CREATE IMPACT!

HANDBOOK FOR SUSTAINABLE ENTREPRENEURSHIP

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Port of Rotterdam

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UNEP/WUPPERTAL INSTITUTE COLLABORATING CENTRE ON SUSTAINABLE CONSUMPTION AND PRODUCTION

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COLOPHON
Create Impact! Handbook for Sustainable Entrepreneurship
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INTRODUCTION

We are living exciting times that are characterized by major power shifts: there is no need for large and complex infrastructures and organisations to transform an idea into a tangible solution. Today, an individual that is empowered with a good idea, determination, and some easily accessible tools can challenge entire industries.

This has led to a new breed of individuals that use entrepreneurial values and approaches to solve major sustainability problems. We call such people sustainability entrepreneurs. Sustainability entrepreneurs apply imagination to challenging problems to conceive, prototype, and create solutions that deliver environmental, social and economic value. Typically, sustainability entrepreneurs are on a personal mission to make the world a better place for people around them.

There are plenty of examples of entrepreneurs that have demonstrated that a look through the lens of sustainability reveals opportunities to improve our natural environment, people's quality of life, while at the same time creating economic value. Examples include Elon Musk of Tesla Motors, Igor Kluin of Qurrent, Matt Flannery of Kiva, or Stef van Dongen of Enviu.

In this guide we collect some of the lessons that have been learned in the field of sustainable entrepreneurship with the aim of providing direction to those who aspire to turn ideas into solutions that succeed in the market. We start by reviewing the concept of sustainability and the relevance of sustainable entrepreneurship today, and describing both what sustainable business ideas are, and what they are not.

With the aim of illustrating the variety of areas in which sustainability is a source of business opportunity, chapter two presents a number of case studies of sustainability start-ups. From this point, the guide outlines different elements of sustainable entrepreneurship and provides guidance on process. Chapter three starts by defining the importance of understanding the stakeholders and value-chains, followed by addressing the question of how to identify and evaluate sustainability-related opportunities and how to analyse assumptions, and understanding user needs.

Chapter four reviews the roles and responsibilities of both supporting partners a core team with complementary skill sets and clearly delineated responsibilities and the importance of these factors to the success of your venture.

Financial support is required to launch even the smallest business venture. Chapter five reviews the different ways to access to financial support from informal sources like friends and family, as well as formal sources like banks, venture capital investors, and public institutions.

Chapter six addresses the basic content and sections of business planning so you can elaborate a plan that helps you organize and clearly communicate your idea to others.

If you are reading this guide, chances are that you have an entrepreneurial idea and intend to make the world a better place. Reality is that there is nothing stopping you from achieving your vision. We hope this guide is a supportive companion on this journey.

SUSTAINABLE ENTREPRENEURSHIP MANIFESTO

1. *Sustainability entrepreneurs formulate new ways to create and capture environmental, social, & financial value;*

2. *Sustainable Innovation develops unforeseen opportunities by delivering solutions to sustainability issues. Technological & social innovation is a frequent element in this process;*

3. *It is a journey, not a goal. Your aim is to constantly improve over the past, your competition, or the the status-quo;*

4. *People are the greatest source of opportunity. Science sets the limits of what is possible;*

5. *Get to know the facts: Opportunities come from an understanding of context;*

6. *Connectivity is productivity. The world is flat, capitalize on this fact;*

7. *Create value for people around you;*

8. *Be a hub in your personal network, leverage others by giving a voice, connecting, empowering;*

9. *Information is power!... you can get it all, for free; use it, share it, filter it, mix it, reflect upon it;*

10. *You can do anything you want, anything. The tools are out there, the power of like-minded people too, and you've got the brains to do it.*

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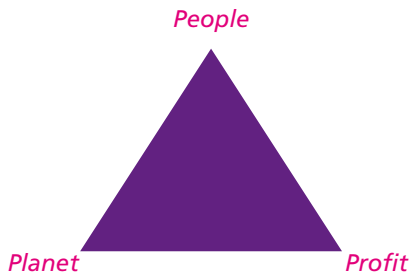
1. SUSTAINABILITY AND ENTREPRENEURSHIP

Environmental and social issues have been on the agenda of companies, governments and NGOs for some years now. As a consequence, much has been done to reduce environmental impact and improve the quality of life of people. It has been only recently that entrepreneurship is emerging as a new forum within which sustainability issues are being addressed. Entrepreneurship has the potential to create value within each of the three dimensions of sustainability while boosting innovation though new products, services, and business models.

Here we start by reviewing the concept of sustainability, sustainable business ideas, and the relevance of entrepreneurship to these concepts.

1.1 WHAT IS SUSTAINABILITY?

Sustainability is a broad and complex concept. For some it speaks to ecology and protection of natural resources. For others it refers to sustained economic progress or, conversely, for social issues and with a focus on development and support of the most disadvantaged. For still others, it is a combination of these. Few see the potential of value creation to contribute toward sustainability. However, sustainability is all this, and more.



Sustainable Development is the balance between environmental, social, and economic development

It all started in 1983 when the United Nations created the World Commission on Environment and Development (WCED). The WCED aimed to address the growing concern „about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development“. The outputs of this commission where published by Oxford University Press in 1987 under the title Our Common Future, also known as the Brundtland Report, in reference to the chairperson of this group.

In Our Common Future speaks to the interrelationships between environmental, social, and economic progress and for first time used the term “sustainable development” to describe the concept. Sustainable development was defined as “development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs.“ With this, the commission highlighted the ongoing requirement to fulfil social and economic needs while dealing with natural resource limitations.

Concerns about environmental and social issues existed before Our Common Future. Still, the general belief was that environmental, social, and economic development where distinct concepts unconnected from each other. The first signs of significant environmental concern appeared in the 1960s with the advent of some major environmental disasters, including the mercury poisoning in Minamata (Japan). Later in the 1980s other environmental crises followed, like the Seveso accident that caused major dioxin pollution or the disastrous contamination of air and water in Bophal (India). By the 1990s it was generally accepted that mismanagement of industrial facilities could lead to major environmental catastrophes, and organisations like Greenpeace used this argument to organize high profile campaigns such as the international movement in opposition to the deep sea disposal of the Brent Spar oil platform. The response from business and academia to three decades of environmental crises was mainly in the form of the design of technical and engineering solutions, which led to concepts like industrial ecology.

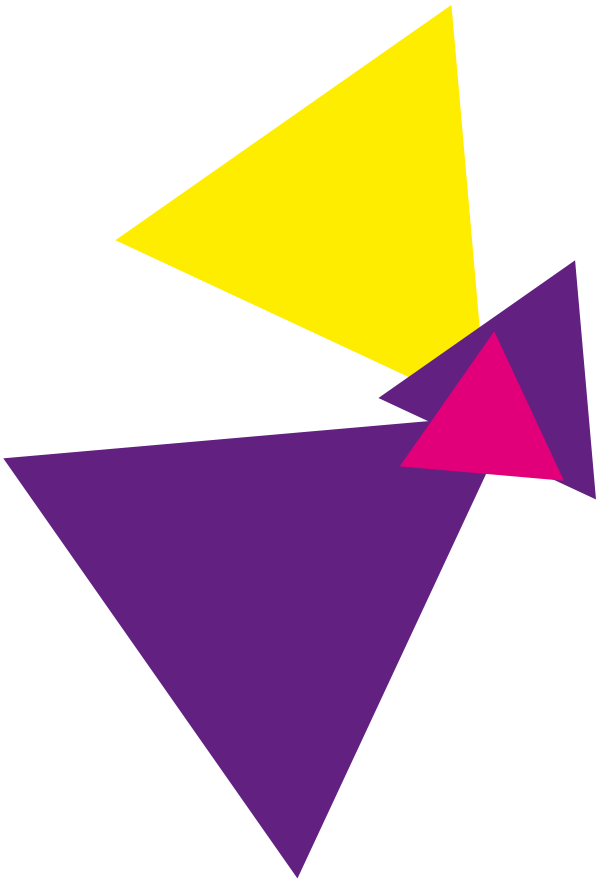
Since that time the environmental dimension has broadened in scope aiming to influence the impact created by consumers, as well as to reduce the adverse effects of production processes. In this regard, product designers see themselves as key actors with the capacity to determine manufacturing processes, material composition, and influence quality of life of the most disadvantaged. By the mid 1990s the concept of sustainable product design and base of the pyramid emerged.

By the late 1990s and early 2000s, environmental and social considerations came to be embedded at the strategic level of large companies and country governments. However, after picking the so called "low-hanging fruit" challenges became apparent to efforts to create business value while also creating environmental and social value.

The nature of sustainable development is a moving field that keeps broadening its scope of action over time. Most probably, new focus areas will be embraced in the coming decades.

Commonly, companies and governments refer to the three pillars of sustainability as a "triple-bottom line", in reference to being accountable for environmental, social, and economic success. This is often represented by the figure of a triangle (see Figure 1).
Note: in this guide, the terms "sustainability" and "sustainable development" are used interchangeably. However, strictly speaking, the former refers to the science and social movement while the second refers to the process.

Today, it is clear that economic, social, and environmental development are inter-connected concepts. However, why is so important to develop models of consumption and production that are sustainable?



1.2 WHY SUSTAINABILITY?

Sustainability aims to do much more than address risky situations like the environmental crises mentioned above. Three are the three main reasons why the development of sustainable models of consumption and production are so important:

1. There is limited availability of natural resources;

2. Exponential human population growth, and;

3. Current and future generations have the right to fulfil their needs.

Below each of these reasons are described in greater detail.

1. Limited availability of natural resources

The earth is a closed system providing that provides the necessary elements for life to develop in the form of plants, insects and animals (humans are animals too!). Life requires certain conditions to flourish, including access to energy, clean air, water, nutrients, and materials. In the case of humans, evolution is not only limited to biological subsistence but also to cultural and societal development.

The amount and quality of natural resources available on earth for life to flourish and develop is either strictly limited or requires very long time frames to be naturally renewed. As result, resources and conditions of particular importance include:

- Energy: generation, storage, distribution, usage
- Air & Water: emission, pollution, scarcity
- Toxicity: human & environmental disruptions
- Materials: over-exploitation, scarcity

2. Exponential human population growth

Human populations have been growing exponentially, particularly since the industrial revolution (see Figure 2). Reasons for this include an overall improvement in health services and an increase in food production and distribution. An exponentially growing population translates into an exponential consumption and extraction of resources. Such exponential consumption of resources is directly related to consumption power (i.e. GDP), which is constantly growing in (almost) all corners of the world.

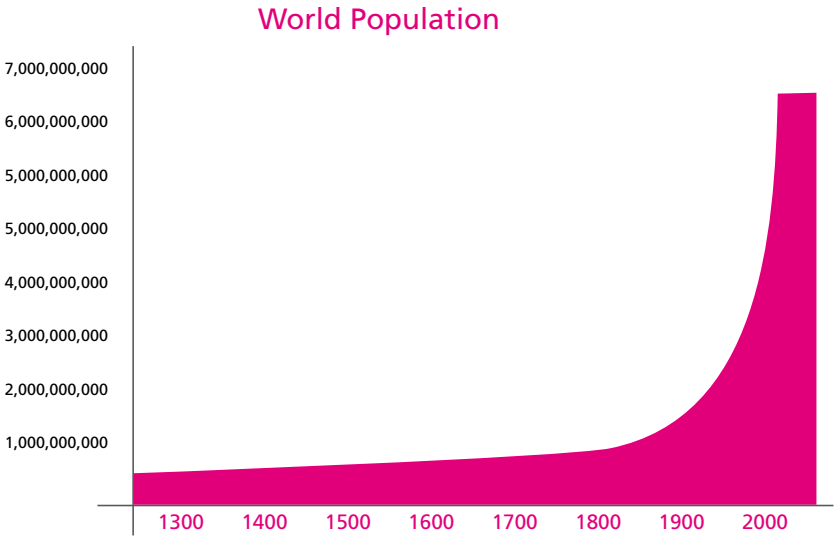


Figure 2: World population growth

3. The right of current and future generations to fulfil their needs

Sustainable development aims to provide the right (and resources) for current and future generations to fulfil their needs. The basic intention of the Brundtland definition is to ensure that future generations will have the capability to enjoy a quality of life, at least as we know currently know it.

The concept of intergenerational equity highlights a controversial concept within the sustainability movement: human needs. What are they (and what is the line between need and greed)? Needs are not uniform across individuals, consumer groups, regions, countries, or economies. Several classification schemes for human needs have been developed. The most recognized of these are basic needs and intermediary needs. In his 1943 work entitled A Theory of Human Motivation, Abraham Maslow developed a well-recognized and comprehensive set of human needs (see Figure 3).

Basic needs for people to develop prosper and with dignified life include access to clean water, shelter, food, energy (i.e. fire, electricity), and healthcare.

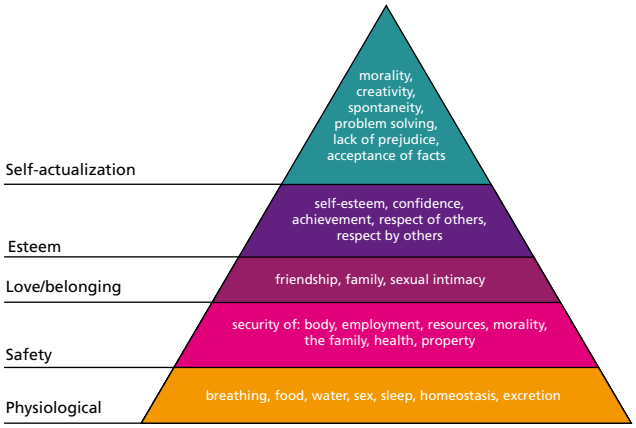


Figure 3: Maslow's Hierarchy of needs

In many circumstances fulfilment of needs is linked to functionality that is embedded into products and services, and these products and services in turn have an effect on natural resources.

