

University of Applied Sciences Kempten

M.A. Global Business Development

Circular Economy

A Model for the Canaries?

Course: International Relations

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1. Introduction

The business ideas are based on the approach of the Circular Economy for the Island of Tenerife.

The current paper emphasizes to be a summary of sustainable business ideas and research, based on the lecture of international relations, held in the winter term 2019/20 at the University of Applied Sciences in Kempten, Germany.

The general approach is to support the island of Tenerife by creating sustainable business ideas related to the circular economy business model. Therefore, students collected ideas, proofed them during a field research on the island and developed these ideas after they returned home.

There are two relevant business models which affect this research paper. The linear business economy model and the circular business economy model. While the linear business economy model does not focus on sustainability, the circular economy business model does. The linear business economy model starts with designing a product, sourcing materials for the production, manufacturing the product, storing the product until it is used or while it is not used. After its lifecycle, the product gets landfill, it has a negative environmental impact and no further use (Geissdoerfer, Vladimirova and Evans, 2018, pp. 402–403). The circular business model tries to loop the product lifecycle at the point when the end of the first product lifecycle is reached. This approach generally decreases the environmental impact of products. For example, fresh paper is used for printing newspapers. These newspapers are thrown away but collected by a recycling company. The recycling company sells it to another company which is able to use this old newspaper to produce, for example, recycled copying paper. (Geissdoerfer, Vladimirova and Evans, 2018, cf. 403-408)

1.1. Task description

The task of the students, joining this research paper, was to find sustainable business ideas for Tenerife on the Canary Islands. Therefore, three to five sustainable business ideas needed to be created within the group. As location factors can have a huge impact

on the business ideas, they needed to be analysed. In addition, the students should understand and apply theoretic models and methods.

1.2. Goals of the group research paper

There are three main goals of this research paper: First of all, it has to be verified that the approach of the circular economy business model fits to the island of Tenerife and that this economic business model creates a sustainable and positive outcome for the ecosystem of the entire island of Tenerife. Secondly, three to five sustainable business ideas which question the circular economy business model need to be developed and described within this research paper. Thirdly, the developed business ideas should generate the basement for further research for governmental or non-governmental organizations, universities or entrepreneurs which are situated on the island of Tenerife. The above-mentioned institutions could use the outcome of the students' research to further develop the circular economy business ideas or to use the students' business ideas as an input to create their own business ideas. All in all, the students' business ideas based on the business model of the circular economy should generate a positive outcome for the ecosystem of Tenerife.

1.3. Structure of the paper

The structure of the research paper can be described as the following: By introducing the reader to the topic of this paper, the general approach is described. The overall tasks and goals of the research and its documentation are outlined. In the second chapter, background information about Tenerife is given. It deals with the topics of economy, education, geography, history, culture, demography, laws and politics. The third chapter analyses the external location factors. This is done by the PESTEL Analysis and the Porter's Diamond model. The fourth chapter deals with the sustainable business ideas of the participating students. The business ideas, their ideation and development process are therein described. The ideas are created from the following topics: recycling, usage of banana leaves, renewable energies, insects as a basement for nutrition, mobility and information technology. The fifth chapter leads us to a critical review of the business ideas and reflection. It includes an outlook and the possibilities for further research.

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2. Background Information

2.1. Economy

Tenerife belongs to Spain and is therefore part of the European Union. But together with the other Canary Islands, Tenerife makes up the EU special zone called “Canary Islands” which results in some differences regarding EU regulations. The most important difference concerning the economy are the distinct tax and customs regulations. Tenerife has no value added tax but instead a so-called local tax on consumption (European Commission, 2019). Therefore, the respective tax rates vary depending on the goods.

On the island, the tertiary sector represents the strongest economic sector which is attributed to the tourism. But also, the primary sector, which means the agriculture, is very important for Tenerife (Cabildo de Tenerife, 2019). Here, the cultivation of different fruit and vegetable varieties, of plants and flowers as well as of grain and rice plays a major role (Parallelus Canary Islands, 2015). Especially the cultivation of bananas has to be emphasized as bananas are considered being the most valuable fruit for Tenerife (Spain-Tenerife 2019). This value is expressed in the export numbers. More than 90% of the cultivated bananas are exported (Sonniges-Teneriffa, 2017). However, the majority of the other cultivated food products are also intended for the export.

The labour market on the Canary Islands is characterized by small and medium-sized companies. Those enterprises employ only a few workers. One third of the companies employ five or less employees and about half does not employ people at all. Unemployment is a significant problem on all the islands. In 2018, the unemployment rate amounted to 20 % and is thereby 5% higher than on mainland Spain. The majority of the people without labour occurs from the service sector, followed by the construction industry and by few non-workers in the industry and agriculture sector (European Commission, 2019a). In detail, occupational groups as cashiers, salespeople in retail stores, reception workers, gardeners, taxi and bus drivers or fitness trainers are mainly affected by unemployment (European Commission, 2019b).

Despite the challenging labour market, some sectors find themselves in an economic upturn. Through the high importance of tourism, most of the job vacancies can still be found in the service sector. But the surplus of qualified people for these jobs results in a

high unemployment rate as well. Further job opportunities can be found in building construction, repair and maintenance of ships and the film industry (European Commission, 2019c).

Overall, it can be observed that the economy of Tenerife is strongly depending on tourism and on the export of agricultural products. Furthermore, the high unemployment rate occurs predominantly in low-wage work and affects especially jobs in the service sector.

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2.2. History and Culture

History

The island arose, about 1.300 kilometres away from Spain right ahead of Morocco and the Western Sahara, seven million years ago through volcanic activity. (Wagner Patrick, 2019) The original inhabitants are called Guanchen (Arge Archäologie, 2017).

Within the 15th century the inhabitants of Tenerife capitulated to the Spanish conqueror after several attempts to take over the island, due to its high strategic location, connecting the three continents of Europe, Africa and America. Today the island holds a strategic position for tourism and trading routes. (Why Tenerife, 2019)

Culture

Since the 15th century, when Spain officially governed the archipelago, Tenerife has been under the influence of the Spanish culture. Therefore, the mindset of the Tinerfeños is still like the Spanish one, for example the lunch break called 'Siesta', when many stores close during the noon. Most of the public holidays on Tenerife, called 'Fiestas', have a religious origin, as most of the Tinerfeños are catholic (Anscombe, 2018).

Public holidays:

1. January	Año Nuevo/New Year's Day
7. January	Epifanía del Señor/Epiphany
2. February	Tenerife "island day" for patron saint Virgen de la Candelaria
18. April	Jueves Santo/Maundy Thursday
19. April	Viernes Santo/Good Friday
1. May	Fiesta del Trabajo/Workers' Day
30. May	Día de Canarias/Canarian Day
15. August	Asunción de la Virgen/Assumption
12. October	Fiesta Nacional de España/Spain Day
1. November	Todos los Santos/All Saints Day
6. December	Día de la Constitución Española/Spanish Constitution Day
25. December	Natividad del Señor/Christmas Day

Reference List:

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2.3. Education

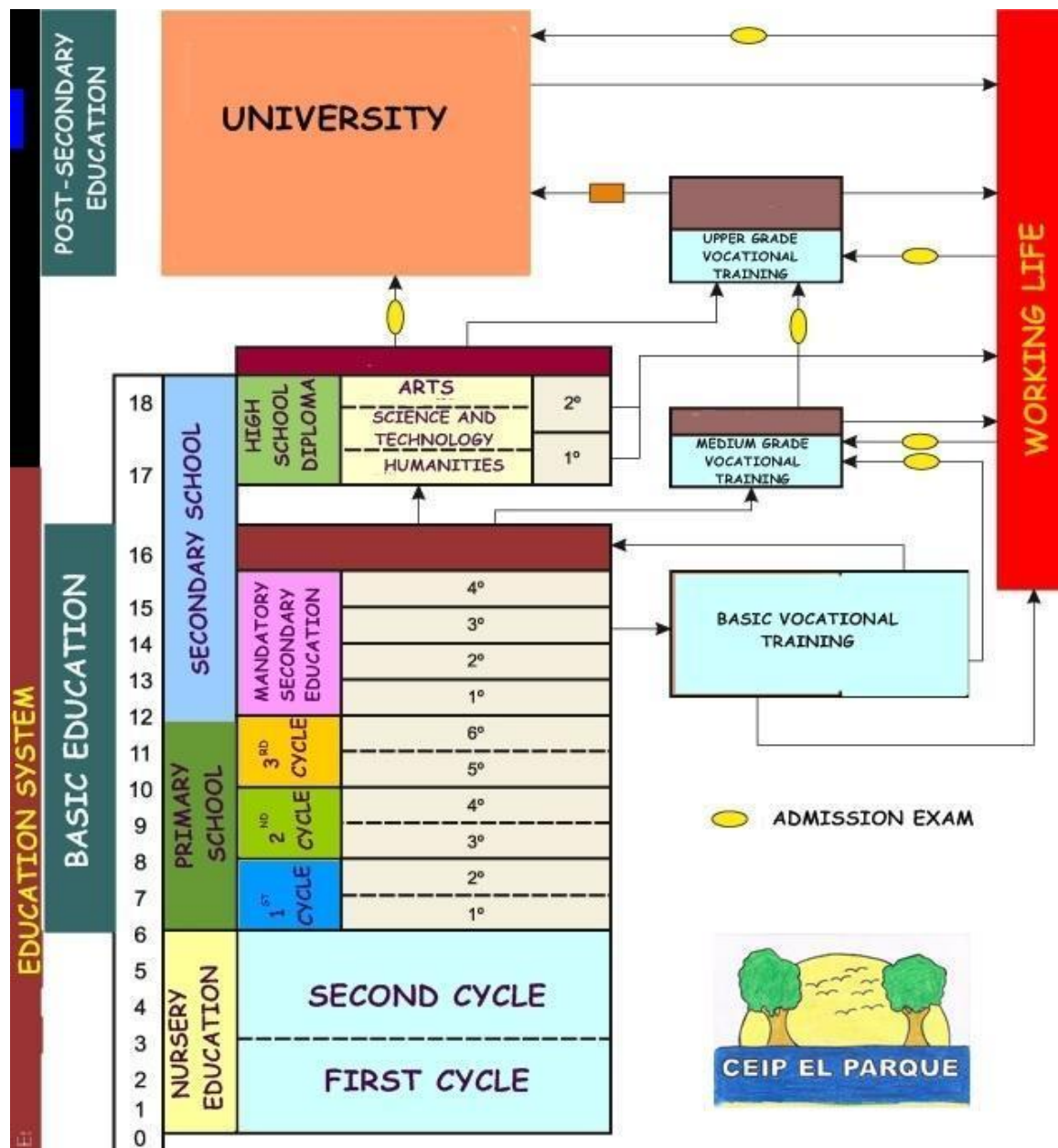


Figure 1: Spanish education system; Source: Educa, 2015

On Tenerife is the same education system like in Spain. Compulsory schooling is from 6-16 years and preschool is possible too. (Educa, 2015). Primary and secondary schools concentrated on 3 parts of the island: Adeje (south), Santa Cruz (north), Orotava (north-west). In addition, there are many private language schools where Spanish is taught. The following list shows the existing educational institutions of the island:

Colleges / Universities, mainly in the capital Santa Cruz, are specialized in:

- Music
- Business management
- Tourism
- Film technology
- Marketing
- Architecture
- Pharmacy & Medicine
- Art & History
- Physics and other natural sciences

(Cabildo de tenerife, 2019)

In general, the colleges and universities need to be paid:

- Public institutions: 680€ - 1.280€ per semester
- Private institutions: 5.500€ - 18.000€ per semester (Yaq, 2019)

The biggest University on the island is located in La Laguna (University of la Laguna). There are almost 23.000 students and the most offered courses have a bachelor's degree with 240 ECTS. As part of the European Union degrees / records are recognized (Universidad LaLaguna, 2019).

Reference List

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2.4. Geography

Tenerife, also called as the “Volcano Island” has an area about 2034,38 square kilometres. The island was formed by volcanic activity 12 million years ago and is still volcanically active today. Furthermore, Tenerife has the largest mountain of Spain, el Pico del Teide, which is 3718 meters high. In general, Tenerife is a very mountainous island. (Szönyi, 2009)

The complete island is declared as a light protection area, meanwhile also more than half of the islands are nature reserves (Instituto de Astrofísica de Canarias, n. d.). The climate of Tenerife is characterized by mild temperatures all year (average temperature: between 17 and 24 degrees) (Spain-Tenerife, 2019). In addition, Tenerife, with its unique climate and geography, is the best place for biodiversity from the Canary Islands (Tenerife Information Centre, 2019). Tenerife therefore has a wide variety of vegetation, about 140 specific plants can just be found on Tenerife only (Tenerife Information Centre, 2019). On Tenerife six types of vegetation can be found, one of them is the dry climate with many hours of sunlight. A lot of the endemic plant species can be found in this region (Tenerife Information Centre, 2019). Furthermore, there is a topographical affiliation to Africa (Morocco – Tenerife: 250km) (Tenerife News, n.d.).

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3. Analysis

3.1. PESTEL Analysis

The PESTEL Analysis focuses on five different aspects. These aspects analyze the external factors. In case of this research paper, the five aspects analyze the location factors of Tenerife. The shortcut PESTEL stands for political, economic, social, technological, legal and environmental aspects. The aspects of the PESTEL Analysis for Tenerife are further described in the following paragraphs. This PESTEL Analysis has also the function of summarizing the background information about Tenerife which has been given in the chapter above. The quotes of this chapter are the same as the ones in the chapter of background information and can be reviewed above as well.

Political Aspects

- Capital of the islands: Santa Cruz de Tenerife
- Huge political autarky from mainland Spain
- Democratic system
- European rules and laws
- Special funds from the European Commission to develop the outstand areas of Europe

Economic aspects

- Special Tax aspects
 - Normal Rules of European Union don't apply
 - Reduced Tax rate based on consumption (IGIC), 6,5%
 - 4% ZEC corporate Tax
 - Economic sectors
 - Tourism (Contains 85 % of companies and 85 % people out of the workforce)
 - Film industry
 - Agriculture
 - Production of tropical fruits, bananas, wine
 - Industrial sector
 - Construction site
- Low cost for staff, low minimum wage

- About 20 % unemployment rate

Aspects of social society

- Education
 - Clustered centers for Education
 - Universidad de La Laguna with about 24.000 Students
 - Possibility of Bachelors, Masters and PhD
 - Studying fees of 680 € to 1280 € per Semester
 - Lifelong learning possibilities: Universidad para mayores
- Demography and people
 - About 1 Million inhabitants
 - 400,000 families
 - 12.6 percent people from foreign countries
 - Average age 42 years
 - Change from agricultural society to service society
 - 85 percent of employed people work direct or indirect for tourism

Technological aspects

- Infrastructure
 - International airport in the south of the island
 - Domestic airport in the north of the island, near La Laguna
 - Modern roads, highway connects international airport with touristic south, Santa Cruz de Tenerife, La Laguna and Puerto de la Cruz, Ring is not closed yet, hilly mountains in between
 - Just busses, no trains
 - Public mobility is provided by busses, but mostly private cars are used
 - Volcano in the middle of the Island
 - Difference of Altitude on the island is about 3700 meters
- Technical Infrastructure and institutions
 - Basic energy supply mostly done by Diesel generators
 - Often blackouts within the energy supply
 - Supercomputer and transatlantic high-speed fiber-optic cable to Africa, mainland Spain, north and south America
 - ITER Center for Information Technology and Renewable Energies

Legal aspects

- Autonomic province of Spain, not all decision and rules of mainland Spain apply
- European Territory, European law, European Benefits, European Rights
- Specific tax laws to support local economy

Environmental aspects

- Climate
 - Constant climate throughout whole year, average temperature around 20 degrees
 - Different vegetation zones because of winds, altitude and rain differences
- Volcanic island
- Island, around 1300 km away from mainland Spain, Africa is close by
- The north of the island is cooler and greener than the south
- Water is a rare resource, not a lot of rain on the island during the year

3.2. Porter's Diamond Model

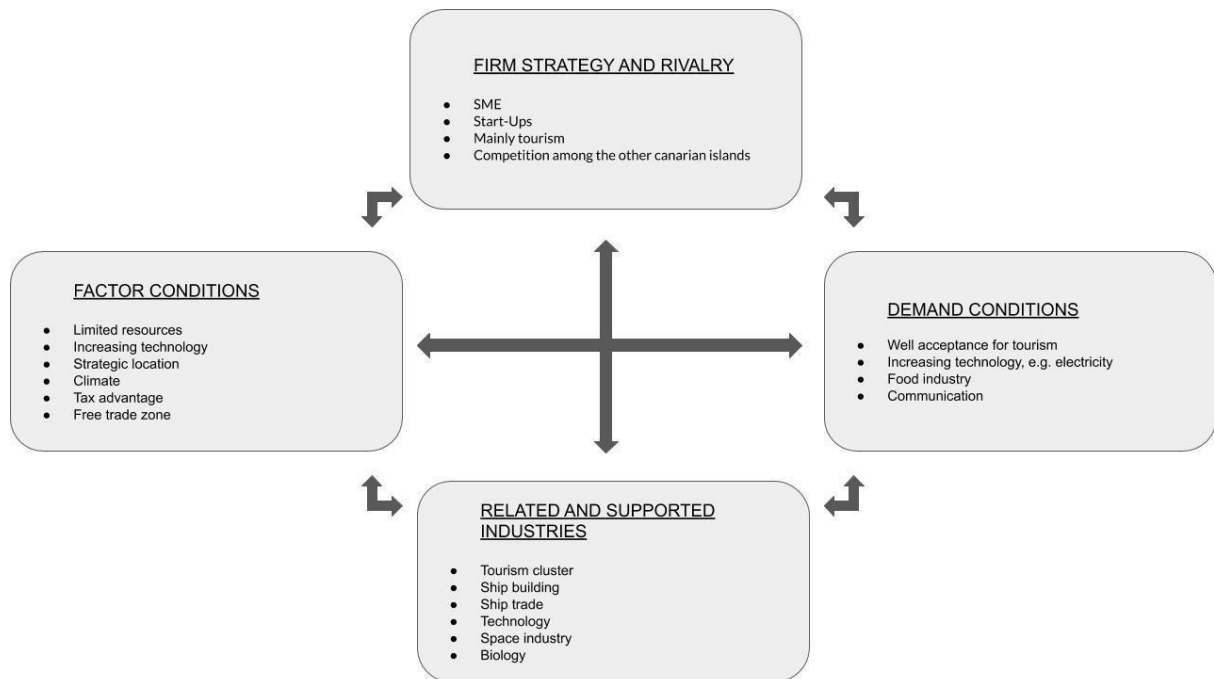


Figure 2: Porter's Diamond Model; Source: Own illustration

Porter's Diamond Model is focusing on four main factors, to explain why certain industries are internationally more competitive than others and which business segments are more likely to develop promising. In this case, the model measures the international competitiveness of Tenerife and explores which circumstances are already given to build up a successful business on the island (Recklies, 2015).

