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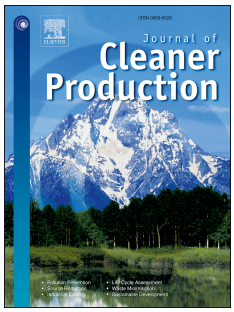

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Credit authorship contribution statement

Inamutila Kahupi: Project excursion, Data sampling and analysis, Conceptualization, Methodology, Report writing – original draft, review & editing. **Dr. Clyde Eiríkur Hull:** Project supervision, Methodology development, Writing – review & editing. **Dr. Okechukwu Okorie:** Project administration, Methodology, Writing – final report & editing, Validation, Supervision. **Dr. Sherwyn Millette:** Data investigation, Writing – review & editing, Investigation.

Building Competitive Advantage with Sustainable Products – A Case Study Perspective of Stakeholders

Journal of Cleaner Production

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Abstract:

Sustainability has gained momentum in literature as government and non-governmental policymakers to fight climate change. Sustainability principles can be good for business and the economy, but businesses have been slow to replace non-sustainable products with sustainable ones. We argue that this is because businesses have a harder time seeing how to build a stronger competitive advantage with sustainable products than they have with the products they already offer. This study thus addresses the question of how sustainable innovators can build competitive advantage around sustainable products. Stakeholder theory advises business owners to build products around the interests of all stakeholders. This paper thus uses a grounded theory approach based on a series of interviews with fifteen key business stakeholders: entrepreneurs, investors, customers, and academics/NGO representatives. There are four major and interconnected findings, viz: (1) investors are the most doubtful concerning sustainable innovations, while customers are receptive and keen to be involved; (2) sustainable entrepreneurs are subsequently advised to make sure that the underlying business case of their firm is well developed as much as the product; (3) the overall barrier hindering the success of some sustainable innovations is not their cost, but the human nature to put off change until problems become critical; and (4) at the moment, investing in sustainable innovations is more attractive in regions with positive sustainability regulations such as California and some European countries.

Key Words: Barriers, Disruptive Innovation, Circular Economy, Competitive Advantage, Sustainable Entrepreneurship

1. Introduction

1.1 Background

Most sustainability policymakers believe that the business community plays a significant part in moving society to a circular economy business model (Geissdoerfer et al., 2017). In response we have seen an increase in sustainable entrepreneurship, which has been viewed as an all-inclusive measure to preserve and care for future generations (Horne et al., 2020; Ratten et al., 2019; Terán-Yépez et al., 2020). Recent literature in the area of sustainability suggests that a variety of stakeholders in the business community are open to pursuing sustainable opportunities if they see how those opportunities can yield a

significant profit (Millette et al., 2019, 2020). Any action that can yield a firm significant profit is typically called a competitive advantage (Belton, 2017; Porter, 2008), or sometimes a green competitive advantage if based on sustainability (Zameer et al., 2020). But this raises the research question: *How can a venture, new or otherwise, build a competitive advantage around a sustainable product?*

Resource-based theory has recently come to emphasize that competitive advantage lies in providing value to multiple stakeholders (Barney, 2018). Thus, to better understand how to build competitive advantage for sustainable products, we conducted a grounded theory study. We interviewed key business stakeholders, i.e. investors, entrepreneurs, customers, and academics/NGO representatives. We then analyzed their opinions, views, and experiences to better understand how to build a competitive advantage around a sustainable product in existing markets dominated by incumbent non-sustainable innovations.

1.2 Theoretical background

Few papers have focused on competitive advantage for sustainable products in non-sustainable markets from the perspective of stakeholders. Therefore, we reviewed closely connected papers and methods to explore the significance of competitive advantage for sustainable products through the eyes of the key stakeholders.

The closest study we found looked at the viewpoints of stakeholders specifically in the bio-based sector in Europe (Leipold & Petit-Boix, 2018). They conclude that the viewpoints of stakeholders can play an important role in determining business strategies that support sustainability and circular economy. Competitive advantage is described as the notion of gaining product value proposition in the marketplace (Porter, 2008; York, 2019). In this paper, we focus on the ability of a business to make more sales and increase customer satisfaction based on sustaining and managing product-based resources and generated waste. Millette (2019) explored the motivation towards participating in a business incubator for the circular economy system and highlight the importance of taking advantage of the opportunities within sustainability and circular economy. Such opportunities can potentially reduce expenses and reinforce the financial performance of the business, while at the same time reducing their environmental impact's footprint (Millette, 2019).

In the same approach, a number of articles look at engaging businesses to help promote sustainability and circular economy (Millette, 2019; Tukker, 2015; Witjes & Lozano, 2016), but they mainly focused on recycling and waste management results. Witjies & Lozano (2016) looked at a framework that is based on the collaboration between stakeholders to improve the process of sustainability and circular economy. However, they did not interview those stakeholders. Similarly, from literature, we discover that most authors omitted stakeholder interviews capturing their opinions towards building competitive advantage. Most studies focused on sustainable competitive advantage and material flows analysis without mention of how sales of sustainable products can potentially be increased (Geissdoerfer et al., 2017; Pratono et al., 2019). Zameer et al. (2020) found that sustainability offers a competitive advantage in equipment manufacturing enterprises in China, but their study focuses on customers, not other stakeholders. Meanwhile, Liu et al. (2017) interviewed stakeholders about joining a collaborative supply chain arrangement, using methods similar to ours, but did not focus on sustainability.

Competitive advantage is connected to environmental strategies because customers around the globe are increasingly getting concerned with the spread of damaging impacts on health and the environment of ecosystems that are associated with conventional manufacturing practices (Forbes et al., 2009; Vermeir & Verbeke, 2004). In order to connect stakeholder views to competitive advantage, we reviewed the results of some papers about stakeholder or customer's views on the firms' environmental

strategies and how they can be connected with the development of competitive advantage. A study by Forbes et al. (2009) analyzed views of sustainable wine consumers in New Zealand to discover if environmentally sustainable practices during the production of wine would have a competitive advantage in the wine market sphere. The results of Forbes et al. (2009) study found that customers strongly opted for the wine that was made using environmentally friendly practices, leading to superior market and financial performances. Similarly, a study by Goworek (2011) focused on the clothing industry's journey towards the product's value appeal to customers, such as making sure that the clothing materials are sourced through socially responsible and environmentally sustainable practices. This approach has been adopted by many clothing industry suppliers, leading to their products being organic and sourced through Fair Trade. It is considered that this is one of the dynamics that has enabled the satisfaction of many customer's concerns and the appeal to customers is recognized as a key factor that gave them the advantage to evolve and remain in business for many years (Goworek, 2011).