The combination of the three elements (limited resources + growing population + right to fulfil needs of current and future generations) represents the challenge that sustainable development aims to address. Moreover, there is no "silver bullet" that can solve this challenge, and many complex issues need to be taken into consideration when aiming to provide solutions.

1.3 CONSIDERATIONS ABOUT SUSTAINABILITY

The process of designing, developing and implementing solutions to sustainability problems is challenging, but not an impossible task. However, you should take into account some considerations when approaching this challenge. The following are some of key points to keep in mind when developing solutions to sustainability challenges.

- Sustainable development is a process, not an end. Sustainable development is measured relative to a defined starting point. For example, if we measure „sustainability" or how „green" a product or service might be, we look first to a point of reference. From here, you can compare other products and services in relation to this reference point. Strictly speaking, there is no such thing as a product or service that is without impact, since any activity or product, just by existing, represents an impact of some type. Calling a product "sustainable" is to understand sustainability as an absolute concept. Instead, what we can say is that a certain product, service or business is more or less sustainable than another. In the latter case, we understand sustainability as a relative concept;

- Sustainability requires incremental and continuous improvement: there is always room for improvement. The objective that we must take into consideration is to keep working and always improve over existing solutions. When each product continues to improve over previous versions or a company continually aims to do a better job we can be confident of being on the right track.

- We cannot always achieve everything; usually one has to sacrifice something. It is very difficult to fix all problems at once. In fact, in the environmental dimension of sustainability it is necessary to establish priorities and understand that it is often necessary to choose one issue in place of another. For example, a few years ago it was decided to reduce energy consumption and CO2 emissions. One of the strategies to achieve this goal has been to promote energy saving light bulbs that dramatically reduce the energy needed to produce light. However, to achieve this functionality in the bulbs, there was a need to used substances such as mercury that cause new pollution externalities. Because of the necessity of such trade-offs it is important that priorities be defined with clarity and to understand that there will sometimes be sacrifices in other dimensions;

- The "Holy Grail" of sustainability does not exist. One can approach sustainability in two ways: trying to find the „Holy Grail" that solves all problems, or seek to develop smaller scale solutions that can be effective in the long run. The first strategy is to seek to develop a „radical innovation". These normally require a large investment of resources (e.g. time and capital) and the outcome and applicability can be uncertain. Experience tells us that it is often more efficient to apply common sense and develop „incremental innovations" that, when added together, create significant positive impact;

- Link individual consumer benefits to social and environmental benefits. Most consumers have four goals in mind when shopping: functionality, price, comfort, and "intangible value". In simpler terms consumer ask: what is the feature that a certain product or service offers me; what price do I have to pay; how will the product make my life easier, and what does the product say about me. Sustainability is only important for the consumer when it is linked to one of these four aspects. Only a minority of the market (less than 25%) has environmental aspects in mind when buying products or services. It is a mistake to believe that consumers can be educated easily to meaningfully change their priorities respecting environmental aspects of products. As in the development of radical innovations, this process requires the investment of substantial resources and the outcome is uncertain;

- a.) Not all consumers are equal. Of the four aspects mentioned above, some consumers are more sensitive to price (looking for basic functionality at the lowest price), others are more attracted the intangible value (willing to pay a disproportionate amount for this aspect), and others might look for extra functionality. When developing sustainability solutions remember that each group of consumers requires a strategy and product design adapted to their unique characteristics;

- Functionality equals impact. At all times it is critical to remain aware that the offer of functionality – for example, lighting or mobility – involves the creation of certain social and environmental impacts. This is inevitable. What we actually seek is that this impact is positive or to minimise negative impacts as much as possible. This is the goal of sustainable entrepreneurship: creating environmental, social, and economic value.

The above list should serve as a guide on how to develop solutions to sustainability issues while creating business value at the same time.

1.4 WHAT ARE SUSTAINABLE BUSINESS SOLUTIONS?

As an entrepreneur you are someone with the capacity to identify and exploit opportunities. That is what entrepreneur do; they have ideas and make them happen. It takes commitment and perseverance to achieve this. However, it can be very rewarding to contribute by delivering solutions that create environmental and social value and at the same time do this in a manner that is self-sustaining from an economic perspective. Sustainable entrepreneurship aims to solve social and environmental problems by applying business principles.

This is accomplished through providing sustainable business solutions that are characterized as:

1. ***Solutions for one specific social and/or environmental problem;***
2. ***Clearly defined business models;***
3. ***Scalable;***
4. ***Inspire others to contribute or trigger action among others to develop their own solutions.***

1. Solutions for one specific social and/or environmental problem;
Such solutions address a problem that is clearly identified and acknowledged by society (see p.1.2 to obtain a list of the most common environmental and social issues).

The impact of the solution can be quantified in relation to the environmental or social impact that the solution addresses. There are many metrics to measure the impact of a problem, however it is recommended to use simple units of measurement such as the number of people affected by the problem or the costs that are avoided through the solution. One should be able to provide an estimate of the contribution of the solution toward the alleviation of the identified problem.

One specific example of an aspect to improve could be the level of energy consumption for public lighting in a city. In this case, it is important to know the actual impact of the electricity system in the form of kW/hr, monetary units, or CO2 emissions. More complex impact measurement systems and indicators do exist, however it is recommended to use simple units that can be easily understood by a large majority of people.

2. Clearly defined business models;
The business model is intended as a means to create and capture value. In the case of sustainable solutions, we talk about creating social and environmental value as well as economic value. In other words, sustainability refers to the question of how to introduce a solution to the market, how to offer value and transform the solution into financial returns while maintaining core sustainability objectives. The business model is not only important for commercial organisations, but also for non-commercial organisations such as NGOs. Yet when the essence of an organisation is other than profit alone, it is necessary to clearly define the necessary economic strategy to preserve the long-term existence of the organisation.

3. Scalable
Scalability is crucial in a start-up that aims to create impact. The scalability of a solution refers to the ability to manage and implement growth in the workload and/or expansion into other territories. In the field of sustainability we are not only interested in solutions that are scalable, capable of growth and able to self support this growth, but also that they are relevant to a variety of contexts and markets. The scalability of a solution is the most important aspect of creating impact and value.

4. Inspire others to contribute or trigger action among others to develop their own solutions
A good sustainable business solution inspires others to contribute to developing the idea and/or inspire others to develop their own version of the solution that adapts to other contexts. If a business solution is outstanding, one can expect that many people will be interested in joining the idea, or in developing similar solutions.

There is a difference between a traditional business solution and one that aims to solve social and environmental problems. While traditional business solutions strive to protect your business idea, and prevent counterfeiting and competition, sustainable entrepreneurship solutions welcome competition. In this sense, intellectual property models that promote the free use of intellectual property by competitors can play an important role in the contribution vs. traditional protectionist models. We call this „open innovation".

1.5 WHY SUSTAINABLE ENTREPRENEURSHIP?

It is only recently that we are aware of the relationship between certain human activities and the implications for the planet. The subject has reached such a level of maturity than it is only now that all the pieces of the puzzle are beginning to come together.

A new generation of individuals is on the rise that are driven to create an impact in society and leave a heritage of improved environmental and social conditions.

Traditionally, environmentalists have focused their attention on established corporations: "They have created all the problems, and they have to solve them". The truth is that the ultimate drivers of the current environmental stress are consumers. It is also true that, until recently, little was known about the effects of industrialisation.

Today large companies are doing much to reduce their sustainability footprint. At the same time it is true that large organisations lack flexibility and often the necessary culture to develop innovative sustainable solutions.

That is why the future of sustainability is in the hands of passionate individuals driven to create environmental, social, and economic value. These are the individuals who will create the innovative technologies and business models of tomorrow.

We would like to introduce you some of those sustainable entrepreneurs in the next section.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2. CASES OF SUSTAINABLE START-UPS

2.1 SUSTAINABLE DANCE CLUB

Co-creating with users to develop solutions that reduce environmental impact, and create business value

One might think that sustainability requires that consumers sacrifice some functionality and fun in favour of the environment. With the Sustainable Dance Club, Enviu has shown that it is possible to combine the creation of environmental value with cost reduction and fun.

Around the world, millions of young people gather to dance in clubs. In 2004, the Dutch foundation Enviu realized that while people have fun in these clubs, they are also responsible for a large environmental impact. On average, it was calculated that every weekend, a mid-sized club uses as much water and electricity, and generates as much waste as two families of four members for two months. This represents a significant opportunity to reduce the environmental impact!

Enviu specializes in the development of solutions for environmental and social problems, and brings these solutions to the market in the form of start-up businesses. To develop these innovative solutions, Enviu engages in a co-creation process that involves the participation of a large variety of actors including users, technical experts, business developers, and young professionals. In this case, more than 200 individuals and organisations where directly involved.

It is especially relevant to understand the point of view of the users and to find solutions that are in line with their expectations. In this case, it became clear that fun is very important for clubbers when going out at night. The solutions created to reduce environmental impact had to be in line with such expectations.
Many ideas came out of the sessions with users and professionals. Of these, some forty were identified as feasible solutions based on the availability of technology and the potential to find ways to find resources for their development. Some of the solutions focus on energy and water efficiency, for instance on the lighting systems, or energy management of the bar area. Among others, the technologies used include dry urinals that do not require water for flushing, or toilets that use rainwater collected on the roof of the club. Also, a bar area was designed where the energy consumption of refrigerators and other equipment and water consumption was reduced to a minimum. All these measures help to reduce the environmental impact of the club, while reducing operating costs.

One of the ideas that stood out was the sustainable dance floor that proposed to turn the dancing movements of clubbers into electrical energy to power the club. Enviu decided to explore the potential of such idea and decided to involve students from the Technical University of Delft, Technical University of Eindhoven, and the interactive design firm Studio Roosegaarde. The Delft and Eindhoven teams focused on the development of a mechanism to harvest energy while Studio Roosegaarde was responsible for developing an interactive interface.

Currently, Sustainable Dance Club is a start-up firm offering products and services to other dance clubs aiming to become more sustainable through reduced environmental impact. Among others, Sustainable Dance Club offers the Sustainable Dance Floor as one of the solutions to their clients.

The current version of the Sustainable Dance Floor is accompanied by a system that indicates the energy that is generated in real time. Although it is on its early years of development, the dance floor has the potential to generate enough power to power the lighting and sound system of the club.
The uniqueness of Sustainable Dance Club lies with the fact that it brought sustainability principles to an industry where it seemed difficult to find a place. Since its first appearance in the media, many clubs worldwide have been inspired by the idea and have developed their own version of the concept.

This case demonstrates how co-creation of solutions with users and experts can result in innovative solutions that create new industries. It is important to identify and understand the needs and expectations of users. Later, when the idea begins to take shape, engage professionals and experts to help grow the concept and identify what is technically possible.

Sustainable Dance Club is a solution to a specific sustainability problem – the environmental impact of dance clubs. The start-up has a clear business model (products and services to reduce environmental impacts of clubs) that is scalable and is an inspiration to many.

2.2 EVENING-BREEZE

Cool nights and energy efficiency

The concept of sustainable tourism was born following the Rio Earth Summit in 1992. After the Summit, the World Travel and Tourism Council (WTTC), together with the World Tourism Organization (UNWTO) and the Earth Council issued the „Agenda 21 for Travel and Tourism Industry" (WTTC, WTO, Earth Council, 1994) which defined sustainable tourism as „tourism that meets the needs of tourists and host regions while protecting and enhancing resources such that they can continue to be enjoyed in the future. Sustainable tourism provides integrated resources so that economic, social and aesthetic values can be enjoyed while maintaining cultural integrity, ecological processes, biological diversity and life support systems.„

Because it exposes some of the compromises that arise in the management of environmental processes the hotel industry in tropical areas presents an interesting sustainable tourism case study. Typically, these hotels are located in areas of great natural beauty where there is often a delicate ecological balance. In fact, the biggest attraction for hotel guests is to be in close proximity to natural spaces that are on the surface unaltered.

In addition, guests expect to enjoy the comforts that a high-end hotel provides, including hot water, clean towels, air conditioning, a bar and restaurant, and swimming pools among other amenities. The compromise arises from the need to ensure that negative impacts from these services do not affect the travel experience enjoyed by the guests. Often hotel management practice aims to develop solutions that are positive for the environment and the customer. Today it is normal for hotels to operate a certified environmental management system such EMAS, or ISO 14000.

Moreover, it is in the interest of the hotel to implement environmental management systems because almost all environmental investments and measures in the hotel industry are quickly recovered as they help to save money.

The challenge of the hospitality industry in general, and for establishments located in areas of natural interest in particular, is to minimize environmental impacts without reducing comfort and guest experiences: how can this balance be achieved?

In 2006, the management team of a hotel in Aruba (Netherlands Antilles) was asking this question. The management team decided to request that two industrial designers from the Technical University of Delft (Yoeri Thomas Nagtegaal and van den Groenendaal) develop new ways to reduce the environmental impact of the hotel. When examining the problems in detail, Yoeri and Thomas realized that some 70% of environmental impacts in the hotel businesses in the tropics are directly related to energy consumption, which is also the largest cost faced by the establishment.

A detailed study of energy consumption identified air conditioning in common areas like lobby, restaurant, meeting rooms, and also in guest rooms, as the largest demand area for energy. A reduction in energy consumption due to reduced air conditioning could represent both significant financial savings and benefits for the environment.