Small and medium sized companies and start-ups are very likely to develop on the island due to the limited space, given by its position as an island. According to the very welcoming and stable climate businesses within the tourism segment are very common (Kramer, 2019).

Since Tenerife is just one of the Canary Islands, there is a high rivalry amongst the islands regarding the takeover of tourism. Given to the island is already the acceptance of tourism on both sides. To the tourists but also to the inhabitants of the island (Excursion Tenerife, 2019).

Newer approaches of the islands focus on technology, the food industry and the communication on the island, which has been developing very promising over the last

several years and still is in progress. Therefore, they could be developing and promising segments on the island (Excursion Tenerife, 2019).

Another very supportive industry on the island is the ship building, trading routes of cargo ships and cruisers. Caused by Tenerife strategic location connecting Europe, Africa and America (Why Tenerife, 2019). Another attractive benefit of Tenerife is the tax-free zone at the harbor. This makes trade between the continents more easily and offers great advantages for creating a business on the island. Furthermore, Tenerife has the lowest income tax rate (4%) for businesses within Europe which attracts the island as a location decision (Why Tenerife, 2019).

Regarding to the Thomas Cook bankruptcy the numbers of tourists have been decreasing - this shows the dependency on the island of the tourism sector (Bornewasser, 2019). Therefore, an economical spread would make higher security to the island and provide more than one mainstay. The creation of an overall view of possible economic sectors is the goal of this term paper.

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4. Sustainable business model

Business model 1:

4.1. GetOn

It's your choice!

Marius Nedele
Stephanie Scheitz
Vanessa Stein

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Business Idea Development:

In order to develop a reasonable business idea around the topic of IT, a brainstorming session was first held. The resulting ideas were then divided into categories. The following mind map (see Figure 3) gives an overview of the broad field of it.

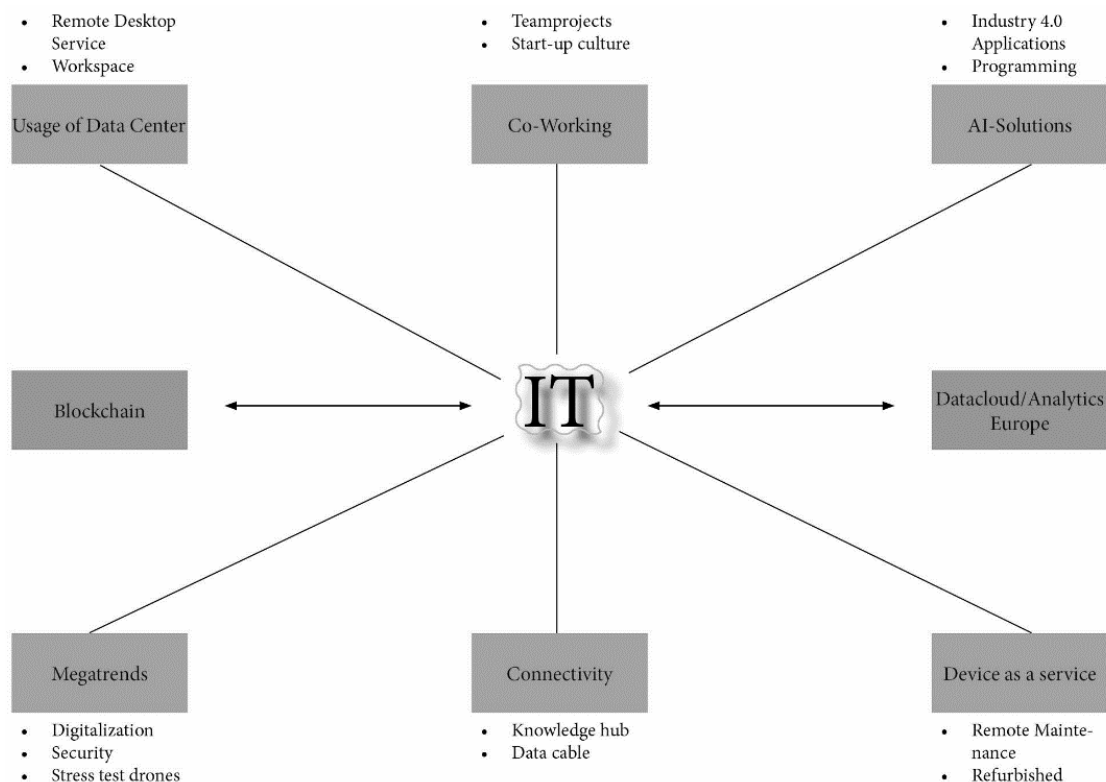


Figure 3: Brainstorming ideas in the IT sector; Source: Own illustration

To structure these results, the following diagram (see Figure 4) “IT House” was developed.

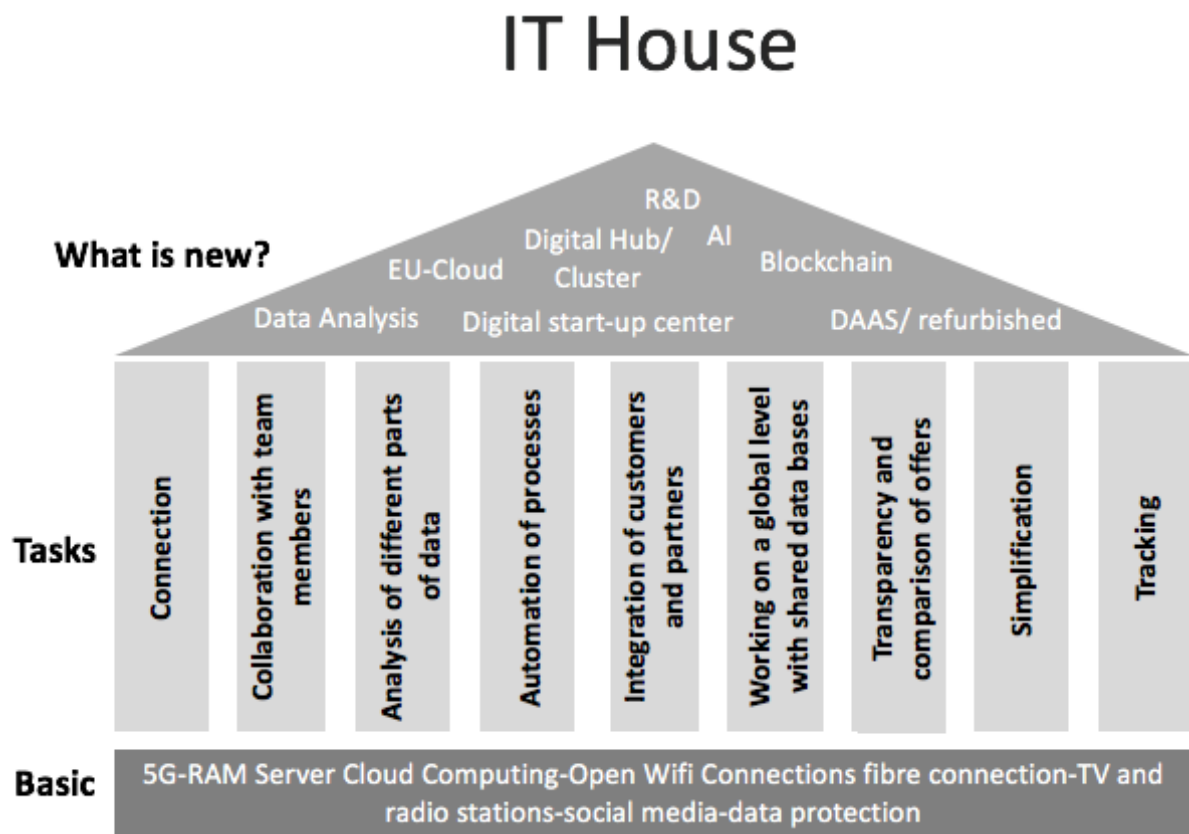


Figure 4: IT House Tenerife; Source: Own illustration

The IT House is based on hardware technologies which are currently important or changing in the sector. These are 5G, RAM Server, Cloud Computing, Open Wi-Fi, fibre connection, TV, radio stations, social media and data protection. The middle part states out general tasks IT has to deliver nowadays. These include, among others, automation of processes, simplification and working on a global level with shared data bases. The bottom states out the technique, the island currently has (Bahny, 2014). Out of that, ideas were formed which are placed into the top of the diagram. Behind all that, the plan was to investigate into future technologies and build up competencies on the island (Excursion Tenerife, 2019). One of the main drivers could be Blockchain. This technology is going to impact a lot of industries, for example the banking sector in case of organizing transfers (Investopedia, 2019). Furthermore, creating a center on the island, where IT hardware can be refurbished, could be also an idea for circular economy. This might be possible because of the geographic position next to Africa, where a lot of technical products are being shipped (Ottaviani, 2014). Another IT-idea came up with the announcement of Mr. Altmaier. He is planning to do a Cloud for Europe under the project name Gaia-X (Sigmund et. al., 2019). Because of the already existing supercomputer, the island could

be attractive and suitable to place the server for this project (ITER, 2009). Creating a technological aligned business is in general attractive on Tenerife because the reduced tax rate of 4% regarding to corporate income tax (Why Tenerife, 2019). This might lead to a start-up centre for technology companies.

To check whether any of these ideas or technologies have already been implemented on the island, some research was carried out. Here it figured out, that there are some companies already working with blockchain technologies on the island. So, this approach was rejected (Mesa, 2019). Besides that, supporting institutions for start-ups are present as well (Startupblink, 2019). After all these points had been examined in detail, a great uncertainty arose as to whether it was even possible to implement a circular business model in the IT sector. With this status quo it was generally decided in the group, that a circular business idea based exclusively on IT would become too complex and technical. Due that Artificial Intelligence, Data Mining, etc. are also pushed by the government it was decided to split up the IT team and move the members to the remaining teams. In general IT was seen more or less as a basement need or standard for the other ideas and not as a “stand alone idea”. On Tenerife a general brainstorming session of all ideas was held. Here it became clear that it was not necessary to base an idea exclusively on IT elements. Thus, an IT group (Vanessa, Marius & Stephanie) was formed to find a circular business idea based on IT solutions (Excursion Tenerife, 2019).

Problem Introduction:

The island at its own is 83.3 kilometres long and up to 53.9 kilometres wide (Sevenislands, 2018). One of the main problems of Tenerife is the critical traffic situation on the island. Especially the motorway TF-1 faces a huge traffic jam problem. The TF-1 is a motorway that connects the eastern and the southern parts of the island and has a length of 103 km (Webtenerife, 2015). Long traffic jams around the roads to Golf del Sur and San Miguel are daily business for drivers on the TF-1. An average of 75,000 cars are affected each day (Lee, 2017). This number is rising on a more general view up to 200.000 affected cars every day on the island. Traffic jams can be up to 15 kilometres long. This means that drivers have to plan a lot of time for their journeys at peak times (Berástegui, 2019).

Current Situation:

Public Transportation mainly consists of busses and trams (Santa Cruz - La Laguna). There already exists a special lane for buses which runs along the northern motorway for several kilometres. There, busses can pass the traffic jam because of the extra lane for busses (Excursion Tenerife, 2019). TITSA (public transport agency) also expanded the line network of the busses to make public transportation as attractive as possible. Currently there are 3,700 bus stops placed all over the island (Titsa, 2015; Excursion Tenerife, 2019). In total, 90% of the people are using their own car. Just 10% are about to use public transportation (Berástegui, 2019).

The platform BlaBlaCar is used moderately on Tenerife. This was confirmed by Mr. Rodrigo of la Universidad de La Laguna. According to him, BlaBlaCar does exist on the island but it is hardly used by the population. Reasons for this were cultural aspects such as the desire for flexibility and independence (Excursion Tenerife, 2019). An existing provider, Lovesharing, is offering a flexible mobility solution based on sharing of electric cars, e-scooters and e-bikes. It provides an “all in one” package which includes e.g. insurance, 24-hour roadside assistance, maintenance, repairs and recharging points on the island. Currently e-scooter are used in Santa Cruz (Lovesharing, 2019; Excursion Tenerife, 2019). Unfortunately, there are no more information available about the usage of car sharing actually. In addition to pure car sharing providers, car manufacturers have already established various car sharing solutions. e.g. BMW - drive now (DriveNow, 2019) or Mercedes - car2go (Car2go, 2019). Toyota implemented the “Toyota Car Pooling App” for companies to organize rides between colleagues. There are many other examples of car manufacturers which try to reduce the Co2 pollution (Toyota Carpooling, 2019). Unfortunately, those providers are only in big cities nowadays and do not offer their solutions on Tenerife (DriveNow, 2019; Car2go, 2019; Toyota Carpooling, 2019).

According to Mr. Rodrigo from the University of La Laguna there are no possibilities to build further roads on Tenerife at the moment. This has historical backgrounds, since some areas of the island are privately owned by inhabitants. Therefore, expanding the highway with another lane for cars to solve the problem is not possible (Excursion Tenerife, 2019). With this knowledge a circular business idea was developed, which avoids the private property problem and still solves the traffic problem of the island. This circular business idea is introduced in the following chapters.

The Business Idea:

One of the first ideas was to introduce a carpool lane in addition to the bus lane (Excursion Tenerife, 2019). A carpool lane is a major road or motorway that is reserved for vehicles with a minimum of two passengers, designed to encourage carsharing (Collinsdictionary, 2019). The idea is to reward shared rides by reducing the daily travel time. In addition, a reward system could be introduced to ease traffic at peak times (anti cyclical driving). This system would not reduce the number of cars in total but downsize the travel time extremely (Funke Media, 2018). This benefit system could also be connected to Blockchain. One example would be that drivers receive coins for not driving in the rush hour (Excursion Tenerife, 2019). As these ideas are dependent from the government and not fully integrable to the circular business model the business idea was focused on a more technical approach. The following illustrations (see Figure 5 & Figure 6) shows the advanced carsharing platform getON! by canvas and the components of the business idea which could be the solution for the mobility problem on Tenerife (Excursion Tenerife, 2019).



Figure 5: GetON! model canvas; Source: Based on model canvas by Florian Hofmann

The business idea of GetON! is going to developed and explained based on the business model Canvas as a strategic tool (Hoffmann, 2018). GetON! is an online platform, as well accessible via application, which connects ride and car sharing together with social media tools paired on a benefit program. This business model can help to reduce traffic and time as well as CO2 pollution. In general it is a flexible used solution which fits for everyone.

As key resources, basically an IT infrastructure and software, the government and corporations are needed. For ride sharing, the platform suits the already on the island implemented BlaBlaCar (BlaBlaCar, 2019). Several car sharing suppliers can be city cars or manufacturer owned systems like “drive now” from BMW in the future. Furthermore, existing local providers like “Lovesharing”, who mainly offer electric scooters for rent, can be integrated. Social media platforms like Facebook, Instagram or WhatsApp will help the users to organize their shared drives or cars via already implemented and used groups. The merger will result in a large volume of online traffic which is significantly greater than any single provider could ever achieve. Since the main target group of getON! are the generations Y and Z influencers will be used as a strategic marketing tool. In this way, advertising is actively perceived by potential getON! users (YouTube, 2019). To attract the locals (younger and older generation), a benefit system or loyalty program (e.g. vouchers of local companies) need to be enforced. One example could be, that if a user books a BlaBlaCar ride via the getON! platform, the person gets a one Euro coupon which can be redeemed in participating shops. For the sake of clarity, the system is summarized once again in the following figure (see Figure 6). In general, this system will reduce the traffic and has also a sustainable effect on the environment. To make a change it is important to attract the locals by benefits. Why driving alone anymore?

In average cars are used about one hour per day (see Figure 6) (Johnson, 2015). Therefore, the integration of the private carsharing of the own car could also be implemented in the getON! platform. To prevent cars from standing around unused, people can offer their cars for rent and earn money for that. The period of the car lending / renting is flexible. Duration from one hour to two weeks or more are possible. In this way, the parking problem on the streets can also be solved (Reverón, 2019). For the implementation of this model cooperations with insurance companies are necessary. Thus, in case of vehicle damages, the repair and maintenance of the cars are guaranteed. After seeing that it takes some effort to get in the market, the project intends to earn money operating in the economic environment. The main income is generated by an agency fee collected per trip which is being booked. Furthermore, the platform is going to generate a huge amount of data. This could be sold to several shareholders, for example companies dealing with navigation and movement, car manufacturers, the government, insurance companies, survey companies, etc... The financing of the project can be handled through various channels. One opportunity is, to make the companies offering the cars pay an entrance fee in advance to get into the channel. Another form of financing, which is by the

way very trendy in the last decade, is crowdfunding. Some other, rather classic possibilities are taking a loan from an investor, finance companies, grants, or to get a credit from the bank. The most cost intense part is going to be the interfaces between the different providers (Hills, 2013).

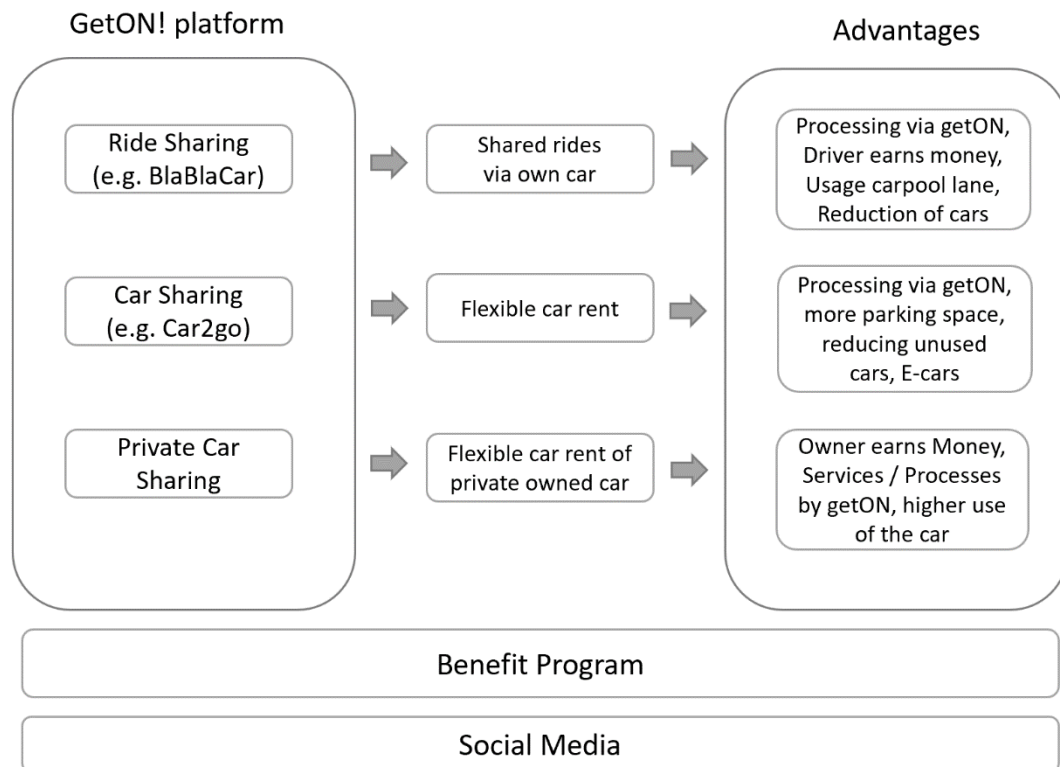


Figure 6: components of getON!; Source: Own illustration

Figure 6 visualize and summarize the system of getON!. Hence, following the illustration from the left to the right, provided is the online platform, bringing together the mobility sharing approach with the people. This is made possible through shared rides and flexible renting. In total, the whole concept is connected with advantages for all of the different stakeholders which are described before.