Sustainable product innovators may require a different business model. For example, electric cars, may require distinctive charging stations and different business plans (Porter, 2008; Westgren & Wuebker, 2019). Some previous literature has focused strongly on the psychological, political and logistical phases of business execution (Michael E. & James E., 2015; Tukker, 2015; Westgren & Wuebker, 2019; Witjes & Lozano, 2016). Most studies are supporting the importance of sustainable products in terms of their design when compared to the implementation of waste management strategies (Andrews, 2015; Lieder & Rashid, 2016; Park et al., 2010). While other studies are reflecting business collaboration and stakeholder engagement as key (Bocken et al., 2014). Some authors argue that sustainable products and circular economy related technologies will need new policy paradigms as much as new business models to flourish (Preston, 2012; Westgren & Wuebker, 2019; Ying & Li-jun, 2012).

Other studies suggests that competitive advantage for sustainable entrepreneurship requires good teamwork, attentiveness to market developments and customer pressure, willingness to change, and strategic thinking (Ratten et al., 2019). Moreover, the complexity of sustainable entrepreneurship demands good planning abilities (Miragaia et al., 2017; Ratten et al., 2019). Therefore, this notion elaborates the barriers that are faced by entrepreneurs during built-up of sustainable products (de Medeiros et al., 2014; Melander, 2020). These writers build on the hypothesis of this paper, especially if the key stakeholder interviews would yield the same recommendations. Thus, this paper would act as a validation of those theories by means of interviews.

This study will use interviews to discover competitive advantage not only because key stakeholders have valuable knowledge but also because stakeholder engagement and commitment is significant in the implementation of a circular economy (Belz & Binder, 2015; Geissdoerfer et al., 2017; Lieder & Rashid, 2016). The insertion of the stakeholder concept has in the past been linked to corporate environmental management (Geissdoerfer et al., 2017; Madsen & Ulhøi, 2001). The importance of considering the opinions and positions of stakeholders has been emphasized by previous studies that used interviews but not in a manner that led to the objectives of this paper. It is also worthwhile to analyze the challenges and opportunities highlighted by stakeholders in regards to building competitive advantages for business partnerships as used and mentioned by (Millette, 2019). The stakeholder theory holds a large momentum for business practices to be based upon theories of social science and normative ethics (Jones & Wicks, 1999). The stakeholder theory is explained by some previous studies that remarked that it may hold the fundamental value that is necessary for all interested stakeholders, and stakeholder interests are all equal without any probable dominance over others (Jones & Wicks, 1999). Therefore, this paper would make sure that stakeholder theory is respected by highlighting the differences and similarities of all the

participants. This way the findings will deliver rich debates at the interchange of business and society, as suggested (Barney & Harrison, 2020; Jones & Wicks, 1999). Thus, the whole exercise of this paper is to make available the missing knowledge that can be relevant to entrepreneurs (Jin et al., 2017).

Investors, customers, and academics/NGOs are some of the key stakeholders for sustainable businesses and their engagement will support circular economy implementation as mentioned by Geissdoerfer et al. (2017) and Lieder & Rashid (2016). It is therefore with this notion that to unlock potential, one should understand what these stakeholders care about in regard to sustainable products.

2. Methodology

A grounded theory method was been used in this study. The theory was previously used by different authors to gather, study and analyze the attitudes of people and/or organizations (Güler, 2019; Liu et al., 2017; Strauss & Corbin, 1994). In this case, grounded theory would involve the observation of the attitudes exhibited by key stakeholders and in their own words, build a recommendation. Therefore, the study will not include or analyze the attitudes of organizations affiliated to them and will focus solely on the stakeholders. This approach allowed the authors to give voice to fifteen key business stakeholders (customers, investors, entrepreneurs and academics/NGO representatives) via semi-structured interviews. The systematic collection and analysis of data (Millette, 2019; Strauss & Corbin, 1994) provided an opportunity the exploration of perceptions associated with the marketability of sustainable products. Following the blueprint illustrated by these authors, the method allows for the organic evolution of concepts to guide the development of interesting themes.

In order to answer the research question of building competitive advantage around sustainable products, it is crucial to understand and increase the salability of products to investors and customers. Therefore, using semi-structured interviews, we would be able to extract the necessary salability characteristics of sustainable products that key stakeholders are looking for when making their purchase decisions. A framework of recommendations would be the overall contribution of this paper and would be directed to entrepreneurs that are seeking that competitive superiority. The transparency of the qualitative research method was enhanced by close observations of the recommendations on research transparency, and replicability – the case of interviews, with elite informants (Aguinis & Solarino, 2019). As a result, the following approach is used in this study.

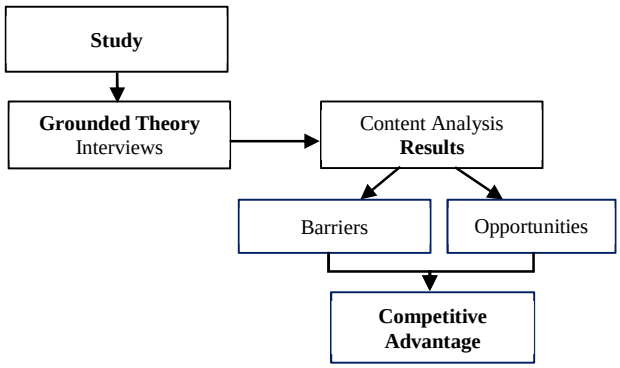

Figure 1 - Overall study methodology diagram

With an understanding that all stakeholders play a significant role in product innovation (Christ & Burritt, 2019). This methodology would allow for the recognition of paths fundamental to the

development of competitive advantages. This methodology emphasizes the need for continued dialogue to minimize the gap of understanding between different stakeholders (Christ & Burritt, 2019).

