Sustainable Entrepreneurship: 
The Motivations & Challenges of Sustainable Entrepreneurs in the Renewable Energy Industry

Master Thesis within Business Administration: Strategic Entrepreneurship

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Sustainability and sustainable development is slowly gathering momentum in public discourse, and greater attention and reverence in academic research. While there still appears to be no consensus defining sustainability, which has lead to hampered discussion, this should not impede nor hinder a greater call for dialogue of how to ultimately change the world, and for the global economy to consider what type of individual will address environmental and social issues simultaneously. We consider ‘traditional’ entrepreneurship still necessary and vital to the continuing development of disruptive innovation and market change, however, a new breed of entrepreneur must now achieve greater focus. A sustainable shift in societies development is required to guarantee a capacity to endure. Sustainable development is critical to not only the environment’s long-term well-being, but also a necessity to curve the ultimate slow demise of the human race. Economic responsibly toward the environment and society is imperative. Sustainable development meets at the confluence of three constituent parts - environmental sustainability, economic sustainability and socio-political sustainability, the foundations to an emerging new field of entrepreneurship - Sustainable Entrepreneurship. Sustainable Entrepreneurs enact a holistic approach to a venture start-up that embeds environmental, economic and social sustainability dimensions. Sustainable Entrepreneurs have received insufficient attention by the media, policy makers and have failed to grab the attention of academics to test theory in an exploratory cross-case analysis approach. Previous research has mainly been conceptual and theoretical. Literature is lacking practical insights into how entrepreneurs conduct sustainable entrepreneurial initiatives and whether such definitions hold true. A cross-case analysis of five entrepreneurs operating in the renewable energy industry is conducted, evaluating theory against real life. We fill this gap by conducting exploratory research in Sustainable Entrepreneurship, identifying the entrepreneurs motivations to start-up their unique venture, challenges faced throughout the venture development process and their impact within their defined market. It is evident throughout the five case studies all our entrepreneurs have encountered some sort of antecedent exposure to an environmental concern; leading to our belief that prior exposure to a sustainability related market failure has resulted in these entrepreneurs to pursue their business initiative. Leading from this analysis, it is evident Sustainable Entrepreneurs are highly motivated to solve environmental and/ or social related problems (sustainability-related market failures). Customer perceptions and unawareness for alternative sustainable products remain a considerable challenge. It is proposed that patents, cooperating with educational institutions, establishment of an international network and organisational culture, are all important practices that assist in the business development.
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## Table of contents

1. **Introduction** ........................................................................................................... 1
   1.1 Problem .................................................................................................................. 1
   1.2 Purpose ................................................................................................................... 1
   1.3 Research Questions ............................................................................................... 2

2. **Theoretical Background** ......................................................................................... 2
   2.1 Sustainable Development ....................................................................................... 2
       2.1.1 “Limits to Growth” - 1974–86 .......................................................................... 3
       2.1.2 Brundtland Commission - 1987–96 .................................................................... 3
   2.2 The Triple Bottom-Line (TBL) ................................................................................ 4
       2.2.1 Three Dimensions of Sustainability ................................................................. 4
       2.2.2 Criticisms to Measuring the TBL ............................................................... 5
       1997- Present ........................................................................................................... 6
   2.3 Ecopreneurship ...................................................................................................... 6
       2.3.1 The Emergence of Ecopreneurship ................................................................ 7
       2.3.2 Ecopreneurship Definition ............................................................................... 7
       2.3.3 Ecopreneurship: Push Vs Pull ........................................................................ 8
       2.3.4 Our Synopsis ................................................................................................... 8
   2.4 Social Entrepreneurship .......................................................................................... 9
       2.4.1 Emergence of Social Entrepreneurship ......................................................... 9
       2.4.2 Defining Social Entrepreneurship .................................................................. 10
       2.4.3 Available Resources ...................................................................................... 11
       2.4.5 Our Synopsis .................................................................................................. 12
   2.5 Ecopreneurship & Social Entrepreneurship Similarities ....................................... 12
   2.6 Sustainable Entrepreneurship ................................................................................ 12
       2.6.1 Sustainable Development and the shift towards Sustainable Entrepreneurship . 13
       2.6.2 Defining Sustainable Entrepreneurship ....................................................... 13
       2.6.3 Sustainable Entrepreneurship ....................................................................... 14
   2.7 Gaps in Sustainable Entrepreneurship literature ................................................ 17