SWOT- Analysis

In the first steps of a business, analysing the internal and external factors is crucial. Hence, a tool for doing a quick investigation about the important factors has to be done.

In order to identify potentials and weaknesses of getON! and to get a better understanding of the market in general, a SWOT analysis (see Figure 7) was executed. The SWOT analysis helps to define a strategy for the business idea by analysing the strengths, weaknesses, opportunities and threats.

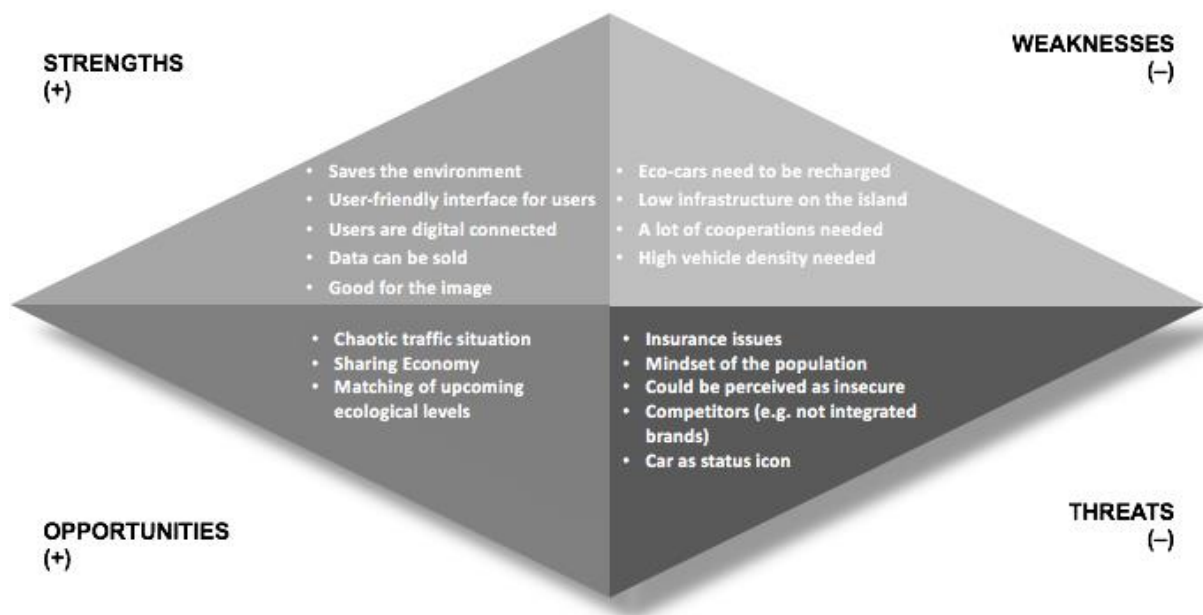


Figure 7: SWOT general business of getON!; Source: Own illustration

Strengths

The strengths of getON! are that the users are connected thanks to social media. It is also a very user-friendly and easy to use platform. Due to the lower CO2 emissions, the environment is protected. In addition, provided e-cars e.g. of Lovesharing are quieter than fuel cars. By setting up their account, users give getON! their consent to the evaluation of their personal data. This data can be analysed, evaluated and then offered for sale to companies.

Weaknesses

In the case of using electric cars by e.g. Lovesharing, those have to be charged regularly. Unfortunately, there are not many of these charging stations on the island yet. The infrastructure is still very weak in this aspect (Guerra, 2019). Besides that, many vehicles have to be brought onto the roads. Currently, there is just one provider, Lovesharing, which might be an option for a cooperation. The issue is, that the supplier only has a very limited number of vehicles. Only if there are enough cars available, getON! might be accepted by the inhabitants. In order to realize this, a lot of company collaborations and persuasiveness to state out the possibilities is necessary (Excursion Tenerife, 2019).

Opportunities

The biggest opportunity for getON! is the chaotic traffic situation on the island. Due to the few motorways and miles of traffic jams are a daily business for drivers. In addition, more and more people are attaching importance to a green environment. Car sharing and electric cars address these values. Car sharing can be classified under the term Sharing Economy. Sharing Economy is a collective term for companies, business models, platforms, online and offline communities and practices that enable the shared use of completely or partially unused resources (Oberhuber, 2016). Car sharing thus prevents cars from standing unused on the parking lot. Furthermore, getON! is addressing the actual megatrend, which means that there might be a vast potential behind the project (Zukunftsinstitut, 2018).

Threats

The biggest risk in the implementation of getON! are the cultural aspects and related mindset of the inhabitants of Tenerife. People place great importance on being flexible and independent. Even the public transport is not used, although it would be a lot cheaper for the users (Titsa, 2015). The own car is perceived as a status symbol for people of Tenerife. By sharing the cars, those are used by many different customers within a short period of time. Therefore, there is a risk that a previous customer has not fulfilled his obligation to report the damage and that damage will not be attributed to the actual causer. So the implementation of a simple, flexible and cheap solution at the same time is going to be difficult. The vehicle insurance cover should therefore be questioned carefully (Excursion Tenerife, 2019).

In addition to the SWOT, also an analysis of the market has been done, by using the Five Forces model by Porter (see Figure 8). In the matrix, the influencing variables suppliers, new entrants, buyers, competitors and subsidiary products have been analysed. As a conclusion of the investigation, establishing a business in this area involves certain difficulties which have to be managed and will be described in the following chapter.



Figure 8: Five forces analysis of getON!; Source: Own illustration

Challenges & Difficulties:

The biggest hurdle in the implementation of the idea is the mindset of the people of Tenerife. Especially the elderly doesn't want to share their car with others and do not want to give up their independence that comes with their own car. Also, the public transport is not used as often as desired. As it is given by statistics, only 10% of the travels are done with public transportation (Berástegui, 2019).

Nonetheless the younger generation is more open concerning car sharing. As it is possible to see in the picture above (see Figure 9), that to a large extend, 43% of the students are up to share their car.

PREDISPOSICIÓN A COMPARTIR EL VEHÍCULO		
COCHE CONDUCTOR		
¿Estaría dispuesto a compartir su vehículo?	Alumnos	%
En absoluto	63	5,42%
En poca medida	241	20,72%
En gran medida	505	43,42%
Totalmente dispuesto	354	30,44%
Total	1.163	100%

Figure 9: Willingness of carsharing; Source: Questionnaire Universidad LaLaguna, p. 27, 2016

As shown in the diagram the younger people are likely to share their cars with others. This means that there is potential for this business idea. On the other hand, there are currently too many elderly people living on the island. Due to the emigration of the population, the birth rate drops significantly. The consequence is the rising average age on the island, which is almost 39 years. The number of the younger population decreases accordingly. In the province of Tenerife almost as many senior citizens live today as children under 14 years of age (Wochenblatt, 2012).

Another aspect of the business idea is connected to some issues. Bringing the own car requires a huge insurance company, a massive program for service, technical solutions for the hand-over of keys and the most crucial point: people bringing their own car into the system. In order to offer the own car for car sharing, many security issues need to be clarified. This frightens people away from providing their car for these purposes. After the introduction of the business idea on Tenerife, the audience reflected, that they rather not tend to give away their own car. Thus, this part of the concept could be cut off, which is not suggesting an impact on the whole idea. It is only a part that falls away. Furthermore, the parking situations in lots of cities are critical. By using new shared cars and intelligent parking technology, the car is able to show empty parking spots, which are close by (Bogoslavski et. al., 2012). Another aspect that for now there is only one car sharing provider (Lovesharing) on the island. It will need some time that BMW and other car manufacturer will implement their business on a small island like Tenerife (DriveNow, 2019).

Conclusion:

Finally, it can be said that getON! is the solution to solve the traffic problem on the island but due the high average age of locals, cultural aspects, fear of flexibility loss by locals and the lack of car sharing providers makes the system for now a challenging solution for the population. The benefit program of getON! is therefore the main driver to change the mobility behaviour of the locals. The team getON! is therefore sure that in the future the island needs to implement such a solution but is aware that the process of changing a culture will be a long way. Tenerife is just not the right place to start the project at the moment. However, it could be a success in due course on a global scale. Due to megatrends, owning a car is tending to become less important to people. It will be more about mobile flexibility and services to getting around by limiting private car ownership,

optimizing shared mobility, and expanding public transit (Hannon, et. al., 2016). According to an article of McKinsey, shared vehicles could account for almost half of passenger miles due to a combination of greater utilization and more passengers per trip by the year of 2030 worldwide. It is also said that this shift will help to clear the air of pollution, time, optimize the use of resources and therefore improve the quality of life for billions of people (Hannon, et. al., 2016).

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Business Model 2:

4.2. Combat Ocean

Time to change the wave!

Lucia Anft
Annika Bleicher
Jennifer Metschir

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1. Introduction

“Water and air, the two essential fluids on which all life depends, have become a global garbage can” (Jacque Cousteau). The idea of recycling has already been established in the very first brainstorming session. The sentence garbage is tomorrow's gold (Ministerium für Umwelt, Klima und Energiewirtschaft, 2015) was somehow inspiring and the idea to create something good and new out of garbage needs a lot more attention. The system and the consumer behavior the world follow at the moment, will not work out until forever. It is frightening to think about how people treat this planet. Although the community is currently on a green wave, trying to implement a sustainable lifestyle, many people are mainly acting superficial. Therefore, the goal of this idea is to inspire people and to create an impact on the planet. Not only by cleaning it, but by changing the wave. Before digging in the aspired solution, it is necessary to create a detailed overview of the topic, to make sure the solution really fits the problem. Consequently, a general overview regarding garbage on the island was created on the first step.

The cruise industry is booming. More than 24 million people have been accommodated and served on the 300 cruise ships worldwide this year. In addition, around 6200 passenger ships are currently on their way on the oceans. All of them produce tons of

waste every day. Each cruise passenger causes up to 2.5 kilograms of food waste, 1.8 kilograms of packaging waste such as plastic and about one kilogram of glass and can waste per day. These quantities have to be dealt with somehow (Platz, 2012). So far, the organic part of the waste is mainly discharged into the sea in permitted zones. In the first place, the organic waste is not toxic for the sea. Nevertheless, as the amount of food waste increases tremendously, the sea starts to over fertilize. Algae growth and lack of oxygen in the water are the consequences (Burkhardt, 2017). The disposal of solid garbage such as paper, plastic and glass are strictly prohibited. In 1973 the “International Convention for Preservation of Pollution from Ships” entered into force. In particular Annex V deals with the “Prevention of Pollution by Garbage from Ships” (International Maritime Organization, 2019). Despite being banned by international law, many ships still illegally dispose their plastic waste "free of charge" in the sea. As Sönken Diesener, a speaker of the German Nature and Biodiversity Conservation Union points out “if you travel to the Canary Islands or the Caribbean on a German cruise ship, you can be sure that waste will go overboard - simply because there is so much waste, and the storage capacity is insufficient”. The consequential costs of the water pollution are mainly borne by the marine life and the coastal communities. These communities which are additionally densely populated and strongly used by tourists in Europe are mainly affected (Lehmköster, 2010). All of these facts were the origin of the business idea, focusing on reducing and recycling the waste generated on cruise ships. However, why should Tenerife be the perfect hub for this concept?

1.1 Tenerife relation

Most favored cruise destinations of german tourists

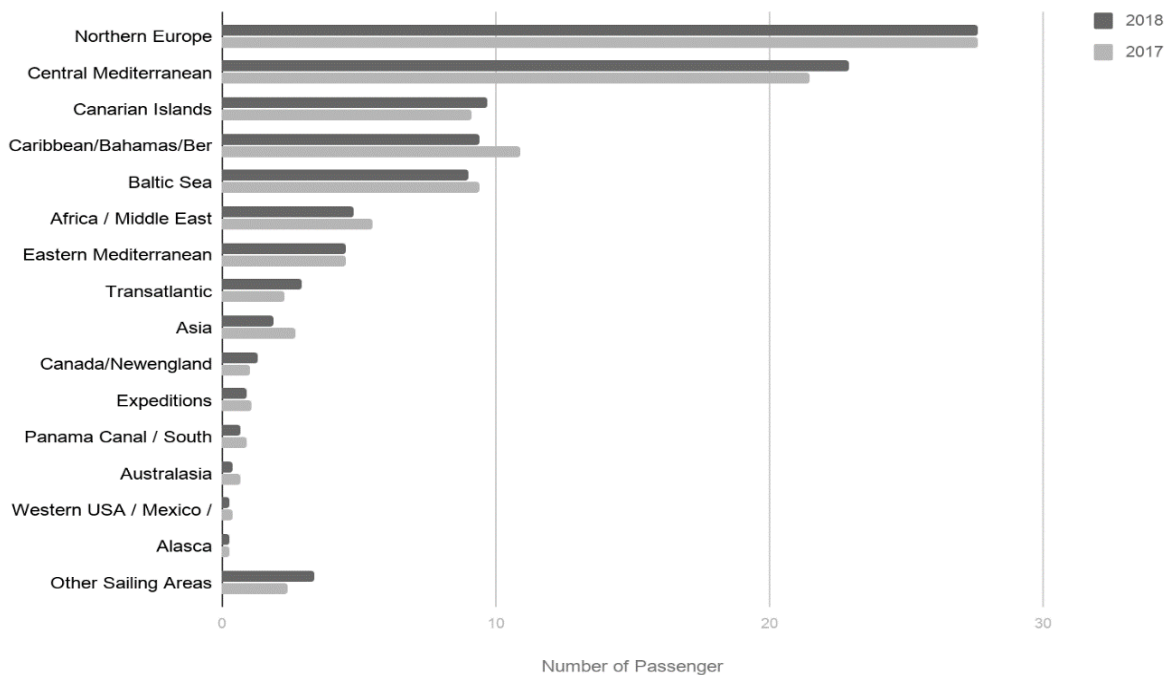


Figure 10: Most favored cruise destinations of German tourists; Source: Own illustration based on Hubert, 2019

Tenerife is the largest island of the Canaries and was founded in the 15th century. The capital, Santa Cruz de Tenerife has developed to a large city with more than 220.000 inhabitants, where the most important harbor of the island is located. As visualized in the diagram below, the Canary Islands are ranked among the top 3 most popular cruising areas worldwide by German tourists (Hubert, 2019). For the upcoming three months, 120 port calls at Santa Cruz de Tenerife are already scheduled (Ministerio de Fomento, 2019). This high number of cruise ships which will dock at the port, puts the island increasingly under pressure. The state of Tenerife has to create conditions that enable ships to dispose their waste at the harbor. Additionally, they have to ensure that the costs for the reception facilities is covered by a fee, as waste management is an expansive process for the government. Consequently, the island faces a huge challenge in finding a way to locally dispose and recycle the waste of cruise ships. Furthermore, the high number of cruise ships off the coast, increases the risk of excessive water pollution and in this connection the contamination of the beaches. Negative effects on tourism could be the result, the government urgently tries to avoid. This is the point, where the business idea will set in. It is not about cleaning the ocean, it's about changing the game - changing the wave. This business idea will tackle the problem at its source and will ensure an improvement of the recycling rate on ships, in order to diminish the amount of waste that will be disposed at the port of Tenerife. Less garbage in the oceans has to be the overall goal.

1.2 Business idea development

The first approach was to develop a local recycling plant on the island. After the exchange with experts in waste management - employees of the “Planta Insular de Residuos Solidos P.I.R.S.” - this idea was discarded quickly, on account of several reasons. The biggest issue is the fact that a recycling plant is uneconomical, due to limited amount of waste produced on the island itself. An additional problem is culture related. To private households it is not common to separate the waste properly. At the moment, plastic paper and glass waste is pressed and transported to Spain and Gran Canaria, as the industry of Tenerife is not capable to fulfill the need of recycled goods (P.I.R.S., 2019). That's why this idea would not have an impact on the ecological improvement of the world and in particular the island.

Still keeping the recycling idea, the new approach was to break down the business concept in order to specialize on just one source of the waste problem. As already mentioned above, ships carry a huge responsibility in generating waste. As the business is supposed to be developed on Tenerife, this next idea was focusing on cruise ships. In summary, the aspired solution was to create a benefit for ships to dispose the garbage in the ports instead of dropping it in the ocean. After several discussions and considerations, this idea was rated as unrealistic and ethical unacceptable.

2 The business idea

The development of several business ideas made a process possible, which lead to a new concept with the mission to connect existing aspirations and technologies to reach a common goal. Therefore, the new idea contains two approaches: the plastic waste concept and the biological waste concept, each offering different solutions to the waste problem, but offered as a combined service.