2.1 Participants

Table 1 - Participants, and their respective portfolios

Stakeholder Categories:	Identification	Portfolio Description
Investors	*Investor A*	Director of Investment Incubator
	Investor B	Investment Evaluator; Incubator Coach
	Investor C	Startup Incubator Coach
	Investor D	Startup Incubator Coach
	Investor E	Senior Investment Manager; Director of an Investment Firm
Entrepreneurs	*Entrepreneur A*	CEO/Founder of a clean energy
	Entrepreneur B	CEO of a sustainable foods production
	Entrepreneur C	CEO/Co-founder of a wastewater to energy
	Entrepreneur D	CEO/Founder of a solar energy
Customers	*Consumer A*	Head of Sustainability; Strategic Manager
	Consumer B	Brand Manager; Sustainability Project Manager
	Consumer C	Head of Procurement; Energy Retail Manager
	Consumer D	Head of Sustainability; Former HOD
Academics/NGO representatives	*Academics A*	Head of Sustainability Department; Professor; NGO Representative
	Academics B	Sustainability Professor; Life Cycle Assessment expert

All the fifteen participants were drawn from managerial responsibilities, and whose portfolios would provide the paper with experience and insights related to the business side of sustainable products. The stakeholders were highly experienced, and the selection criteria involved: experienced investors (e.g. directors of investment firms and investment practitioners), CEO's and founders of sustainable companies (e.g. renewable energy corporations), customers (e.g. head of sustainability department and supply chain), and professors/NGO representative (e.g. head of a college and sustainability professors).

The participants are divided into four stakeholder categories that consists of:

1) Four successful sustainable entrepreneurs *a, b, c, & d* were selected. The identified sustainable entrepreneurs that were selected for this study are mostly from a successful local business incubator.
2) Four identified customers *a, b, c, & d* were mainly selected because their firms purchase sustainable products in large amounts. This identity means that they have an in-depth understanding of the politics related to purchasing decisions as well as insights on the opinions of their firms. Their dialogue would seek to explain the thought process that hints towards the choice of the firm to identify a need, create options, select a particular product and choosing the preferred brand/make.
3) Five investors *a, b, c, d, & e* were identified from local investment firms and an incubator for their opinions related to investments towards sustainable innovations. They will explain their investment criteria and decision-making analyses that leads to financing sustainable startups and technologies.
4) Two academics/NGO representatives *a & b* that were selected are mainly university faculty members of sustainability departments and laboratories. Their core contribution to this study may be related to their experience with working with various sustainability related startups, students' researchers and local sustainable practitioners through consultation. The participants for this category were enough

because similarities exist in the field of sustainable education when compared to other stakeholders, such as entrepreneurs that can be in dynamically different innovations and business experiences.

2.2 Data Collection and Analysis

Semi-structured interviews were conducted with fifteen participants in Table 1. Suddaby (2006) claims that it is crucial to keep collecting data until the new data is not adding to what has already been collected. Thus, the sampling of data collection was carried out until a positioned level of attitude and perspectives started to repeat and emerge in each stakeholder category. Therefore, that is why the specific number of each of the interviewed stakeholder categories is selected and sufficient. The audio recording of the interviews were transcribed and analyzed using Dedoose software to examine the transcripts, line by line, and apply an iterative coding pattern as it is standard with a grounded theory approach (Liu et al., 2017; Millette, 2019; Strauss & Corbin, 1994).

Coding and Analysis

Axial coding procedure (Liu et al., 2017; Millette, 2019; Strauss & Corbin, 1994) examines underlying similar themes within the transcripts of different contributors. The code structure that is employed is shown in Table 2 below, underlining shared themes that emerged during the data analysis of the transcripts.

Normalized Results

Results that have been normalized per person is to compare results at an equal rate and comprises of dividing data with the number of stakeholders per stakeholder category and then level the answer in a percentage format.

$$x_{(norm)} = \left[\frac{x_{coded\ phrases\ in\ the\ stakeholder\ category}}{\frac{x_{number\ of\ people\ in\ the\ stakeholder\ catergory}}{24_{sum\ of\ average\ total\ phrases}}} \right] * 100\ \%$$

Table 2 - The coding structure employed showing words of interest

Code (Topic) Name	Description	Quoted Examples
Familiarity	• General view of sustainability • Participants' familiarity with the views of other stakeholders on sustainability	"I spent 20 years in the education and research sector working on different sustainable technologies, and I have painful experience in commercialization a laboratory breakthrough. We tend to do things on a much smaller scale, which is so far from commercial viability that they often underestimate the challenge in developing prototypes and scaling up the technology." – ***Academic A***
Motives	• Motive for investment • Motive for selling • Motive for purchasing	"Right now, the delay in sustainable products' purchases is influenced by, the fact that it is not affecting people directly. But like most things, human nature is to put off and put off, to the rainy day – it is always in the future until it becomes more crucial." - ***Investor B***
Sustainability Challenges	• Challenges related to sustainability investments • Challenges faced by companies • Challenges for customers to buy	"Generating a return is a must-have requirement - sustainability qualities, such as environmental friendliness, is a nice-to-have." – ***Investor E***

Sustainability Openings	• Positive openings for investments • Opportunities for sustainable innovations • Opportunities for the future	"The biggest opportunity for sustainable products such as solar is the realization that every empty roof of a hospital, home, school, and so forth is an opportunity to provide that infrastructure with renewable energy. This approach supports the idea for other forms of development on untouched land, rather than mounting solar farms on accessible land." – ***Entrepreneur D***
Lessons • **Building Trust** • **Quoted Lessons**	• Subject advises from experts • Competitive advantage takeaways • **Child codes:** Building Trust through relationships, and, • Quotes that emerged as advice	"Oftentimes entrepreneurs have lots of passion for the long-term future talks, but their startup will fail, they themselves may die. The style that is easy to understand is a short-term project that works step by step, because it is easily trusted, and most investors would likely tail that investment." – ***Investor E***

3. Results

3.1 General Findings

Some general findings came to light during the interview process before content analysis.

Table 3 - The coding structure employed is shown below

General Findings	**Terminology** *Sustainability use context* – stakeholders are familiar with the term sustainability, but mostly in relation to social & environmental friendliness compared to financial terms.
	Sustainable products are expensive The majority of the participants highlighted the familiar notion that sustainable products are more expensive than non-sustainable products. Investors consider their "high return on investment" as the most attracting investment criteria and a "must-have" for businesses. While, sustainability is a "nice-to-have" criteria.
	Business *Business plan* – the underlying business case of the company is more important than the product. Therefore, the sustainability qualities need to be backed with superior business understanding.