3. **Research Methods** ................................................................................................. 17
   3.1 Qualitative Research vs. Quantitative Research .................................................. 18
   3.2 Case Study .............................................................................................................. 18
   3.3 Data Collection ....................................................................................................... 19
       3.3.1 Primary Data .................................................................................................... 19
       3.3.2 Participants ...................................................................................................... 19
       3.3.3 Interviews ....................................................................................................... 19
       3.3.4 Sample Choice ............................................................................................... 20
   3.5 Data Analysis ......................................................................................................... 20
   3.7 Renewable Energies ............................................................................................. 21

4. **Empirical Data Analysis** ....................................................................................... 21
   4.1 Case study companies ......................................................................................... 22
   4.2 Exposure to a Need for Change ......................................................................... 24
   4.3 Motivations............................................................................................................ 25
1. Introduction

Over the past two centuries, the global industrial transformation has led to a rapid increase in ecological scarcities. Growth in the global economy is transforming the character of the planet and especially of human life (Mebratu, 1998, p. 496). ‘Vital signs’ are becoming evident, a signal that the natural environment has reached a limit (Brown et al. 1996). A sustainable shift in societies living conditions, work practices, technology development and the consumption of resources is required to ensure a capacity to endure with greater responsibly regarding environmental, economic and social dimensions. It took the Brundtland Commission to conceptualise sustainable development - a publicising effort toward sustainability - and engage human development interfaces with economic activity. We note that sustainable development is critical to not only the environments long-term well being, but also a necessity to curve the ultimate slow demise of the human race. Sustainable development meets at the confluence of three constituent parts - environmental sustainability, economic sustainability and socio-political sustainability. It will take a special individual that will enact a holistic approach to a venture start-up that will embed these environmental, economic and social sustainability dimensions and cause disruption among traditional, unsustainable market offerings. Sustainability minded individuals will introduce processes, products and service innovations that are often radical and disruptive, ultimately causing a market shift with their objective to change consumers mindsets and unsustainable, irresponsible consumption. These innovations are turnaround events that mark the beginning of an industry’s transformation towards sustainability - shifting the sustainable paradigm to Sustainable Entrepreneurship.

1.1 Problem

Mr. Nick Blitterswyk, co-founder and CEO of UGE (Urban Green Energy), a company that manufactures and sells renewable energy solutions, is an entrepreneur with a sustainable mission: “Within the company there is this common mission of making the Earth a better place”. Entrepreneurs like Blitterswyk are needed to solve the sustainability related problems we face. Sustainable Entrepreneurs have received insufficient attention by the media, policy makers and have failed to grab the attention of academics to test the theory in an exploratory cross-case analysis approach. Current scientific literature has mainly been conceptual and theoretical (Hockerts & Wüstenhagen, 2010). Past academic studies have mainly focused and contributed to literature concerning the development of corporate sustainability or the large incumbent love affair of Corporate Social Responsibility. Established incumbents have the structures and processes in place to practice their sustainable development initiatives, however, there appears to be a lack in focus on Sustainable Entrepreneurship by start-ups. This is important as entrepreneurs are found to be better in leading sustainability-motivated value creation, compared to managers in existing firms (Cohen, Smith and Mitchell, 2008). Entities that acts environmentally and socially responsible from the initial outset of business development and strategy. Hockerts and Wüstenhagen (2010, p. 489) have expressed the need for a qualitative approach in future research: “additional insights can be gained from comparative studies of sustainable entrepreneurial initiatives in both small and large firms, by doing case studies”. Furthermore, Shepherd & Patzelt (2011) advocate that future research into the focused attention; motivation and feasibility, could address valuable insights into Sustainable Entrepreneurship. This research will look at the practical side of Sustainable Entrepreneurship, presenting five case studies of entrepreneurs in the renewable energy industry, striving to solve a sustainability related problem.