2.1 Plastic waste concept

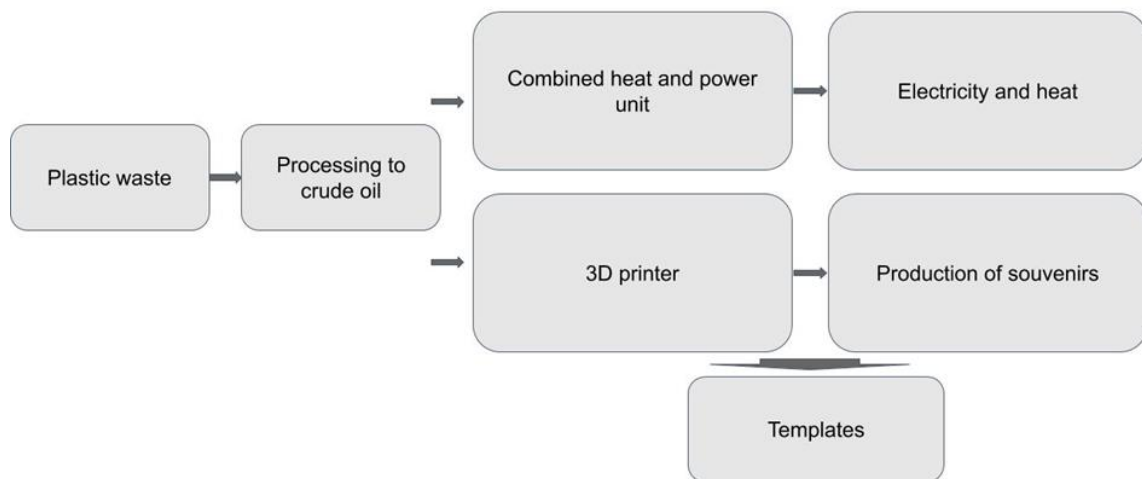


Figure 11: Plastic waste concept; Source: Own illustration

The aspired plastic solution is to find a way of using plastic waste on board to receive a direct outcome for the ship. For example, some AIDA cruisers are already using a combined power and heat unit. To do so, they are using liquid natural gas flow, which needs to be provided and supplied from the mainland (IHR-BHKW, 2019). Hence, the new approach is to reduce the amount of waste onboard by finding a way of how to use the waste in an efficient way. An Austrian scientist has developed a rudiment of how to transfer plastic waste into crude oil by using heat, pressure and certain solvents (MDR, 2019). The crude oil, gained by using the re-Oil process, can be operated in the combined power and heat unit, in order to create electricity and heat. Depending on the amount of plastic waste available, crude oil can still be bought externally to make sure electricity and heat are permanently available.

Another usage for the reused plastic is to create souvenirs for the cruise ship tourists on board by using a 3D printer, as shown in the graphic below. This action follows two objectives. First to increase the awareness of the society for plastic waste produced onboard and second to improve the sustainable image of cruise ships. The purchase price for the 3D printer is calculated to be around 1700 euros. Hence it would be an efficient solution for ships to invest in an own plastics processing plant.

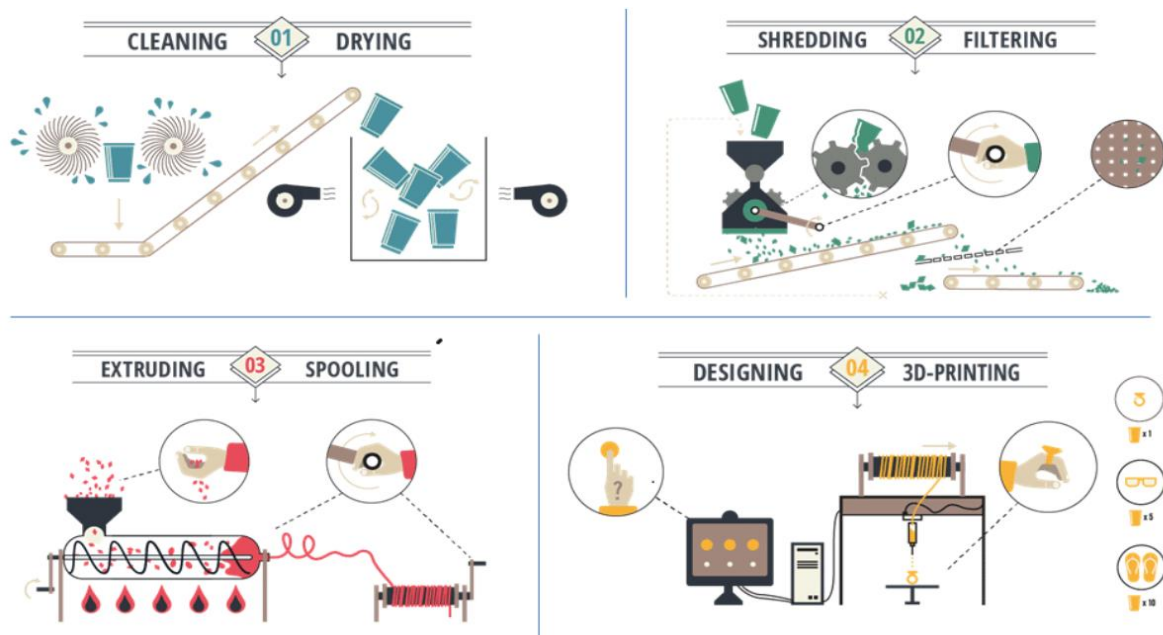


Figure 12: Four steps to recycling material for 3D printers; Source: König, 2015

2.2 Biological waste concept

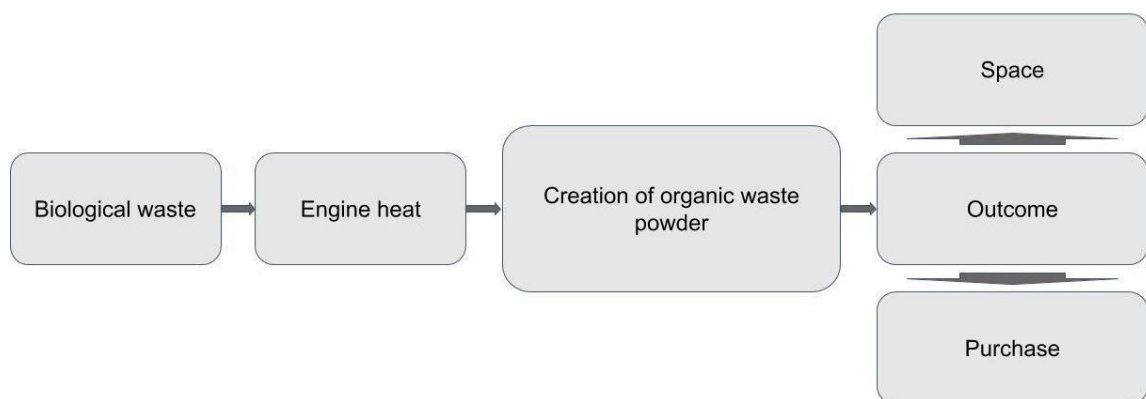


Figure 13: Biological waste concept; Source: Own illustration

Each cruise passenger causes up to 2,5-kilogram food leftovers each day. These quantities have to be dealt with in a way it still complies with the current environmental requirements. As a status quo, cruise ships shred the organic waste, collect it in tanks and dispose it in permitted sea zones legally in the ocean. Alternatively, biological waste is being dewatered and dried on the ships. The dried organic waste powder can then be costly disposed at the next port. Nevertheless, this process is a very energy-consuming one and will not be the solution for the future. Even though it is ecologically questionable, some cruise ships still burn the food leftovers on board in ship's own incinerators.

Especially large cruise ships have such waste incinerator plants (EU-Recycling, 2019). Hence, there is the need of finding a new approach how to deal with the amount of organic waste on the ships.

The recent idea focuses on the utilization of the waste heat from the engines. Two-stroke marine diesel engines are characterized by high efficiencies. Waste heat from engine processes is largely lost to the environment so far (ZHAW Zürcher Hochschule für Angewandte Wissenschaften, year unknown). The first cruise ships such as “Mein Schiff 6” have already started to use the waste heat, as an example for heating the pools on board (Lieske, 2017). The idea behind is built up on using the generated waste heat to make a dried and carbonized treatment product out of the biological waste, without the need of supplied extra energy. A product that contains a large amount of organic acid is the result. The dry solid can be used as nutritious dry feed. Hence, this resulting product is being purchased by Combat Ocean and further sold to livestock farming such as insect farms. In addition, dried organic waste uses less space and facilitates the storage for the cruise ships (Hee Han, 2017).

3. Proof of concept

However, are these ideas feasible? The next abstracts provide a detailed answer to this open question using the business model canvas, the model of Porter's Five Forces and the SWOT Analysis. Each of these tools contributed a lot in working out the unique selling point of the business idea, as well as the feasibility of the whole project.

3.1 The business model canvas

In order to develop the business model in detail and illustrate the idea's potential trade-offs, the Business Model Canvas has been used as a strategic tool. Analyzing the future value proposition, customers, infrastructure and finances help to gain a common understanding of the individual component of the business idea.

What is the Value Proposition?

In 2019 there are about 6500 passenger ships worldwide on the oceans, of which about 300 are cruise ships. All the facilities and amenities on board generate an enormous amount of waste, which contain hazardous substances for the environment. During a one-week cruise, ships produce around 50 tons of solid waste such as plastic, paper or glass (The Ocean Conservancy, 2002). In addition, several tons of organic waste are produced,

which are then shredded and disposed at the oceans. The business idea aims to reduce the amount of plastic and organic waste on the cruise ships in order to prevent to global pollution of the ocean and the world. Recycling plastic and organic waste directly on board of the ships can help to increase the tarnished image of cruisers and additionally creates cultural awareness and change.

What are the key activities?

Combat Ocean operates as a service provider, the most important activities in executing the company's value proposition is the communication. For the utilization of plastic and biological garbage, the company equips the cruise ships with a combined heat and power unit for the gain of heat and electricity. A 3D printer for advertising and ensure the contact and service with the local retailer of these machines. The main activities further include providing service and maintenance for the technical equipment. To market the newly emerging green image of the cruise ships constitutes another part of Combat Ocean's area of responsibility. In addition, purchasing the organic waste powder from the cruise ships and further selling it to livestock forms another main activity of the business in order to gain money.

What are the key resources?

The resources that are necessary to create value for the customer are mainly the untreated plastic and organic waste, which has been daily produced on the cruise ships. In addition, the technical resources such as the combined heat and power unit and the 3D printer are strongly needed physical resources. Human resources including service engineers and maintenance employees as well play an important role.

What are the key partners?

Combat Ocean's key partners are first and foremost the ships, which are coming increasingly under pressure to become more environmentally friendly. On the other hand, the technical retailer for the 3D printer and the combined heat and power unit, who are the ones to equip the ships and are equally responsible for the needed service and maintenance. There it is the organization's task to cultivates the buyer supplier relationship. The government of Tenerife is the third key partner for the business idea as they have a particular interest in reducing the amount of waste on ships and consequently in the ocean, the local beach and the seaside. The acquisition and service of the technical

equipment is a costly investment for cruise ships, subsidies from the government should be taken into account.

What are the customer segments?

The company's key partner and at the same time customer are still the ships for buying or lending the technical equipment. Furthermore, as producing souvenirs out of plastic with the 3D printer on board, the passengers constitute another customer group. The third buyer segment are companies, which purchase the organic waste powder.

What type of customer relationship do they create?

The aspired relationship Combat Ocean wants to build with all its customer segments is the shared awareness for increasing waste worldwide and the willingness to do something against it. The concept relies on customer loyalty and sustainable awareness.

What channels does Combat Ocean use?

As it is a major goal of the business to promote the green image of the cruise ships, in particular social media and travel platforms will be used. Moreover, Combat Oceans offers digital services, what facilitates the customers to get in contact.

What are the revenue streams?

Combat Ocean is generating money by offering a fee-based service in equipping cruise ships with 3D printers and combined heat and power units and make a contact with the local technical retailers. The cruise ships benefit from this technology and they receive additional profits from the sale of the souvenirs.

What is the cost structure?

The business is built on a rental service which provides the customer with the necessary equipment, knowledge and service. Another followed cost structure is the sale of the organic waste powder, which is in the next step sold to other customers.

3.2 Porter's Five Forces

Another very important consideration is the competitiveness of the business idea to obtain a better overview of the bargaining power of forces. To check the business concept's competitiveness, porter's five forces is a very useful tool.

The observed forces are:

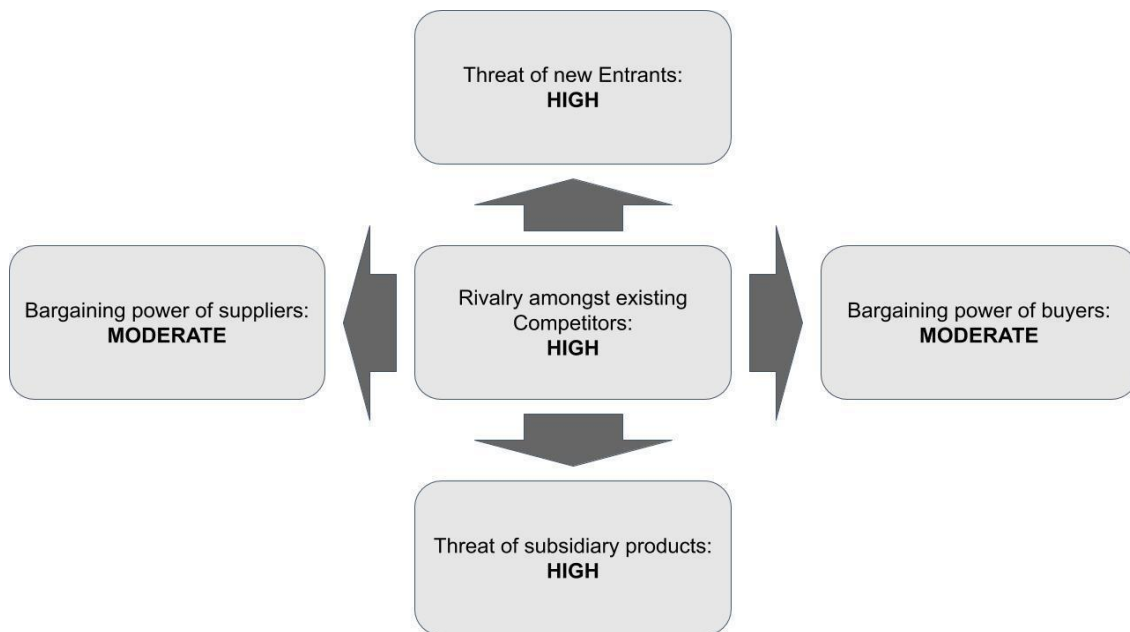


Figure 14: Porter's Five Forces; Source: Own representation

The threat of new entrants can be scored high, due to the circumstance that this is a very current problem. People are very concerned about the development of the growing waste number in the oceans and all around the world (Umweltbundesamt, 2019). Ships are one of the biggest sources of trash, by just dropping most of their waste into the sea, some of it legally and some of it illegal (Dr. Kim Cornelius Detloff, 2019). Hence, several companies are working on solutions of how to reduce garbage on board of the ships. Another reason, why the threat of new entrants can be scored high, due to the fact the garbage is named as tomorrow's gold and therefore many organizations are experimenting on how to make use of old materials and waste.

The bargaining power of suppliers is scored between moderate and high. This business ideas follow several approaches. Each approach works with other suppliers. Some of them have great power on the business idea and some have less power.

The ones with low power are the technical retailers, which provide the 3D printer and the necessary services. Their power is scored low, because there are several retailers and 3D printers and are easy to use and maintain (Roland Losch, 2019). Therefore, no special know-how and special workforce is necessary to provide the service. Even maintenance by explanation via virtual reality could be an approach on how to save costs and workforce. (Virtual Reality, 2019)

More difficult are the very technical approaches. They follow the idea of processing plastic waste into crew oil and drying organic waste with the waste heat of the engines. To implement this process, the business idea relies on long-term partnerships and the need to create a great network. Implementation, service and maintenance need to be done by specially educated people.

The rivalry among existing competitors is scored high, because several companies are working on different approaches, how to tackle the waste problem in the oceans (WinFuture, 2018; Alexander Flexande, 2017). A new approach to reduce the rivalry among the competitors would be a collaboration amongst them. They could share their research and development results in order to find new collaborative ideas by sharing the experience and knowledge.

The bargaining power of buyers is also scored moderate. This outcome is connected to the high number of competitors and subsidiary products. Since many opportunities are available on the market, this approach needs to be the most valued one, to make sure customers will prioritize Combat Ocean's idea. Another reason why the power of buyers is scored moderate, is the fact of cultural division. As some people are not interested in sustainability. In addition, many companies often follow economic incentives rather than sustainable ones.

Threat of subsidiary products is scored between moderate and high, depending on how well products of competitors establish and how fast the R&D departments of the competitors are able to create products which could endanger the business idea.

3.3 SWOT- Analysis

In order to analyze the business idea even deeper and on a long-term view, the use of a SWOT analysis is recommended. It is about to depict the strengths, weaknesses, opportunities and threats of the concept. It is a way of getting a better view on the pros

and cons and helps to identify both potentials and risks. For this reason, a SWOT-Analysis is a suitable tool, especially for the early stage of the model development.

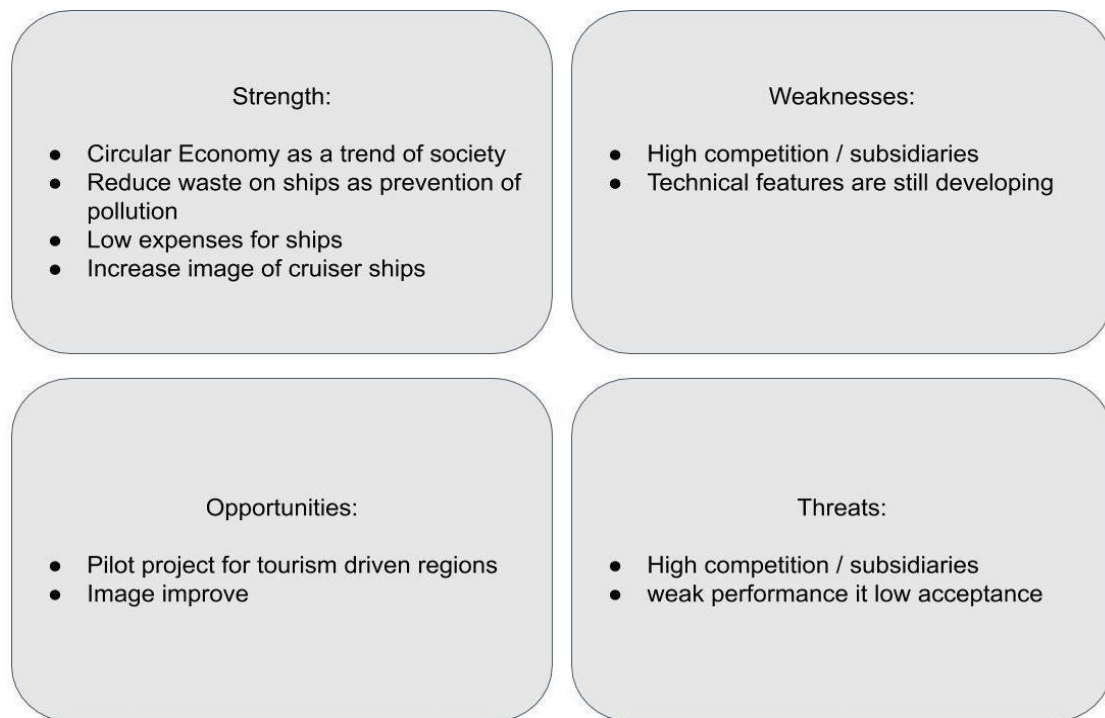


Figure 15: SWOT Analysis; Source: Own illustration

Strengths:

“Circular Economy” is a trending approach in today’s ecology sensitive society. The business idea behind Combat Ocean takes this up. As a sustainable model, the main concept goal is to reduce waste on ships to prevent the pollution of the ocean. It is now the best time to implement such projects, because companies are more willing than ever to invest in experimental acts for sustainability, not least to present themselves with a green image. One advantage of the model is the low expense for the customer. The concept is completely elaborated and can be realized without having a long period of implementation. In addition, it requires little space and space is an absolutely crucial point for cruising ships.

