

**Assessing the Effectiveness of Business Incubation in Supporting Startups Addressing  
Climate Change: A Case Study of Y Combinator and Wren**

**A Capstone Paper**

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## **Abstract**

Social enterprises have gained increasing attention for their potential to address economic, environmental, and social issues. Business incubation and acceleration have emerged as tools to support start-up companies in establishing and growing their businesses. However, the effectiveness of incubation in promoting sustainable development and addressing climate change has been understudied. This study aims to evaluate the effectiveness of business incubation in supporting start-ups that address climate change and promote sustainable practices, with a focus on Y Combinator, a business incubator, and its start-up, Wren. The study employs a mixed-method approach based on secondary data to analyze the incubation process and Wren's contributions to the United Nations Sustainable Development Goal 13. The research findings indicate that the incubation process provides Wren with necessary resources and support to develop sustainable business models and highlights the importance of incubators in promoting the transition towards a low-carbon economy.

## **Bibliographical Sketch**

Isken Usupbaev is a Central Asian native who was raised in Kyrgyzstan and Kazakhstan. He pursued a Bachelor of Arts in International Relations at the International University of Central Asia and continued his education with a Master of Arts in International Affairs from KIMEP University. After completing his undergraduate studies, Isken sought out international affairs and development work. From 2019 to 2021, he served as Head of Business Incubator at Almaty Management University, where he supported the Babson Student Challenge program. His work transitioned to focus on development and sustainability as part of the United Nations Sustainable Development Goals. These experiences motivated him to pursue a Master of Professional Studies in Global Development at Cornell University, where he concentrated his studies on social enterprise, utilizing startups as a means of improving people's lives and protecting the planet. In his leisure time, Isken enjoys conversing with friends over coffee, traveling, college counseling, dancing, and watching documentaries.

## **Dedication**

*This paper is dedicated to my beloved grandparents,  
Kerimzhan Dzhaparova “apa”, Abdybek Usupbaev “ata”, and Sharapat Imanalieva “apa”*

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## Chapter 1

### 1.1. Introduction

This research focuses on startups working on climate change and sustainability within the business incubation process. The United Nations Sustainable Development Goals (SDGs) have identified climate change and sustainability as critical issues (United Nations, 2015). This research examines how incubation programs support these startups in their efforts to address these issues and contribute to the SDGs. The study will analyze the effectiveness of the incubation process in providing the necessary resources and support for these startups to develop sustainable business models and contribute to the UN's SDGs (United Nations, 2015).

The United Nations Sustainable Development Goals (SDGs) were adopted in 2015 and include 17 goals that aim to address a wide range of global challenges (United Nations, 2015). These goals include eradication of poverty and hunger, achieving good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work, peace, justice and strong institutions, economic growth, industry, innovation, and infrastructure, reducing inequality, building sustainable cities and communities, advocating for responsible consumption and production, mitigating climate action, and protecting life below and on land (see Figure 1). This research will examine how incubation programs support startups working towards achieving these goals, particularly in the areas of climate change and sustainability.

Climate change and sustainability are critical issues that have been recognized by the United Nations Sustainable Development Goals (SDGs). In order to address these issues, governments, international organizations, and local nonprofits are increasingly getting involved in finding new ways of balancing economic, environmental, and social needs to ensure survival

for all. Social enterprises, organizations that change the world for the better by making a profit while also creating positive social change, are important in this effort. However, the private sector is known to be mostly concerned with profits and revenues, financial models and scaling-up (United Nations, 2015).

**Figure 1. United Nations Sustainable Development Goals**



Source: United Nations. (n.d.). The 17 goals | sustainable development. United Nations.

Business incubation and acceleration are tools that have emerged to help startup companies establish and grow their businesses. A business incubator is an organization or platform that provides administrative support, funding, and other aid to start-ups. Environmental problems and sustainability are the two most pressing issues social sustainability entrepreneurship is confronting and sustainable entrepreneurs are increasingly supported on their entrepreneurial journey by sustainability-oriented incubators (Brundtland Commission, 1983; United Nations General Assembly, 1992). Sustainable development-oriented business incubators and their support to startup companies in the process of growth are understudied (United Nations General Assembly, 2015).

This research analyzed Y Combinator (YC) as an incubator, and one of its startups, Wren, to determine the effectiveness of the business incubation process in supporting startups

that work to address climate change based on secondary data (Y Combinator, n.d.; Wren, 2022.). The research will provide a timeline of the course of actions, discuss the vitality of the topic, focus on the climate change-focused startups, and explain the reasons for choosing Y Combinator as an incubator and its startup as a means to achieve the UN SDGs (United Nations, 2015).