There are two ways to save energy on air conditioning; either the establishment installs more efficient appliances (offering the same functionality at a lower consumption), or one has to sacrifice comfort and adjust the equipment to more moderated temperatures. In any case, the challenge here was to reduce consumption without negatively influencing the guest experience.

As good industrial designers, Thomas and Yoeri began to search for opportunities within the needs and habits of guests. Observations confirmed that most customers come to this type of establishment in search of leisure, and as consequence they spend much of the day offsite visiting nearby attractions. In fact, it is mostly at night when clients spend their time in their rooms and need the comfort of a pleasant and moderate temperature.

A study of user needs supported the idea of reformulating the original problem statement which led to a focus on how to provide a pleasant experience during sleep while reducing energy consumption for air conditioning to a minimum.

To answer this question, the designers looked at the organisation and structure of rooms as well as the functioning of the conditioning system. It was found that most cold air is wasted by cooling entire rooms during the nights although the guests occupy only a limited area during sleep. They considered the possibilities and limitations of cooling the bed area where guests spend the night as a means to achieve greater energy efficiency.

After several brainstorming sessions it was clear to the team that the solution was to bring the air conditioning system closer to the bed. However, this solution had the problem that the devices available were too noisy to be placed near the host which would impact the potential for a pleasant sleep experience.

The next phase was to work with manufacturers of air conditioners to develop equipment that, aside from being energy efficient, would also be quiet enough to place close to guests and not disturb sleep. And they succeeded.

The final product is Evening Breeze, a very quiet and highly energy efficient air-conditioning system that is coupled with a canopy bed. Fresh air is circulated through a porous drive to the top of the bed, covering the area where the host sleeps and providing a pleasant night temperature without cooling the entire room.

After working on an initial prototype, five beds were manufactured and tested with different guests. The results were very positive. Guests did not miss the air conditioning in the remainder of the room during the night and rated the experience as being very pleasant. In addition, the hotel manager was also pleased with the solution, particularly after realizing that Evening Breeze reduced room energy costs by 40%. An order to equip the rest of rooms was immediately made.

By observing use patterns and reformulating the problem the industrial design team developed an innovative solution, both from an environmental perspective and in relation to the sleep activity of guests.

Today the Evening Breeze bed is installed in several hotels in the Caribbean and designers Yoeri and Thomas continue to develop solutions for hotels to reduce the environmental impact of tourism and maintain or improve the guest experience.


qbox

2.3 QURRENT

Transforming consumers into producers

Sometimes technological innovation creates real disruption in the industrial world. For instance, during the last decade, personal computers and Internet connectivity has been the base for a new breed of business models related to the production and distribution of content, including music, news, design, radio or photography. Technology has been the reason for the lowering of entry barriers which has allowed a multitude of "amateurs" to gain access to creation and distribution tools. Over time, these „amateurs" have found ways to monetize their creativity either by directly selling content created online, or by acquiring projects (new leads) as a result of promotion and recognition acquired via their online activity.

The decentralized nature of the Internet forced a power shift in the content production industry. While traditionally these industries relied on centralized models where a producer of content was in control of its creation and distribution, now the base is a series of decentralised resources. The result is that consumers are turning into producers. This new figure is known as „prosumer", and it refers to the shift from passive consumers toward active participation within the system.

Currently, the decentralisation of production and distribution is expanding to other sectors and industries, going beyond digital formats and embracing physical products (See C. Anderson, In the Next Industrial Revolution, Atoms are the New Bits)

From an eco-innovation perspective, the question we ask is the opportunities that decentralized networks offer to the creation of environmental and social value? How can consumers become producers and in which way does this contribute to the goals of sustainable development?

Igor Kluin, a Dutch entrepreneur, is answering this question by applying decentralized production and distribution principles to the energy sector. The result is Qurrent, a platform providing a combination of services and technologies that transforms consumers of electricity into producers.

To achieve this, Qurrent offers clean energy generation systems, energy management, and distribution services.

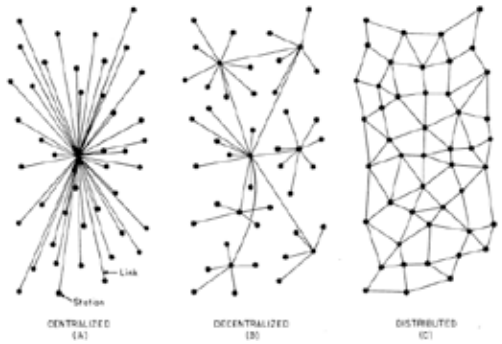


Figure X: Centralized networks (A), Decentralised (B), & distributed (C) (Paul Baran, 1964)

It is only recently that generation of energy at the personal level has become cost-effective. In this case, the company works closely with construction companies so Qurrent systems can be installed in new building blocks to become an interesting option for prospective buyers and users, distributing costs among the many different users. Accordingly, wind power generation systems, solar panels, and co-generation systems are installed in neighbourhoods and communities in new construction areas, creating a network of local energy generation and distribution.

Although not a requirement, this network is also connected to the general grid through an electrical connection. First, energy generated is used by members of the local network. In the case that the community generates surplus energy this energy is sold to the grid. The same system also works in the opposite direction: when the local network does not generate enough energy, then it is supplied by the general grid.

One of the innovations introduced Qurrent is an energy management system that allows predictions of generation capacity and energy consumption. This process is managed automatically by a software platform that continuously collects data in real time from all members of the network and makes predictions on the basis of the data. Based on these predictions, distributed devices in the homes of consumers/producers adjust their activity to optimize the use of energy resources in the network. This activity can be managed through the user interface.

2.4 THREDUP

A case of collaborative consumption

Thredup began as a project between three friends: James Reinhart, Chris Homer and Oliver Lubin. Reinhart and Lubin were roommates at Boston College and Reinhart and Homer were friends at Harvard Business School. They shared a common problem: each has too many unused clothes and limited storage space in their flat. They decided to find an easy and inexpensive and efficient way for consumers to swap clothes. In October 2009, they launched Thredup, a web-based peer-to-peer clothing exchange service.

Soon they realized that there was an important costumer segment searching for clothes: moms. Their kids grow pretty fast and their clothes are expensive. In fact, the entrepreneurs determined that kids grow out of their clothes every 3 to 6 months and parents retire some 1,400 articles of clothing as a child grows. In April 2010, they launched Thredup Kids that became so successful that within months the original clothing swap service was discontinued. The system is simple; for $5 USD plus shipping costs, members could buy a box of used children's clothing and also upload and offload their own boxes.

They claim that their service aims "to bring a new level of affordability, convenience and eco-consciousness to a highly fragmented, billion-dollar market for second-hand children's clothing". It is designed to help parents easily swap clothes that their kids have outgrown for great new items that fit. By September 2011, Thredup had raised $8.7 million in venture capital.

Collaborative consumption market places are everywhere: media, car rental, lodging, staffing, textbooks, apparel, custom graphic design and even finance. Loosely defined, collaborative consumption is a business model in which shared goods or services are distributed via a marketplace to a community of users. It reshapes markets by changing supply and demand economics. At the cost of market size, reuse liberates the environment from excess consumption.

Rachel Botsman and Roo Rogers recently published What's Mine is Yours, a global survey of collaborative consumption efforts. In the book, the authors define three categories of collaborative consumption. First, product-service systems enable products like DVDs, cars, books or homes to be rented. Second, redistribution markets, which are exchanges for used items, including clothing. Third and finally, collaborative living services that aim to broker relationships for individuals with service providers.

Technology is the key enabler for this resource allocation optimisation. Marketplaces attract customers and build communities using the web. Social networks, proprietary and public, help build trust among users. Computers and mobile phones bring simple payment mechanisms that enable transactions to happen anywhere. The ultimate beneficiaries of this competition and additional selection will be the consumer and the environment.

http://www.entrepreneur.com/article/220256
http://venturebeat.com/2011/05/12/thredup-funding/
http://www.huffingtonpost.com/mit-entrepreneurship-review/peertopeer-startups-are-e_b_837144.html

2.5 O'FOIL

Nature as source of eco-innovative solutions

Nature has always been a source of inspiration that has supported the development of innovative solutions. Examples abound; from the Velcro (inspired by the thistle flower), to photovoltaic panels (inspired by tree leaves) to Gaudi's architectural solutions. The technique to observe nature's design and develop solutions on the basis of these observations it is known Biomimicry.

Biomimicry is based on solutions that nature has refined over millions of years and adopts the principles of life to the design of products: sustainability, efficient performance, energy savings, savings in material use and disposal of waste. Unlike traditional industrial principles based on the extraction and misuse of nature, biomimicry learns from nature. The term "biomimicry" comes from the „bios" (life) and „mimesis" (imitation).

J.M. Benyus, is considered the father of biomimicry. Benyus proposes a biomimetic world as: „In a biomimetic world, we fabricate as animals and plants do, using energy from the sun and simple materials for fibres, ceramics, plastics chemicals that are completely biodegradable. Farms and fields would be modelled on prairies, self-fertilize and be resistant to pests. To find new drugs or crop species, we would consult and observe animals and insects that have used plants for millions of years to stay healthy and well fed. Even computing would follow the example of nature" (source: JM Benyus, Biomimicry, Innovation Inspired by Nature).

These principles inspired Bas Goris, a naval architect to develop a propulsion system for ships based on the design and move of marine mammals. This would result on a more efficient system than those presently available, specially the propeller. It was the motion of whales, which inspired him to design a similar propulsion system for boats.

O-foil refers to „oscillating foil". In this case, a sheet generates propulsion by creating a driving force in the water, like the conventional propeller. But unlike the propeller, the blade covers the entire width of the ship and as a result the propulsion surface is much larger. Besides saving fuel and reducing costs, the system offers other advantages such as reduction of CO2 emissions, reduction of vibration and noise on board, and reduced maintenance costs when compared with a traditional systems.

In 2010, Bas built a 10-meter long prototype that demonstrated the advantages of the nature-based design. The new oscillating propulsion system is 50% more efficient and reduces fuel consumption by 33% relative to a traditional propeller.

2.6 CLIMATECARS

Eco-friendly taxis from London

Nicko Williamson, at the age of 22, started writing his business plan during his last year of University with the aim of disrupting an existing market. His idea was to launch a carbon neutral Taxicab company called Climatecars. Founded in 2007 Williamson today operates a profitable and growing company.

The inspiration came when he was a student. "I was studying at Bristol University and kept driving past a gas convergence station that was advertising itself as a green fuel business. The idea was that you could convert a normal car to run on LPG (liquefied petroleum gas), which was much greener and the emissions much lower. It was at that point I suddenly thought of taxis, as I had been in and out of London where everybody was using this company called Addison Lee, the biggest in the market, and I just thought 'why can't I make this greener?"

He realized that he needed experience in the industry and searched for job at a rival company that allowed him to see how the business worked. After a few months, he understood the model and felt ready to develop his own idea. He used his savings and raised money from friends and family for initial capital that formed a basis to generate additional external investments.

Climatecars is a discreet taxicab firm that serves corporate clients but in a more environmentally friendly way than other companies in the market. The company understands that clients aren't necessarily willing to pay extra to be green. "When I started I was determined that we weren't going to price ourselves out of the market. We need to be cost-competitive. While the green angle is great I am very much of the view that people are not going to be pay more for a green service or product. I didn't want environmentally friendly cars where people say 'oh great idea but we can't afford it.'"

Climatecars is fast approaching a fleet of 70 Toyota Prius taxicabs, targeting a turnover approaching £3.5m for next year. They offer a hybrid technology combined with a carbon offsetting service. Additionally, they have brought a few innovations to the industry. First, something they consider shouldn't be considered as a luxury: cold mineral water to quench the thirst of clients and reading material such as magazines and newspapers to make the rides more interesting. They claim that they can't eliminate traffic jams, but they can certainly keep clients absorbed during the ride. Another distinctive element is that all their cars have bike racks on board, so tired bicycle riders can ride home in a cab with their bike.

Climatecars have two important partners. One is Belu Water, the first bottled water company that doesn't contribute to climate change (the brand offered on board), and Carbon Trade Xchange, the world's first global spot electronic trading platform for voluntary carbon credits. The vision for the company is to eventually work with fully electronic vehicles and they are starting to build toward this ambition with the first fully electric vehicles to be introduced in early 2012.

http://yourhiddenpotential.co.uk/2011/04/13/climate-cars-targeting-a-turnover-of-3-5m-nicko-williamson/
http://www.startups.co.uk/climatecars-nicko-williamson.html
http://www.climatecars.com/company.html

3. OPPORTUNTIES & IDEAS

3.1 STAKEHOLDERS & VALUE-CHAIN

A stakeholder is any party who affects, or is affected by a company's actions. We call the system created between the start-up company and the stakeholders around it the "value-chain".

There are two types of value chains: internal and external. The external value chain refers to the interactions between business and interest groups that surround the business. Normally this includes consumers, government, lobbying organisations, and financial institutions. The internal value chain refers to the actors and activities necessary to provide value in the market. It includes, among others, suppliers, management, engineering, marketing, legal, production, and marketing activities.

From all interactions and existing value chains, the environmental value chain is the one responsible for channelling and connecting activities and actors in the process of creating environmental value in the form of products and services.

It is essential that anyone intending to develop a new product or service understand the interests of each of the actors in the value-chain. The biggest challenge one faces in the field of innovation is not the development of a technology, but managing the value chain and the sometimes differing interests of each actor. Understand and handle the interests of those around you properly, and the likelihood that your idea will survive multiplies.