1.2 Purpose
The purpose of this research paper is to explore more in-depth what characterises the phenomenon of Sustainable Entrepreneurship. A cross-case analysis of five entrepreneurs conducting business operations in the renewable energy industry will be conducted to evaluate theory against real life Sustainable Entrepreneurship practice. Various authors have tried to define the concept of Sustainable Entrepreneurship, but literature is lacking practical insights into how these entrepreneurs conduct sustainable entrepreneurial initiatives and whether such definitions hold true. We strive to fill this gap by conducting exploratory research in Sustainable Entrepreneurship, identifying their motivations to start-up their unique venture, challenges faced throughout the venture development process and their impact within their defined market, along with how these entrepreneurs differ from ‘traditional’ entrepreneurship foundations. Moreover, we will summarise the best practices and lessons learnt from our case studies. Doing so, it is our purpose to provide valuable practical insights into individuals acting as Sustainable Entrepreneurs and provide future research opportunities into Sustainable Entrepreneurship.

1.3 Research Questions
Our research investigates five case studies, looking to explore how Sustainable Entrepreneurship Research stands in practice. To do so we propose several research questions:

1. What are the key characteristics of and motivations behind Sustainable Entrepreneurship?

2. What are specific challenges Sustainable Entrepreneurs face, and what are typical best practices Sustainable Entrepreneurs use to maximise the most out of their start-ups?

2. Theoretical Background

This chapter provides a theoretical background with an extensive overview of Sustainable Entrepreneurship scientific literature. The theoretical background is structured chronologically, delivering a cohesive timeline, which amplifies where the concept of Sustainable Entrepreneurship derives from, how it has developed and most importantly what concepts it entails and why it is relevant in current literature. We believe by developing a chronological timeline it will offer the reader greater insight into the history of sustainability and the important shift for entrepreneurial research to focus more towards the new wave of Sustainable Entrepreneurs and Sustainable Entrepreneurship.

2.1 Sustainable Development
To unite the international community and pursue sustainable development together, the United Nations established the Brundtland Commission, which was named after the former Norwegian Prime Minister, Gro Harlem Brundtland. The Brundtland and United Nations commission was established to address worldwide political consensus and to communicate the urgent need for policies worldwide to include the three main pillars of sustainable development (Goodland, 1995).

Definitions of sustainability have varied over the past decades, with numerous academics reaching contrasting definitions and a resounding number of concepts peeling off from the fundamental principles of sustainability. There appears to be no consensus, which has led to hampered discussion by the lack of uniformity in defining sustainability. This chapter will delve into the foundations of sustainability and recognise the spin-off terms that have gained increasing attention and adoption, not only from academics and organisations, but also the new wave of Sustainable Entrepreneurs.
2.1.1 “Limits to Growth” - 1974–86

The Limits to Growth written by Donella Meadows, Dennis Meadows, Jorgen Randers and William Behrens III (1972), first brought to attention, the World3 model – determining the consequences of the interactions between the Earth and human systems (Meadows et al., 1972). The authors strive to explore economic growth and its impact on the Earth’s finite resources. The study attempted to explore such consequences of population growth, pollution, industrial output, food production and resource use - with the aim to stimulate discourse on how to plan for the overshooting of the carrying capacity of the Earth. The book argued that unchecked consumption and economic growth would ultimately lead to the Earth’s downfall and disaster. Predictions were conducted through computer modelling, however predictions encountered numerous oppositions and arguments for the applied data. The computer models tested different assumptions about the future state of the world with respect to the above-mentioned consequences of economic growth, although findings were criticised as inaccurate, unsystematic, irrational and even pessimistic. Policy makers ignored such findings, and economic growth carried on.