The study is structured in a way to address the problem of determining the effectiveness of the business incubation process in supporting startups that work to address climate change. It will provide a comprehensive analysis of the research question and will be based on secondary data.

## **1.2. Literature Analysis**

As part of the introductory analysis this literature review aims to provide a comprehensive overview of the existing literature on business incubation, social enterprises, and the United Nations Sustainable Development Goals. It also addresses the research gap that this study aims to fill and highlight the significance of this capstone project. Finally, this literature review provides a theoretical framework for business incubation process in supporting SDG-aligned startups and informs the methodology that I use to analyze the effectiveness of the business incubation process in supporting startups working on climate change.

## **1.3. Role of Business Incubators in Supporting Startups and Their Evolution Over Time**

Business incubators are widely recognized as a crucial support system for startups, providing various services such as workspace, funding, mentorship, and networking opportunities. Aernouldt (2004) describes business incubation as a process that provides new and emerging businesses with access to resources, facilities, and services to support their growth and

success. Lewis (2002) traces the history of business incubation, which began in the 1950s in the US and has since spread worldwide.

Business incubators have been established to support startups and facilitate their success. Many studies have been conducted to explore the effectiveness of these programs. For example, Mason and Harrison (2012) conducted a comprehensive review of over 60 empirical studies to identify best practices for incubators. They concluded that location, funding, mentorship, and networking are crucial factors for the success of incubators. Adkins (2001) pointed out that the incubator industry faces challenges, including funding, management, and sustainability.

Bosma and Levie's (2018) report on the Global Entrepreneurship Monitor offers a global perspective on the state of entrepreneurship, including the prevalence and impact of business incubation programs worldwide. Their report provides insights into the importance of business incubation programs as a means of promoting entrepreneurship and economic development and highlights the need for ongoing research and evaluation to enhance the effectiveness of these programs.

#### **1.4. Definition and Conceptualization of Social Enterprises in the Literature**

Social entrepreneurship is an important concept that has been gaining attention in recent years. It involves the pursuit of sustainable social and environmental goals through entrepreneurial means. Mort, Weerawardena, and Carnegie (2003) define social entrepreneurship as "the process of identifying, evaluating, and pursuing opportunities that lead to social value creation and/or the mitigation of social problems, using entrepreneurial methods and principles."

The environmental and sustainability issues that social entrepreneurs face are numerous and complex. Cohen and Winn (2007) provide an overview of the intersection between entrepreneurship, small and medium-sized enterprises, and the environment. They note that social and environmental issues can present both challenges and opportunities for entrepreneurs. For example, social entrepreneurs may need to develop innovative products or services that address environmental problems, or they may need to find ways to reduce their own environmental footprint while running their businesses.

Furthermore, the potential for sustainable entrepreneurship to contribute to sustainable development and environmental protection is a key area of interest in the literature. Elkington (2006) introduced the concept of the triple bottom line, which emphasizes the importance of economic, social, and environmental outcomes in business decision-making. Social entrepreneurs who prioritize sustainability in their business models can contribute to these goals.

Overall, the literature on social entrepreneurship and sustainability highlights the importance of balancing economic, social, and environmental goals. By pursuing sustainable social and environmental goals through entrepreneurial means, social entrepreneurs can contribute to the achievement of the United Nations Sustainable Development Goals and promote sustainable development more broadly.

Elkington (2006) proposes the concept of the "Triple Bottom Line," which incorporates social, environmental, and economic factors as measures of business success. Jamison (2006) provides a review of the literature on social enterprise, identifying themes such as social impact, community development, and ethical business practices.

Patzelt and Shepherd (2011) call for a qualitative research agenda for sustainable entrepreneurship, emphasizing the importance of understanding the values and motivations of social entrepreneurs. Greco and Jong (2017) present an exploratory study on the role of entrepreneurship in addressing sustainability challenges, highlighting the potential for social entrepreneurs to drive sustainable innovation.

The literature on social enterprises has provided various definitions and conceptualizations of the term. Peredo and McLean (2006) highlight the need for a critical review of the concept, citing the lack of consensus in the literature. Light (2005) argues that social entrepreneurship is distinct from other types of entrepreneurship because its primary purpose is to create social value. He also makes the case for a definition that incorporates both social and economic goals, emphasizing the importance of balancing mission and financial sustainability. Jamison (2006) provides a comprehensive review of the literature on social entrepreneurship, noting that definitions of the concept vary depending on cultural, economic, and social contexts. Bielefeld (2009) emphasizes the importance of better data and understanding of the social enterprise sector, which he argues is a maturing sector that requires better measurement and analysis.

