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# **Sustainability orientation in conventional start-ups**

**Uta Milow<sup>1</sup>**

<sup>1</sup>University of Applied Sciences and Arts Northwestern Switzerland

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Uta Milow

University of Applied Sciences and Arts Northwestern Switzerland (FHNW), Peter-Merian-Strasse 86,  
4002 Basel, Switzerland

E-mail of corresponding author [uta.milow@fhnw.ch](mailto:uta.milow@fhnw.ch)

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## Abstract

Sustainable entrepreneurship research often evaluates start-ups that pursue a sustainability goal as a main aspect in their business model or at least follow an ethical motivation. In this study so called conventional start-ups will be examined that do not have this special sustainability focus or ethical motivation as a core of their business model. The question is if and in which areas these numerous start-ups contribute to sustainability in our economy and how this contribution could be improved. Therefore, the sustainability orientation and previous experience in sustainability management of the founding teams was examined. Secondly, the types of ecological and social contributions and their extend were explored. 26 start-ups were interviewed with a semi-structured interview guide. In this explorative study, the interview transcripts were qualitatively analyzed. Many teams claim to have a sustainability-oriented mindset. The experience in managing sustainability issues in previous jobs or projects is low, though. Overall, ecological and social issues play a minor role in the analyzed conventional start-ups' founding processes, and if, they mostly contribute to areas that are easy to implement. The focus of the start-ups was to first enter the market and gain revenue and include sustainability aspects later. As start-ups would have the chance to include sustainability improvements more easily at an early stage, though, support should be developed that offers training and best practice for conventional start-ups. The generally positive attitude of the interviewees towards sustainability is promising. Future research could further explore sustainability contribution patterns of conventional business models to make support more effective.

## Keywords

Sustainable Entrepreneurship, Sustainable Business Models, Start-ups

## Introduction

Dealing with the consequences of human activities on our planet is the challenge of our time. Sustainability must be incorporated into our actions not as one among other aspects, but comprehensively. Companies play an important role here, as they are key players in the economy, both in terms of resource consumption and in terms of how we interact with each other (George et al., 2016). The traditionally dominant way of using resources to produce products and services and discarding them after use is being challenged with new approaches such as the circular economy (PwC-WWF, 2021). Sustainable business is essential to keep our

planet livable for future generations, as it was already announced in the so called Brundtland Report “Our Common Future, from One Earth to One World” in 1987 (World Commission on Environment and Development, 1987). In this same Report, companies are also held accountable, along with individuals, governments and other institutions (World Commission on Environment and Development, 1987).

Start-ups have to make a contribution to increasing sustainability (Bocken et al., 2014; Stubbs & Cocklin, 2008). They have the opportunity to incorporate sustainability aspects into the business model from the very beginning. 80% of the environmental impact is already determined in the design phase of a new product, according to a study by the European Commission (European Commission, 2014). On the other hand, start-ups cannot yet foresee and manage the entire production cycle in the start-up process and accordingly cannot always foresee sustainability impacts (Picken, 2017).

To maximize the sustainability contribution in our economies, all start-ups should challenge their business model with regard to implementing sustainability aspects. The types of business ideas are very broad, though, and can vary according to opportunities, skills, gender, age, culture, technology, sector and other variables (*Global Entrepreneurship Monitor Global Report 2021-22*, 2022). Do the founders of a new company take sustainability aspects into account when designing their business idea? And if so, in which areas and to what extent? This is examined in this article. The overarching context of this paper is to draw conclusions for the sustainability promotion of start-ups, following the evaluation of the sustainability contributions and characteristics in this study. One restriction might apply, though. If start-up teams already have a promising business idea, they are most likely not willing to completely change it if they learn how to include sustainability aspects.

The target group of this investigation are so called conventional but generally innovative start-ups that do not have a special sustainability focus as a core of their business model or do not have a sustainability oriented mindset. This is a big group in the start-up scene and can have a huge impact on the economy (*Global Entrepreneurship Monitor Global Report 2021-22*, 2022). Their sustainability contribution has not been explored much so far. Some primarily want to be successful with an innovative business idea and want to generate profit but do so while taking social and environmental needs into account (Thompson & MacMillan, 2010). Others act entirely from an ethical motivation, and still others do not consider sustainability at all. The start-ups in this survey represent a diverse mix of very different business models from different industries and with different motivations. They participated in the entrepreneurial competition Swiss Innovation Challenge. This contest was launched by the University of Applied Sciences and Arts Northwestern Switzerland (FHNW) already in 2014 and takes place every year since (FHNW, 2023). The Swiss Innovation Challenge lasts a total of eight months and includes three pitches of the participants with an evaluation of their business ideas and projects by a jury. For this article, 26 start-up teams from the 2021 cohort were evaluated.