3.2 Number of Codes That Emerged

Globally, the frequency of similarly coded concepts allowed for the emergence of a global themes amongst participant. Major concepts emerging included lessons, sustainability challenges, and sustainability opening (*Table 2*). The most discussed topic is "Lessons" (lessons learned in regard to sustainable products from stakeholder's viewpoints) consisted of two distinct categories (building trust and quoted lessons). The second most common concept identified particularly with investors and entrepreneurs is the idea of barriers faced by sustainable product makers and is coded as sustainability challenges.

Figure 2 below shows that the interviewees performed well in relation to the created codes (topics). The figure also tells that the code structure table *(Table 3)* is certainly matching the language, attitudes, and/or opinions of the participants. In the analysis of dominant topics that emerged from the interviews, Customer C *(head of retail for an energy corporation; consumer price commerce)* shared the most, in terms of explaining well, answering all the questions and giving examples, with 38 total phrases related to the 5

discussed codes/topics. While Entrepreneur B *(CEO and founder of a sustainable foods' startup)* shared the least during the interview, with just 8 phrases that were coded.

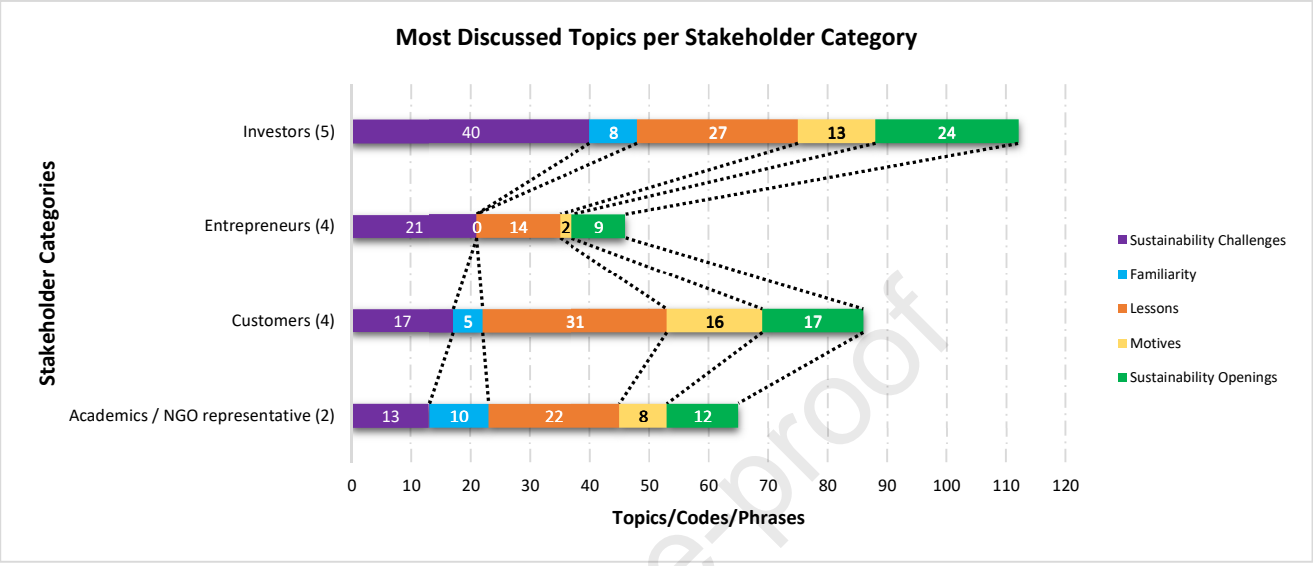

Figure 2 - Most discussed topics in relations to the stakeholder categories

3.2.1 Discussed Topics Per Stakeholder Category

Table 4 - Sums up the number of times that the participants discussed the topics (codes) during the interview. The number of participants per category is shown in brackets.

Stakeholder Category (# of participants)	Total number of topics (codes) identified				
	Sustainability Challenges	Familiarity	Lessons	Motives	Sustainability Openings
Academics / NGO representative (2)	13	10	22	8	12
Customers (4)	17	5	31	16	17
Entrepreneurs (4)	21	0	14	2	9
Investors (5)	40	8	27	13	24
Total	**91**	**23**	**94**	**39**	**62**

3.2.2 Sustainability Challenges

Table 5 – Summary of barriers expressed by stakeholders

Stakeholders	Challenges related to sustainable innovations
Challenges for academics	Academics have expressed barriers within the process of turning a small

	laboratory breakthrough into a viable business.
Challenges for Investors	Investors brought up a number of barriers related to returns, cost, marketplace, trends, team, trust, and risks within sustainable innovation

Participants indicated many challenges faced sustainable products. By analyzing the interview transcripts, negative sentences can be counted as barriers that would need to be overcome. In counting those negative sentences, it became apparent that they were frequently mentioned by participants and they are the second most occurring attitude, with a total of 91 occurrences. *Figure 3* below, shows the number of negative related mentions from each category, normalized per person and compared at an equal rate to indicate which stakeholder category shared more negative phrases related to sustainable products.

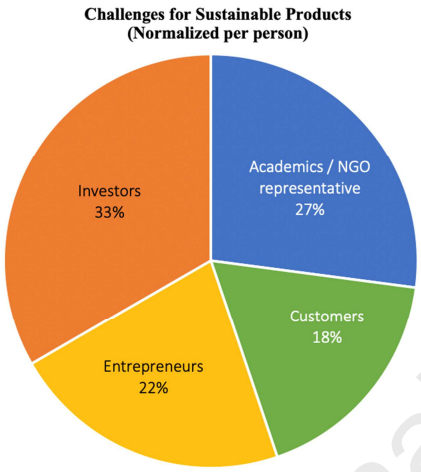

Figure 3 - Number of times that the participants discussed the code challenges (negative phrases)

Amongst the interviewed stakeholders, investors highlighted the most negative statements and mentioned many challenges of investing in sustainable products more than other stakeholders as shown in *Figure 3* above. Investors underlined the importance of a good business plan, irrespective of the sustainability characteristics of the product.