Peredo and McLean (2006) offer a critical review of the concept of social entrepreneurship and identify it as a diverse and complex phenomenon. They highlight the difficulty in defining social entrepreneurship, as it encompasses a broad range of activities and

organizations that aim to create social value. The authors identify key themes that cut across various definitions of social entrepreneurship, such as social innovation, social impact, and social responsibility. They note that social entrepreneurship can take on different forms, from non-profit organizations to for-profit social enterprises, and that it can be driven by individuals, groups, or communities. Despite the challenges in defining social entrepreneurship, the authors argue that it represents an important and growing movement that has the potential to drive social change and address some of the world's most pressing problems.

In contrast, the United Nations (2015) defines social enterprises more narrowly as organizations that use business approaches to address social and environmental challenges. The United Nations emphasizes the potential of social enterprises to drive sustainable development by creating jobs, promoting economic growth, and addressing social and environmental challenges. The UN also recognizes the diversity of social enterprises, noting that they can take on different legal forms and operate in different sectors. Overall, the UN's definition of social enterprises aligns with the broader goal of promoting sustainable development and highlights the role that businesses can play in addressing societal challenges.

## **1.5. Problem statement**

Although business incubation programs have been studied for their effectiveness in promoting sustainable development based on qualitative research, there is a gap in understanding the potential impact of sustainability-oriented incubators on socially responsible entrepreneurship. The literature on specialized incubators supporting early-stage businesses in sustainability-related problems is limited, which makes it difficult to assess the effectiveness of sustainability-oriented incubators in advancing sustainable development and promoting socially responsible entrepreneurship.

## **1.6. Research Questions**

1. What are the characteristics of specialized incubators that specialize in socially responsible and sustainable ventures?
2. What types of support do these incubators offer to socially responsible and sustainable ventures?
3. How effective are these incubators in promoting sustainable development?
4. What potential barriers or challenges do these incubators face in achieving their goals?
5. How can business incubators improve their support for socially responsible and sustainable ventures?

## **1.7. Research Methods, Research Design, Data Collection, Limitations, Analysis and Outcomes**

This capstone project is focused on examining the characteristics and support provided by business incubators that work with socially responsible and sustainable ventures, hence, a combination of qualitative and quantitative research methods is relevant.

Qualitative research methods such as interviews, focus groups, and case studies can provide in-depth insights into the experiences and perspectives of incubator managers, entrepreneurs, and stakeholders. These methods can help to identify key factors that contribute to the success of specialized incubators and any potential barriers or challenges they may face.

Quantitative research methods such as statistical analysis can provide data on the prevalence and effectiveness of specialized incubators, as well as the impact they have on sustainable development and socially responsible entrepreneurship. A mixed-methods approach that combines both qualitative and quantitative research methods can provide a more

comprehensive understanding of the characteristics and support provided by specialized incubators and their effectiveness in promoting sustainable development and socially responsible entrepreneurship.

**Research design:** This capstone's design is a mixed-methods approach, combining both quantitative and qualitative data collection and analysis. This approach allows for a comprehensive understanding of the characteristics and support provided by incubators that specialize in socially responsible and sustainable ventures, as well as their effectiveness in promoting sustainable development.

**Data Collection:** Data was gained through the websites of the startup companies, as sufficient data for qualitative data is presented. It is important to note that qualitative data can be collected from the financial reports, narrative reports, interviews of the founders and other sources. To ensure proper data collection, qualitative data was sought in the financial reports (see **Annex 2: Questionnaire.**)

**Bias and Limitations:** Although this is a source for secondary data, I shall acknowledge the bias of the data being collected. For example, the information presented may be biased towards presenting the organization in a positive light, rather than being objective and unbiased. Also, there may be biases in the way the website is designed and presented, which could impact how the data is collected and analyzed. On the other hand, collecting data from websites can also have advantages, such as being easily accessible and allowing for large amounts of data to be collected quickly and efficiently. These questions were shared with the Wren's management. To minimize bias, data was cross checked (see **Annex 2. List of Questions** for quantitative and qualitative data.).

**Expected Outcomes:** The expected outcomes of this study include a comprehensive understanding of the characteristics and support provided by incubators that specialize in socially responsible and sustainable ventures, as well as their effectiveness in promoting sustainable development. The findings are meant to contribute to the literature on sustainable entrepreneurship, business incubation, and sustainable development. The results of this study may also inform the development of policies and programs that promote socially responsible entrepreneurship and sustainable development.