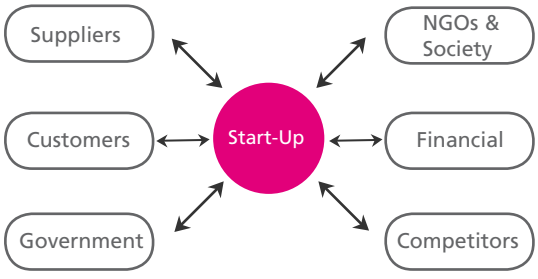


Figure 4: External value-chain

Some of the most common actors in the external value-chain and their interest are:

- Suppliers: suppliers provide components or services that support the development of the product or service you intend to offer. A good relationship with suppliers is essential to successfully bring your idea to the market. Suppliers are typically interested on creating long-lasting relationships with their clients, improving the products they can offer, and expanding their business;

- Customers: customers and users are not necessarily always the same actor. A customer pays for your solution, and the users benefit from its functionality. The customer is interested in paying a fair price for the solution while the user is interested in ease of use, convenience, and other factors.

- Government: government is typically interested in improving the competitiveness of its local economy and also improving and securing the quality of life of citizens. Because of its legislative powers government is responsible for defining what is and what is not allowed within its jurisdiction. This might set boundaries around aspects of your solution, but it might also open a window of opportunity;

- Financial organisations (i.e. banks): financial organisations can provide loans and financial support to launch or expand your business. Today, the range of financial organisations includes established institutions like banks as well as newly created forms (i.e. micro-financing, crowd-financing). Financial organisations are interested in your business model (how you create value), and also in establishing long-term client relationships;

- Competition: under traditional entrepreneurship rules, competitors are perceived as those that you aim to defeat (take out of the market). However, competitors have the potential to add value to your product or service, especially in the field of sustainable entrepreneurship where you aim to solve environmental and/or social issues. The more start-ups/people working on solving certain problem, the better for the rest of society.

- Environment: here we consider the environment as a stakeholder because your aim is to create a positive impact. One might say that the interest of the environment is to continue to provide life-sustaining resources;

- Society: as with the environment, society is also a stakeholder to take into consideration. Although different social groups might have different interests the overall goal of society is to develop prosperity (in all its forms).

Although this is a rather basic description of the actors in the external value-chain, it provides an idea of the different interests that might need to be managed and taken into consideration when developing a solution and bringing it to market. Spend some time identifying the stakeholders involved in your solution and talk to them to identify their specific interests. It is always useful to speak the language of your stakeholders: engineers speak technical language, bankers speak financial language.

You might want to know really well the final user of the solution you are developing. Getting to know the user helps you discover innovation opportunities that will facilitate acceptance of your solution.

Empathising with the user

Of all the actors in the value chain, the most important of all is the end user of your product or service. Understanding her/his interests, desires and frustrations is essential to develop a solution that creates value for she/he, and for the development of a business model.

One of the reasons why sustainable entrepreneurship fails is that there are usually very good intentions but also very little knowledge about the problem. This is why so many of these initiatives fail.

Markets are not homogenous; each segment has its own interests and solutions tailored to those interests are required. The entrepreneur can organize to better understand the user. There are various techniques that can help this process. You can start by doing desk research and studding existing information about the problem, who has worked in the field in the past, what kind of solutions are currently available, and why past attempts have been or have not been successful.

Moreover, you want to understand how the problem is perceived from the perspective of the user. This can be achieved through observation, following the user in their daily activities, particularly those with a connection to the identified problem, as well as involving the end users in the development of the solution.

Identified observations can be summarized on the so-called "User Empathy Map". This tool helps to organize a debate on the needs of a particular user. The discussion will focus on what has been observed, and what can be inferred about the beliefs and emotions of the user. The User Empathy Map consists of four quadrants on paper or a chalkboard that are populated with the observations from fieldwork. The questions within the map are as follows:

- What does the user do and say? What are some of the quotes and words used to define the problem? Which action and behaviours are observed? His/her attitude in public, appearance, relationship towards others;
- What does the user think and feel? What does this say about his/her beliefs? What emotions might the user feel? Main worries and aspirations;
- What does the user see? The context and environment around him/her, friends, colleagues, other solutions from the market;
- What does the user hear? What are his/her friends saying? What is the boss saying? What do other influential individuals say?

3.2 IDENTIFYING OPPORTUNITIES

There is no straightforward way to identify opportunities for the development of sustainable entrepreneurial solutions. In most cases, entrepreneurs find an opportunity without actively looking. However, here we illustrate some practices and exercises that will help you develop a mindset and attitude that will help you identify opportunities and become opportunity-focused in your work.

It is recognized that business opportunities are timely, attractive, durable, and are attached to a product or service that creates value for the user. In the case of sustainable entrepreneurship, opportunities are also impact-driven, that is they aim to create impact through creating environmental and/or social value.

Products that represent an opportunity are efficient, empowering, and non-toxic:

- Efficient: products that require fewer resources to deliver a basic or enhanced functionality than existing alternatives. This category of products includes consumer electronics that are more energy efficient, or mobility solutions that are more fuel-efficient. Those opportunities create value both for the environment (reduced consumption of resources) as well as for the user (reduced cost of ownership);

- Empowering: functional products that allow the user to be productive and "make things". Think of power tools for instance; they allow people to build things. However, the term "empowering" is broader than that. A clean and durable light bulb is an empowering tool for someone that has a business in a village where there is no energy grid since the business can operate after the sun has set. Empowering products might be focussed on providing social, rather than environmental value;

- Non-toxic: environmental and social impact might be also created by finding alternatives to existing products that require the use of toxic components to deliver functionality. The opportunity here is to aim for non-polluting or non-toxic products. Examples of this include cleaning products, batteries, or electronic components. The Cradle to Cradle concept proposes to address this issue by closing material cycles (technological & biological) and using product waste as food for newer products.

Opportunities attached to services may involve the provision of goods or services that meet basic needs, empowerment, convenience, and the efficient use of idle functionality:

- Provision of basic needs: this includes access to clean water, food, clean and renewable energy, health services, and education. The impact that those services might create is clear. The challenge is to find a business model that supports a sustained provision of these goods or services. A good opportunity is to turn users of those services into merchants or micro-entrepreneurs;

- Empowerment: empowering services allow people to further develop at a personal and professional level are usually a good basis for entrepreneurial opportunities because of their high value to the end user. Empowering services might involve easier or more efficient connectivity with others. Think of communication services, or mobility;

- Convenience: a good range of services are based on the idea of offering convenience that make life easier by saving time and money, or by making certain experiences more enjoyable. Services linked to convenience include repair services, cleaning, or entertainment. The advantage of this sort of solution can include shared use of resources, which results in more efficient use;

- Efficient use of idle functionality: a new range of service-based opportunities is rising within what has been coined as "collaborative consumption". The idea is that, for a variety of products, most of their potential functionality is idle, un-used, which leads to wasted resources. Think of a car that is only used during weekends, or a power-tool that remains unused. Thanks to the connectivity that the Internet offers, new services are being born that connect users with idle functionality. Examples of this include peer to peer car rental systems, or product swapping.

3.3 ECO-INNOVATION & LIFECYCLE

In the previous section the concept of sustainable development was introduced. Eco-innovation concerns the development of products and services that solve or address environmental problems. A variety of terms are commonly used to refer to concepts of eco-innovation. These include eco-design, eco-efficiency or clean tech. All these concepts and disciplines have a similar objective or are part of the practice of eco-innovation. Here, we use this term 'eco-innovation' in a general and inclusive sense that refers to products, services or technologies.

In the case of product eco-innovation, opportunities arise by analysing the product's lifecycle and exploring ways to create value in the different lifecycle stages. Typically, a product lifecycle includes extraction of materials, processing, manufacturing, distribution, use and end of life:

- **Extraction of materials:** the life of a product starts with the extraction of materials. These materials are generally minerals, metals, oil, timber and other resources. Some of these materials require large amounts of energy for extraction.

- **Processing of materials:** normally materials in their natural state cannot be directly used in the manufacture of products, first they need to be transformed. For example, the conversion of oil into plastic and then into a specific shape/form.

- **Manufacturing:** the different parts and components get assembled into a finished product, which is now able to provide a certain function. Depending on the efficiency of the factory, there will be more or less material or energy losses during this process.

- **Distribution:** from the factory to the retail store and then to the end consumer. Currently the majority of products are manufactured far away from the location where they are consumed and used. The most commonly used means of international transport is by sea, then train and then by truck to the point of sale.

- **Use:** the longest phase of life for the majority of products is the use phase when the function of the product is used by the consumer. For this functionality, the consumer has paid a price.

- **End of life:** once the product no longer offers the desired functionality, or does not meet user needs, it becomes waste. There are several ways in which product can be treated at the end of its life depending on the available systems in the geographical area where it will be disposed; incineration, recycling, landfill, etc.

Although the lifecycle stages are the same for all product categories, the impact at each stage for different products differs. If we aim to find solutions to improve the environmental impact of a product, it is necessary to understand the lifecycle and identify the phases where there are opportunities for improvement.

What follows is a list of eight strategies that can help you find innovation opportunities in product design:

1. New concept development
2. Selection of low-impact materials
3. Re¬duction of material usage
4. Optimisation of production techniques
5. Optimisation of distribution system
6. Reduction of impact during use
7. Optimisation of product life
8. Optimisation of product end-of-life system

3.4 FROM IDEA TO SOLUTION

In this section we review the concept of Design Thinking, a practice based on the method and sensitivity of design to develop solutions that meet user needs and create business opportunities. Design Thinking promotes a focus on user observation, visualisation, prototyping of ideas, and iterative development of product solutions through user testing with the goal of maturing potential solutions.

Here we use Design Thinking as a way to identify and develop opportunities. There are other ways to achieve the same results; however we believe that design thinking has significant potential owing to its practical and experimental approach, especially in the field of eco-innovation which is dominated by learning by doing. Design Thinking is presented here as an alternative to traditional analytical thinking with the intent of providing a more intuitive way of thinking.

Design Thinking is a process and an approach. Design thinking can be defined as an approach to innovation that combines a specific set of practices, attitudes and cognitive processes.

The process involves several steps, summarized here:

1. Getting to know the user
2. Development of ideas
3. Prototyping; thinking by building
4. Iterating

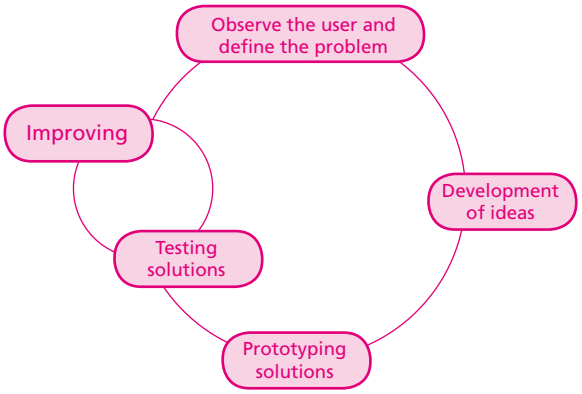


Figure 5: Iterative process

3.4.1 Getting to Know the User

In the previous section we discussed the importance of observing the user to understand his/her needs and develop solutions that fit those needs. It is important to develop observation skills to identify those characteristics and elements that others may overlook. The best way to identify opportunities is to become an observer. You can practice and develop observation skills in your day to day activities; for instance, by identifying those moments in which you, and people around you, feel frustrated. Find products, activities and situations that feel „broken", or that could be made in a simpler, friendlier, or more efficient way. Record your observations in a notebook and get into the dynamics of becoming an observer. This practice will be useful to identify opportunities when trying to solve a specific problem.

3.4.2 Development of Ideas

Taking into consideration the input received during the observation phase, and especially what the user says, sees, feels, and hears (see User Empathy Map in section 3.3), develop ideas to resolve the problem at hand. The goal is to develop as many ideas as possible. This work should not be done alone, but in a group with other stakeholders with a variety of personalities and different fields of expertise to bring a wealth of experience to the process.

You can organize a brainstorming session where participants actively contribute with ideas. When organizing a brainstorming session, take into consideration the following factors: quantity matters, each idea should be written down, don't judge, crazy and wild ideas should be welcomed. Later on, ideas generated can be clustered and combined and further developed.

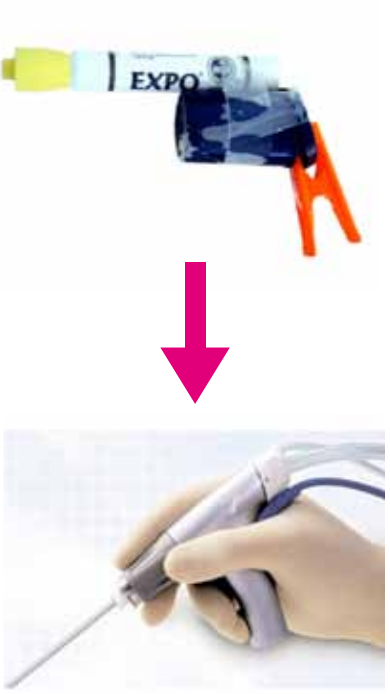


Figure 6: Example of a rapid prototype made during the development of a technical tool
Source: IDEO

3.4.3 Prototyping Solutions

One of the most used quotes from Design Thinking is to „fail early and fail often." The sooner solutions are shared with others the better, in order to detect failures and possibilities for improvement. It is very expensive and complicated to make changes once a design is taken for a finished product that has been put to market.