Weakness:

A great challenge is the large number of competitors on the market. More and more suppliers of sustainable improvement systems for cruise ships are entering the market. Especially when it comes to waste disposal on ships, a huge amount of ideas established. A direct competitor for example is the use of biogas plants on cruise ships (compare: <https://www.biogas-maritim.ibz-hl.de/>). In general, the continuous development of the global research and development for marine clean-up techniques is very advanced. Many

technical features are still in progress and have to be adapted to the business idea. In order to become a pilot project, the concept must prevail against other models.

Opportunities:

The greatest opportunity for the model is to become a Pilot project though in the tourism driven region of Tenerife. For Tenerife it is the chance to take a pioneering position. Furthermore, as an island, Tenerife is particularly affected by marine pollution. This new approach has also the chance to be one of the first projects in the cruise ship sector to receive EU funding. The special approach of directly combating the causes of waste pollution on board of the ship is something new.

Threats:

Subsidiary products are seen as a risk. Particularly in the sector of waste reduction, there are always newly developed technologies and start-up ideas. Additionally, the strong dependence on both suppliers and customers puts the idea under greater risk. Due to the strong dependence on several key partners, such as provider of the 3D printer or the cogeneration unit, the suppliers have big bargaining power. Even more power comes from the customers of the cruise ships. In order to prevent marine pollution, as many cruise ships as possible must apply the concept. The fewer cruise ships participate, the less effective the fight against pollution will be.

4 General Conclusion:

The cruise ship industry has cemented its role in becoming a vacation opportunity for more than 30 million guests by next year. The persistently increasing demand forces the ships to make sustainable investments towards their goal to reduce the amount of waste onboard. Thus, the need for a cost-saving, sensible solution is becoming more important in achieving responsible tourism. The business idea aims to give cruise ships an viable incentive to rather recycle the organic and plastic waste instead of disposing it in the ocean. This concept offers a feasible solution for the waste problem, instead of imposing punitive tariffs as some governments are currently trying to tackle the problem with. Embracing new collaborations with the local government of Tenerife and the community in order to fight marine pollution as an entity is the new approach. Nevertheless, sustainable business models bear the risk not to be accepted by the suppliers and customers, due to the fact that fostering a more sustainable environment generally

requires considerably higher efforts and money. Analyzing the business concept in detail provides a clear picture, that this business model will not shape Combat Ocean into a multi-billion-dollar enterprise. However, it is a start in tackling the global waste problem in the oceans. The ecological and economic impacts on Tenerife beyond the marine pollution are hard to assess at the moment, hence it is essential to find a viable solution in the early stages. Governmental subsidies for the technical equipment of the cruise ships might help the idea to get realized in the long term. As an additional concept, marketing campaigns could be offered to customers in order to enhance the green image of the ships further. In summary, the sustainable concept of this business model constitutes the major strength of Combat Ocean. It is the company's mission to protect Tenerife against the littering of the island and the resulting negative effect on the tourism industry. It is now time to change the wave. Because “progress is impossible without change, and those who can not change their minds cannot change anything” (George Bernard Shaw).

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Business Model 3:

4.3. Greenerife

Leaves no waste.

Franziska Denzinger
Sarah Nonnenmacher
Sandra Rühle

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1 Cultivation of Bananas on Tenerife

The cultivation of fruits and vegetables on the Canary Islands is a crucial contribution to the economic output. Especially bananas are the most important export good. The climatic conditions on the islands foster the growth of the yellow fruit and are furthermore the basis for ensuring the harvest, that is independent of seasons. As already mentioned in the background information, more than 90% of the cultivated bananas are produced for export (Sonniges-Teneriffa, 2017). Attributable to the favorable conditions for the banana plants, many plantations nowadays are located on the Canary Islands and especially on Tenerife.

1.1 Idea Generation

Due to the high number of banana plants, the idea of utilizing the leaves occurred at a very early stage of the semester. After doing some research regarding the possibilities for utilization, two main ideas arised: Firstly, it was thought of using the banana leaves for furniture production. The material of the wickerwork comes from the leaves and fibers of the plant and is, after a rotation process, a very solid material (Massivum, 2019). Secondly, the intention to use the leaves as an alternative to plastic packaging came up.

The concept is to wrap fruits and vegetables with the leaves and by that creating an eco-friendly form of packaging (Biovegan, 2019). Before proceeding with any of these two approaches, it had to be checked if the banana leaves are available in general or if they are already envisaged for a specific use. Furthermore, if cutting off the leaves would affect the plant in a negative way, both concepts would not have any chance for an implementation.

After further research and internal discussions with other group members, the decision of pursuing only the idea of packaging was made. The production of furniture made of leaves requires the establishment of a complete production site on Tenerife. Through the location of the island in the Atlantic Ocean and the distance to the mainland of Spain, the position was evaluated as being not ideal for furniture production. Despite doing research on the utilization of the leaves, a lot of important questions for the business model of establishing banana leaves as a packaging material remained unanswered. Hence, the visit of a banana plantation on Tenerife was crucial for the further course of action. With the additional information gained on the banana plantation the potential of the idea, to establish a circular business model on Tenerife, could be assessed.

1.2 Methodology

The data acquisition occurred through an expert interview. The questioning was based on an interview guideline, which was constructed upfront (see Appendix 1). Due to the extensive knowledge about banana plants a plantation worker was interviewed. The interview took place during the Tenerife excursion on a visited banana plantation. The key information of the interview was summarized and can be reviewed in Appendix 2. The following chapters are based on the gathered information during the interview.

1.3 Banana Plantations on the Canary Islands

On the Canary Islands the sum of acreage of all banana plantations is about 9.000 hectare. Each hectare includes roughly 1.600 banana plants, which sums up to 14.4 million banana plants on the Canary Islands. The following figure (Figure 16)

demonstrates the potential number of banana leaves as a side product on banana plantations:

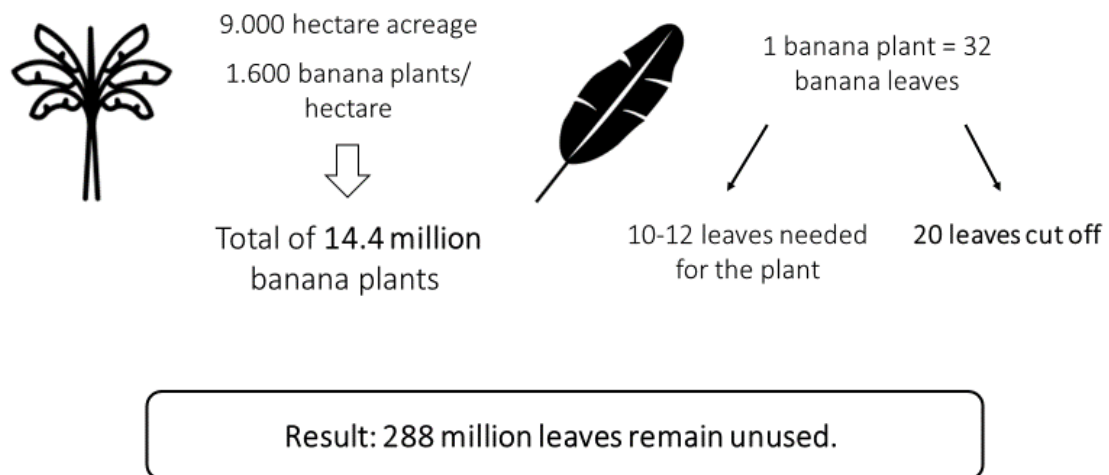


Figure 16: Potential number of banana leaves as a side product on banana plantations; Source: Own illustration

During its life cycle a banana plant possesses more or less 32 leaves. While ten to twelve leaves must remain at the plant until the bananas are harvested, the rest is cut off during the cultivation, as the plant needs to be able to get enough sunshine. Overall, this means that around 288 million leaves remain unused.

2 Business Idea

The business idea “Greenerife” relies on those banana leaves, which are dispensable and need to be removed regularly. The idea is fairly simple: using banana leaves to wrap fruits and vegetables and to fix it with a strap that is for example made of bamboo.

This form of packaging is already used in some Asian countries like in Thailand (Forbes, 2019), but the integration of the concept for the European market is novel. In comparison to Asia, Tenerife as part of Spain and the European Union has certain locational advantages. For example, the island is very close to mainland Europe and has to comply with the regulations of the EU. On the basis of the mentioned circumstances, an implementation of packaging with banana leaves on Tenerife appears reasonable.

2.1 Life Cycle of a Banana Plant

The lifecycle of a banana plant starts with a little seedling which grows right next to its mother plant. During the growth leaves have to be cut off so that the plant gets enough

sunshine. After six months the seedling is fully grown and becomes a mother plant. Soon a new seedling will develop next to it. At that time, the bananas on the mother plant can be harvested. Afterwards the plant will decompose and provide the necessary nutrition for the next seedling. The life cycle of banana plants is important for the harvesting and availability of the leaves. Because of their particular growing process, banana leaves are available throughout the entire year. They have no specific harvesting season and the plants on a plantation are always in a different stage of the growing process. Hence, the leaves are continuously available, and the business model is not depending on a specific season.

2.2 SWOT-Analysis

In order to define necessary methods for the further development of “Greenerife”, the following SWOT-Analysis proves several strengths and opportunities, just as it points out potential weaknesses and threats.

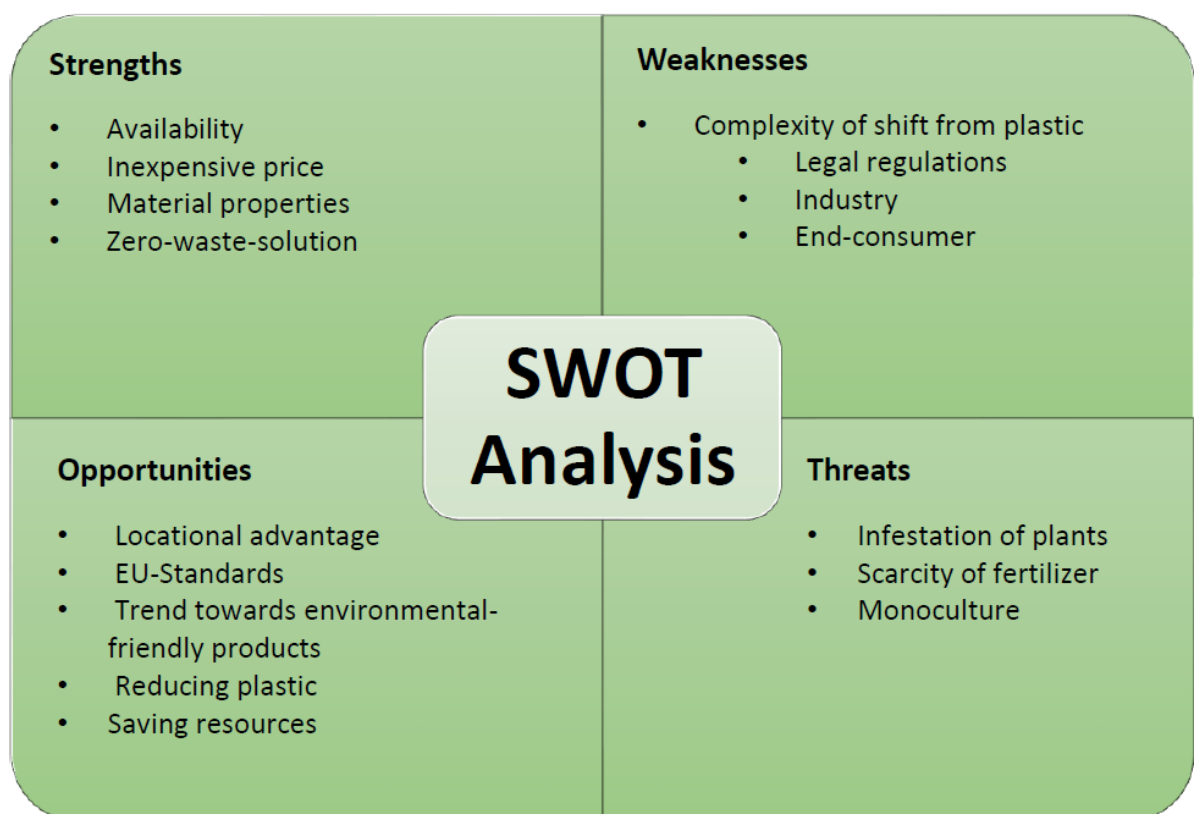


Figure 17: SWOT-analysis of "Greenerife"; Source: Own illustration

Strengths:

Banana leaves are already available on Tenerife as a side product of the banana cultivation. Due to the life cycle of a plant, the material is locally available throughout the entire year. It is inexpensive, since many banana leaves remain unused so far (see Figure 16). Banana leaves are a robust natural material, which is resistant to environmental stress. In terms of packaging the leaves are a fully biodegradable zero-waste-solution, which outplays plastic in several aspects (see 2.4 Zero Waste Solution)

Weaknesses:

However, the transition from plastic packaging to “Greenerife” may turn out as a difficult, long and potentially costly process. To make the business model work, several steps and a shift in people’s mindset seems to be necessary:

- Legal regulations may have to be adjusted.
- Food industries must be persuaded by the benefits of natural packaging material.
- The process of food packaging in the factories must be adjusted.
- The end consumer must be convinced.

Opportunities:

Banana leaves as a packaging material are already used in some Asian regions. Yet, Tenerife holds a significant locational advantage due to the geographically short distance to other European countries and its vicinity to the European market.

As a member of the European Union, Tenerife must follow the EU regulations in terms of banana cultivation. Consequently, they can only use approved fertilizers and pesticides. The quality of the banana leaves can easily be controlled by the EU and customers are more likely to trust the new packaging material.

Additionally, there is a massive trend towards environmentally friendly products, production, transportation and packaging. Banana leaves seem to have a great potential to satisfy those evolving customer needs, as the material is already locally available und fully compostable. This diminishes unnecessary CO²-pollution caused by the transportation of packaging material and also any trash.

Taking a long-term view, “Greenerife” may help in reducing plastic and saving resources.

Threats:

Potential threats of the business model are any kind of infestation of the plant. A common one is for example the fungus “White Fly”, which infects the banana plant and leaves with a white pest. If the infected plant is not treated instantly, it can spread quickly to the other plants growing nearby.

A portion of the banana leaves needs to be left on the ground as a natural fertilizer for the seedlings (see 2.1 Life Cycle of a Banana Plant). However, if using banana leaves as packaging material is a profitable business, one might try to exploit the business to its fullest and start to use too many leaves. Consequently, the life cycle of the banana plants is disrupted due to the scarcity of leaves on each plant or as a natural fertilizer. Even if the used banana leaves are transported back to the plantation, this affords a huge logistical effort and may not be possible.

Additionally, monocultures may become a severe threat. If the cultivable acreage is massively used for only one type of plant over several years, this may be followed by different issues, such as the nutrition of the acreage is only used unilateral and more supplemented fertilizers along with pesticides become necessary (Schulz, 2019).

2.3 Contribution to Circular Economy on Tenerife

As the overall goal of the whole project is to find business ideas that promote the circular economy on the island, it is interesting to see how “Greenerife” contributes to this specific goal. The typical circle of the use of banana leaves would look as described in the following section and as shown in Figure 18. In the beginning, the banana plants are growing on the respective plantations. During the cultivation some leaves are cut off the plants in order to ensure the proper growth of the banana fruits. The cut off leaves are then available for further usage. Additionally, after the harvest of the bananas the remaining leaves of the plants are also available for any further usage. Here, “Greenerife” intervenes and uses the leaves as packaging material for various fruits and vegetables. The fruits and vegetables are then distributed to supermarkets where the consumer buys those products. After the consumption of fruits and vegetables, the packaging material made of banana leaves is not just thrown away, but it is reused. The banana leaves return to the plantations where they serve as a natural fertilizer. This ensures that new banana plants are able to grow properly and in return there are new banana leaves available for

“Greenerife” to use as a packaging material. Therefore, the reuse of the banana leaves closes the circle.

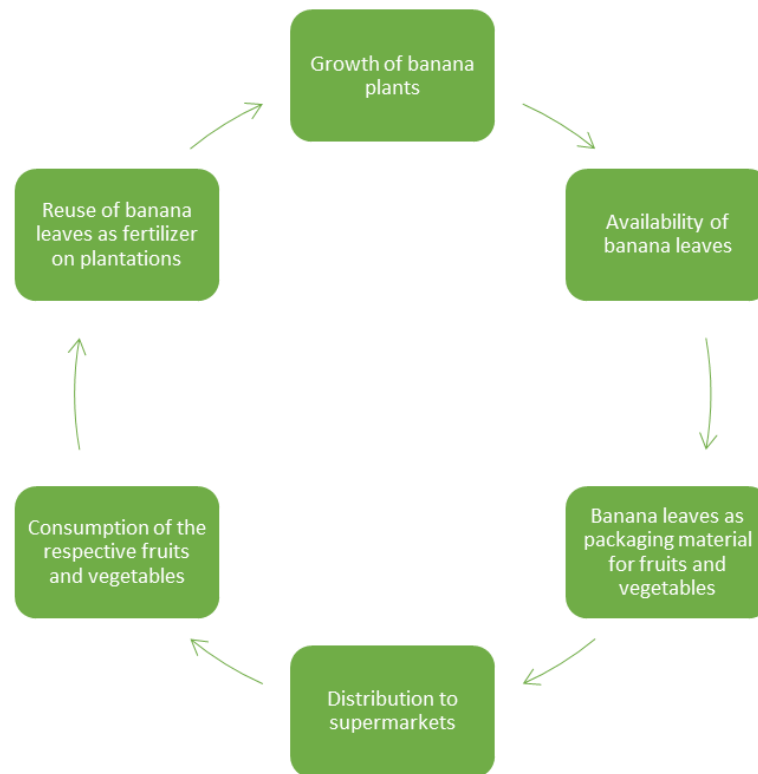


Figure 18: Circular use of banana leaves; Source: Own illustration

Furthermore, concerning the “ReSOLVE-Framework” for business ideas supporting Circular Economy (see Appendix 3), the business idea of “Greenerife” is allocated in the part of “Regenerate”. Banana leaves are a naturally renewable material as banana plants and in return the banana leaves are constantly growing again. By replacing plastic packaging with banana leaves, “Greenerife” contributes to retaining the health of ecosystems. Moreover, after their usage as packaging material the banana leaves are returned to the biosphere. This means that the quality of banana leaves as being a good fertilizer is not lost but used for the biosphere.