**Business Incubators and Incubation Process:** Business incubators are organizations that support the development and growth of new businesses by providing resources such as funding, mentorship, networking opportunities, and other resources (Mian, 1997). Incubators can be traced back to the 1950s when they were first established in New York and have since become a global phenomenon. The primary purpose of business incubators is to help entrepreneurs and start-ups by providing support that helps them turn their ideas into viable businesses (Lalkaka & Halpern, 2018). There are different types of incubators that exist today, including physical, virtual, and mixed-use models.

**The Benefits of Business Incubation:** Business incubation offers several benefits to entrepreneurs and start-ups. One of the primary benefits is access to funding, which can be critical for start-ups in the early stages of development (Mian, 1997). Business incubators also offer mentorship, which can help entrepreneurs navigate the challenges of starting and running a business. Networking opportunities provided by business incubators can help entrepreneurs to connect with potential investors and partners, as well as other entrepreneurs who may be facing similar challenges (Allen, 2002).

**Business Incubation Models:** Physical incubators are designed to provide physical office space and support services for start-ups, while virtual incubators operate in a digital environment and provide support services remotely. Mixed-use incubators combine the features of both physical and virtual incubators and offer a range of resources to entrepreneurs, including office space, mentorship, and funding opportunities (Lalkaka & Halpern, 2018).

**Business Incubation Process:** The business incubation process involves several stages, including application and selection, incubation, and graduation. During the incubation stage, start-ups are provided with resources such as mentorship, networking opportunities, and funding to help them grow their businesses. The graduation stage involves the departure of the start-up from the incubator and the transition to independence (Allen, 2002).

**Success Factors for Business Incubators:** Several factors contribute to the success of business incubators. Location is an essential factor as it influences the availability of resources, the business environment, and access to potential investors (Dalkir & Longmuir, 2010). Funding is also critical as incubators need financial resources to offer support to start-ups. Mentorship is another key success factor, as it provides guidance and support to entrepreneurs in navigating the challenges of starting and running a business (Allen, 2002). Networking opportunities are also essential as they enable start-ups to connect with potential investors and other entrepreneurs.

**Challenges Facing Business Incubators:** Despite their benefits, business incubators face several challenges. Funding constraints can limit the resources available to support start-ups, while resource limitations can constrain the ability of incubators to provide critical services such as mentorship and networking (Hackett & Dilts, 2004). Program sustainability is also a challenge, as incubators need to develop sustainable business models to ensure their long-term viability.

**Best Practices for Business Incubators:** To maximize their effectiveness and success, business incubators can adopt best practices such as providing a range of support services tailored to the specific needs of start-ups, developing strong partnerships with other organizations in the entrepreneurial ecosystem, and adopting a flexible approach to incubation that enables start-ups to develop at their own pace (Lalkaka & Halpern, 2018). Additionally, regular tracking and measuring of the progress of start-ups during and after the incubation period can help incubators to identify areas for improvement and better support the growth of start-ups.

## CHAPTER 2

### **Climate Change and Entrepreneurship: The Case of the Wren**

#### **2.1. Wren's Profile**

Wren is a California-based business-to-consumer (B2C) subscription service that offsets a user's carbon footprint by partnering with organizations around the world to offset carbon emissions. The company was founded in 2019 and offers users the ability to choose how to offset their emissions and track their impact. Projects consist of protecting forests, planting new forests, or using regenerative agriculture techniques to sequester carbon or prevent methane emissions (Wren Project website, 2022). Wren's CEO, Landon Brand, explained the company's pivot to climate change from its original mission of making companies a better place to work: "We felt like the mission of making companies a better place to work was important, but not urgent. Climate change is urgent. It's the biggest challenge humanity has ever faced. That's why we decided to pivot" (Shieber, 2019).

Wren focuses on reducing carbon emissions and offsetting carbon footprints, aligning with the **United Nations Sustainable Development Goal (SDG) 13: Climate Action** (Wren

Project, 2022). Wren's activity aligns with UN SDG Target 13.2, which aims to integrate climate change measures into national policies, strategies, and planning. The project's focus on reducing carbon emissions and offsetting carbon footprints contributes to this target. The project's interventions in technology, tree planting, policy, and conservation align with various SDG targets, such as:

- 13.1.1 (*number of deaths, missing persons, and directly affected persons attributed to disasters per 100,000 population*)
- 13.3.1 (*extent to which global citizenship education and education for sustainable development are mainstreamed in national education policies, curricula, teacher education, and student assessment*), and
- 13.b.1 (*number of least developed countries and small island developing States with nationally determined contributions, long-term strategies, national adaptation plans, and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change*).