The research question that this paper helps to answer is how observable sustainability contribution is among start-ups that do not have a special focus on sustainability. This will be examined with an investigation of the

attitudes towards sustainability and the experience in sustainability management that these entrepreneurs contribute (sub-question 1) and secondly with an analysis of the areas that these conventional companies make a sustainability contribution to (sub-question 2).

The research project aims to contribute to a deeper understanding of the sustainability implementation in conventional start-ups and to show how these entrepreneurs can also contribute to sustainability. The specifics and diversity of the start-ups, which generally do not have a particular sustainability focus in their business model, will be elaborated in a qualitative analysis of the interview transcripts. The results can be the foundation of and link for support measures for start-ups.

The next section will provide a theoretical background about categories of sustainability contribution in entrepreneurial activity. The third section will describe the research approach and the method used in this qualitative analysis. Then, the conducted interviews will be analyzed (section 4) and discussed (section 5). Finally, conclusions will highlight the main results and derive suggestions for further research.

## **Sustainability and Entrepreneurship – theoretical and contextual background**

### **Sustainability in Business Models of Start-ups**

The term business model has been sharpened in recent years. A business model describes the rationale of how an organization creates, delivers, and captures value (Fiel, 2013; Osterwalder & Pigneur, 2010, p. 14). Thus, it is an elaborated concept which includes in addition to the business idea a concept of revenue generation and market entry. A business idea should be understood here as the idea of a certain product being sold to a target group. This term is used rather for an early phase of a business start-up (Hougaard, 2006) and means the basic idea of the developing enterprise, without further elaboration and framework. However, it can be understood more broadly and include a new business idea in an already existing company (Birkholz, 2022).

A start-up or a nascent entrepreneur is understood here as being in the process of establishing or having already entered the market up to a maximum of 3.5 years after start of business. The definition of the Global Entrepreneurship Monitor is used here (GEM, 2023). A distinction is made between the early seed stage, in which the concept is developed but no sales are generated yet, the start-up stage, with a market-ready offering with the first customers, and the growth stage with strong sales growth (Trautwein & Fichter, 2018). The subsequent phases for established companies are not considered here.

In this study, the term sustainability is to be understood broadly. It is based on Elkington's definition with a subdivision into social, environmental and economic areas (Elkington, 1998), which, however, are not mutually exclusive but complementary. The sustainability contribution of companies can be very diverse: a reduction in energy consumption, introduction of circular economy in production and supply chain or social aspects such as the treatment of employees in the company - to name just a few examples.

Much of the literature points out that companies are responsible for contributing to a reduction in the environmental and social harm they cause, e.g. (Schaltegger et al., 2014). On the other hand, companies also benefit from these challenges by generating new business ideas (Alberti & Varon Garrido, 2017). Large, international companies are not the only ones responsible for sustainable business (e.g., in (Schaltegger & Wagner, 2008)). Increasingly, small and medium-sized enterprises are also held accountable (Pomare, 2018). In addition to the more theoretical debate on both technical possibilities and societal changes, there are now various studies that deal with sustainable entrepreneurship. Here, business models are systematized in terms of their sustainability, and measures are described on how sustainability can be improved (Sarango-Lalangui et al., 2018; Schaltegger & Wagner, 2011). The focus is often on how new startups can emerge that, at their core, aim to improve sustainability. A clear normative orientation is assumed (Breuer & Lüdeke-Freund, 2018). From the outset, social and ecological values should ideally be anchored in all areas of corporate management or taken into account in innovation management (Boons & Lüdeke-Freund, 2013). Sustainable entrepreneurship then refers to business development that takes social, economic and ecological aspects into account in the development of products. Benefits are then broadly understood to include non-economic goals (Shepherd & Patzelt, 2011). Here, it is emphasized that a comprehensive understanding of different areas of sustainability is necessary to be considered sustainable entrepreneurship. For an overview of sustainable business model definitions and categories, see Geissdörfer, Vladimirova, and Evans (Geissdoerfer et al., 2018).

Other articles describe what types of sustainability-oriented business models there may be (Breuer & Lüdeke-Freund, 2018; Lüdeke-Freund et al., 2019). Again, the focus is on such business models with explicit consideration of sustainability. From this research, tools and measures could be derived on how to promote the creation of business models for targeted sustainability improvement (Breuer et al., 2018; Breuer & Lüdeke-Freund, 2018).