To summarize, “Greenerife” makes a valuable contribution to support Circular Economy on Tenerife.

2.4 Zero Waste Solution

By implementing banana leaves as a form of packaging a *Zero Waste Solution* will be established. Zero Waste is the creation of products which does not cause harm to the environment. In fact, the basic idea is to take advantage of natural life cycles where used materials are becoming resources for other components in an ecosystem. The overall goal of Zero Waste is to encourage people to change their lifestyles and behavior patterns

towards a more environmentally friendly way of living. (ZWIA, 2018) The usage of banana leaves for packaging is one initiative to achieve this goal. Hence, it is crucial to concentrate in detail on the benefits of this business idea in consideration of the Zero Waste Model.

Firstly, banana leaves are free of chemicals and softeners. The cultivation of banana plants on Tenerife takes place in accordance with the regulations of the European Union. The leaves are free of any scent and taste and therefore ideal for the packaging of other kinds of food. Furthermore, the natural condition of the leaves ensures that they are 100 percent biodegradable and compostable. As a result, the reduction of plastic is supported through the substitute product. The robust and natural material is resistant to environmental stress like moisture. Banana leaves are already locally available on the island. In many cases the leaves are useless at the moment, as only some of them are needed for fertilization processes. Therefore, it is an inexpensive resource. The implementation of banana leaves as packaging is a 100 percent natural and environmentally friendly solution and can be defined as Zero Waste Solution.

2.5 Profit Generation

One crucial factor for a business model is the generation of profit. The usage of the banana leaves for packaging requires no high investments from the owners of the plantations. The leaves are already available on the plantations of Tenerife. Moreover, the cutting takes place anyway, because the leaves have to be removed in order to support the growing process of the plant. At the moment, plastic is required for the packaging of bananas and other fruits on a plantation. If the leaves can replace the plastic packaging, the owners do not have to buy the material from other suppliers. Instead, the available leaves on a plantation can directly be used to package the fruits coming from the same plantation. With this approach, the farmers can achieve savings through the replacement of plastic with their own resources. In addition, if after the packaging of their own products a surplus of the leaves remains, farmers can sell it to supermarkets or other interested parties.

3 Vision

The aim is to successfully establish banana leaves as a substitute for plastic packaging of fruits and vegetables. “Greenerife” avoids the large amount of plastic waste and in consequence contributes to slow down the climate change using available, fully compostable resources. After establishing “Greenerife” on Tenerife, the business can be

expanded to the rest of the Canary Islands, Spain as well as to the whole EU-market. Furthermore, the creation of additional products made of banana leaves seems to be a possible option for the future. An example could be the creation of reusable plates and bowls out of banana leaves which would be an ideal alternative to disposable dishes.

3.1 Outlook

Nowadays on Tenerife, the packaging process of fruits and vegetables is a manual task. This showed a visit of “La FAST” where the incoming fruits are packed and prepared for the delivery to the various clients like supermarkets. For the future, the option of packing the fruits and vegetables automatically on respective packaging machines needs to be elaborated. A company visit of “Multivac” located in Wolfertschwenden in the Allgäu already provided some first insights concerning this issue. “Multivac” is a leading company in the production of packaging machines (Multivac, 2019) and within the company, the trend towards using environment-friendly packaging solutions is already a highly discussed topic. At the moment, they are evaluating the possibilities of designing packaging machines that are able to process materials like paper or leaves from different trees and plants. Here, the banana leaves as a packing material would be included. First results of the evaluation process showed that this is not an easy topic in terms of technical realization. Further efforts in terms of finding an appropriate solution for developing such packaging machines are needed, which will take time. Nevertheless, the fact that the industry is already aware of the future demand for packaging machines designed to pack products with environment-friendly materials, encourages the business concept of “Greenerife”. Although it is not possible at the moment to fall back on an automated packaging solution, the future might provide respective machines.

3.2 Critical Discussion and Further Research Questions

The business model “Greenerife” seems to have several benefits in terms of cost-saving and being an environmentally friendly solution. However, one needs to be critical whether the concept is convertible. First of all, the quality of the banana leaves has to be guaranteed at all times. Due to the contact with food, harmful impacts to human health must be eliminated. This means, the leaves must be checked constantly in order to ensure their quality. In comparison to plastic, the leaves are a natural material, which can be easily affected by external influences and therefore may harm the packaged food. Frequent quality inspections may be cost and time intensive. Secondly, in order to not

disrupt the banana plant's life cycle, one either must spare enough leaves as a natural fertilizer or the banana leaves have to be transported back to the plantation after being used. However, massive logistical requirements will be necessary.

Furthermore, the business model remains with the following questions to be researched:

1. Is it possible to ensure the quality of the banana leaves at all times?
2. How does a banana leave react with different food? Does the food oxidize faster or is the banana leaves durability influenced?
3. Is an industrial automatization possible by utilizing banana leaves as packaging?
4. Are there specific legal regulations on Tenerife or the EU-market towards the packaging of food, which might prohibit the use of banana leaves?

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Appendix

Appendix 1: Guideline for the expert interview on the banana plantation

Introduction:

Introducing project: Student group from Germany, Master in Global Business Development, Developing circular business ideas for Tenerife

Questions:

1. Are the banana leaves already used for anything like production material, packaging or furniture? If yes, for what especially?
2. Have you ever thought about using the leaves in such a way? If yes, why was the idea not implemented? Reasons for this?
3. What happens to the plant if the leaves are harvested?
How many leaves can be cut off? Can you only cut off dead leaves or can green ones be cut off as well?
Are there any consequences for the banana fruits if leaves are cut off?
How many leaves does one plant have?
4. How many years is the lifetime of a plant?
How long does it take until the seedling has grown to a proper banana plant?
5. Do the banana leaves grow again after harvesting?
If yes, how long does it take?
6. Life cycle of a plant: How often can bananas be harvested?
What are the times for harvesting?
Can leaves and bananas be cut off at the same time?
7. How does the packaging for the exported bananas look like?
Are there any regulations to use a specific kind of material?
8. What factors could harm the plantations? Is there the risk of vermin/pest or fungal infestation? Are there any risks for the leaves?
9. Are pesticides (plant protection) used to take care of the plantations?
10. How many plantations of bananas are on the island/Canary Islands? How large are the plantations (in hectare)? How many trees do exist?
11. How many workers are on the plantations?
What is needed to take care of the trees? (cost calculation, expenses)

Conclusion:

- Ask for a banana leave for presentation
- Ask for email address in case of further questions
- Acknowledgements for interview

Appendix 2: Memo of the expert interview on the banana plantation

Interviewee: Javier Pereyra

Date: 12/11/2019

Place: “Coplaca” banana plantation

Memo:

- Bananas are harvested within a cycle of six months
- Bananas grow all year, not depending on seasons
- Trunk of banana plant is not consisting of wood but of several layers of leaves
- There are always three plants standing next to each other: one “mother plant” with the bananas, one “grandmother plant” that rots after the harvest and one “daughter plant” that grows up
- One banana plant has around 30-32 leaves
- 20 of those leaves are cut off during the growing process
- The remaining 10-12 leaves stay at the banana plant in order to protect bananas, as long as there are leaves to protect the plant, the other leaves that are cut off can be used further
- At the moment, the cut off leaves are used as a fertilizer on the ground of the plantation and as food for animals
- Bananas are packed in plastic and in paper
- There are 9000 hectare of banana plantations on the Canary Islands with around 1600 plants per hectare
- “Coplaca” plantation with around 2400 banana plants on a surface of 1.5 hectare
- For daily tasks on the plantation one worker is enough
- Every 15 days the ripe bananas are harvested
- During the summer, bananas are harvested every week
- The female part of the plant provides the bananas
- The male part of the plant is useless, it is cut off, provides only the pollen
- The use of pesticide is controlled through European regulations
- Pesticides are used once or twice a year
- The whitefly is the main pest on the plantations, pesticide is used to fight the whitefly
- The whitefly came from outside and now the flies are everywhere

- The flies settle on the underside of the banana leaves, they are not a big problem for the bananas, using the pesticide, the spread of the whitefly is gained under control
- The goal is to bring good and harmless insects on the plantations to fight the harmful insects, search for natural enemies
- The pesticide is put inside the plants and not applied on the plant, it is used from inside and not from outside, there is no impact on the environment
- Additionally, there are harmful beetles on the plantations
- The beetles lay their eggs in the banana plants, the plants are then eaten up from inside
- It cannot be seen that the eggs and the born beetles are inside the plant
- To fight the beetles, there are traps on the plantations that attract the beetles through pheromones, around 15-20 are caught within one month on the plantation
- There are no harmful spiders on the plantations

Appendix 3: ReSOLVE-Framework for Circular Economy



Business Model 4:

4.4. SeaOn

So what? (Save Oil With Hydrogen and Technology)

Marco Streit
Hermann Weiß

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1.Idea development before the journey

The initial situation of the current task was to find a sustainable and successful business model for Tenerife. The focus of the work has been on renewable energies in order to be able to operate successfully there. The power supply on the island is vulnerable and depends on many external factors. The consequences are regular power outages that affect the entire island (Hinke, 2019). Like mainland Spain, the Canary Islands are highly dependent on the import of energy raw materials, as their own resources are scarce. In the case of the islands, however, the high energy dependency becomes a decisive cost factor. The electricity supply of the Canary Islands costs around EUR 1.2 billion per year. Although the potential for the production of renewable energy on the islands is very high due to the given climate conditions and tides, in 2016 only about 8% of the energy produced in the Canary Islands came from renewable energy sources (Fresenius ,2018, p. 43).

The first approaches to a successful business idea focused on a possible in-house electricity production. After research and first information from the on-site presentations, the focus shifted to renewable energies and their energy generation. Because an entry into the Spanish energy market as an energy supplier is strictly regulated by the state. Concepts were geothermal energy, solar energy, wind energy, hydroelectric energy, energy production by falling height in the mountains. The possibility of a biogas plant was also considered due to the high number of farms on the island. Each possibility was evaluated based on a pros and cons list. This list has shown that a complete solution of a Circular Business Model on Tenerife based on renewable energies is technical possible. The first complete sustainable business model for a stable energy supply was theoretically generated even before the visit of an energy supply site and some inputs from experts on Tenerife. This theoretical solution provides that the kinetic energy of waves is used to generate permanent and sustainable electricity. Waves have a higher energy density than

wind. In addition, energy from the sea fluctuates far less than the output of wind turbines (Odenwald, 2012). In comparison to solar and wind energy, wave power is almost always available, due to wind and tides (Maier, 2019). Marine energy could ideally complement existing renewable energy sources. It delivers clean green electricity. In times of overproduction of electricity, the proposed solution would be an integrated pumped storage power plant in the electricity grid of the island. This would provide a relatively

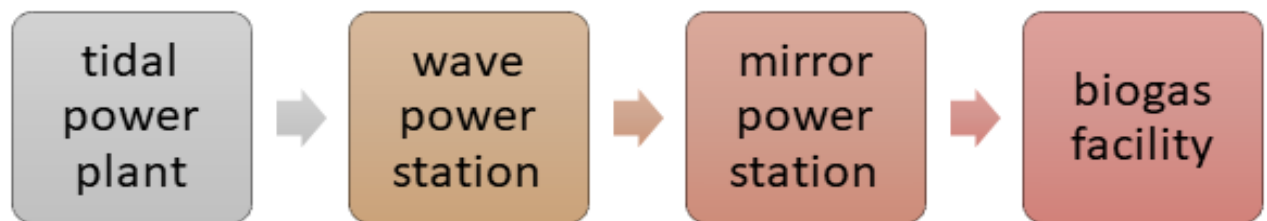


Figure 19: Possibilities of renewable energies; Source: Own illustration

simple solution for the storage of currently unusable electricity. The geographical nature of the island offers ideal conditions for this solution. There are steep differences in height to be found on the smallest area. In this case, artificially fed water in the mountains would serve as a reservoir for potential energy, which could be converted back into electrical energy during peak periods solely by gravity and with the help of a conventional turbine. The disadvantage of such plants is their limited capacity. Reservoirs cannot be fed infinitely with water. In addition, there is the possibility to switch seawater into fresh water. In this case, drinking water could also contribute to the supply of the population, but the impact on nature, through the pipes, would be very large. Therefore, the model of a sustainable solution would not be fully guaranteed.

2. On-site visit and input from the experts

The challenge was to develop a sustainable business model from the given factors such as existing infrastructure, grid structure, etc., which could provide a positive cash flow and return on invest. At the beginning the approach was followed concentrated on a complete solution for the island in case of the energy supply and got the first inputs. According to forecasts, the energy supply turnover in Spain by 2022 will amount to around 120 billion euros. The focus is on renewable energies, to increase their shares (Eurostat, 2019). The real power supply of the island by the renewable energies was clarified on the basis at the following diagram:

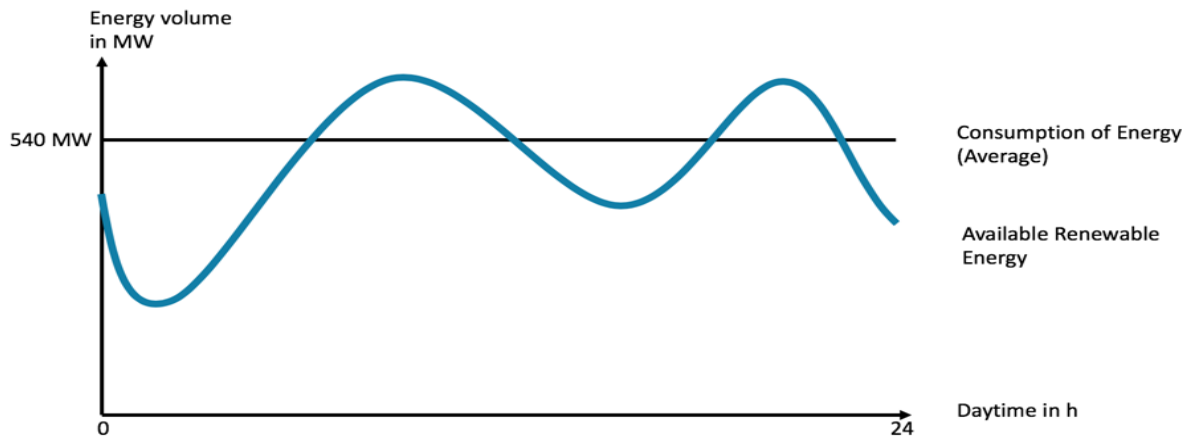


Figure 20: power supply of Tenerife by renewable energies; Source: Own illustration

This diagram illustrates that there is currently no complete supply of sustainably generated electricity in Tenerife. This can be attributed to several factors, such as the lack of electricity from renewable sources: Weather conditions, insufficient capacity, technical failures, etc. The X-axis shows the daytime in hours and the Y-axis the needed energy volume in MW. Furthermore, an average energy supply of 540 MW is necessary to saturate the entire island with the demand for electricity. This is illustrated by the black horizontal line. The fluctuating blue line indicates the power supply of renewable energies. The route of the line clearly shows that Tenerife's electricity supply varies considerably at different times of the day. At the beginning of the day, the average electricity supply of the demand is significantly higher than the sustainably produced quantity, this can be due to the sun which is not yet high, possible weak wind or poor weather conditions and a high demand. In this situation the local energy suppliers are obliged to use fossil fuels to close that energy gap. The use of these energy sources like Oil is associated with the production of a large amount of greenhouse gases such as carbon dioxide. With increasing solar radiation and other factors, an energy deficit in relation to renewable energies is accompanied by an energy surplus. So that the energy production with the help of fossil fuels is completely renounced. In order not to overload the power grid, the energy suppliers on Tenerife are forced to consume the energy gained unused and free of any economic efficiency in order to prevent possible technical disruptions.

3. Idea development

The previous approach to use the kinetic energy of wave power for sustainable power generation, was finally discarded by the presentation of an energy consultant. Based on the knowledge that seawater represents a major danger for all metallic constructions on

the open sea and thus causes extreme damage due to corrosion. For this reason, despite its untapped advantages, this type of project hardly attracts investors to enter these types of sustainable energy generation. Due to the high maintenance costs and the technically demanding replacement of the individual components, the business idea proved to be uneconomical and unattractive for potential investors and business partners. Neither the scalability of the business model nor the uncertainty regarding profitability were given. Instead of concentrating on a certain problem in the predominant system, the solution was to imitate a system provider comparable to SIEMENS. All projects in the forefront turned out to be unrealizable or were already so close to known technologies that are already in exploration or were being worked on their completion.

On the island of El Hierro, for example, work has already begun on the completion of a pumped water storage facility, which will enable the island to be self-sufficiently supplied. Our preliminary idea to connect the individual Canary Islands with submarine power cables in order to create a larger power grid was already partly realised or in certain parts not feasible (Louvren, 2019).

Given factors were analysed with the help of the given materials from the lectures. Instead of a completely revolutionary production method for electricity or a sustainable power plant type, the research focused on already existing circumstances and potentials in a given environment and create a sustainable economic cycle in this particular niche.

4. Final Concept after the field trip

The focus is to generate hydrogen with an unused resource. The production of hydrogen in that case is based on a simple electrolysis with seawater. Electrolysis means the decomposition of a chemical compound under the influence of an electric current. Electrolysis thus converts electrical energy into chemical energy. Especially in the case of

water decomposition into hydrogen and oxygen. Electrolysis of water consists of two partial reactions that take place at the cathode and anode.