"A perception exists that sustainable products have to cost more." – ***Investor A***

Investor A continued to elaborate that sustainability is important but, is not the leading criteria for most investment firms. This is because they are primarily guided by what the charter of the fund is for the satisfaction of the shareholders and stakeholders. Investor A claims that his personal belief is that sustainability is going to become more of a factor in the future. Looking at a five or ten-year view, sustainability might weigh and improve the financials of the product, because, the majority of the population is entering an era where sustainability, energy consciousness, carbon footprint, etc. are becoming more evident to everyone. Therefore, there is going to be some financial bias for sustainable products in the future through policy and government support.

On the other hand, customer interviews yielded fewer negative sentences related to sustainable products. This indicated that customers are interested, receptive and keener to be involved with sustainable products *(Figure 4).* This discovery is also backed by perceptions of some entrepreneurs that

explained that customers from all over the world, call them to buy their products, and are willing to buy sustainable products.

"Even if investors are measured and slower at getting on board with sustainable startups, we receive calls from all over the world for our sustainable products." – ***Entrepreneur C***

The CEO's and founders of successful sustainable product's companies elaborated that fundamentally, one major challenge that some sustainable entrepreneurs have to overcome is the existing non-sustainable technologies that are cheaper in production, use and disposal. For example, a case of plastics bags when compared to the reusable shopping bags. This notion was clarified by a director of an investment firm who stated that the cost is what investors are most skeptical about because when they consider making a decision about a potential company from an investor's viewpoint, then sustainable products are faced with an uphill climb. The director added that it would be difficult to risk investment funds just because the products are sustainable but do not generate the much looked-for and worthy returns on investment. Other investors also highlighted that there is momentum in acquiring sustainable products but the return on investment is not attractive, and thus entrepreneurs have to make sure that the underlying business case of their companies are well developed as much as their product.

"Startups should understand the tradeoffs caused by their products because most sustainable innovations can be environmentally friendly today and still have negative environmental impacts later". – ***Academic B***

Other challenges mentioned by investors are the current market size for sustainability related products; which is still taking shape and existing infrastructure for non-sustainable products that would need to be replaced (Thacker et al., 2019). Three of the five investors that participated concluded that all these challenges are linked to the approach that the human nature to put off change until problems become critical – change remains always in the future, until when problems become serious.

"Most investors are not prioritizing sustainability and may not be buying into the notion yet. The small size of the market shows that the majority of the population doubt the science behind climate change. For example, they are not seeing the impacts of climate change at the moment. But there are goals, such as, governmental and large corporation branding targets out there that are driving sustainability towards a dominant direction. The difficulty is knowing how quickly it will take to get there." – ***Investor C***

3.2.3 Sustainable Product Openings and Opportunities

All the participants underlined the potential opportunities within sustainable innovations that exist today and in the future. *Figure 4* below also shows that amongst the interviewed stakeholder categories, customers spoke more positively towards sustainable innovations with 55% of their responses being opportunity/openings related. Customers highlighted that the price of the product plays a significant measure when making a purchasing decision, but apart from money firms are considering community impacts and decreasing their carbon footprint (sustainability characteristics).

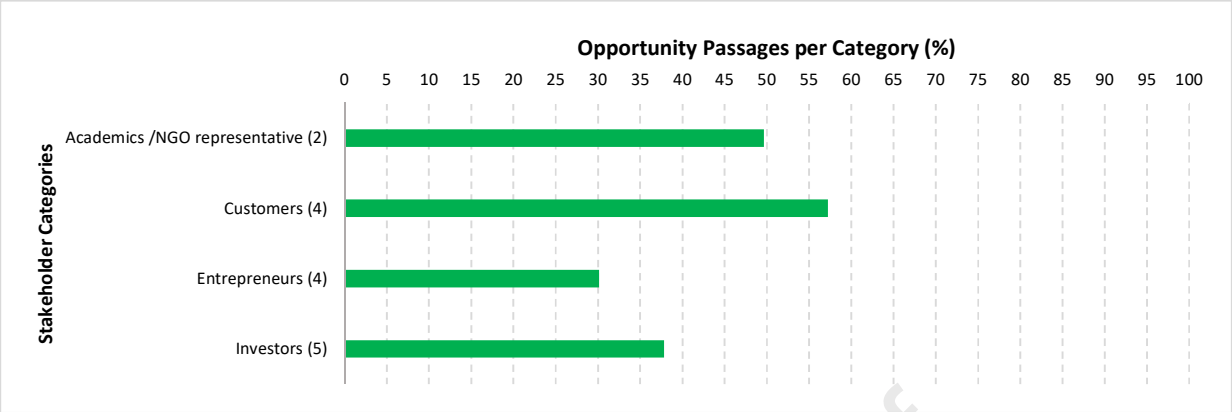

Figure 4 - Average percentage allocation of the number of times that positive views towards sustainable innovations were discussed by the participants.

Customer B, who is a sustainability manager of a global mining corporation highlighted how important the assessments of the product's energy and water use are important in making procurement decisions both for personal and corporate product purchases. This is a clear indication that large corporations are starting to prioritize sustainability ambitions through the use of sustainable practices such as the selection of green products.

"I ask myself how long it will the product last and sometimes I take into account the energy or water consumption for using the product." – ***Customer B***

Another potential opportunity that was mentioned through the stakeholder interviews is that some firms are deciding to pay more for sustainable products because of branding purposes. Three investors supported the notion and added that larger corporations such as Apple, Tesla, and a large number of top universities have big profit margins than most companies and can afford carbon analysis to be executed on most of the products that they use in development, manufacturing and/or distribution.

"Companies use sustainability as branding. They do so by choosing renewable energy, using electric mobility, reusable products and maintaining sustainability accreditations for their buildings and related operations." – ***Customer C****, Head of retail for an energy corporation; consumer price commerce*

Academics/NGO representatives were also full of positive opinions regarding sustainable innovations. Their optimistic views in support of sustainable innovation compliments a great partnership that can be built between stakeholders. This type of partnership is recommended and underlined as necessary by the entrepreneurs. Adding that it is crucial for building a competitive advantage, especially with access to the university facilities such as labs and students, professors, and recommended local NGOs. Academic B (an award-winning experienced sustainability professor that works with NGO), added that opportunities for sustainable products would also arise in the future mainly because innovations that pollute less and built around environmental consciousness, would be easier to regulate, sell and this can equate to financial gains.