As a result, Design Thinking encourages rapid visualisation of ideas rather than working with abstract concepts for a long time; visualize the idea as soon as possible using materials that you have around. This is known as „rough prototyping". The goal is to build to think, and does not require the use of complex and costly machinery, or detailed designs for your solution. The goal is to develop a tool for discussion; an object, sketch, video, used to show the idea to others, and iterate at low costs. Prototyping is a way of thinking, not an end; it is a powerful tool for developing new ideas, and for exploring different directions. Like visualisation it makes abstract concepts tangible and facilitates the exploration of new ideas.

There are three types of prototypes, varying in complexity depending on the stage of idea development:

- **Rough prototype:** using any material you may have at hand with the aim of communicating the idea of the solution that you are proposing and iterate;
- **Proof of principle prototypes**: aimed to prove that a particular system or mechanism works. Often it is part of the overall idea and it does not need to look like the final product;
- **Aesthetic model:** a prototype that looks like the final solution, but might not be fully functional;
- **Pre-production prototype:** looks, feels, and works like the final product. This type of prototype can be produced to mimic how it could actually be manufactured to check that everything will fit together correctly.

One might start prototyping ideas using whatever material is available: paper, cardboard, clips, straws, tape, parts and pieces from other products, toys. The goal is to build a quick model that can be completed with sketches, or some simple form of media. For instance, you might want to develop a storyboard in the form of a comic strip that illustrates how a user's day looks. The focus here should be on user experience. This way, you might be able to illustrate how the proposed solution fits within the daily activities of users.

Other solutions to support the early development of your idea includes mood maps (a collage made of magazine pictures), media (an imaginary article or piece of newsprint describing the product or service), or a theatre play (recreating a service concept by acting).

3.4.4 Iterations

One of the advantages of prototyping is experimenting and testing with users to validate the assumptions (hypotheses) that you may have. Iterative process include testing - modifying - testing, and repeating the process several times until the solution is completely validated by the user, hence the importance of developing rapid prototypes.

Here we have seen a way to identify opportunities and develop solutions by applying design principles. In the next section we will see how solutions can be evaluated.

3.5 EVALUATING SOLUTIONS

One of the biggest challenges an entrepreneur aiming to develop eco-innovative solutions faces can be the multitude of different ways to tackle a given issue.

When this happens, it is always difficult to assess which of the different alternatives is best suited to the identified goals that you want to achieve. In these situations it is sensible to evaluate the different options available in relation to all of its dimensions. First, it is important to evaluate the potential benefits that the idea might provide to the different actors in the value-chain. Here, we focus on the benefits to the environment, business model, the user/client, and society in general. This list could be modified to include other stakeholders, depending on the needs and circumstances. Next evaluate the different solutions or alternatives on the basis of technical and financial feasibility.

This table can be completed in many ways; quantitatively or qualitatively. The main idea is that one can compare different options and solutions easily and efficiently, bringing together available information into a single space.

	Benefit				Feasibility	
	Environment	Business	Customer	Society	Technical	Financial
Option #1						
Option #2						
Option #3						
Option #4						

Figure 7: Feasibility matrix

3.6 TESTING SOLUTIONS

Once you have played around with your idea, defined its scope & boundaries, and clearly defined how value is created, and for whom, it's time to test the idea by getting the opinion of others.

- Use prototypes to let as many people as possible experience the idea. Observe their reaction
- Ask friends and family for their reactions
- Ask professors and mentors
- Ask people experienced in the field or industry

It is a good idea to prepare properly for this exercise. The next part of this module will cover the preparation of a pitch, so your idea flows clearly to your audience.

12 Ways to add Design Thinking to your Project

(adapted from Tom Hulme presentation at HackFwd)

1. *Keep challenging questions*
2. *Think hard about who to involve; embrace diversity*
3. *Involve partners in the process; they're smarter than you*
4. *Be user-centered; more than focus groups*
5. *Look at analogous environments*
6. *Look at extreme users, the outliers*
7. *Think about the entire journey*
8. *Prototype*
9. *Think stories, not concepts*
10. *Design everything, even non-consumer facing stuff*
11. *Launch to learn; build it & ship it*
12. *Iterate; act on the feedback*

3.7 COMMUNICATING SOLUTIONS

Now that your idea has matured, it is time to let others know about it. You may have a really good sustainable business idea, but if you are not able to communicate its benefits its contribution toward a certain problem it will be difficult to get partners on board who are able to help make your idea a reality.

Remember, usually you cannot do it all on your own, you need partners!

There are several reasons why it is important to communicate the benefits and value that your idea creates. First, because most likely you will not be able to fully develop the idea alone. You will need to get others on board to make this happen. This includes partners, investors, local authorities, and customers.

Today there is an infinite collection of means that can be used to spread your message and engage others in your venture, including radio, newspapers, television, websites, blogs, social networks, web video, or podcast.

The medium to use is a strategic choice; you should go where your prospective audience is, rather than expect them to come to you. What matters is the content. If the message is clear and compelling, it will reach your audience regardless of the medium.

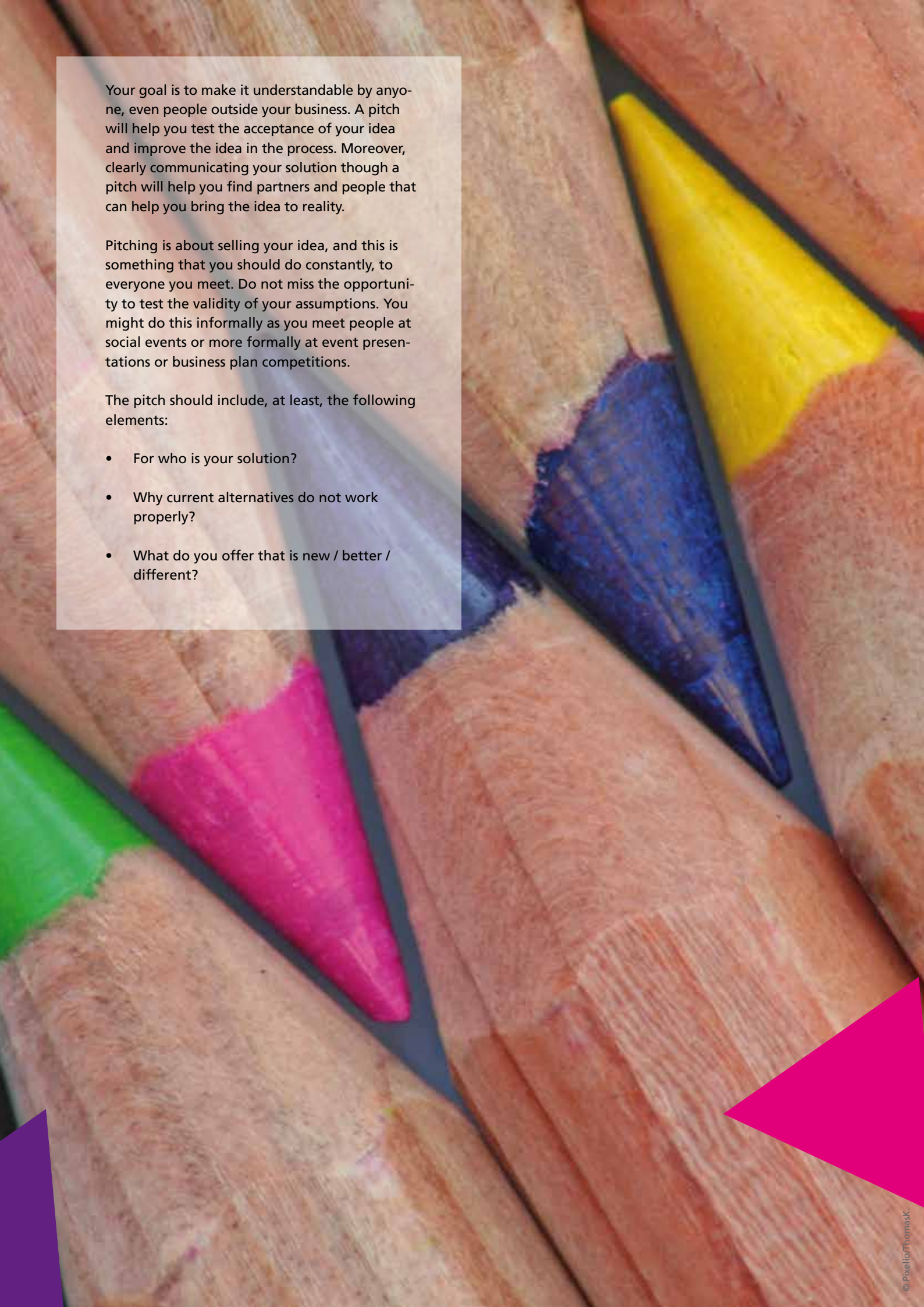
To start communicating your idea you might want to develop a pitch; a short overview of your solution that can be delivered on a minute. Developing a pitch helps make your idea clear and concrete.

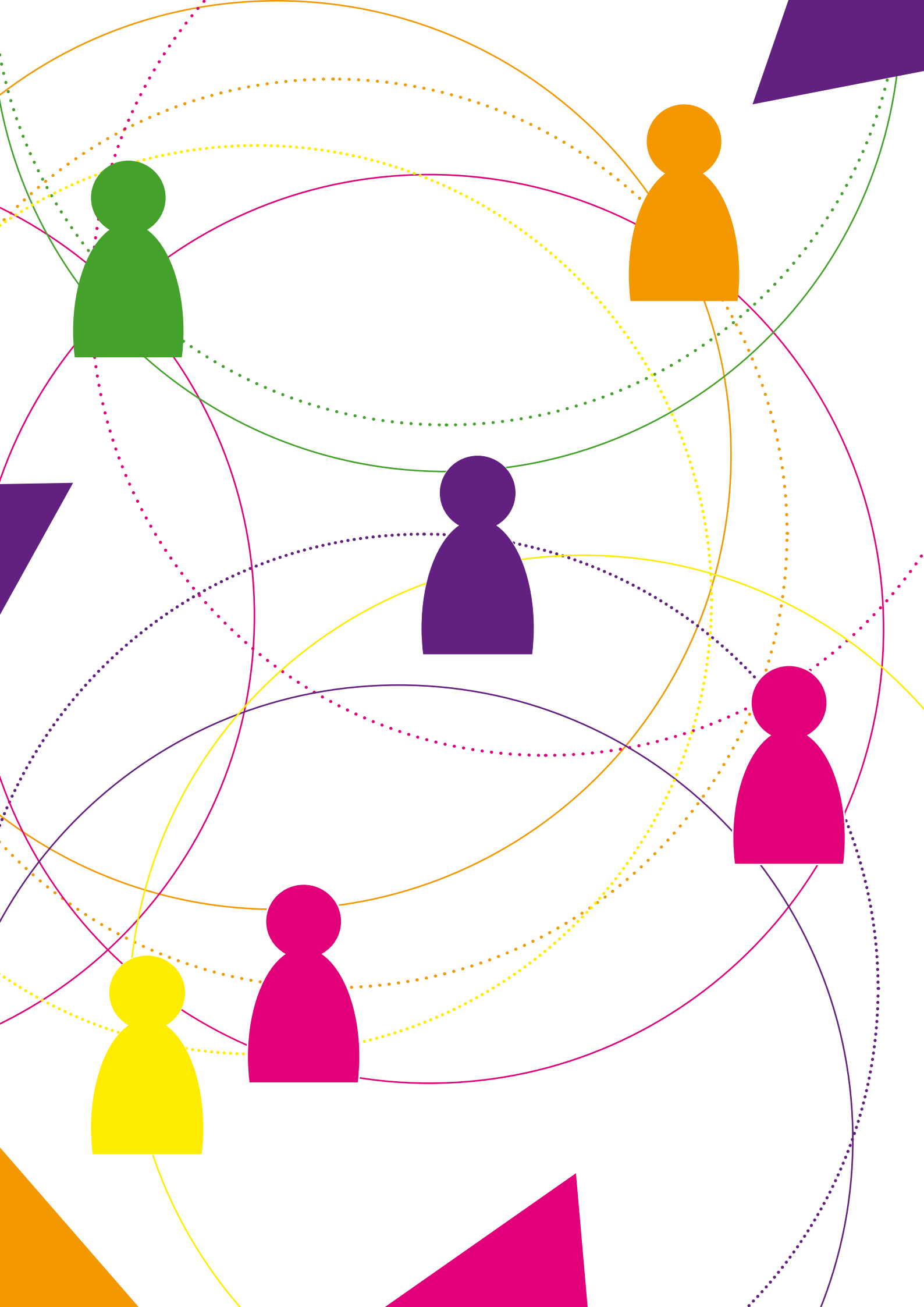
Your goal is to make it understandable by anyone, even people outside your business. A pitch will help you test the acceptance of your idea and improve the idea in the process. Moreover, clearly communicating your solution though a pitch will help you find partners and people that can help you bring the idea to reality.

Pitching is about selling your idea, and this is something that you should do constantly, to everyone you meet. Do not miss the opportunity to test the validity of your assumptions. You might do this informally as you meet people at social events or more formally at event presentations or business plan competitions.

The pitch should include, at least, the following elements:

- For who is your solution?
- Why current alternatives do not work properly?
- What do you offer that is new / better / different?





4. TEAM

As mentioned earlier, to develop your idea you will require the support of many people. Some will work closer with you, and some will have a more supporting role.

A start-up has no history or track record. Therefore, the attributes of the launching team should seek to overcome this challenge of a lack of a proven record. This is achieved through a team that breathes talent, passion, and dedication. Make sure that the members of your team, especially the core team, possess these qualities.

4.1 CORE TEAM

If you are aiming to receive financial support in the form of investment or loan, first spend some time setting up a solid core team. This is a crucial aspect that banks and investors consider when deciding to grant a loan. The reason for this is that people do not invest on ideas, but in people, and also in people that know their market.