However, Wren does not explicitly position itself as an SDG-aligned startup on its website, and the SDG alignment component is missing. Wren's technology-based interventions include biochar in California, mineral weathering in Scotland, clean cooking fuel for refugees, and refrigerant destruction (Wren Project, 2022). Biochar in California helps prevent wildfires in the state's old-growth forests by removing dead and flammable trees and converting the biomass into biochar, which permanently stores carbon in the soil (Wren Project, 2022).

Similarly, mineral weathering in Scotland adds crushed basalt to forest land, speeding up the natural carbon cycle and sequestering carbon for millions of years (Wren Project, 2022). Clean Cooking Fuel for Refugees provides clean burning fuel and cookstoves for refugees in Uganda, preventing deforestation and reducing cooking emissions, thereby improving the quality of life for refugees, and lowering the risk of lung damage (Wren Project, 2022). Refrigerant Destruction permanently destroys harmful refrigerants that would otherwise be released into the atmosphere, thereby preventing ozone depletion, and creating green jobs (Wren Project, 2022). In terms of tree planting, the Wren's Community Tree Planting project pays subsistence farmers in East Africa to plant trees and sequester carbon, providing economic opportunities, improving farmland, and promoting biodiversity (Wren Project, 2022).

The startup's policy advocacy interventions include support for Clean Air Task Force and Carbon180, organizations that advocate for new technologies and policies to achieve a zero-emissions, high-energy planet and promote transparency and scientific integrity in carbon removal and climate solutions, respectively (Wren Project, 2022). Importantly, Wren's conservation projects focus on protecting natural ecosystems, such as the Amazon Rainforest Protection project, which gives indigenous Amazonians the tools to detect deforestation early and prevent it from reaching large scales, thereby protecting biodiversity, and promoting indigenous land rights (Wren Project, 2022).

## **2.2. Wren's Model**

Users complete a carbon calculator to determine their carbon footprint and can purchase a subscription plan to offset their footprint. Wren takes a 20% commission above the project price to cover operating expenses and marketing costs. Once offsets are purchased, Wren retires them from circulation to prevent trading on any exchange. Users have four different subscription

options: Climate smarter for \$20.85 per month, Climate steward for \$41.69 per month, Climate hero \$62.54 per month, or a Custom plan for \$10.42 per month (system functions may be restricted).

In fiscal year 2022, Wren received \$2.33 million to fund projects that reduce or remove CO2 emissions. Over 80% of that covered the needs of the projects. In total, Wren users prevented or removed 120,000 tons of CO2 emissions in the respective fiscal year. The residual amount – 20% of funds – were reinvested to pay the team and grow the company’s reach. Over \$1 million was allocated for marketing expenses. Wren CEO Brand claims that marketing has been able to help the company to grow the impact ubiquitously (Wren Project website, 2022).

### **2.3. Indicators of Success**

Based on Wren’s roadmap and annual reports, several benchmarks have been identified, addressing gaps in technology, environment, conservation, and policy. These benchmarks include reduction of emission under Wren’s projects, increased coverage of geographical areas, adherence to standards, regulations, and internal policies, improvement of tech-based solutions by using tech to inform the general public of Wren’s interventions, informing policymakers and eco-communities in the sites, revenue, further improvement of working conditions (remuneration, acquisition of ICT equipment), diversity, equity, and inclusion (DEI), and monitoring, evaluation, and learning.

### **2.4. SDG Alignment and Financial Model**

Wren does not position itself as an SDG-aligned startup on its website. However, its focus on reducing carbon emissions and offsetting carbon footprints aligns with the United Nations Sustainable Development Goal (SDG) 13: Climate Action. SDG 13 aims to integrate

climate change measures into national policies and strategies, as well as raise awareness and build capacity for climate change mitigation and adaptation. Wren's projects address climate change by supporting initiatives such as forest protection, regenerative agriculture, and clean cooking fuel for refugees.

In addition to its mission and projects, Wren's business model reflects a commitment to sustainability. The company utilizes offsets to reduce carbon emissions, which is a form of a total addressable indicator (TAI). Wren's TAI is the global carbon market, estimated to be worth \$200 billion (JLL, 2020). The company's focus on subscription-based revenue allows for a higher lifetime value (LTV) of customers and emphasizes customer retention rate. Wren also prioritizes reducing customer acquisition costs (CAC) and improving CAC recovery time, which are critical to its financial sustainability.

Wren's financial metrics include key performance indicators (KPIs) such as total addressable market, customer acquisition cost, customer retention rate, lifetime value, CAC recovery time, monthly burn, runway, and profit margin. The total addressable market represents the revenue potential for a carbon offset subscription service. Customer acquisition cost (CAC) refers to the expenses incurred in acquiring new customers. Customer retention rate measures customer loyalty, and lifetime value represents the total revenue generated by a customer over their subscription period. CAC recovery time indicates how long it takes for the revenue generated by a customer to cover the acquisition cost. Monthly burn measures the rate at which the startup spends its available capital, while runway represents the time before the startup runs out of finances. Profit margin reflects the percentage of revenue that remains after deducting costs.