Products that are certified as sustainable are in demand today, and in the future, policies will help push them forward." – ***Academic B***

The five interviewed investors collectively mentioned and agreed that the future would be more sustainable compared to today, supported by policies and regulations. These investors highlighted that investments in sustainable innovations is more attractive in environments with supportive policy and governments support. Adding that perspectives from stakeholders (i.e. investors) in certain areas with policies and regulations backing sustainability such as the State of California or certain European countries might have sustainability qualities as one of the top investment criteria that they seek.

3.3 Lessons That Lead to Competitive Advantage

3.3.1 Building Lasting Relationships and Trust

Mutual trust is required to maintain relationships (Jan et al., 2008; Zafari et al., 2020). Entrepreneurs explained that this trust can be difficult to build over the phone and may require face-to-face interactions. They added that to build trust, one needs to improve the communication, act in a reliable manner, show commitment, be honest, and work towards the attainment of assignment targets.

Two entrepreneurs added that it is required to make time to construct a personal as well as a business relationship with investors and desired potential investors. Subsequently, investors highlighted that they want to trust the entrepreneur on their promise to deliver good returns and periodic updates of the progress made. Customers added that they would like to trust an entrepreneur that builds reliable-competitive products that solves their problems, adds value to their lives, and grows over time. In addition, all entrepreneurs encouraged the concept that potential investors must be identified and engage monthly or quarterly on the progress of the product and company performance.

3.3.2 New Ideas/Quotes That Emerged

All the key stakeholder that participated gave good insights on building competitive advantage for success. For example, academics and entrepreneurs are both supporting that startups must work with universities in order fill the gap of expertise, inadequate staffing and lack of profits at the early stages of their business development. They added that the same concept applies by joining necessary local NGOs.

Customers explained that the life span of the product is important to them because of the positive impact on sustainability. They added that sometimes the cheap option might be the wrong product because it won't last longer and that is why they are willing to pay more for sustainability.

Table 6 - Lessons related to sustainable innovations

Stakeholder Category	Lessons for Competitive Advantage
Academics /NGO representatives	• Working with universities on products is a good approach because startups might not have the time, knowledge, data and financial means for software and extra personnel. • NGOs play a key role in raising problems and pressuring businesses to change and be involved.

Customers	• Between price and sustainability, sometimes the cheapest option might not necessarily be the better option. • Apart from money, and before getting to environmental considerations, the life span of a product is considered important and compliments sustainability.
Entrepreneurs	• Product performance is what sells, not necessarily the sustainability characteristics. • Even if investors are reluctant to get on board with sustainable startups, customers from all over the world are forthcoming. • Companies that have only one product have a higher risk of investment.
Investors	• The investment firms prioritize the concept of "must-have" and "nice-to-have" requirements. The first consideration for investors is the ability to generate returns on investment. • Investors are looking for an important value proposition in a large and growing market, for a company with a good team that can execute it. • Sustainable innovations may involve high costs. This is not an ideal situation because they are mostly unproven, and often entrepreneurs make unrealistic projections.

4. Discussion

Entrepreneurs mentioned that startups that do not have access to an incubator-like facility can face financial difficulties because its capital will be spent on rent, personnel, and facilities.

"The business incubator [university name] is an important firm for our sustainable company, because of three main deliveries: (1) rent-free offices; (2) free business mentors; and (3) access to facilities of similar institutions." – ***Entrepreneur C***

A technology assessment from the literature review for investors underlined a key finding that investors may not support innovations that are made by an entrepreneur who is unable to outline and understand how the product fits into the market (Product-Market Fit) (Gasser, 2015; York, 2019). This notion was further supported by this study that investment criteria are strongly based upon the underlying business case of the company and the ability to generate returns on investment *(Table 8).* Thus, the interviews confirmed that sustainability is important but sustainable qualities alone do not sell to the majority of the investors.

"Academics that are working with sustainable entrepreneurs would require the collaboration to go beyond innovating and finding solutions. The partnership should go as far as using the terminologies and formats of reporting that the business industry can easily understand." – ***Academic B***

Customers interviews yielded more positive attitudes towards sustainable innovations, and they are willing to pay more for sustainable products. On the other hand, customers also indicated that they are not enthusiast of uncertainty and disruption during the change from non-sustainable products. Investors have specific stringent requirements when investing in sustainable product companies, starting with their top attraction being a company that generates significantly high returns, irrespective if it is a sustainable innovation or not. Investors have indicated that economic sustainability is the most important investment criteria compared to environmental and societal sustainability. Investors also suggested that environmental and societal sustainability needs to be backed up by data that is from trustworthy and

certified life cycle assessment analysis and takes into account where all the components in the product come from, how the product was made, and where it will go at the end of its life.

"A product may have short-term environmental benefit, and long-term environmental damage." – ***Investor E***

Entrepreneurs have indicated their challenges to access resources such as capital, and personnel to propel their products to new heights. They are aware that customers are willing to buy sustainable products much more than investors are willing to gamble other people's funds on unproved technologies. Business persons indicated that successful startups are ones that build and maintain strong relationships with its investors and potential investors. They are also mindful that business incubators provide excellent grooming conditions for startups. The companies in sustainable innovations are easily accepted in business incubators around the world. In addition, startups in incubator-like facilities can easily acquire large trades and work contracts when affiliated with an incubator.

4.1 Building Competitive Advantage

4.1.1 State of Current Affairs

It is encouraging to note that all the participants envision significant opportunities for sustainable innovations. It is evident that all the participants agreed that sustainable innovations are valuable to environmental, and societal objectives, which in return will make financial sense. Currently, the business world is focused more on financial gains over environmental and societal value. So far, policies, regulations, awareness, and education have played a vital role in influencing sustainable products. The momentum regarding competitive advantage for sustainable products is predicted to continue growing.