In fact, many start-ups consider sustainability aspects only alongside other criteria for successful business creation, if at all. Thus, a primary and explicit sustainability orientation does not have to be the stated goal of a start-up (Schaltegger & Burritt, 2018) in order to make a (possibly small) sustainability contribution. Founders want to be successful with their business model, and a sustainability focus can contribute to this if, for example, climate change stimulates innovative energy production. On the other hand, addressing more sustainable production conditions can also increase costs and thus reduce the financial success of the company (Schaltegger & Burritt, 2018).

There can be a whole range of variations in the extent to which a start-up considers economic and social values. “Social” is broadly understood here in the sense of useful to society, i.e., sustainable. The term hybrid enterprise has been introduced to describe such enterprises that combine both ambitions (Haigh & Hoffman, 2012; Shepherd et al., 2019). Thus, it is possible for a company to be profit-oriented while also considering societal needs to a certain extent. Cesinger, Vallaster, and Müller emphasize that sustainability-oriented entrepreneurs have to meet both requirements, on the one hand the profit generation and other market-oriented

challenges and on the other hand the societal, sustainability-oriented requirements. Both have to be managed with changing intensity in the start-up process (Cesinger et al., 2021). In these studies mentioned above, it is often assumed that companies explicitly address sustainability, that even the business case can be secondary (Alberti & Varon Garrido, 2017). For this research, it is important to note that different combinations and manifestations of market- or profit-oriented and societal goals can exist, and they usually influence each other.

## Attitude and experience of the founders

The positioning of a business concept with regard to sustainability, profit and other dimensions is assumed to be related to the general attitude of the founders towards sustainability issues (Williams & Schaefer, 2013). Various goals can be summarized under the term of a sustainability-oriented motivation, such as the lowest possible environmental impact, reduction of CO<sub>2</sub> emissions, a fair distribution of resources and income, and many others (Schaltegger et al., 2018). Personal values play a role here, which are reflected in the motivation (Saha et al., 2020). The societal motives of sustainable management are presented in a differentiated way in Schaltegger and Burritt, where in addition to the societal benefits, those for the managers and the company are elaborated (Schaltegger & Burritt, 2018).

Furthermore, experience with sustainability management in previous activities can play a role in considering societal criteria also in the current company formation. It has been shown that the level of knowledge about social and environmental contexts has an influence on sustainability-oriented management (Patzelt & Shepherd, 2010).

## Types of sustainability contribution

The distinction of sustainability contributions according to the already mentioned triple bottom line is a rather general one. In the ecological area, especially on the circular economy, further categories of sustainable business models have been formed and distinguishing characteristics have been defined.

Under the umbrella term of circular economy, a distinction is made between 'narrowing', 'slowing' and closing resource loops (Bocken, 2020). Narrowing refers to the reduction of resource consumption by using materials and energy more efficiently. Ultimately, we are still in the linear economic model of take-make-waste, which is nevertheless improved. Slowing refers to a longer usage, which is achieved with various measures such as durability, repair, reuse by new users or sharing and the like. Products are returned into the circular economy. Finally, closing the loop refers to reusing the material and returning this to the circular economy. The original product is destroyed, and the materials recycled (Bocken, 2020). As catchy terms for the different loop models, the "re-..." words have become established. Henry, Bauwens, Hekkert and Kirchherr focus on these five terms: reduce (use of resources), reuse, regenerate (biological), recycle, recover (energy) (Henry et al., 2020).

However, the authors of the cited articles mainly have start-ups with a strong and initial sustainability focus in mind. For this study of conventional business models, the categories will be applied if possible. Further categorization proved not to be useful as other models again focus on mostly sustainability-oriented business models (Henry et al., 2020; Lüdeke-Freund et al., 2018).

## Research gap

In recent years, numerous studies have dealt with sustainable business model innovations, see the previous sections. The approach usually was to put a focus on sustainability already in the design of the business model. Systematization should identify typical business models, show best practice examples and thus create the incentive to improve the sustainability of society with new start-ups.

There are several tools that motivate start-ups in the founding phase to contribute to sustainability, e.g. (Fichter & Tiemann, 2015), or tools that can be used to determine the sustainability contribution of nascent entrepreneurs, e.g. (DIN, 2020), or coaching programs like in the Swiss Sustainability Challenge that also foster sustainability aspects. Here, entrepreneurs are encouraged to comprehensively consider sustainability in the business idea from the outset. Numerous categorizations and studies of start-ups refer explicitly or implicitly to those with a sustainability focus (Trautwein, 2021). Even though it is noted that sustainable innovations emerge in different ways and also develop randomly and with little guidance (Ahrend, 2019), the typology of sustainable business models in these studies assume business ideas that are sustainability oriented at their core, e.g. in (Lüdeke-Freund et al., 2018). From the beginning, these have as one motivation among others the contribution to sustainability, and this determines the business model and the approach. The application of the tools and accompanying research will identify typical business models (Bocken et al., 2014; Henry et al., 2020; Lüdeke-Freund et al., 2018) to motivate others to adopt similar business ideas and to show typical patterns.