Ideally, you will launch your start-up having three well-defined characters within your core team. These complement each other and cover the basic needs that you might have when setting up your start-up, specifically: a solution (product or service), a business model, and a selling strategy.

1. The Business Person: experienced business individual who understands sales, marketing, business development. This person must be able to easily and accurately convey the value of your product or service to potential customers, investors and partners. This person must also be able to properly communicate with technical team members. This becomes critical for product development when user feedback begins pouring in.

2. The Technical Person: an industrial designer or an engineer with experience and a feeling for user-centric design. This person should actually be someone with both design and technical skills, capable of identifying and capturing insights and design opportunities and turn these into innovative solutions, either in the form of a product or service. Many new start-ups are launched by “the inventor”; someone that has developed a technical innovation and aims to bring it to the market. Those always need to be supported but the other two profiles described here.

3. The Marketing Person: someone experienced in communication, capable of defining a strategy to communicate the value that your solution provides externally, not only to future users and customers, but also to develop an image that is attractive to a larger group of stakeholders. Make sure someone is thinking about overarching plans for public relations, marketing and sales, and spends time crafting the right messages, understanding audiences and figuring out distribution channels.

4.2 BOARD OF ADVISORS

In the early days of your start-up, you might want to do everything on your own. However, once your solution has proven to create value for its intended market and you see that advice from experienced entrepreneurs would be of assistance it is time to think of setting up a board of advisors.

A board of advisors is designed to provide independent advice and counsel to the entrepreneur or management team. Moreover, members of the advisory board might also help you build credibility, make key introductions, or be of support in moments of crisis.

Who should take part on the board of advisors? Experienced entrepreneurs, people that have been there before you and know what is required to make things happen; passionate individuals who are well-connected and possess a good reputation; people committed to attend board meetings, give advice, and get involved.

5. FINANCING THE SOLUTION

You have a fantastic idea for a sustainable business proposition. In most cases that costs money, sometimes a lot of money. If the business proposition is truly sustainable – which means that it is financially and economically sustainable as well – then it will generate revenues too. But many costs normally have to be paid before you see revenues and you will need financing to move your idea to reality and to develop your business. This is the subject of this chapter.

5.1 BANKS AND INNOVATION

Banks are a key source of financing for sustainable and innovative ideas. They are not the only ones, as we will see below. But because banks play an important part we shall devote attention to the general approach they take to innovation and sustainability. Banks look at these points in two ways at the same time. On the one hand they respond enthusiastically to new ideas. Banks are also on the lookout for new customers and investment projects. They are happy to be associated with eye-catching and socially responsible projects, which are of interest to customers, stakeholders and employees. On the other hand they respond cautiously to new ideas. New means risky and banks don't like risk. The point is that they lend out money belonging to other people, their savers and bondholders, which they must manage carefully. Banks are not investors who may take risks using their own funds or funds that have been entrusted to them. Banks may assume far less risk. Their approach to innovation is therefore marked by a degree of restraint unless, of course, feasibility is guaranteed and the revenue stream from the business is certain.

5.2 WHAT A BANK IS LOOKING FOR?

Every project or business idea is different. That means that only after discussion with the bank you know if the bank would like to help you. Nevertheless it is possible to point to a number of aspects that will make a project or an idea more or less bankable:

- **Earning capacity.** This is the most important precondition any bank will place on any project. Will the business, new or not, generate enough money to repay the loan and the interest? Earning capacity is determined as the difference between costs and revenues. Knowing when the business gets to break-even is important. This is the point at which revenues exceed all the costs incurred up to that time. Gross margin is another significant aspect. This is the difference between sales and direct costs. A gross margin of at least 40% is recommended: this will leave enough space to cover indirect costs (development costs, administrative overheads, marketing, etc.).
- **Entrepreneurship.** Running a business is about people and, fortunately, that applies to the banking business as well. The business plan counts, but so does the question of whether the entrepreneur really has what it takes, someone with ambition who can seize a chance, honour tough commitments and deadlines and run a company. A consideration here is the size of the relevant network at the entrepreneur's disposal. Can he/she get sufficient assistance and can he/she access the right suppliers and organisations? Sometimes the conclusion is that the entrepreneur is more of an inventor. If so, the recommendation will be to sell the business idea or to look for a partner for the necessary entrepreneurial aspects.
- **Timetable & Scenarios.** How does the entrepreneur see his business developing? Starting is hard enough so people starting a business often have a short time horizon. It's better to have an approach to the medium term as well. Clarity about all the steps to be taken in the short term is also important. This will involve a detailed budget and forecast. The bank will want to see the kinds of scenarios that have been drawn up for the project: what will happen if crucial circumstances change? A good entrepreneur knows the risks in business and can therefore indicate alternative approaches going forward if the optimum scenario fails to be realised.
- **Collateral.** At some point the money the bank has lent will have to be repaid. The bank will therefore require collateral to serve as its assurance in the event that problems are encountered in repayment. This may include pledging of stock and debtors, a personal guarantee issued by the owner or supplier, or a mortgage (which could be a second mortgage) on your home. Patents are usually not accepted as collateral as a bank will find it difficult to extract direct value from a patent. Licences, however, that generate revenues directly are often accepted as collateral. Start-ups often have a problem with a lack of collateral. This can be lessened by reliance on a government guarantee or by raising additional share capital.

5.3 MONEY COMES IN DIFFERENT SHAPES

If you need funding for your business idea as a starting entrepreneur, you may quickly decide that „money is money". But that is not so. One hundred Euros from the bank is not the same as one hundred Euros from the government nor is it the same as ten Euros from an investor. The origin of the funds determines the conditions under which the money was made available, its price (in the form of interest or dividend) and its terms of repayment.

We distinguish three types of funding: share capital, loan capital and subsidies.

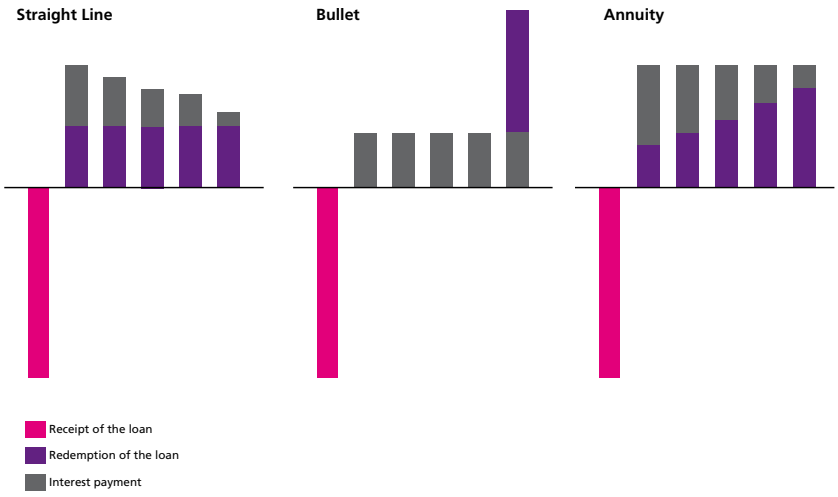
Share capital is also called risk capital. It is the share capital contributed by the owner of the business and other Investors. These other players place share capital in the company in return for the part ownership they obtain by having acquired shares. Share capital is the company's capital reserve. It is deployed against the greatest risk. In the worst case – if the business fails and the company ceases trading or goes into liquidation – it is shareholders who will lose their stake.

Loan capital includes credits and loans. This money is not made available on a permanent basis but usually for a specified term that can vary from a few months to many years. A fee must be paid to access this money in the form of interest. Capital supplied by those extending loan capital, which can take the form of various types of loans from banks or others, takes precedence over capital that shareholders invest. If the company runs into difficulties, those who are owed loan capital will be the first to get their money back with the shareholders only being entitled to the remainder.

Subsidies. Government subsidies may sometimes be available for sustainable ventures. The advantage of government subsidies is that they do not usually need to be repaid nor is any interest payable. There is no charge for the funding. The disadvantage of government subsidies is that very strict conditions often govern the application process for funding and reporting is often required on how the money is spent. Compliance may prove highly time-consuming.

5.4 BANK FINANCING

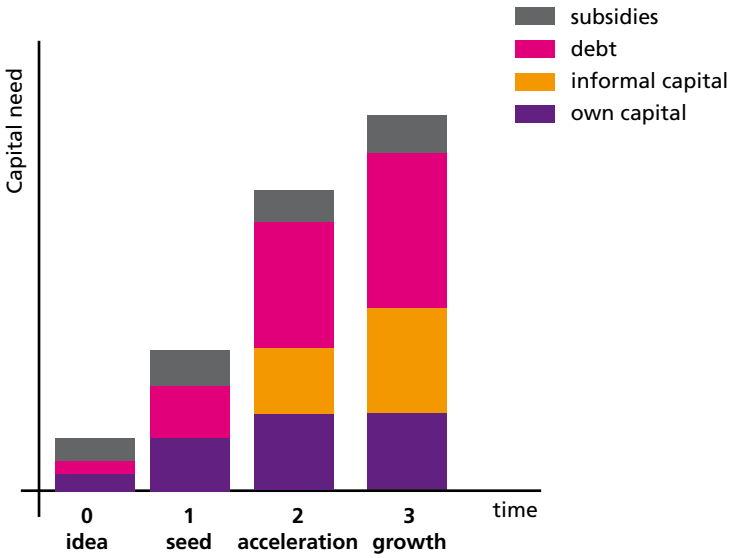
Put simply, there are two types of bank financing: credits and loans. The bank will offer whatever form best suits the financing requirement – too much money or money at the wrong moment is inconvenient for an entrepreneur and expensive, and that translates as risky for the bank. Three types of loans may be distinguished: straight line, bullet and annuity loans [see chart]. Starters usually only use straight line loans. The disadvantage is that you need to start repayments fast while the advantage is that the interest charges decline as the years pass. The term for financing can vary from one to more than ten years. Starters often find a five year term possible.



How the interest is made up varies from bank to bank. The key point here is that the banks tap the capital markets for their own funds. The rates applicable in those markets are a combination of the Euribor (Euro Interbank Offered Rate) interest rate to which a liquidity surcharge is added. The latter is a function of the bank's creditworthiness. Further surcharges covering debtor risk and the bank's internal costs come on top of the purchase price. This total determines the interest rate payable by the client on the loan or credit. The rate for a credit is usually a little higher than for a loan. The longer the duration of a loan, the higher the rate, the point being that the further one goes into the future, the greater the risk exposure. So as not to burden start-ups with fluctuating interest charges and accompanying high risks, fixed rates (fixed for up to 3 years) will normally apply to these businesses.

5.5 MONEY IN VARIOUS STAGES

Various phases in the development of a new company can be distinguished. During the seed phase the business idea is developed and an overall feasibility study is undertaken. Then follows the start phase, in which a legal entity is set up for the venture, a business plan is written and a timetable for the development of the product and the business is drawn up. In the acceleration phase, manufacturing facilities are set up and customers – which are likely to be the first customers – take delivery of the first series of the product. By this stage the company has taken root and the pioneering stage is over. The growth phase follows. Manufacturing facilities are extended, development capacity is allocated to additional activities and customers are supplied with a wider portfolio. During this phase some companies decide to try to reach international clients. Other sources of financing stand ready to be tapped at each stage of business development [see chart].



In the company's earliest stage share capital, coming from you, your friends or family, is the most important source of financing. Nobody else is prepared to put money behind what is just an idea. There may be subsidies and maybe a personal loan as well. In the seed phase one's own funding remains important, but in this phase banks are usually willing to extend a modest starter loan. Subsidies may also be available for your business proposition. A company may attract investors in the acceleration phase: they can invest additional amounts of share capital in the company. Based on this and of course on the growth prospects banks are often willing to extend substantial funding. This applies to the growth phase as well. As the company grows and reaches maturity, the fraction of financing that bank financing represents as a proportion of total assets will grow steadily. Depending on the industry this can top 80% in the case of a mature company.

Virtually all-innovative companies go through "death valley" once. This is the phase when virtually nobody wants to invest any money in a company. The company has already come so far that the entrepreneur himself and all his friends and family have reached the limit of what they can invest in the company. But the company has still not got to the point where it can attract outside investors and bankers. The trick, of course, is to avoid death valley or to get through it really fast. If, as an entrepreneur, you nevertheless find yourself stuck in death valley, then you need to attract soft capital: funding specifically designed to assist entrepreneurs in this phase. This type of capital is available from government or special investment funds.

5.6 ALTERNATIVE SOURCES

Banks are key for the provision of loan capital. Loan capital is cheaper than share capital, but banks will only step in once it has been more or less proved that your idea works. Other forms of capital are thus needed at an early stage. "Business angels" may help. These are people who invest personally in new businesses and by so doing make their experience available as many business angels are or were themselves entrepreneurs. Money and knowledge is an attractive combination for the new entrepreneur. You can find them in every country and sometimes there are different regional networks of business angels as well. Private bankers sometimes organise sessions for clients wanting to invest in new business, and these events are where start-up entrepreneurs may make their pitch.

There are also venture capitalists. These are more than business angel investors with a formalised structure. Although they may sometimes be individuals with an entrepreneurial background, they are more often investment funds that have raised cash from private individuals and investors. Many venture capitalists do not invest at the very earliest stage of a company. They only become interested once the company has reached the acceleration phase. But competition between several investors for a good idea may arise. This may persuade some venture capitalists to get close to a start-up entrepreneur as soon as possible. Venture capitalists track interesting propositions using their own network. Because of the complexity of the task of assessing and managing new ventures, venture capitalists usually focus on specified sectors and technologies.