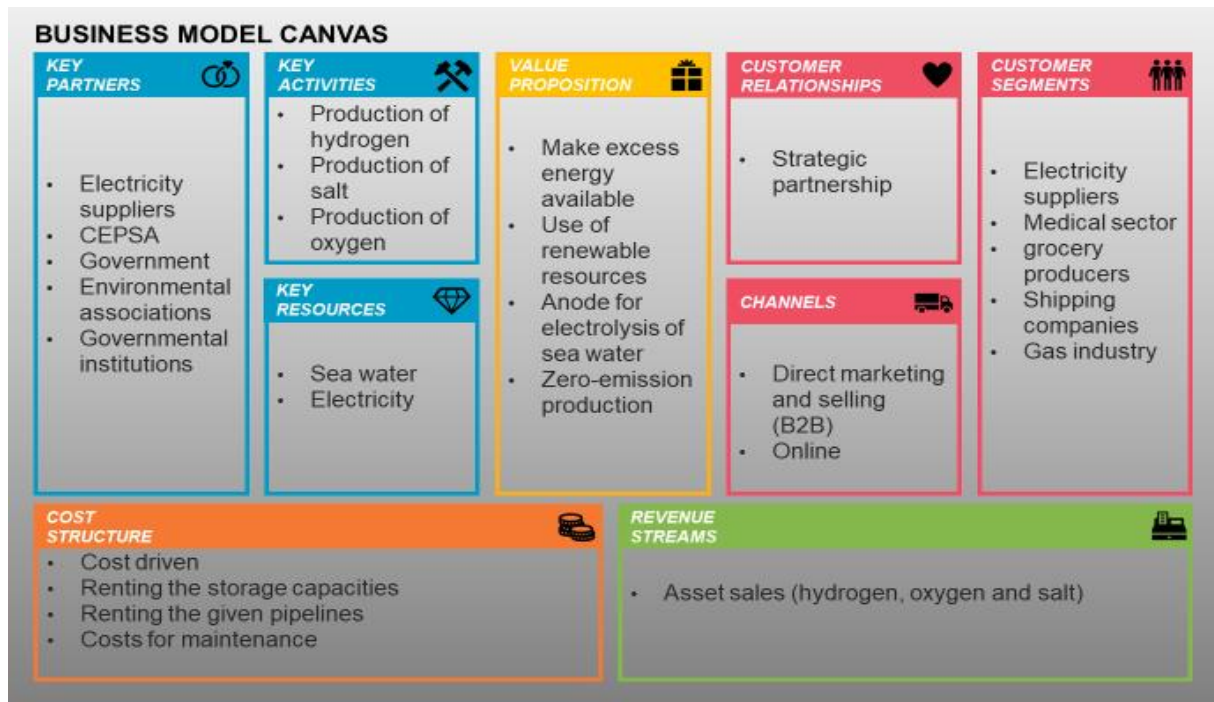


Figure 21: SEQ Figure 1* ARABIC 20: Business Model Canvas for the given environment; Source: Own illustration

The efficiency of the electrolysis of water is close to 100% (Knecht, 2019). For the production of 1 m³ hydrogen, modern plants require 4.3 – 4.9 kWh of electricity. The current electricity price for industrial consumers is 10,10 Ct./kWh (Kemper, 2018, p. 39). A new approach to power generation, which has already been extensively tested in San Francisco (SF, USA), caught attention. It based on unused seawater as a sustainable resource to produce hydrogen. Through this development it is possible to use a previously useless resource as a basis for energy generation. In the case of an island like Tenerife, seawater represents a previously unusable natural resource in large quantities. Since hydrogen, in contrast to electricity, has clear advantages in the area of storage, there is potential in the problem of energy supply in the daily course of the island. The business idea concentrates to smooth out the island's energy supply curve with this technology and to achieve the sustainable side effect of reducing the amount of energy generated by fossil fuels. By using this specially coated anode, the company clearly differentiate itself from all our competitors and gain a strategically important competitive advantage.

The approach differed in important characteristics. In comparison to the previous economic ideas, in this case the already existing environment was analysed in advance. In order to position a company in this niche, it is essential to know who the potential suppliers of electricity are and who the potential buyers of hydrogen are. In addition, the

infrastructure owners are also an Important component of the project. From their willingness to cooperate in that project. Away from the idea of becoming an independent player in the local energy market, the company is dependent on existing structures.

Institute of Technology and Renewable Energies (ITER) present a similar pilot project with tries to cover exactly that problem on the island. Both ideas were based on a peculiarity, scientists had succeeded in covering an anode in such a way that it was able to enable the electrolysis of sea water. The hydrogen obtained is made available to the inhabitants of the island in a specially constructed gas station as fuel for modified vehicles (Bigot, 2019). The disadvantages of the presented project also became obvious. In order to create a demand for hydrogen at the private customer level, it is necessary to retrofit electric or combustion engine powered vehicles. The business sector does not have direct access to the hydrogen.

		INTERNAL ANALYSIS	
EXTERNAL ANALYSIS		SWOT	
		<u>STRENGTHS</u>	<u>WEAKNESS</u>
		• Use of renewable resources • Technological lead (anode) • Secure energy supply • Cost efficiency	• Short production time windows • No direct access to the raw material • High procurement costs for the anode
<u>OPPORTUNITIES</u>	• Storage of excess electricity • CO₂ neutral production • No waste products • Fuel for cruise ships	Storage of superfluous energy with the help of renewable resources	efficient production planning and maintenance
<u>THREATS</u>	• Technically sophisticated products • No own storage capacities • Dependent on partners	economic solution for uneconomical situation	promote long-term cooperation with the key partners

Figure 22: SEQ Figure * ARABIC 21: SWOT analysis of the company; Source: Own illustration

The strategic orientation of the company SeaOn is based on the level of B2B model. In the given ecosystem the company buy cheap electricity at times of overproduction from the electricity producers, like ENDESA, IBERDROLA or REE and sell the hydrogen more expensive back to the same electricity producers when there is a supply gap on Tenerife. Compared to the B2C sector, this is a crucial advantage. Both the number of suppliers and customers is significantly smaller. Quantities, revenues and delivery schedules can

be planned much more precisely. Another advantage is that the supplier circle reflects the customer circle at the same time, even if raw material and product differ in form and state of aggregation. The overproduction of renewable energies through unstored energy reserves makes it possible to purchase electricity for our electrolysis at low cost. During this period, the production of hydrogen respectively electrolysis of seawater takes place. By storing the produced hydrogen in the existing tanks, the company achieve a permanent storage of the energy carrier. As soon as the electricity producer has a demand for electricity, the hydrogen is selling and delivered. The supply of the hydrogen would be carried out with the help of the already existing pipelines to the gas turbine. Every electricity supplier is already connected to the fuel tanks in the port, which would not require any necessary investments in this area. This would ensure the transport of the hydrogen and the related costs would remain calculable for the producers. These two points clearly indicate that the cooperation with the company CEPESA is the key element in that business idea.

The profit is calculated from the proceeds from the sale of hydrogen to the electricity producers. Currently, the price for one kilogram of hydrogen at the filling station stands at 9,50 € (Beurden, 2019). In addition, the use of seawater skims off the excess brine and sells it as sea salt to wholesalers, the current market price for 1kg sea salt in B2C range about 1,99 € (Souque, 2019). The third income from the Circular Business Model results from the electrolysis of the sale of pure oxygen for hospitals. A gas bottle 0.8l/200bar with pure oxygen is currently traded at about 87,80 € on the market (Angel,2019). Here, the side effect of producing oxygen from the chemical reaction is exploited profitably and thus the entire business idea is exploited down to the last detail. All resulting elements become accessible for the market, there are no waste products. Through this green business idea, the sustainable footprint is linked to a competitive advantage. This means that no CO₂ emissions are emitted. In the near future, the European policy will raise the tax of emissions, whereby energy production based on fossil fuels will suffer a loss in profitability (Brandt, 2019). The business model also enables a just-in-time solution from hydrogen for the immediate use of the energy source by the electricity suppliers at any time. Furthermore, there is the possibility of a spread on the entire Canary Islands as well as on all countries with coastal regions. The potential for growth is global, with enormous economic potential. In times of climate change and increasing demand for electricity. This technology can be the base for a stronger development of renewable energy, because

the storage is guaranteed. At the same time, it does not primarily use limited resources for energy generation. Seawater covers about 71% of the world's surface and about 31.7% of the oceans are between 3,000 and 4,000 m deep, with the deepest part measuring more than 11,000 m. The sea has a total volume of 1.332 billion km³ and thus a share of 96.5 % of the world's water resources (Abbott, 2010). The funding of the project like this consists of European funds, crowdfunding, private investors, insurance funds but also state pension funds. Here, the potential of a European promotion of start-ups of currently more than 80 billion euros is decisive and directly adapted to our business sector (Klein, 2019).

Tenerife is a deliberately chosen place, as various technical and historical milestones have been set there in the past, such as Alexander von Humboldt. Furthermore, the geographical location and structural conditions of the island are perfect for the test phase

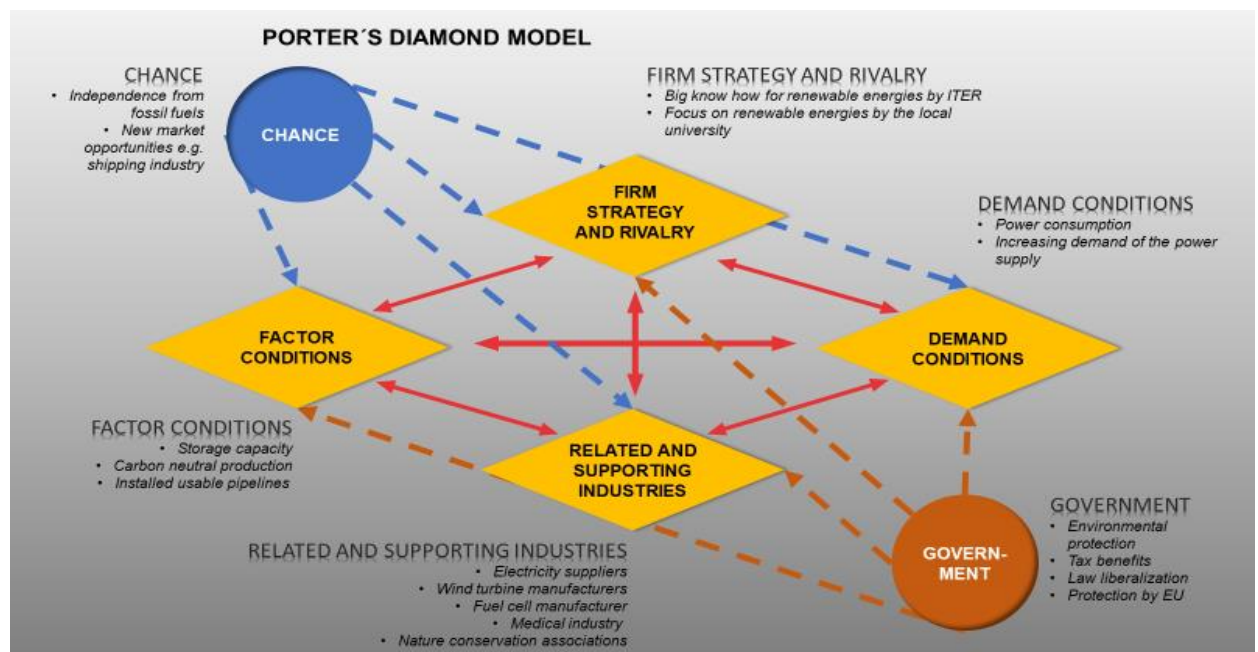


Figure 23: SEQ Figure * ARABIC 22: Porter's Diamant for the analysis of the business environment; Source: Own illustration

and the subsequent expansion of the entire hydrogen production market.

Another potential for the future is the possibility to use hydrogen as fuel for cruise ships. The current solution with the help of LNG is regarded as a technical intermediate step to synthetic fuels or hydrogen. In order to supplement the technical advantages of the products with further economic advantages, the settlement of the company in the free trade zone would be a strategic competitive advantage. Conventional cruise ships produce an enormous amount of greenhouse gases. There is the mission to supply these ships with hydrogen to reduce from fossil fuels in this sector as well. During a seven-day

round trip with the new AIDAnova with the LNG engine, the emissions amount is about 187 kilos of CO₂ per passenger. The number of passengers at the AIDAnova is about 5000 persons, as a result: for one seven-day trip with AIDAnova 935.000 kilos of CO₂ emissions are emitted (Gless, 2019). Therefore, there is a great potential to make this tourism sector, which is also strongly represented in Tenerife, more sustainable.

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Business Model 5:

4.5. next taste

Insectify your life!

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1. Main Idea and market potential

The main idea of Next Taste's circular business model is based on the breeding and processing of food insects on the Tenerife island. The advantages to do so are numerous and will be explained by this business plan draft. The Food and Agriculture Organization of the United Nations predicts the protein demand to double as the world population will grow to 9 billion people by 2050 (Halloran and Vantomme, 2013, p. 1). Feeding that many people will be a huge challenge. Climate change and decreasing resources worsen this situation even more (Halloran and Vantomme, 2013, p. 1). Therefore, food insects are the perfect solution. It is well known that conventional protein sources are ecologically problematic and not available in sufficient quantities: Currently, the main supplier of protein is meat. But its production has a destructive environmental impact. It accounts for almost fifteen percent of all greenhouse-gas emissions worldwide (FAO, 2019). Alternatives like cultured meat are years away from the market. Algae Protein has high labor input and is heavy in processing just like plant protein from soybeans (Lux Research, 2016a, 2016b). So, in order to live in a more ecological and sustainable world, these options are only suitable to a limited extent. Feeding people sustainably will only be guaranteed by taking new paths like eating insects. But for 2 billion people worldwide that doesn't sound as extraordinary as one might think. In many countries' entomophagy, the

consumption of insects by humans, is already part of the daily life (Halloran and Vantomme, 2013, p. 1). The main goal concerning the business model is to create a reliable and sustainable source of food that can solve the future challenges in order to satisfy world hunger. To do so humanity must start now and not tomorrow. But insects are not only meant as food for poor people. They are also a real and serious alternative for the European market. Changing mindsets of generation Z will facilitate the entry of insects into supermarkets as they are looking for sustainable alternatives to meat. But still a lot of convincing has to be done for all age groups, what is one of the main objectives of Next Taste. The worth of the edible insect market will rise to \$8 billion by 2030 (Taylor, 2019). To summarize there is an enormous potential in the edible insect market. Environmental impacts, the population growth and increasing awareness for environmentally friendly behavior call for action. By building an edible insect farm on Tenerife, the island could consolidate its position in this market and become a pioneer in sustainable nutrition in the long term. This business model not only considers profitability goals but also aims to introduce Europeans to the topic of food insects and at the same time is satisfying the hunger in the world on the long run.

2. The product

The company specializes in breeding and selling of mealworms for human consumption.

2.1. Advantages of mealworms over conventional animal protein sources

Mealworms require significantly less feed, water and rearing area than conventional animal protein sources (see Fig. 24). Compared to mammals and birds, as they belong to the warm-blooded (ectothermic) animals, they can convert much more energy from their food. In addition, mealworm breeding produces only a fraction of greenhouse gases (see Fig. 25). The edible part is also much higher than in livestock. Since the organism of mealworms differ completely from human organisms, they cannot transmit diseases to humans when heated before consumption - so no viruses can become dangerous for humans compared to protein sources from livestock breeding (van Huis et al., 2013, pp. 74–75). This insect species also has very good nutritional values (see figure 24)

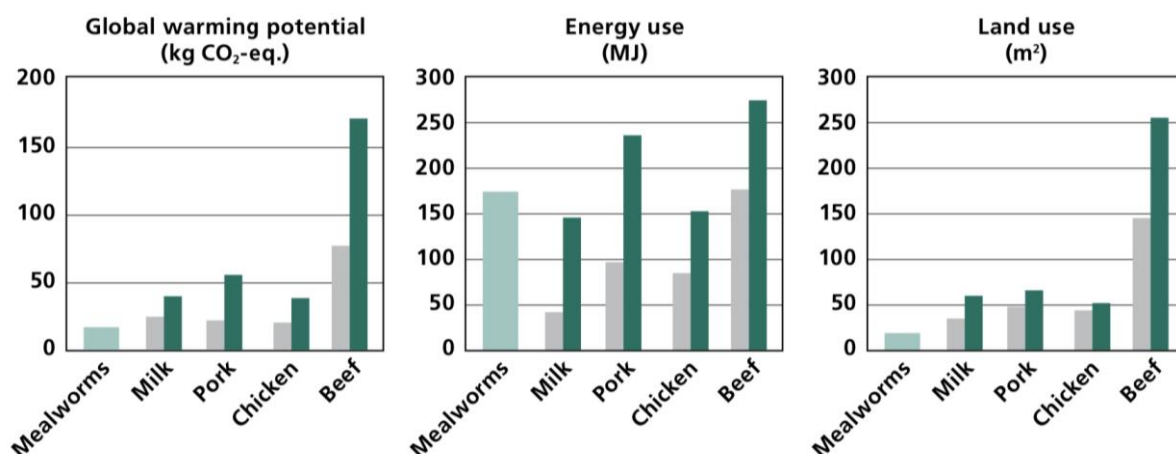


Figure 24: Global warming potential, energy use and land use due to the production of 1 kg of protein; Source: van Huis et al., 2013, p. 64



Figure 25: Production of GHGs and ammonia per kg of mass gain; Source: van Huis et al., 2013, p. 63

Nutritional values (per 100g freeze-dried mealworms):

Energy 550 kcal / 2303 kj

Fats 37,2 g

Saturated fatty acids 9,0 g

Monounsaturated fatty acids 17.3 g

Polyunsaturated fatty acids 10,9 g

Carbohydrates 5,4 g

of which sugar 0.0 g

Dietary fibre 6,5 g

Protein 45,1 g

salt 0,37 g

all 9 amino acids, important nutrients and vitamins (including iron, magnesium, zinc, selenium, biotin, vitamin B12)

Figure 26: Nutritional values of mealworms; Source: Drulea, 2017

2.2. Characteristics and development of mealworms

The larvae of the meal beetle are called mealworms. It belongs to the black beetle family. Mealworms/meal beetles are widespread worldwide and can often be found in tree bark, bird nests or grain stores. The ideal environment for mealworms is a temperature of 20-24°C and little light. Mealworms can be fed with many different substances, including cereals and biowaste. It is particularly noticeable that the mealworm gets along almost without drinking water (animals use water of the carbohydrates released by oxidation). The flour beetle then needs moisture in the fed substances (e.g. fruit and vegetables containing water).

The natural life span of the meal beetle is 5-6 months. During this time, adult females can lay up to 500 eggs. The larvae hatch from the eggs after about 12 days (initial length: 2 mm). In the next 3 months the mealworm skins several times, becomes darker and grows to a length of 2-3 cm and a weight of about 0.5 g. Then the mealworm pupates and after 1-3 weeks the meal beetle hatches (length: 1,5-1,8 cm; can fly very limited) (Reinke-Nobbe, 2007, pp. 10–11).