Other Business Models develop in an innovative high-tech context, find a niche of customers' needs or further develop existing business models. Business model innovation sometimes even is lacking any framework and is rather developing in an ad hoc process. Some business model innovations are growth driven, other innovations are implemented to become profitable (Heikkilä et al., 2016). Initially, these businesses often do not develop in a sustainability context or network and do not implement or only at a limited extend sustainability requirements. With a growing awareness of sustainability topics, the founders might know about the urgency of respecting the social and ecological boundaries, but this does not directly influence their motivations and will be considered as a side aspect, or not at all. In this study this type of so-called conventional businesses will be explored.

The sustainability contribution of these start-ups has not been explored in detail so far. There is oneThe article is intended to help fill these gaps. It aims to contribute to a deeper understanding of the variety of more conventional versus more sustainability-oriented entrepreneurs and to show how conventional entrepreneurs

can also contribute to sustainability. Mostly, the examined business models would not meet the stricter criteria of sustainable entrepreneurship. The range of consideration of sustainability was wide, and this range will be mapped and examined here.

Starting new businesses is vital for any economy and contributes with new jobs, increased incomes and added value. Furthermore, it fosters innovation and brings new technologies and products to society (*Global Entrepreneurship Monitor Global Report 2021-22, 2022*). By numbers these start-ups are a big group with potential for sustainability contribution.

## Methodology

### Data collection and sample

Even though it is ultimately the impact that matters in order to improve the sustainability of our economic activity (Global Impact Investing Network, 2021; Trautwein, 2021), most start-ups are not yet at a stage where impact can actually be measured, especially at an early stage of development. Historical data is often not available and a deep understanding of the context is not necessarily given (Picken, 2017). Therefore, in this evaluation characteristics that are related to the expected impact are used and presented in the previous section.

Since start-ups are not yet able to survey their entire value chains, both existing features and future opportunities are considered (Trautwein, 2021). First, for the future integration of sustainability aspects into business activities, the motivation and profit orientation of the entrepreneurs, their sustainability orientation and their sustainability experience are used as criteria or indicators. Then, sustainability aspects of business models are examined with regard to type and intensity and their contribution to the circular economy. An explorative approach is used as knowledge about sustainability in conventional entrepreneurship is still limited.

Suitable cases were first selected for this iterative, inductive approach (Yin, 2009). The start-ups should represent the breadth of the start-up landscape and not be selected on their sustainability orientation. The target group is “conventional” start-ups as this is the main group in entrepreneurial activity, but those with a stronger sustainability focus could also be included by chance. The start-ups should either have started their business or at least should be able to present an elaborated business plan. Participants in the Swiss Innovation Challenge, that the University of Applied Sciences conducts since 2014, generally fulfil these criteria. However, a bias towards an interest in sustainability issues cannot be ruled out, as interview participation was voluntary, and the topic of the interview was announced. Teams were asked for an interview after the second pitch of the competition because at this stage they had to submit a detailed business plan. This ensures a good level of quality of the business cases. The participating teams came from Switzerland or the neighboring countries and could be assigned to various industries.

In this inductive research design, the 26 start-up cases were each considered as a separate “experiment”. With evaluating numerous cases, the study yields new insights into interrelationships and theories (Eisenhardt &

Graebner, 2007). The interview questions were derived from the above considerations. Face-to-face online interviews were conducted to give the interview partners the opportunity to ask questions. It was assumed that they had little knowledge in the field of sustainable entrepreneurship. Compared to an online survey, another advantage of personal interviews was the better participation rate. In addition, interviews give the opportunity to flexibly include additional questions. (The interview guide is available upon request.)

## Data analysis

The interviews were recorded, transcribed, coded and qualitatively analysed. The codes were derived from the interview areas and questions in order to answer the research questions. First, an overview was created with the coded transcripts on general sustainability topics. These were then in a second step supplemented with related codes and further differentiated according to the above categories and criteria (Gioia et al., 2012). Finally, common and specific features were worked out and described. A second expert double checked the coding. For the analysis, the interviews were numbered consecutively from 1 to 26 (numbers in parentheses behind the quotation in the section below). Some interviews were conducted in English, the others were translated.