The last option is crowd funding that harnesses social networks for the task of collecting capital. One example taken from the Netherlands is crowdaboutnow. This platform links entrepreneurs with an appetite for financing to people willing to invest small amounts, from EUR 10 to EUR 50. This allows people to invest in an idea they believe in. The investment is to be considered as a loan. If the business idea fails the investors lose their stake. Crowd funding has arisen as a consequence of the fast growth of social networks and the popular anger at banks fanned by the financial crisis. The concept is heart-warming and accessible but there are many barriers derived from the complex regulations surrounding financial flows. You need to be careful before resorting to crowd funding.

5.7 WHERE THINGS GO WRONG

Only a small number of all new companies survive the first five years. Some are terminated soon after having been started as success eludes them while others go into liquidation leaving liabilities behind. Even the survivors often have a hard time.

- **Costs going over budget.** More or less every new business has problems with going over budget. Developing something new scarcely lends itself to perfect budgeting, and certainly not when a new concept is to be sold in a completely new and sustainable market. It always costs more than was thought. A flexible budget with ample allowance for contingencies is key.

- **Delay.** Going over budget is often the result of delay. Research and development take more time than was planned. Or the first customer takes time to materialise. Innovative products often come up against the problem of a market that fails to take to a product. Customer relations are time-consuming. Delay means lack of revenues while expenses mount up. This puts pressure on your budget.

- **Lack of customers.** Okay, you've got your first customer and then what? Many start-up operators are fixated on getting their launch customer. True, the first customer is exceedingly important. It is thought that the rest will then follow, but often that is not the case. You must invest sufficient resources into marketing and sales. Not just where this is a consumer product, but even in B2B situations you will need to put intensive effort into selling your product to potential clients.

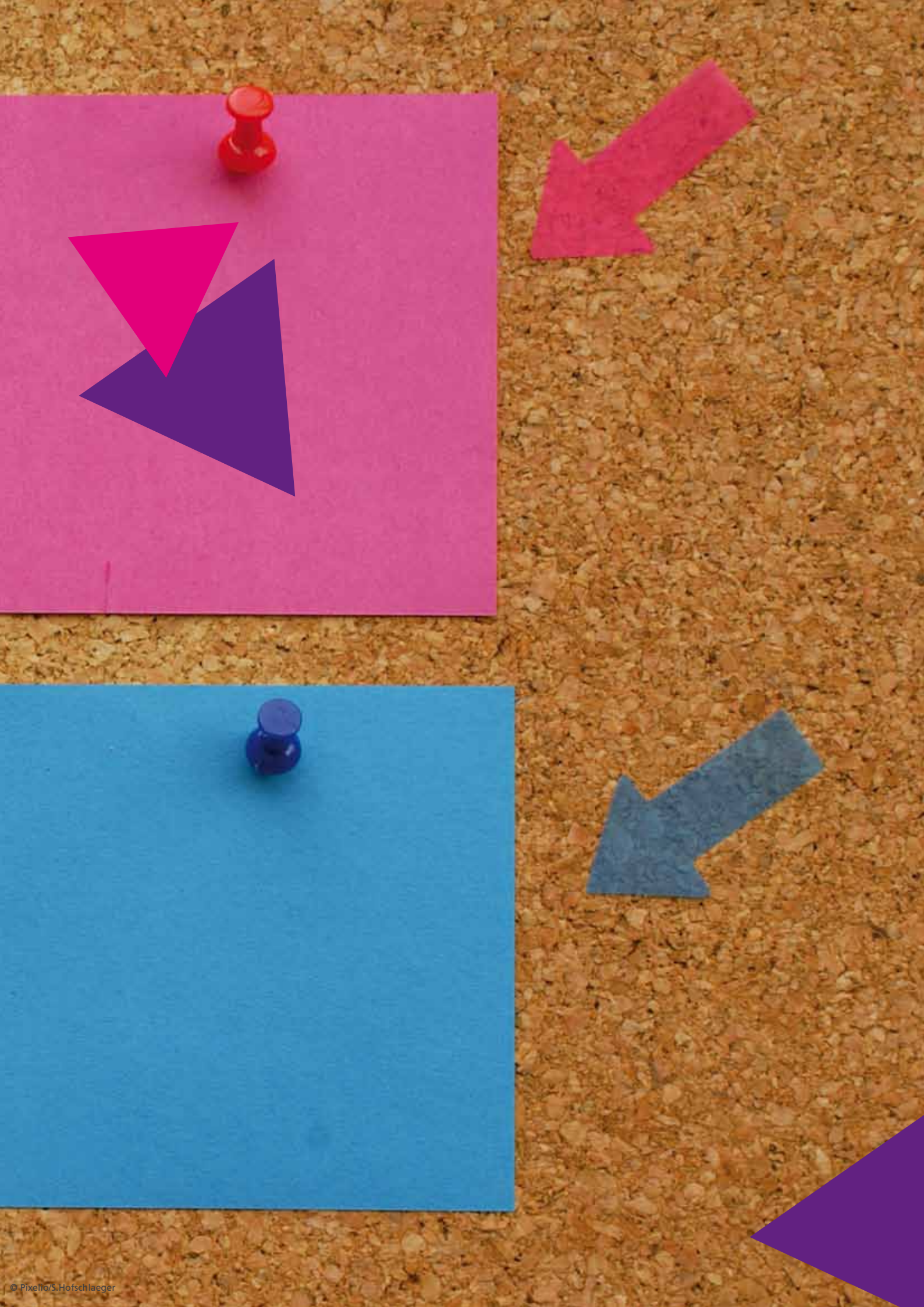
- **Cash shortfall.** The wrong financing structure can spell doom to any company. This is especially the case when your debtors pay your invoices slowly while creditors insist on prompt settlement. Whether for administrative or psychological reasons tight control of receivables is often difficult for start-ups but without proper cash flow management commercial success may nevertheless take the company over the brink.

- **Pricing.** If you have a sustainable business proposition it is of great importance to identify clearly the added value to the customer: where can the customer save money or seize another advantage? Do not leave it with a cost price and a thought. Or with the idea that success will only come when the product is cheap. Put yourself in the customer's shoes and decide what the value of your product is to him.

- **Contracts.** Start-up entrepreneurs often lack the courage to insist on signed orders from their customers as they worry that if they do so they will be shown the door. But as a start-up entrepreneur you need to be businesslike and define in detail your financial interests and responsibilities. Take time before doing a pilot without any commitments from the other side. No contracts or bad contracts may be a problem but you also need to take care not to sign contracts for industrial premises or employees too quickly. You will often find yourself tied up for a long time while costs mount up at a rapid pace. That is especially painful when sales are slow or non-existent.

- **Success that comes too fast.** Many entrepreneurs are realistic and know that launching their product may take a long time. But entrepreneurs are regularly caught by surprise when the market quickly takes to their idea and this makes it necessary to ramp up supply fast. Can you scale up fast and make additional agreements with suppliers, finance inventory, make agreements with distributors and keep your invoicing department ticking over smoothly? These things may sometimes go sideways and the company implodes.

Requesting financing from a bank is exciting business; a new world for many start-up entrepreneurs. The conditions may be tough and the time needed to get to a definitive offer may sometimes be long. But it pays. Bankers are accustomed to judging business plans and often ask good questions, not just so as to safeguard the bank's position but also to give the entrepreneur good advice and to protect him from mistakes.



6. BUSINESS PLAN

6.1. WHAT IS A BUSINESS PLAN?

A business plan is a blueprint of the steps you need to take to build a business. It is a written statement of what you want to achieve and how you plan to go for it.

6.2 WHY IS IT NECESARY?

Every business, no matter its size, needs a working plan for the future detailing where you are now, where you want to be and your strategy for growth. You will need it to:

- Focus your efforts, set objectives and company direction
- Identify potential pitfalls before they happen
- Set realistic targets
- Track your growth
- Structure the financial side of your business
- Present the business to important external stakeholders, particularly financial stakeholders when rising finance.

6.3. STRUCTURE OF A SUSTAINABILITY BUSINESS PLAN

The sustainability business plan highlights the advantages of sustainability for the business. Before writing the business plan, pay attention to the following issues:

- Investors and financial institutions base their financing decisions on the expectation that the investment will bring about a positive process, organisational and market impacts, which of course will be reflected in cost reductions and revenue increases.

- Therefore, you can present your business plan as a "target-performance comparison" document. It, of course, will keep the format of a traditional business plan but additionally will highlight the expected improvements of the business if finance resources are provided.

- Depending on the expected impact of your sustainability investment, you can give more weight to some parts of the business plan than to others. Here are three different examples:

    - o if the investment is mostly related to equipment or machinery, you might need to focus more on the production process section;

    - o if you plan is to buy new vehicles to transport your finalized products, you will have to highlight marketing strategies (promotion and selling of your product/service through commercial channels);

    - o if you simply plan to upgrade your operational facilities, then the expected impact will be reflected mainly in the administrative cost strategies.

- Regardless of the field of relevance for the sustainability investment try to present all the sections of the document in a way that they will emphasise direct or indirect positive impacts of the action.

- Talk the language of financial institutions and investors. Most of the time, they pay attention to the financial statements when assessing applications for the diverse financial instruments. All qualitative explanations given in other sections of the document will need to be reflected in the financial statements through projections showing the cost saving benefits or other economic gains after the implementation of the sustainability strategy.

The following is a suggestion of a business plan format. This example provides guidelines and relevant aspects to take into consideration when it comes to communicating the benefits of an envisioned sustainable business to investors. An example of an imaginary company that produces energy efficient light bulbs for houses, "Ecolight", will be used as a case to provide readers a better idea of the elements of each section.

a) **Executive summary:** A summary of the overall business plan in 1½ pages. It is essential to highlight the fact that the implementation of sustainability strategies[1] will represent a competitive advantage for your business. Notice that the document will present a qualitative explanation of how sustainability investments can increase the value of your enterprise and also the way in which this will be reflected in the financial statements of the company in the future.

b) **Concept of the business:** Mention the idea upon which your business is based (is it a product, a service, a mix of both?) Highlight the main characteristics of your business model:

- Value Proposition: How is the company creating value for different stakeholders? What are the opportunities to improve this value through your product, process, and operations once you have implemented your sustainability strategies?

- Supply Chain Innovation: When interacting with actors at different stages of your supply chain, take into consideration possible alternatives, strategies, or activities after the implementation of the sustainability investment. How does the delivery system of your product or service occur and how will it be improved through the sustainability investment?

- Target Customers: Who are you going to approach with your offer and how? What is the geographical coverage of the business? To what extent will the sustainability strategies that you are applying affect your customers?

In the example of Ecolight, the concept of the business model is based on a product: efficient light bulbs. The Value Proposition, the element that differentiates the product in relation to its competitors is the fact that it has lower energy consumption. The product is aimed at households in Germany and is commercialized though the 3 biggest retail chains in the country.

c) **Mission and Vision:** Mention the "reason your enterprise exists" by pointing out its contribution to economic, environmental and social sustainability. In other words, the future that you imagine for your company. Also, highlight the market and sustainability goals that you want to achieve in three, five, ten, and/or twenty years.

For our case study, the mission could be "Ecolight is a company engaged with the production and commercialisation of energy efficient bulbs that provides high quality and environmentally friendly illumination solutions to its customers and contributes to the development of its employees". The Vision: "By 2020, one of every 3 households in Germany will be using Ecolight bulbs".

[1] Such strategies mainly include capacity building for technological innovation measures (technologies and techniques) and stakeholder engagement measures.

d) **The team:** Financial institutions and investors pay a lot of attention to the people behind the business. Therefore highlight the experience of the management team in the business, past successes achieved, academic background and formation, motivational factors to make the enterprise economically, environmentally and socially sustainable.

The Ecolight team consists of two electrical engineers and a business manager. Together, they offer some 50 years of combined experience in the industry. They have developed the product in close collaboration by applying their vast expertise with the aim of providing an efficient alternative for illumination requirements in their country.

e) **Concept of the product and service:** Describe the reasons why your product or service could be considered more successful and sustainable[2] in the market after having implemented the sustainability investment. Likewise, explain the physical characteristics[3] of the product and explain how it contributes to satisfying customer/beneficiary needs. What aspects does the consumer need to consider when using the product? How can it be re-used, recycled, or disposed? Does the enterprise consider recycling and management of products at the ends of the useful life? What is the added value that your sustainability investment offers in comparison to the current situation?

For the example of "Ecolight" bulbs, the concept of the product will be that they provide same degree of illumination and look similar to normal bulbs, but because of innovate materials and design, the bulbs consume 40% less energy.

f) **Market analysis:** Quantitative and qualitative information is needed in this section.

- **Quantitative:** According to their size (micro, small, medium and large) list the other enterprises that make up the sector in the country or intended market; the number of companies operating from a geographic focus (local, regional, national); annual turnover of the whole sector in the last three years in local currency (domestic and international); volume of product units sold in the last three years (national and international); what has the creation or retirement rate of enterprises in the last three years been?

  It is also important to mention the number of people/beneficiaries impacted by the sustainable start-up. Here it is important to formulate the argument in a way that you can show the investor that (s) he will have also a positive reputation impact in the eyes of his/her stakeholders resulting from your sustainability initiative.

- **Qualitative:** What have other enterprises in the sector achieved in the past in sustainability terms? Which sectors in your supply chain influence the development of your business? What are the main reasons enterprises are willing to enter or leave the market?

[2] Sustainable products and services are characterized by being designed in a way that represents more value to customers, made out of low-energy and resource intensive raw materials and are produced using sustainability-oriented processes; such products can be used and reused many times and often have a long life span.