"*Even though the markets and governments might not be very friendly to sustainability, there is enough momentum and direction from a lot of companies to get there." –* ***Investor C***

Investors have underlined the following challenges that bring disinclinations towards investing in sustainable companies *(Table 7).* Some of the challenges can be turned into opportunities/openings and are listed from the most important (1) to the least significant (10)

Table 7 - Key challenges that sustainable entrepreneurs need to solve – to add competitive advantages

Challenges highlighted by the investors in their order of importance		
1	Business	No underlying business case (impractical figures)
2	Cost	Existing technologies are cheaper
3	Marketplace	Not a large marketplace
4	Team	Good personnel to bring the results
5	Scalability	Ability of the product to be expanded for greater returns
6	Climate change	Impacts of climate change not visible to the majority
7	Education	Uneducated margins to influence purchasing decisions
8	Lifecycle assessments	Greenwashing (incorrect lifecycle assessments)
9	Product	Underdeveloped product intelligence
10	Support	No government support (regulations, policies, incentives, tax)

There is competitive advantage in the understanding and attentiveness of potential barriers that can hinder business success. The table above *(Table 7)* summaries those barriers that an entrepreneur needs to be mindful of. In addition, turning those challenges into valuable opportunities can propel extraordinary advantage during competition. The business industry shows great potential and appetite for investment in sustainability in the future, even though today sustainable products cannot compete cost-effectively with the incumbent technologies.

Customers are forecasting an increase in sustainable products to become household norms, especially when sustainable startups are acquired by larger corporations that can capture a larger market share. The opportunities would also arise in the future because products that pollute less and are built around environmental consciousness, would be easier to regulate, sell and this can equate to financial gains. Products that are sustainably certified will be in high demand because policies would help push them forward. In addition, branding departments for large corporations and universities are more interested in buying sustainable products for accreditations.

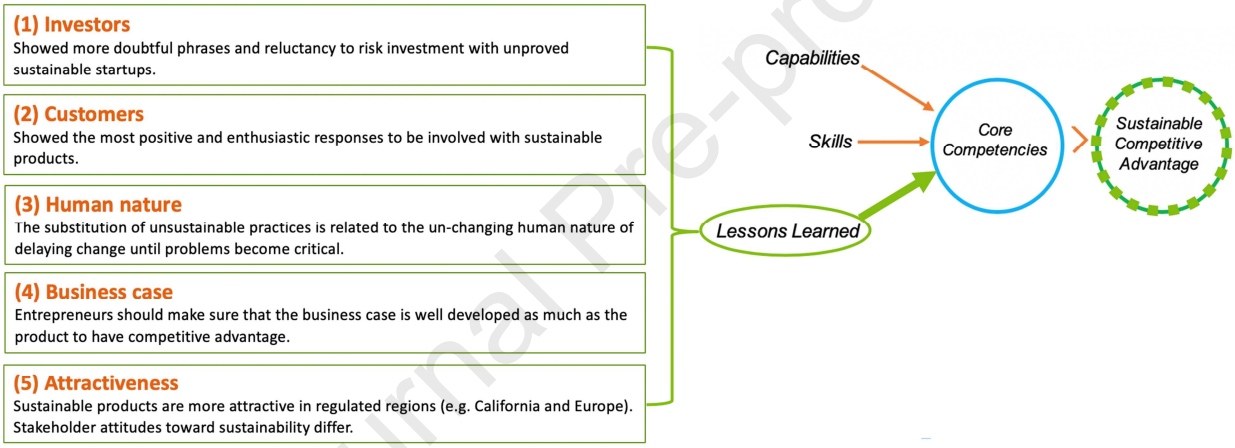

Figure 5 - Key findings that are related to sustainable innovations from the stakeholders

4.1.2 Recommendations

In order to achieve and maintain competitive advantage, it is suggested that sustainable entrepreneurs should be mindful of the challenges in *Table 7*, *a*nd attend to the following recommendations:

1. Prevent the innovation of products that are built solely on environmental and societal value, and not built on a fundamentally sound business case (understanding of the marketplace, life cycle of the product, and customer involvement).
2. Involve potential new investors on the progress of the company. Furthermore, they should also continue building a trusted business and personal relationship with investors.
3. Approach innovation with the method of step-by-step, because that is a method that is greatly trusted by stakeholders such as investors and customers. This minimizes risk, creates a strong foundation and improves trust.
4. Focus on the survival of the company by maintaining key acumens such as making sure that the employees are well taken care of, research and developments is part of the business, as well as investing in the incorporation of cost-benefit analysis.

5. Provide the sustainability feedback of the products with exercises related to certified, open result data of life cycle assessment. This applies mainly if the company wishes to make sustainability a key focus area to the stakeholders and shareholders.
6. Target products that may not require new infrastructure and aim for industries with existing systems such as internet, road networks, and charging stations to name a few.
7. Develop access to an incubator-like facility because it can save capital that could be spent on rent, extra personnel, laboratory facilities, and other resources. This cost reduction can bring the overall product cost lower.

The recommendations of this paper are consistent with the reviewed theories and literature. Previous studies by Forbes et al. (2009) and Vermeir & Verbeke (2004) indicated findings that are in line with the recommendations when they mentioned that customers are starting to be concerned by damaging unfriendly products and manufacturing practices. This notion was supported by this paper's findings, one of them being the majority of customers are interested in sustainable innovations. However, this paper went further into providing that customers are only willing to accept products that add value to their lives and have less interference on the ways of life. This is new information not reported in previous literature regarding competitive advantage and key business stakeholders. We believe this justifies the methodology employed.

Previous research theories were reported by Porter (2008) and Westgren & Wuebker (2019) that sustainable product innovators may require different business models. For example, electric cars may require distinctive charging stations and different business strategies. These theories were validated by this paper's findings. The investors and customers stressed it as the reason why sustainable innovations have been slow in replacing incumbent technologies. It is also linked to being the cause of the high cost of investment towards sustainability. Unlike previous literature, this paper's recommendation went further by explaining that entrepreneurs that are producing products that make use of existing infrastructure, may have an easier diffusion path into the marketplace when compared to those that require new infrastructure and business models. Investor A clarified this theory well with the following statement:

"I think many sustainable products fall into that bucket where they need new infrastructure. This makes them disruptive but offers tremendous barriers and opportunities." – ***Investor A***

Previous literature by Ratten et al. (2019) and Miragaia et al. (2017) expressed that competitive advantage for entrepreneurship requires companies to demonstrate good teamwork, customer involvement, strategic thinking, and attentiveness to market developments to triumph into the future. This theory is closely related to the findings of this paper, especially the first recommendation (1) that points out that products should not be solely built on environmental and societal value but rather developed on a well-founded business model. The difference is that this study explained that theory from the perspectives of key business stakeholders and gives evidence of affected elements such as the concerns surrounding greenwashing and the importance of prioritizing return on investment for the involved key stakeholders and shareholders.