## Analysis of Swiss Start-ups – empirical findings

### Founding process and general information about the teams

First, the start-up teams were asked about the circumstances and motivation of their founding, whether the business idea originated in the professional environment and how advanced the teams are with the implementation of their business idea. Another aspect that characterizes the teams is the degree of profit orientation, which is treated here independently of sustainability orientation (explained above). With regard to the sustainability orientation, which is dealt with in the following sections, it is also interesting to know to which industries the business ideas can be assigned.

### Circumstances of founding, motivation and professional environment

Most business ideas arose from the recognition of a need for the product or service in question. The founding teams identified a problem that needed to be solved and for which they had a product idea. For example, in team number 8: "Basically, it arose from a problem. It wasn't a need yet, that's still important. Just because it's a problem doesn't mean there's a need. There are many problems that we solve every day and don't realize that there is a better solution." (8), or "[The business idea came about] at lunch when we had a soft drink on the table and realized there was no good solution. [...] Then we talked to people and saw if that would generate interest." (1). The concrete implementation with the appropriate technology was planned afterwards.

However, it must be said about this observed sequence that, in general, the participants have already dealt with the subject area. Thus, a general knowledge or professional and industry knowledge was already present. This was disclosed in a separate question. For most of the founders, the business idea arose in their professional environment or, if they were still studying or working on their doctorate, in the same environment at university,

but generally not in their private environment. Teams 12 and 14, for example, explained that the business idea had arisen in the context of their studies or doctorate at universities in Switzerland. In many teams, professors were involved as advisors in the start-up.

There was also the reverse case, where an innovative technology was developed and then a market application was sought. "After the PhD studies, you are virtually an expert and actually know everything about your topic, which is highly unsatisfactory for me. So I wanted to do something new and the idea of taking this research, the many years, and developing something further from it that would benefit many people, was of course a personal driver and that also motivated me in principle to inevitably give up many things." (12)

Although it is obvious that most start-ups fundamentally want to generate income with their company, as can be seen below from the profit orientation, this aspect was hardly mentioned when asked about their motivation. By far the most frequently mentioned answers were the self-affirmation and self-realization with one's own business idea and the satisfaction of successfully starting one's own company. "The goal is to make the company work, that we have a product that I can stand for. That it generates added value for the customers. And also that I like doing it, the personal aspect is also very important. Finding the right work-life balance and that I still have fun in two to three years when we move on. Those are the two main aspects." (1). Another frequently mentioned aspect was the greater satisfaction of working as an independent entrepreneur or, more specifically, the greater flexibility in a start-up compared to a large company. "My main motivation was always to be self-employed one day." (26)

### **Start-up Phase**

The vast majority (14) of the start-ups were in the seed stage at the time of the interviews. In other words, they had a developed business plan, but had not yet generated revenue. Another nine start-ups were in the so-called start-up stage and had a marketable offering and had already generated initial sales. Three teams had successfully launched their company on the market with significant growth (growth stage).

### **Profit orientation**

Most teams describe their company as profit oriented. Fifteen startups state this exclusively, "We are fully profit-oriented" (15). Eight others say that profit orientation is dominant, but that non-financial goals are also considered, for example "We are not purely profit-oriented, but we are not non-profit either. Profit has to come out of it, but the main incentive for the others and me is that we have a great deal of knowledge and want to make it available to the population." (21)

For three teams, the focus was on the non-profit sector, but here, too, the costs are to be covered with the revenues (not really non-profit). "We hope to be a social business with of course a general profit in order to do good." (3), or "We definitely have a non-profit part. Specifically, we keep it as a side goal or side project to help people who live in areas where the resources are low. [...] The non-profit part is very important to us, but

in the end, we know that we have to earn money to make this possible." (17). None of the teams were non-profit in a strict sense.

## Industries

There was a clear focus of the startups considered in the IT sector. Many business ideas either provide software themselves or at least make substantial use of information technologies to realize their business model. 11 start-ups can be assigned to the "information technology and information services" sector (categories according to NOGA, Swiss Federal Statistical Office). Some start-ups come from the medical technology sector. The other business ideas are broadly spread across various industries, from house construction and precision mechanics to food production and textiles.

## Attitude towards and experience in sustainability issues

The teams were asked about their basic sustainability orientation, i.e. their attitude towards sustainability issues. Subsequently, they were asked to provide information on their experience in sustainability management, for example, gained at previous workplaces or in private life (associations, citizens' initiatives, etc.).

There were two typical answers to the question about sustainability orientation. Either the interviewees said that they were already sustainability-oriented in principle, but that this was not (yet) a major priority in their current business model. "However, we have not analyzed it in detail, we definitely have the awareness of it, which is already very important in the first place. Now we are still looking for solutions." (11).