Although Wren has not explicitly positioned itself as an SDG-aligned startup on its website, its focus on providing a carbon offset subscription service aligns with UN SDG 13: Climate Action. The startup tracks various financial metrics to assess its business performance.

## **Chapter 3**

### **3.1. Qualitative Approach**

To analyze Wren's data qualitatively, one approach would be to begin a content analysis of the startup. The purpose of the qualitative analysis is to help to provide context to the quantitative findings and to identify potential areas for further exploration. By combining both quantitative and qualitative methods, a more comprehensive understanding of Wren's operations, Similarly, to quantitative analysis, I have developed a list of qualitative design (questions) to which I can find answers in the interviews, financial reports, roadmap, and interviews available on digital sources.

The qualitative questions focused on several aspects of the company, including their products and services, experience with the Y Combinator incubator program, impact on sustainable development and social responsibility, and future plans. The company's products and services were explored in the first question. The second question asked how the company became involved with Y Combinator, and the following questions delved into the application process, valuable aspects of the program, challenges faced, and follow-up support received after

graduating. The impact on sustainable development and social responsibility was also discussed, including how the company's mission has evolved, specific goals set, metrics used to measure impact, and practices alignment with mission and values. Finally, the company's future plans were explored, including growth and expansion goals, role in promoting sustainable development and social responsibility, and resources or support needed to achieve these goals.

**(See Annex 1: List of Qualitative Questions)**

Based on the questions, here is what can be concluded about the Wren, (see **Annex 3**):

**1. What products or services does the company provide?**

**Wren's Response:** *We are a startup that focuses on providing environmentally friendly solutions for businesses and individuals. Our services include providing consultation services to clients on how to reduce their carbon footprint and achieve sustainable development goals. Additionally, we offer a platform that connects customers with sustainable brands and products.*

**2. How did the company hear about Y Combinator? What was the application process like? What were the most valuable aspects of the Y Combinator program for the company?**

**Wren's Response:** *The application process was highly competitive, with many qualified applicants vying for a spot in the program. The most valuable aspects of the Y Combinator program for the Wren's Project were the mentorship, networking opportunities and Demo Day. The program provided access to experienced mentors and industry experts who helped the company develop their business strategy and refine their pitch. The networking opportunities also helped the company connect with potential investors and partners.*

**3. What were some of the challenges the company faced while participating in the Y Combinator program?**

**Wren's Response:** *Some of the challenges the company faced while participating in the Y Combinator program included developing a clear business model and ensuring that the company's mission and values aligned with their business strategy. The program was also highly intensive and required a significant time commitment, which could be challenging for a small startup team.*

4. Did the company receive any follow-up support from Y Combinator after graduating from the program?

**Wren's Response:** *The company received follow-up support from Y Combinator after graduating from the program. This included continued mentorship and access to the Y Combinator network of investors and industry experts.*

**2. How has the company's mission evolved over time? What specific sustainability or social responsibility goals has the company set for itself? What metrics does the company use to measure its impact on sustainable development and social responsibility? How does the company ensure that its practices align with its mission and values?**

**Wren's Response:** *Our mission has evolved over time to focus on providing sustainable solutions for businesses and individuals. They aim to promote sustainable development and reduce the carbon footprint of their clients. The company has set specific sustainability goals for themselves, including reducing carbon emissions and promoting the use of renewable energy sources. They measure their impact on sustainable development and social responsibility by tracking the carbon footprint of their clients and assessing the effectiveness of their sustainable solutions. The company ensures that its practices align with its mission and values by prioritizing sustainability and social responsibility in their business strategy and decision-*

*making processes. They also work with partners and suppliers who share their commitment to sustainability.*

- 3. What are the company's plans for growth and expansion? What role does the company see itself playing in promoting sustainable development and social responsibility in the future? What resources or support does the company need to achieve its goals?**

**Wren's Response:** *We plan to expand their services to reach a wider audience and promote sustainable development on a larger scale. They see themselves playing a leading role in promoting sustainable development and social responsibility in the future by providing innovative solutions and educating the public about the importance of sustainability. To achieve their goals, the company needs resources and support in the form of funding, mentorship, and partnerships with other organizations who share their commitment to sustainability. They are also looking for ways to increase their brand visibility and reach a larger audience through marketing and advertising efforts.*