5. Conclusions

The study was able to analyze the challenges and opportunities conveyed by the key stakeholders. Similarly, the attentiveness of the challenges within sustainable innovations would help entrepreneurs to have an understanding of fundamental "must-knows" as well as mapping out the paths that create doubt in the minds of stakeholders to ultimately lead to the success within the sustainability marketspace. The overall findings of this study have generated concepts of understanding what is deemed as a "must-have" and a "nice-to-have" criteria of a product competing in the sustainability marketplace. The one-formula-fits-all approach does not apply to all industries, therefore, a fundamental concept of seven essential recommendations that can increase the probabilities of succeeding has been created from the viewpoints of key stakeholders.

The stakeholder categories received different tailored questions; therefore, their unique perspectives were elicited. All the stakeholders indicated optimistic views towards sustainable innovations and high pointed the importance that they play to counter climate change and population growth. This paper was able to add new information by analyzing the views in the order of significance according to the stakeholder's main concerns, experience, and judgment. The novelty of the paper is the recognition that even though sustainable products are important, it is not the most important benchmark to stakeholders as identified in this study. Firstly, investors are demanding products that are made through a credible business plan with high incentives for profits and survival in the market; while customers are asking for sustainable products that have an additional value proposition and cause less disruption to their existing ways of life.

Four key findings were discovered in this study. These include, (1) investors are the most doubtful concerning sustainable innovations because they forecast low returns on investment, while customers are receptive and keen to be involved with the products; (2) sustainable entrepreneurs are subsequently advised to make sure that the underlying business case of their company is well developed as much as the product; (3) the overall barrier hindering the success of some sustainable innovations is not their cost, but the human nature to put off change until problems become critical; and (4) at the moment, investing in sustainable innovations is more attractive in areas that have positive sustainability policies and regulations such as California, and some European countries.

Lastly, further research can extend the scope and scale of the study as this is a small-scale qualitative study. These include adding more interviewees, quantitative data (i.e. surveys, and product costs) to extend the findings and themes generated. The limited set of sampling applied by this study yielded focused results within the intended scope, therefore, further research direction can focus on non-sustainable product stakeholders (e.g., non-sustainable entrepreneurs) to broaden the understanding.

ACKNOWLEDGEMENTS

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Appendix

Supplemental submission if desired:

Summary of Participants

Figure 6 - Stakeholder categories and their sub-identification names

Stakeholder Categories:	Portfolio	Number of interviewees
Investors	• Highly experienced investors • 2 Directors of investment firms • 3 Experienced Investment Practitioners	5
Entrepreneurs	• 4 CEOs, Founders and Innovators of their companies and products	4
Customers	• 3 Heads of Sustainability for Organizations • 1 Head of Energy Retail	4
Academics/NGO representatives	• 2 Highly experienced sustainability professors	2
	Total	***15***

Methodology

Each participant was given a set of materials and questions before the interview. These materials *(Appendix 2: Document (1-4))* were made up of an invitation letter to partake in this research, the abstract of this research, the consent agreement form to take part as well as a copy of questions that are specifically designed for that stakeholder. The consent agreement emphasized that all rules and regulations of the Policy for the Protection of Human Subjects in Research at Rochester Institute of Technology were followed. This policy outlines a declaration confirming that this study will not yield damaging impacts on participants. Thus, it was necessary to sign the consent agreement form to be protected for their participation and responses.

This clarifies that the unprepared data will not be included in the study, only analyzed reportable content. In total fifteen, half-designed interviews were led with all selected participants. Ten face-to-face interviews and five telephone interviews. The interviews were completed in a period of 7 weeks (19 February 2020 to 3rd April 2020). The interview sessions were recorded and saved in an Evistr MP3 Model: L157 Digital Voice Recorder. The answers were saved in MP3 format and used to produce dialogue transcripts. The process required 18 hours of tape-recorded interviews and decoded to 324 transcript pages for content analysis. Interview dialogues averaged between 15 to 20 minutes long.

Interview Questions

Each participant was asked between three and four questions that were specifically designed for the understanding of key opinions (barriers and enablers) on their viewpoint towards sustainable innovations.

Figure 7 - Stakeholder categories, and questions asked

Stakeholder Categories:	Questions Asked
Investors	1. What are the considerations that relate to investing in sustainable innovations? 2. Tell me your thoughts on circular economy and sustainability as an investor? 3. What are some of the barriers and opportunities faced that are unique to sustainable innovation?
Entrepreneurs	1. In general, what are some of the barriers and opportunities faced by startups? 2. What are some of the barriers and opportunities you faced that are unique to sustainable innovation? 3. How do you build a lasting business relationship with investors and customers?
Customers	1. Apart from money, what criteria do you consider when making a new product purchase? 2. Between the price and sustainability qualities of a product; which of the two is more important to you towards your purchasing decision? 3. If a sustainable product cost more money upfront but saved you money thereafter, what sort of breakeven timeframe would be the minimum you'd accept, all else equal? 4. What would it take to persuade you to buy a sustainable product instead of a competing non-sustainable product that you already use? Please consider a specific product for this question. Please consider a specific product for this question.
Academics / NGO representative	1. What are the considerations that relate to supporting companies with sustainable innovations? 2. Tell me your thoughts on circular economy and sustainable startups – as an educator or NGO? 3. What are some of the barriers and opportunities faced that are unique to sustainable innovation?

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The Editor-in-Chief
Journal of Cleaner Production

29 December 2020

Dear Editor,

RE: Building Competitive Advantage with Sustainable Products – A Case Study Perspective of Stakeholders

I write in reference to the above heading, which is a topic of an article, I am submitting to the Journal of Cleaner Production.

Thank you for your various communication with me regarding this submission. We declare that there are no Conflict of Interest with regards to this paper.
We will appreciate if you accept this submission towards the Journal of Cleaner Production. Thank you very much.

Best Regards,

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