Alternatively, interviewees indicated that they or the whole team were very sustainability oriented. "To be honest, we are all very sustainability oriented." (22), or "Within the project there are clear principles for progress, we are not willing to make any compromises. I think in our team the personal interest in striving for sustainability in our private life is also extremely high." (24). Few stated that they had not yet dealt with sustainability issues at all and accordingly had no attitude towards it.

Many of the teams interviewed had not been able to gain experience with sustainability issues in their previous careers. "In the team, we have no experience. No one has worked in sustainability." (1). Some interviewees indicated that sustainability was an issue at the university. "So, a little bit I got from my minor in college. Geography has addressed that from time to time." (5), or "In your studies you already learn a little bit about lean chemistry, risk and sustainability analyses, we already did all that. You already know how it works and how it should be done, roughly." (9). Single individuals in the founding teams, however, also brought a lot of experience to the table, "So I know that [name], my daughter, does a lot in this area because she works at Ford. There they advise big companies on how to become sustainable." (10).

## Areas of contribution to sustainability

The interview participants were first asked quite general questions about their start-up's contribution to the Triple Bottom Line before going into details. The interviewer first gave a brief introduction to the topic of sustainability. The teams thus had some prior knowledge to be able to answer the question. Many teams were able to make a sustainability connection in their business model but said quite clearly that sustainability was not a priority for them or even didn't matter. "Not necessarily, to be honest, No. " (16). "It's still something that's always in the back of our minds. So, we are aware of that, that we also want and have to keep in mind environmental aspects [...]. We haven't really implemented anything actively there yet." (5)

Other priorities were to get to market first as a start-up and address sustainability issues later, if necessary. "As I said, that's not the first priority, plus we really have to get to market relatively quickly and as unfortunate as that sounds, sometimes you just have to take the lowest prices from suppliers, which of course always have to match the quality. The price is of course very central for a start-up, which is why we don't weight the environment and sustainability components as much as perhaps price and quality issues. But it is of course the case that if we later grow, we must pay more attention to such points at the latest." (13).

In few cases, sustainability was the core of the business model or had a high priority from the beginning. "Exactly right, for us it is about decarbonizing the grid-bound heat supply, which means we have these local and district heating networks, which account for about 10% of the final Co2 emissions to heat our buildings, our houses. [...] The goal is of course to reduce this heat supply, which makes a large contribution to our overall Co2 emissions. That's what drives us and that's what we do with full motivation." (12), or socially "We are fighting poverty, we are building an economy that supports the poor, we are not looking for middle class content creators, we are looking for the lowest class. [...] We tell stories to motivate people to become active and to clear up prejudices." (22)

The question about the three areas of sustainability was understood in quite different ways. Many responses referred specifically to the own business model. In addition, some interviewees seemed to be thinking about the sustainability of their business for the first time during the interview. Accordingly, the answers were spontaneous and less structured. For example, the interview partners generally talked about sustainability issues, not about their business. "There are some who say, by decentralizing production, of course we can bring in environmental protection thinking. Because we save transport costs, emissions. That's not the central focus for us now, but it's certainly an aspect we're taking up." (18).

As in previous studies and in consultation interviews, the opinion was again encountered that as a service company, especially in the IT industry, one would not have to worry as much about sustainable operations, since it was not classic production with a lot of resource use and goods traffic. "We are simply solving an organizational problem, we are making the organization in a company more transparent, but we don't have

sustainability issues. We're not in an industry that produces big CO<sub>2</sub>, we have an IT company, we don't burn anything, we don't have vehicles, there's actually nothing environmentally harmful." (26)

Only some of the interviewees have heard of the Sustainable Development Goals. They were able to assign the contribution of their business model to individual goals, insofar as a sustainability contribution was recognizable, without claiming completeness. In other interviews, possible goals were identified in conversation with the interviewer. Goal number 3 "Good Health and Well-being" was mentioned particularly frequently. This fits in a broader sense with the more frequent medical technology and pharmaceutical business ideas. The other clustering is for goal number 9 "Industry, Innovation and Infrastructure." This goal addresses economic sustainability, which for-profit business models can fulfill more easily by being innovative and providing jobs through their operations. All other goals were mentioned rarely or not at all.

With regard to the use of resources, including energy, many interviewees were able to name measures to improve energy efficiency. Although this is not a contribution to the circular economy in the strict sense, it is an improvement in the linear economic model. Attention is also paid to energy efficiency labels in this regard. "We certainly look at this, but it does not have a main priority, but with new screens we pay attention to this." (11). In the linear economic model resource efficiency also was addressed in general. "We work in a resource-efficient way. By producing just in time, we don't produce unnecessary things." (18).