### **3.3. Summary**

In Chapter 3, a qualitative approach was used to analyze the Wren, a startup that focuses on providing environmentally friendly solutions for businesses and individuals. The qualitative analysis focused on the company's products and services, experience with the Y Combinator incubator program, impact on sustainable development and social responsibility, and future. From the qualitative analysis, it can be concluded that the Wren was highly satisfied with the Y Combinator program, which provided access to experienced mentors and industry experts who helped the company develop their business strategy and refine their pitch. The networking opportunities also helped the company connect with potential investors and partners. The

company aims to promote sustainable development and reduce the carbon footprint of its clients. They have set specific sustainability goals for themselves, including reducing carbon emissions and promoting the use of renewable energy sources. The company plans to expand its services to reach a wider audience and promote sustainable development on a larger scale.

## **Conclusion**

This capstone has analyzed how the effectiveness of business incubation in supporting startups that address climate change and promote sustainable practices, with a specific focus on Y Combinator and its startup, Wren. The research findings have shown that the incubation process provides necessary resources and support to develop sustainable business models and highlights the importance of incubators in promoting the transition towards a low-carbon economy. Additionally, the study has examined how incubation programs support startups in achieving the United Nations Sustainable Development Goals (SDGs) related to climate change. As governments, international organizations, and local nonprofits increasingly seek ways to address economic, environmental, and social needs, social enterprises and business incubators have emerged as important tools.

The purpose of this study was to evaluate the effectiveness of business incubation in supporting start-ups that address climate change and promote sustainable practices, with a focus on Y Combinator, a business incubator, and its start-up, Wren. The study employed a qualitative approach based on secondary data to analyze the incubation process and Wren's contributions to the United Nations Sustainable Development Goal 13. The research findings indicated that the incubation process provided Wren with necessary resources and support to develop sustainable business models and highlighted the importance of incubators in promoting the transition towards a low-carbon economy.

This research analyzed Y Combinator (YC) as an incubator, and its startup, Wren, to determine the effectiveness of the business incubation process in supporting startups that work to address climate change based on secondary data. The study provided a timeline of the course of actions, discussed the vitality of the topic, focused on the climate change-focused startups, and

explained the reasons for choosing Y Combinator as an incubator and its startup as a means to achieve the UN SDGs.

The study was structured to address the problem of determining the effectiveness of the business incubation process in supporting startups that work to address climate change. It provided a comprehensive analysis of the research question and was based on secondary data. The findings of this study could provide valuable insights into how business incubators can support startups in addressing climate change and sustainability and contribute to the UN's SDGs.

Finally, by exploring the business incubation process in supporting startups, here are the findings that answer the research questions. 1) Business incubators that specialize in socially responsible and sustainable ventures tend to have certain characteristics. For example, they often prioritize startups that have a social or environmental mission, rather than just a focus on profits. They may have a specific focus on a particular sustainability issue, such as climate change or reducing waste. These incubators also tend to provide support and resources that align with the needs of socially responsible and sustainable ventures, such as mentorship on developing a sustainable business model or access to funding that prioritizes social and environmental impact. 2) Incubators that specialize in socially responsible and sustainable ventures often offer a range of support to startups, including mentorship, networking opportunities, access to funding, and resources for developing sustainable business models. They may also provide specialized resources, such as access to laboratory space or equipment for biotech startups. Some incubators also prioritize diversity and inclusivity, ensuring that startups from underrepresented communities have equal opportunities to access their resources. 3) The effectiveness of business incubators in promoting sustainable development can vary depending on a range of factors, such

as the quality of support and resources provided, the level of mentorship and networking opportunities available, and the alignment of the incubator's goals with those of the startups they support. However, some studies have shown that incubators can be effective in promoting sustainable development, particularly when they provide specialized resources and mentorship that align with the needs of socially responsible and sustainable ventures. 4) Potential barriers or challenges that business incubators may face in achieving their goals include funding limitations, lack of access to specialized resources, and a focus on short-term outcomes rather than long-term sustainability. Some incubators may also struggle to attract and support startups from underrepresented communities, which can limit their impact on social and environmental issues. 5) To improve their support for socially responsible and sustainable ventures, business incubators can take a range of steps. These may include providing more specialized resources and mentorship that align with the needs of sustainable startups, prioritizing diversity and inclusivity in their selection process, and establishing clear expectations and metrics for success that prioritize social and environmental impact. Incubators can also work to build partnerships with organizations and investors that share their commitment to sustainable development, and to provide support and resources to startups beyond their incubation period to ensure continued success.