2.3. Keeping and breeding of mealworms

The keeping of mealworms is comparatively simple. Multi-level shelves are mounted for keeping the mealworms. The different stages of development of the meal beetle are held in different levels. In order to separate the development stages of the meal beetle from each other, a suction mechanism is used, which can separate the eggs and larvae by the suction force. The containers do not need any cover (only at the beetle stage a fine-meshed sieve is used as a cover) and have holes in the walls to ensure good air circulation. The containers must be cleaned regularly to remove excrements and food residues before mould growth.

Most of the mealworms are used for sale, but some of the larvae need to be preserved in order to continue breeding and maintain a continuing insect population.

Compost or dried substrates are fed in the larvae containers, as the mealworms do not need any additional water. In the flour beetle tank compost/biowaste are used for feeding. These rearing conditions are very similar to the natural habitat (Exotic Nutrition, 2018).

2.4. Product manufacturing and product characteristics

The mealworms are sold as freeze-dried worms or worms processed into flour. The mealworms are not fed for 2 days before processing so that the intestine does not contain any residues of the feed. In order to freeze-dry, they are gently frozen (flour worms cannot feel any pain due to non-existent receptors) and then processed in freeze-drying. A food processor is used to grind the flour from the freeze-dried mealworms.

The pure freeze-dried mealworms can be roasted, boiled or processed into snacks at the customer's premises. These insects taste slightly nutty and resemble crispy chips after roasting. Allergies are not yet known. However, as mealworms belong to the arthropods, it is possible that people with allergic reactions to shellfish and other insects could also react to mealworms (Drulea, 2017).

3. EU policies and potential subsidies

According to the Novel Food Regulation (EU) 2015/2283, various insect species have been considered novel foods in the EU since 1 January 2018 (European Union, 2015). So far, no insect species have been officially approved, but there is currently a transitional regulation that allows insects to be sold on the market as human food. EFSA is currently reviewing the applications and an approval for mealworms is expected in the very near future. Individual companies will be audited upon request and will be able to sell insects before the EU takes a final decision (Minhoff, 2019).

The WHO and the EU see great potential in the use of insects for human nutrition. Accordingly, there are also promising EU Commission funding opportunities for companies that produce insects as food. According to Ricardo Tavio, consultant of EVM, EU funding through Horizon2020 and Life is very likely.

4. Market and Competition

“The global edible insects’ market is expected to reach USD 7,956.7 million by 2030, supported by a CAGR of 24.4% during the forecast period of 2019 to 2030. Also, in terms of volume, this market is poised to grow at a CAGR of 27.8% during the forecast period to reach 732,684.1 tonnes by 2030” (Meticulous Research, 2019). A large increase in the

market volume for insects is already expected for the next 4-year period. The European market will also increase from USD 82.1 million to USD 261.5 million (see Fig. 27).

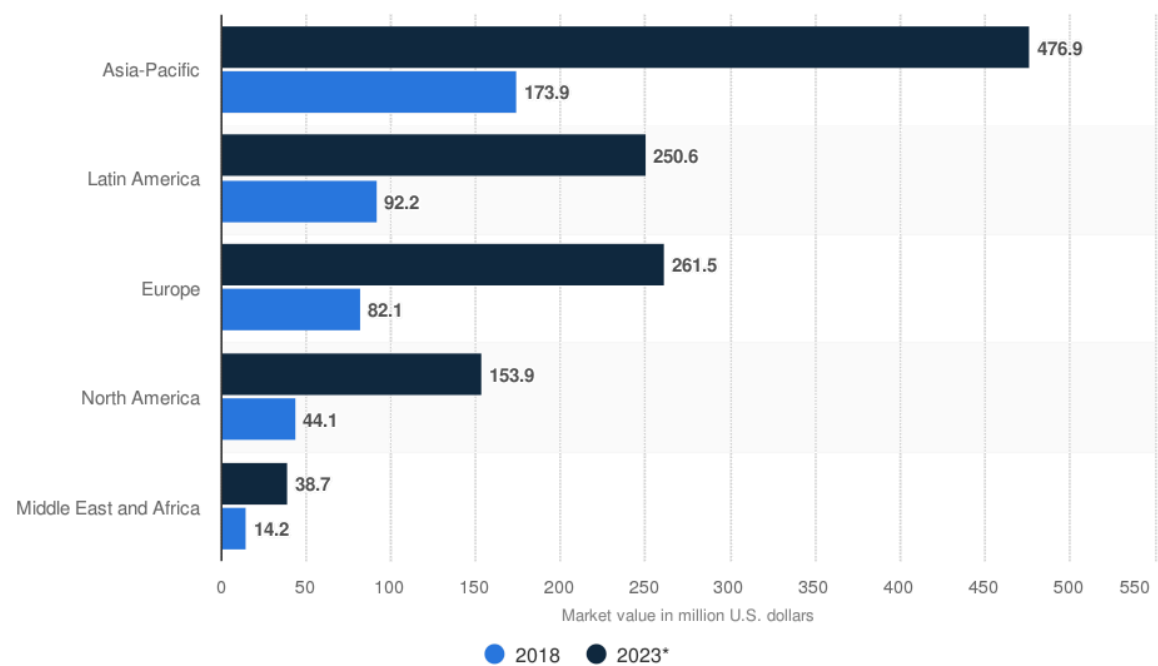


Figure 27: Market value of edible insects worldwide in 2018 and 2023, by region; Source: Statista, Meticulous Research, 2019

As a result, new competitors are constantly entering the market as entry is comparatively easy. There are already some key players at the global level:

Edible Insects - Global Key Players	
KrecaEnto-Food BV	Ynsect, Eat Grub Ltd.
Thailand Unique	Bitty Foods, LLC
Entomo Farms	EAP GROUP – MICRONUTRIS, Edible Inc.
Haocheng Mealworm Inc.	Bugs Solutely
Global Bugs Asia Co. Ltd	Crik Nutrition
Agriprotein Holdings Ltd.	Enviro Flight, LLC
JIMINI’S (ENTOMA LTD)	Entotech SAS
EnormApS, Chapul Inc.	Deli Bugs Ltd.
Hargol Food Tech	Aspire Food Group
All Things Bugs, LLC	

Although strong market growth is forecast, few people in Germany are currently willing to eat insects (see Fig. 28). Similar attitudes towards insects can also be seen in other

European countries. Accordingly, there is a lot of potential in the market size. The market could be further expanded by raising people's awareness of insects as food.

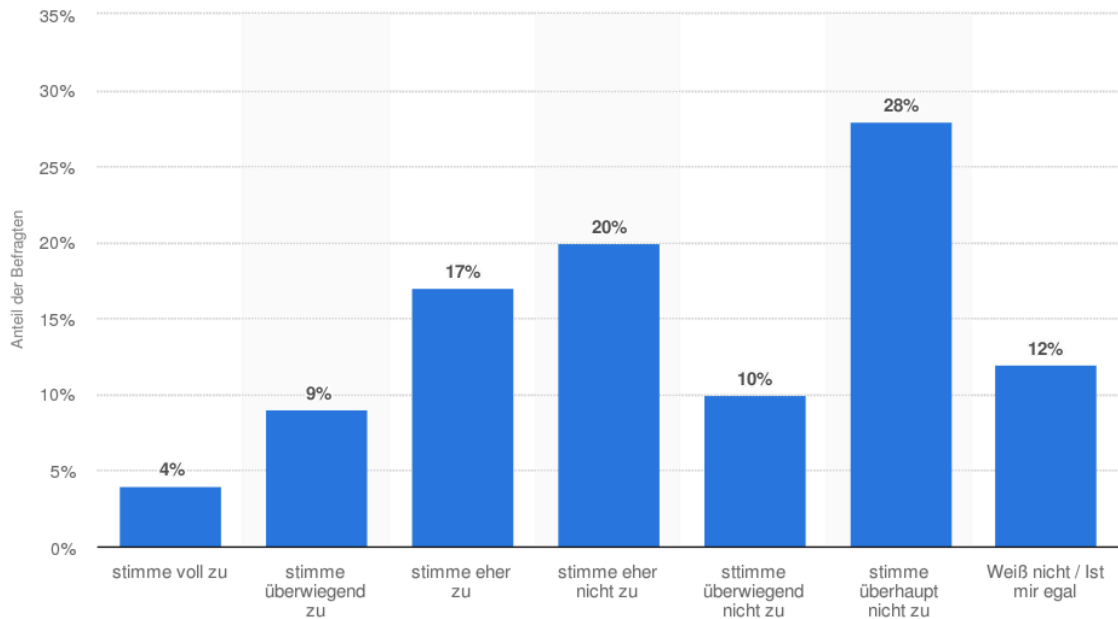


Figure 28: Willingness to buy insect proteins; Source: Statista, Uni Gießen, 2018

5. A circular business model that fits to Tenerife

There are more than enough reasons to choose the Canaries for building an insect farm. First, the general location factors are a good starting position for breeding as well as shipping the product. The consistently high temperatures provide the perfect conditions for mealworm breeding. Complex breeding facilities or additional heating are not necessary. Also, the humidity level on the island is perfectly suitable for the animals. Additional factors like low corporate taxes and the strategic relationship to the European Union as well as to Africa round off the advantages of the location. The “Made in EU”-label is trustworthy and appreciated by customers worldwide. Second, the business concept is circular and therefore contributes to a more sustainable image of the island. As shown in the illustration below, the process from feeding with organic material through processing of the mealworms to their sale is resource-saving and leaves hardly any waste. The garbage that remains is actually a good natural fertilizer that can be sold as side-product.



Figure 29: Circular Process of the Next Taste business model; Source: Own illustration

In summary it can be said that no other location in Europe has such good conditions for the breeding of food insects as Tenerife. Since the focus of this business model is both on the habituation of Europeans to this new protein alternative, and on the fight against world hunger Tenerife is a strategically well-located starting point to reach both Europe and poor regions like Africa.

6. Circular Business Plan

Value proposition

Next Taste – insectify your life! In order to stick to a circular business model, the company established different strategies. The goal is to solve problems on three levels: First, Next Taste wants to combat world hunger by implementing a foundation that deals with the provision of self-breeding vending machines for insects in poor countries.

Secondly, at EU level, the company wants to change people's awareness of the future global food scarcity. Therefore, Next Taste is targeting the Europe-wide distribution of edible insect products and the opportunity to take a holistic look at the topic of food insects during an *"Insectify-Tour"* at the headquarters on Tenerife. People should recognize that edible insects are a real, meaningful and healthy alternative to conventional protein sources. The production is very environmentally friendly and uses just little space, water, and feed. Besides, all products are produced under the strict EU-regulations.

Thirdly, on a local level Next Taste helps the Tenerife island to make steps towards a more sustainable economy and alternatives to traditional tourism. Environmentally and health conscious tourists who participate in the Next Taste *"Insectify-Tours"* bring

enormous added value to the island as they are willing to pay for good, local and sustainable accommodation, leisure activities and food. for food insects.

Customer segments

Next taste is active in B2B and B2C business: The company sells its products to business partners such as companies which produce protein bars, insect pasta, insect breads or mealworms chips. The flour made from mealworms is mostly demanded by companies which are in the insect bread and pasta business. Completely freeze-dried mealworms are especially demanded by the insect chips companies. Additionally, Next Taste is selling insects to the targeted end consumers, which are mainly wealthy people who pay attention to nutrition, or who need many proteins e.g. athletes or diet-conscious people. Also, food insects are good for consumers who do not want to eat animals which have suffered and people who are into food trends. Targeted are B2B and B2C customers that are mostly located in the EU, since we produce our products according to EU standards.

Channels and customer relation

Next Taste reaches out to business partners mostly by attending food fares in order to get in contact with potential new partners. Furthermore, business partners can contact Next Taste via its expressive website including an extra section for B2B customers. To get in contact with its B2C clients, influencer marketing and social media are used heavily. There is also a blog where the latest recipes for delicious insect-meals are demonstrated in order to encourage customers to try something new. End consumers can purchase the products online. Next Taste's sales partners are companies like Foodist, Gourmondo or Amazon. When the business has established itself after some time other partners like for example supermarket chains with elevated price levels will be addressed as well. After Next Taste got an organic certificate, its products can be sold by organic supermarkets too.

Financial aspects: revenue streams and cost structure

The company's income consists of selling insect flour and as well as whole freeze-dried mealworms. When selling to its business partners the income is gained directly. If the product is sold by trading partners, Next Taste's income is reduced by the commission they take for offering the products on their webpages. An additional income stream is the sale of the excretion by-product, which can be used as a natural fertilizer. Other costs reducing the company's income are maintenance costs for the plant, personnel costs and

costs associated with the feeding, breeding and processing of mealworms. Costs for the plant are rather low since heating is generally not needed on Tenerife due to the perfect climate conditions throughout the whole year. By collaborating with the local waste management company and hotels which produce a lot of organic waste, Next Taste just has the costs of establishing a biowaste collection system because these facilities are happy to get rid of their waste. Yearly one-off costs for new insects must also be calculated. Another cost that comes up once a year is the maintenance of plants and machines like the dry-freezer, the food-processor and the packaging system. In addition, costs for online marketing, influencer marketing and the food fares need to be considered in the company's expenses. Besides that, Next Taste wants to contribute to a campaign which introduces insects as a normal daily diary to Europeans in order to change the way people think about eating insects.

Key Partners, resources and activities

Next Taste's key partners are businesses who buy the products. In addition, Next Taste depends on companies or hotels who provide the organic waste used as food. Well-known sales partners with a high reach are very important as well to get in touch with as many end consumers as possible.

The strategic partnership with other food insect companies from Europe is an important key factor in raising people's awareness of the consumption of mealworms and other food insects. A joint, Europe-wide advertising campaign is to ensure that people firstly become aware of the precarious supply situation worldwide and secondly rethink their own eating habits. Insects are recommended to them as a healthy and tasty protein alternative.

The key resources are definitely the mealworms and the property the company owns. The employees and their knowledge are an important component of the business model.

The feeding and maintaining the health of the mealworms are the key activities of Next Taste. This happens by keeping track of their nutrients and adjusting the climate around them. Furthermore, breeding new worms is important to not be dependent on always buying worms from external companies. In general, Next Taste the key activities are based on the expertise to breed, keep, process and market mealworms. The sale of organic fertilizers resulting from the production of worms can be regarded as a supplementary business. The maintenance of the website, the online shop and the contacts to the sales partners are also part of the main activities.

7. Overall mission and conclusion

Next Tastes mission consists of three levels: Globally the company combats world hunger by investing in its foundation and pushing forward research for self-breeding vending machines in developing countries. The mission on the second level is about changing the mindset of Europeans concerning edible insects. Finally, the perception of the Tenerife island will change in a positive way. Where party tourism dominated in the past, environmentally conscious tourists will then travel the island.

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5. Idea evaluation and conclusion

Developing the business ideas turned out to be a very unique and challenging process within each individual group: the idea finding process was completely different, some groups had to reject their ideas several times and find completely new approaches, while other groups could work with the same idea since the beginning. In addition, the business ideas differed greatly in their complexity and were developed to different degrees over time. Through extensive preparation and initial idea development before the trip, various potential business areas have already been discovered. The stay on Tenerife enabled us to find out whether the implementation of the ideas is possible at all and how the ideas can be processed further. Subsequently, the business ideas have been worked out in detail.

Finally, we have evaluated the five final business ideas based on various factors like general feasibility or market growth. The following spider chart shows the outcome of the evaluation:



Figure 30: Evaluation of the business ideas based on various criteria; Source: Own illustration

In the following, the main advantages and disadvantages of each business idea are presented concludingly.

Business Idea „GetOn“:

The traffic problem on the island can be solved by increasing the joint use of cars. This will reduce the traffic volume and allow each individual to reach his or her destination more quickly. The combination of car sharing, and ridesharing can even improve individual mobility. To this end, the company offers a platform that combines these services.

However, this idea cannot yet be implemented on the island: surveys have shown that residents are not prepared to carpool or make their cars available to others. People's attitudes must change fundamentally in this respect. Thus, the business model cannot yet be realized for Tenerife - but this is mostly a cultural limitation and it is probable to work in other environments.

Business Idea „CombatOcean“:

Cruise ships often throw their garbage into the sea. One corporate solution is to reduce plastic waste and biowaste on board during the cruise. The plastic is converted back into crude oil and then converted into electricity and heat in the block-type thermal power station without harmful emissions. The biowaste is dried by the heat of the ship engine, so that a remainder of 30% of the original mass remains in powder form. This is a sustainable solution to combat marine pollution.

At this stage, the profitability of the model is questionable. In addition, there are many competitors who are developing technical solutions.

Business Idea „Greenerife“:

Banana leaves are purchased from banana plantations and resold as sustainable and degradable packaging material. The model offers a direct zero-waste solution for the current packaging problem. Since banana plantations are located on Tenerife, no large transport routes have to be overcome.

On the other hand, banana leaves are not available in large quantities on the island. It may also be necessary to import leaves from other countries. So far not all forms of packaging can be replaced by banana leaves.

Business Idea „SeaOn“:

The renewable energy sources produce electricity, at certain times even more than the island needs. The not needed electricity is used for the electrolysis of seawater to store

the energy in the form of hydrogen. The approach offers the possibility to store surplus and useless energy, adjust it to the demand and reduce energy production from fossil fuels. In contrast to other storage options, only renewable resources are used in this case. The technical solution offers an economic solution for an uneconomical situation. On the other hand, as a non-autonomous company, cooperation with electricity providers and infrastructure partners is crucial in this case. Also, access to the raw material can be restricted.

Business Idea „Next Taste“:

Mealworms are freeze-dried as food and sold as flour. They require only a tiny fraction of the traditional animal protein sources in terms of water, feed and rearing space. In addition, breeding is simple, and diseases can not be transmitted to humans. It provides a solution for current and future environmental and nutritional problems worldwide. The environmental conditions on Tenerife are ideal for breeding. At the same time, however, other companies have been able to expand their expertise for some time and a lot of work has to be put into the willingness to eat insects in Europe.

Regarding all those aspects, our overall conclusion is as follows: Tenerife provides a diverse environment for new business ideas since much can be tested within a small limited ecosystem. In general, the project has been a very useful experience for the whole group, showing us how complex the creation of new business models can be and how many local factors can influence the feasibility that were not considered before. On the island we have met interesting people and institutions that are making a lot of effort to make Tenerife less dependent on fossil resources and non-sustainable business concepts.

In conclusion it can be said that circular business models are a suitable alternative for Tenerife. It is important that the island is rethinking and dares to break new ground. To this end, we have shown various approaches that address the current problems on the ground. Each of the generated ideas has its advantages and disadvantages in regard to the feasibility on the island or the general competitiveness. But in terms of the circular economy concept, business ideas have great potential for Tenerife but also for implementation in other regions.