In addition, many interviewees mentioned recycling. "The sustainability aspect, that we create something new again from recycled materials, is also given. It is just this subscription process that is important, that what the customer gets is created from recycled previous lamps. [...] We don't source it out, we have it in-house so that we can react immediately to also design it in a way that suits us." (14)

Often recycling measures were formulated as a possibility that are not yet implemented, "Not only do you have to scale production, but you have to scale recycling at the same time. That's where we decided against it now for the beginning, even though the idea actually is good. [...] Now it is more important that you survive as a company than that you directly build in the perfect circular economy." (9). Or the interviewees said that they do not use recycled products or precursors. "What we can we certainly do. But the possibilities are, I think, already very limited there." (10)

The environmental benefits of a long duration of use in terms of "reuse" were addressed in several ways. Some companies could contribute if their products were of good quality and durable. From the start-ups' point of view, this area is encouraging because good quality is often sought independently of sustainability considerations. You can contribute without really having to change anything in the business. " We make a reusable bottle and expect it to last about three years." (1) Products that can be put to further use when the first consumers no longer need the product are particularly desirable. "Because we prefabricate the rooms and work with assemblies, we can also reassemble them, so to speak. I don't have to destroy them." (7)

An organized sharing platform with digital access is not used by any of the start-ups, however. It could extend the lifecycle for durable products. For some start-ups, a rental model is an option (5) (6). In general, this model is available only for physical products. For some products, reuse is not allowed for hygienic reasons, for example in the medical field, or is less attractive, such as for shoes.

Another way to extend the life of a product is to repair it. On the one hand, this involves the fundamental possibility that a product can be repaired, for example through appropriate design. On the other hand, the manufacturing company can also offer a repair service. "Since we've been in Africa, we've given them repair kits so that they can mend things themselves and don't have to send them back to Europe. The results were rather mixed because it didn't always work even together with our support. [...] Realistically, it's more likely it will end up in the trash than being sent back." (9). Other participating teams could not name an exact contribution to the circular economy.

Finally, the interview partners were asked about specific measures to improve sustainability in their start-up. Due to the large number of measures and answers, only some frequently mentioned topics can be addressed here. A general awareness of energy savings and non-fossil energy generation was evident with declarations of intent on CO<sub>2</sub>-neutral electricity and solar installations. However, many start-ups rent co-working spaces, occupy rooms at a university or work in a home office, so from a company perspective, the energy provider cannot be influenced. Offsetting any CO<sub>2</sub> emissions is very uncommon. "No, we haven't planned or discussed this either. The reality for us is simply that we are dealing with these issues - this sounds stupid now or perhaps provocative - that we cannot yet afford the luxury of thinking about such issues because we are still operating in an environment of maximum uncertainty." (8)

There were numerous positive responses regarding family-friendly working conditions. Flexible working hours are typical at start-ups, so this could be interpreted as family friendliness. Some teams state that they value gender equality and deliberately hire women. However, interview participants were asked about the founding team at the beginning of the interview. Here, it was revealed that the proportion of founding men is significantly higher than the proportion of women in the teams. There are only two all-female founding teams, compared to numerous all-male and some mixed teams.

Very few already have an active impact management and communicate the impact to the stakeholders. Other interviewees emphasize that it is too early in the start-up process to already introduce impact management. However, they plan to do so later. "At some point you will be able to work in such a way that these topics will also become relevant. But first you have to be able to be sustainable as a company, financially functioning, self-supporting." (8). Only two companies are already working with sustainability labels or standards. For some, again, the question comes too soon. "We are currently persuading one to get ourselves labeled, but not yet" (2). Others either haven't thought about it yet or don't plan to. "But we don't pay attention to certain labels, no." (9). On the other hand, sustainability is perceived by many as a selling point. "I think, yes. It's a selling point, yes

absolutely" (6), or "[That's] our or one of our core arguments for buying our product. " (7). A discrepancy can be observed here.

## Discussion

When the teams are addressed directly in the interview, many present themselves as having a sustainability-oriented mindset. The interview partners are obviously aware that generally ecological and social needs of society should be included in corporate management. However, only a few have experience with sustainability management from previous projects or jobs. At least some of the interview partners stated that sustainability topics were part of the curriculum at university, so they had prior knowledge, but had not yet put it to the test in practice.