[3] If the product requires packaging, name the physical reasons why the packaging of your product is an environmentally friendly product (reasons such as low material use, easily removed inks, ease of recycling or reuse through supporting their functionality, low water and energy use for production and recycling process).

Name and describe the companies that compete in the market with similar products and services. Describe the characteristics of the product or service, the value proposition for the consumer, price, and why the firm has positioned itself in the market. List the three major competing brands. Describe their sales pattern and distribution companies/channels. What does the production process of those companies look like? What is their financial capacity? What is the proportion of the market that they cover? How can your enterprise be distinguished from the others? How can you achieve a competitive advantage?

- **Technological innovations:** Name the major and outstanding technological innovations or techniques that exist in the sector in terms of: product/service, production processes, organisational processes (list at least three for each category). In addition, explain how the start-up will help to close the gap between the current state of your enterprise and the competitors in each category.

  For the example of Ecolight, this section will require research on the European and German market. It would be useful to determine the main competitors and evaluate their latest activities; the turnover of the sector and the volume of products sold. An example of this can be OSRAM, a firm that is already producing energy saving lamps and compact fluorescent lamps that had a revenue of 4.7 billion Euros in 2010.[4] "Germany has a leading position in the segment of lighting and is positioned first in Europe, ahead of the UK, Italy and France. The estimated turnover of the European Energy-Efficient Lighting (CFLs, LEDs and halogen lamps) market reached US$ 1.25 billion in 2009".[5] These are some brief examples of what should be written in this section of a business plan. For the actual business plan further information and analysis will be required.

g) **Definition of the market share and sales volume:** Present the current market share numerically upon which your business will focus and compare it with the expected market once the sustainable start-up starts operations.

For our case study, the current market share is zero, since it is a new company. The vision proposes that 1/3 of German households will be using Ecolight by 2020. This implies having 33.33% of the market in that year. The necessary sales volumes can be calculated using estimates of the demand for bulbs projected for that year.

h) **Marketing strategies:** Briefly describe how you will develop marketing actions and how the actions will contribute to improve marketing effectiveness through the investment. Focus on the following:

- Promotion and sales of your product/service through commercial channels
- Definition of price
- Acquisition of raw materials and relevant inputs for production processes
- Provision of customer service that fulfils what the marketing promises

[4] www.osram.com/osram_com/News/Business_Financial_Press/2011/110705_Siteco.html

[5] www.gtai.com/fileadmin/user_upload/Downloads/Industries/Electronics/1_Englisch/FactSheet_LightingIndustry_June2011_GTAI.pdf

For the example of Ecolight, some ideas for marketing strategies could be to promote the product in sustainable product trade fairs; setting prices close to "average" prices to promote its consumption, or offering the possibility of enabling consumers to trade old bulbs as a portion of the payment for new during the initial introduction of the product to the market.

i) **Production strategy:** Describe the entire production process without using unnecessary technical language. List the necessary resources needed to carry out production: materials, human knowledge, technologies, and physical space. List the main activities of the operational process and explain how the sustainability strategies would enhance productivity and therefore reduce operational costs. If possible, present this information numerically.

Likewise, try to project the type and quantity of waste that will be generated and therefore minimised during the production/development, distribution, consumption and disposal of the product/service (solid, liquid, gas).

In the case of Ecolight, this section will describe the manufacturing processes and activities. Any initiative for recycling or reducing production by-products should be included. For example, if glass residues from the shaping process will be re-used.

j) **Administrative strategy:** Aside from organisational issues such as business structure, legal and tax issues, you can also remark that the start-up initiative will make use of an effective personal management strategy as it is expected that the personnel will increase productivity and motivation in the workplace due to the improvements.

Some examples for this section regarding Ecolight could be mentioning that it will be constituted as a public limited company where the 3 main partners well hold 51% of the shares and the investing partners the other 49%. The taxes paid will be the ones settled by law to this type of company in the country. As part of the reward and motivation strategy for the employees, a scheme for granting corporate shares will be applied. In this way employees will feel they own a stake in the company and will directly benefit directly from the anticipated growth.

k) **Financial strategy:** Calculate the cost savings and expected monetary gains achieved following development of the sustainable start-up. Basically, present the last three years financial performance of the business and project the financial statements (balance sheet, income statement, cash-flow statement) for the next years. Of course, if the start-up initiative attempts to build new facilities the expected benefits that are planned in the long-term should be outlined.

Example of a balance sheet:

YOUR BUSINESS Balance Sheet For the Year Ended December 31.20XX			
ASSETS		**LIABILITIES**	
Current Assets		**Current Liabilities**	
Cash	$1,000	Notes Payable	$5,000
Petty Cash	$100	Accounts Payable	$5,500
Temporary Investments	$5,000	Wages Payable	$2,500
Accounts receivable - net	$5,500	Payroll Tax Payable	$500
Inventory	$3,000	Income Tax Payable	$3,100
Supplies	$500	SE Tax Payable	$3,100
Prepaid Insurance	$500	Unearned Revenues	$1,500
Total Current Assets	$15,600	Total Current Liabilities	$21,200
Investments	$6,000	**Long term Liabilities**	
		Notes Payable	$10,000
Fixed Assets		Mortgage Payable	$70,000
Land	$5,500	Total Long-Term Liabilities	$80,000
Furniture and Fixtures	$6,500		
Equipment	$6,000		
Building	$75,000	**Total Liabilities**	$101,200
Less: Accum Depreciation	-$6,000		
Total Fixed Assets	$87,000		
Intangible Assets		**Owner's or Stockholders' Equity**	
Goodwill	$25,000	Owner Investment	$30,000
Trade Names	$20,000	Retained Earnings	$25,400
Total Intangible Assts	$45,000	Total Owner's Equity	$55,400
Other Assets	$3,000		
Total Assets	**$156,600**	**Total Liabilities & Owners' Equity**	**$156,600**

Example of an Income Statement:

YOUR BUSINESS Income Statement For the Three Months Ending March 31.20XX		
	Year to Date	
Revenues		
Landscaping Fees	$20,075.00	$99.50
Finance Charge Income	$100.00	$0.50
Total Revenues	$20,175.00	$100.00
Cost of Sales		
Total Cost of Sales	$0.00	$0.00
Gross Profit	$20,175.00	$100.00
Expenses		
Auto Expense	$2,200.00	$10.90
Commissions and Fees Exp	$6,000.00	$29.74
Dues and Subscriptions Exp	$600.00	$2.97
Insurance Expense	$250.00	$1.24
Total Expenses	$9,050.00	$44.86
Net Income	**$11,125.00**	**$55.14**

Example of a Cash Flow Statement:

YOUR BUSINESS Cash Flow Statement For the 1st Semester 20XX						
	Month 1	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**
RECEIPTS						
State Grant	$12,400	$12,500	$0	$2,500	$12,300	$12,600
United Way	$9,450	$0	$9,450	$0	$9,450	$0
Donations	$1,430	$2,000	$4,300	$1,200	$1,200	$1,200
Hourly Fees	$2,450	$2,500	$2,200	$2,200	$2,200	$2,200
Loan Received	$0	$0	$0	$12,000	$0	$0
TOTAL RECIPTS	**$25,730**	**$17,000**	**$15,950**	**$40,400**	**$25,150**	**$16,000**
DISBURSEMENTS						
Salaries	$19,550	$19,550	$19,550	$19,550	$19,550	$19,550
Fringe	$3,519	$3,519	$3,519	$3,519	$3,519	$3,519
Rent	$1,320	$1,320	$1,320	$1,320	$1,320	$1,320
Legal	$0	$0	$450	$0	$0	$0
Debt Service	$0	$0	$0	$0	$860	$860
Capital Purchase	$0	$0	$0	$15,000	$0	$0
Insurance Expense	$1,800	$0	$0	$0	$0	$0
Telephones	$246	$250	$250	$250	$250	$250
TOTAL DISBURSEMENTS	**$26,435**	**$24,639**	**$25,089**	**$39,639**	**$25,499**	**$25,499**
STARTING CASH	**$15,450**	**$14,745**	**$7,106**	**($2,033)**	**($1,272)**	**($1,621)**
RECEIPTS	**$25,730**	**$17,000**	**$15,950**	**$40,400**	**$25,150**	**$16,000**
DISBURSEMENTS	$26,435	$24,639	$25,089	$39,639	$25,499	$25,499
ENDING CASH	**$14,745**	**$7,106**	**($2,033)**	**($1,272)**	**($1,621)**	**($11,120)**
GOAL - 30 Days Cash	$24,639	$25,089	$39,639	$25,499	$25,499	

l) **SWOT Analysis:** Describe the strengths, weaknesses, opportunities, and threats around the company, its operations, and relations with stakeholders once the sustainable start-up begins its operations.

Remember that strengths and weaknesses refer to situations within your company and within your control, whereas opportunities and threats are external factors.

For the example of Ecolight, the following illustrates a schematic chart of the SWOT Analysis:

Strengths:
- Recognized and experienced team.
- Unique product in the market.

Weaknesses
- Limited budget.
- New company.

Opportunities
- Growing eco friendly market in the country.
- New government policies that enhance the use of energy efficient devices.

Threats
- Long tradition of current competitors in the market.
- Possible development of alternative technologies using, for example solar energy.

7. RESOURCES

BUSINESS INCUBATORS

Dnamo Incubator
Heijplaatstraat 21
3089 JB Rotterdam (The Netherlands)
info@dnamo.nl
http://www.dnamo.nl

Eco-Emprenedor XXI
Barcelona Activa
Llacuna 162
08018 Barcelona (Spain)
T. (+34) 93 401 97 77
barcelonactiva@barcelonactiva.cat
http://www.ecoemprendedorxxi.es

Yes!Delft
Molengraaffsingel 12
2629 JD Delft (The Netherlands)
Tel: (+31) 015 2782816
Fax: (+31) 015 7440102
info@yesdelft.nl

Change Fusion
444 Olympia Thai Tower, 22nd. Fl.
Ratchadaphisek Rd
Samsemnok, Huaykwang
Bangkok 10310 (Thailand)
Tel. +662 938 2636

Unreasonable Institute
1321 College Ave, #150
Boulder, CO 80302
wisdom@unreasonableinstitute.org
http://www.unreasonableinstitute.org

Rabobank
Blaak 333,
3004 AA Rotterdam
The Netherlands
+31 10 400 333

BOOKS

Getting to Plan B: Breaking Thorough to a Better Business Model
John Mullins & Randy Komisar
Harvard Business Press (September 2009)
http://www.amazon.com/Getting-Plan-Breaking-Through-Business/dp/1422126692

The Art of Start; The Time-tested, Battle Hardened Guide for Anyone Starting Anything
Guy Kawasaki
Portfolio Hardcover (September 2004)
http://www.amazon.com/Art-Start-Time-Tested-Battle-Hardened-Starting/dp/1591840562

What Management Is: How It Works and Why It's Everyone's Business
Joan Magretta
Free Press (April 2002)
http://www.amazon.com/What-Management-Works-Everyones-Business/dp/0743203186

Exploring Materials: Creative Design for Everyday Objects
Inna Alessina, Ellen Lupton
Princeton Architectural Press (March 2010)
http://www.amazon.com/Exploring-Materials-Creative-Everyday-Objects/dp/1568987684

What's Mine Is Yours: The Rise of Collaborative Consumption
Rachel Botsman, Roo Rogers
Harper Business (September 14, 2010)
http://www.amazon.com/gp/product/0061963542?ie=UTF8&tag=cc0dbc20&linkCode=as2&camp=1789&creative=390957&creativeASIN=0061963542

Starting Green: An Ecopreneur's Toolkit for Starting a Green Business from Business Plan to Profit
Ph.D., Glenn Croston
Entrepreneur Press; 1 edition (October 1, 2009)
http://www.amazon.com/Starting-Green-Ecopreneurs-Toolkit-Business/dp/1599183552

Build a Green Small Business: Profitable Ways to Become an Ecopreneur
Scott Conney
McGraw-Hill; 1 edition (October 24, 2008)
http://www.amazon.com/Build-Green-Small-Business-Profitable/dp/0071602933

ONLINE RESOURCES

SMART Start-Up Training on Sustainable Entrepreneurship
UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)
http://www.scp-centre.org/fileadmin/content/files/6_Resources/1_Publications_pdfs/49_CSCP__2011__-_SMART_Start-up_The_Story_en.pdf

SMART 52 Weekly Business Actions
UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)
http://www.scp-centre.org/fileadmin/content/files/6_Resources/1_Publications_pdfs/48_SMART_52_Weekly_Business_Action_en.pdf

A new course on Sustainable Entrepreneurship
Anuradha Basu, Asbjorn Osland, and Michael Solt
http://nciia.org/conf08/assets/pub/basu1.pdf

Sustainable entrepreneurship and innovation
Anne Gerlach
Centre for Sustainability Management (CSM), University of Lueneburg
http://andersabrahamsson.typepad.com/sustainable%20entrepreneurship%20and%20innovation.pdf

Sustainable Entrepreneurship:
Broadening the Definition of 'Opportunity'
Norris F. Krueger, Jr., Ph.D.
Program Manager, TEAMS
Boise State University
http://www.sbaer.uca.edu/research/sbi/2005/pdffiles/papers/35.pdf

WEBSITES

http://enviu.org
http://www.scp-centre.org
http://www.rabobank.com
http://www.entrepreneur.com
http://www.startups.co.uk
http://sustainable-future.org/links
http://www.seedinit.org
http://seialliance.com
http://www.future-lifestyles-entrepreneurship.org