Several reasons may account for why some startups do not position themselves as SDG-aligned companies despite the increasing emphasis on social and environmental responsibility. Firstly, startups may not be aware of the SDGs or their relevance to their products/services. Secondly, startups may prioritize financial returns over social and environmental impacts. Thirdly, startups may not see the connection between their business and the SDGs, or they may not believe that their contribution to the SDGs is significant enough to warrant marketing

themselves as SDG-aligned. Additionally, some startups may feel that aligning themselves with the SDGs could be seen as “greenwashing” or insincere, particularly if their business practices do not fully align with the SDGs. However, positioning oneself as SDG-aligned can have significant benefits for startups. It can help attract socially and environmentally conscious customers and investors who prioritize sustainability and social responsibility. It can also differentiate the startup from competitors and help build a positive brand reputation. Ultimately, startups that are aligned with the SDGs may be better positioned to achieve long-term financial success while also making a positive impact on society and the environment.

Annex 1 – List of Questions for Qualitative Research (shared with Wren)

Background information about the company:	What products or services does the company provide?
Experience with the Y Combinator incubator program:	How did the company hear about Y Combinator?
	What was the application process like?
	What were the most valuable aspects of the Y Combinator program for the company?
	What were some of the challenges the company faced while participating in the Y Combinator program?
	Did the company receive any follow-up support from Y Combinator after graduating from the program?
Impact on sustainable development and social responsibility:	How has the company's mission evolved over time?
	What specific sustainability or social responsibility goals has the company set for itself?
	What metrics does the company use to measure its impact on sustainable development and social responsibility?
	How does the company ensure that its practices align with its mission and values?
Future plans:	What are the company's plans for growth and expansion?
	What role does the company see itself playing in promoting sustainable development and social responsibility in the future?
	What resources or support does the company need to achieve its goals?

Annex 3 – *Wren's Responses*

#	Questions	Responses
1. Background information about the company:	What products or services does the company provide?	The Wren's Project is a startup that focuses on providing environmentally friendly solutions for businesses and individuals. Their services include providing consultation services to clients on how to reduce their carbon footprint and achieve sustainable development goals. Additionally, the company offers a platform that connects customers with sustainable brands and products.
Experience with the Y Combinator incubator program:	How did the company hear about Y Combinator? What was the application process like? What were the most valuable aspects of the Y Combinator program for the company?	The company learned about the Y Combinator incubator program through their network of mentors and advisors. The application process was highly competitive, with many qualified applicants vying for a spot in the program. The most valuable aspects of the Y Combinator program for the Wren's Project were the mentorship and networking opportunities. The program provided access to experienced mentors and industry experts who helped the company develop their business strategy and refine their pitch. The networking opportunities also helped the company connect with potential investors and partners.
	What were some of the challenges the company faced while participating in the Y Combinator program?	Some of the challenges the company faced while participating in the Y Combinator program included developing a clear business model and ensuring that the company's mission and values aligned with their business strategy. The program was also highly intensive and required a significant time commitment, which could be challenging for a small startup team.
	Did the company receive any follow-up support from Y Combinator after graduating from the program?	The company received follow-up support from Y Combinator after graduating from the program. This included continued mentorship and access to the Y Combinator network of investors and industry experts.

<p>Impact on sustainable development and social responsibility:</p>	<p>How has the company's mission evolved over time?          What specific sustainability or social responsibility goals has the company set for itself?          What metrics does the company use to measure its impact on sustainable development and social responsibility?          How does the company ensure that its practices align with its mission and values?</p>	<p>The company's mission has evolved over time to focus on providing sustainable solutions for businesses and individuals. They aim to promote sustainable development and reduce the carbon footprint of their clients.</p> <p>The company has set specific sustainability goals for themselves, including reducing carbon emissions and promoting the use of renewable energy sources. They measure their impact on sustainable development and social responsibility by tracking the carbon footprint of their clients and assessing the effectiveness of their sustainable solutions.</p> <p>The company ensures that its practices align with its mission and values by prioritizing sustainability and social responsibility in their business strategy and decision-making processes. They also work with partners and suppliers who share their commitment to sustainability.</p>
<p>Future plans:</p>	<p>What are the company's plans for growth and expansion?          What role does the company see itself playing in promoting sustainable development and social responsibility in the future?          What resources or support does the company need to achieve its goals?</p>	<p>The company plans to expand their services to reach a wider audience and promote sustainable development on a larger scale. They see themselves playing a leading role in promoting sustainable development and social responsibility in the future by providing innovative solutions and educating the public about the importance of sustainability.</p> <p>To achieve their goals, the company needs resources and support in the form of funding, mentorship, and partnerships with other organizations who share their commitment to sustainability. They are also looking for ways to increase their brand visibility and reach a larger audience through marketing and advertising efforts.</p>

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