The primary motives of the founding teams were identification with their own business idea and the satisfaction of successfully implementing this idea in a company. At this point, interestingly, income generation was generally not mentioned. However, when the interviewees were directly asked about profit orientation, it turned out that all companies ultimately want to make profits. Some have other motives besides this, including sustainability-oriented ones, which is why profit orientation is not the first priority for all of them. Consideration of environmental or social issues is seen as independent of profit-making.

Overall, ecological and social issues play a minor role in the start-ups' founding processes. Service companies, mostly from the IT sector, sometimes held the view that they were sustainable anyway due to the lack of traditional production with resource consumption. However, even though the environmental impact may be lower, there are of course numerous areas in which these companies should take sustainability aspects into account, ranging from office and server operations, travel to the workplace, and social aspects.

There was little awareness of the United Nations' Sustainable Development Goals. Some business models could be assigned to the more economically oriented SDG 9 "Industry, Innovation and Infrastructure". The multiple business ideas in pharma and medical technology could be related to SDG 3 "Good Health and Well-being" if they improve the health of the population. A more detailed analysis of the SDG contributions is not possible with interviews, as too little knowledge about these goals was available. For this, the business plans would have to be evaluated, or references to the SDG would have to be explored in further interviews. In general, the prior knowledge of the interviewed team members on sustainability topics was mostly low. Only three teams had attended a seminar on sustainable management of start-ups that was offered in the competition.

It is noticeable that some interviewees were not even aware that they were already making a contribution to sustainability with their business, for example in the area of circular economy. Some interviewees were so flexible that they were able to make the connection to sustainability issues just in the conversation and spontaneously presented their business model in a correspondingly positive light, for example with the longevity of the products and possible reuse, or local production and short delivery routes.

When it came to the topic of circular economy, low hanging fruits were identified, but other teams had already made very differentiated considerations about the circular economy. In the areas of energy use, recycling and resource management in general, rather small contributions could be identified overall, which, moreover, had generally not yet been realized. This is also generally true for impact management and documentation. Being asked in the interview, many have plans but do not install it yet, possibly because of the much represented seed stage of the start-ups. Specific questions were asked about targets and KPI. In contrast to the first questions of the interview, where it was still possible to answer in general terms with declarations of intent, actual actions had to be disclosed here - and these were often not (yet) available.

Few teams have already recognized that contributing to sustainability can be useful for marketing. On the other hand, many recognize it as a selling point when asked, but this is not yet implemented in communications, and there is still little collaboration with labels.

Many sustainability improvements were formulated as an option for the future. On the one hand, this is understandable, as many of the teams interviewed were still in the early stages of starting a business. On the other hand, an early inclusion of ecological and social issues might be easier than at a later stage. Other teams have not yet thought about sustainability in their business and answered spontaneously.

## Conclusion

The awareness that sustainable management is important in our society was largely present in the start-up teams observed. This is a good prerequisite for encouraging conventional companies, and start-ups in particular, to adopt sustainability-oriented management. There was little experience in this area (sub-question 1), few measures have been implemented to date and little concrete knowledge seemed to be available for implementation.

Start-up teams only exceptionally include sustainability aspects already on their own initiative, and this mainly in areas with a low effort implementation (sub-question 2). The introduction of incentives, information and training by a variety of institutions and universities could advance this process. In the early start-up phase, there is still a chance to consider ecological and social needs from the beginning. On the other hand, the interviews showed that teams generally prioritize the scarce time for other tasks. Sustainability is not perceived as a priority. The interview participants want to get to market first, secure financing, and start production and sales. To solve this discrepancy will be the task for future support systems.

Limitations of this study are the small number of start-ups that were interviewed. Second, the selection of the cases might have a bias towards sustainability orientation as the topic of the interviews was announced. Third, only one person per team was interviewed. Therefore, in this explorative, qualitative research design results cannot be generalized. Further research is needed in the field of how start-up teams can be motivated and enabled to include sustainability at an early stage in the founding process. At what point can sustainability orientation best be influenced? Could linking financing to sustainability criteria be a solution? To answer these

questions, the typical patterns of sustainability contributions in conventional startups could be further investigated. It was found that existing categories from the literature can be predominantly assigned to business models that are aligned with sustainability at their core, other than the ones in this study. For example, in one analysis, these five types were identified: design-based, waste-based, platform-based, service-based and nature-based start-ups (Henry et al., 2020). In another analysis, the categories were chosen more broadly so that many different sustainable business models could be represented. 11 pattern groups with altogether 45 patterns were identified (Lüdeke-Freund et al., 2018). With further research, the goal could be to have a rather complete picture of possible sustainability patterns in conventional business models that work as best practice cases and allow to develop more effective support.

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