Arguments against Limits to Growth were based on the notion that technological innovation and market signals would facilitate economic growth to continue. As resources become scarce, market prices would increase, resulting in decreased market demand - a key opposition argument. Constant technological improvements and innovation would find substitutes and assist the progress of continued growth. Operating at the edge of sustainability (i.e. the maximum sustainable scale) is now clearly dangerous and should be avoided at all costs. It was evident in 1972 that the growth of the global economy was set to destroy human civilisation. While past computer simulation modelling was questioned for its accuracy and legitimacy, Meadows et al. (1972) at least initiated discussion and attempted to explore how exponential growth interacts with finite resources. Even though Meadows et al. (1972) faced stern opposition, their research shed light on the need to focus on approaches that would limit the overshooting of the Earth’s finite resources. Limits to Growth offered the only reasonable solution; reduced levels of material throughput.

2.1.2 Brundtland Commission - 1987–96

In 1987, at the World Commission on Environment and Development (WCED) of the United Nations, also often referred to as the Brundtland Commission, the term ‘sustainability’ was enlarged to ‘sustainable development’. The emerging report defined sustainable development as – “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs“ (WCED, 1987, p.43). Now 25 years on and the definition still holds relevance and has proven to be a vital instrument in the development of sustainability at a global level and has repeatedly been cited by academics. This may be true, due to its broad, vague and ambiguous definition. It took the recognition of the United Nations Environmental Program in 1978 to instil reverence towards the environment and development, to finally be recognised internationally that environmental and developmental ideas needed to be considered concurrently (Mebratu, 1998).

The Brundtland Commission also included two key concepts: The concept of “needs,” - the critical needs of the world’s poor - to which overriding priority should be given - and the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs (WCED, 1987). These two key concepts were incorporated in the commission to ensure that economic growth considers social and environmental concerns, with the development of close ties to the world’s poor of captious importance. Sustainable development promotes the need for renewable resources to be utilised as much as possible, and that a conservative shift must extend the viability of non-renewable resources. At its core, sustainable development ought to account for the fact that “all natural systems have limits, and that human well-being requires living within those limits” Hall et al. (2010, p.440).

The WCED definition stipulates the confluence of three constituent parts – environmental, economic and socio-political sustainability (the three pillars of sustainable development). Sustainability minded companies are able to create a win-win situation by “greening” their business, enhancing and building a
favourable corporate image and competitive advantage in the process (Elkington, 1994). Environmental conscious entities conduct operations with sustainable environmental, social and economic dimensions embedded within their products, processes and services - these dimensions will be discussed later. Such practices must be done in an ethical manner, and not to be executed with a ‘Greenwashing’ approach. Sustainability is a multidimensional concept, incorporating environmental protection, economic development and social equity (Choi & Gray, 2008, cited in Gladwin et al., 1995). Choi and Gray (2008) maintain, successful entrepreneurs are able to simultaneously create a profitable enterprise while also achieving environmental, economic and social objectives – therefore pursuing the ‘triple bottom-line’.

2.2 The Triple Bottom-Line (TBL)

In 1995 John Elkington first defined the Triple Bottom-Line (TBL) in his book, *Cannibals with Forks: the Triple Bottom-Line of 21st Century Business*. Elkington strived to go beyond the traditional accounting measures of profit, ROI and shareholder value, focusing on the broader environmental and social dimensions (Slaper & Hall, 2011). At its narrowest, the TBL is an accounting framework used for gauging and calculating performance against the three dimensions (economic/financial, social and environmental). “At its broadest, the term is used to capture the whole set of values, issues and processes that companies must address in order to minimise any harm resulting from their activities and to create economic, social and environmental value. This involves being clear about the company's purpose and taking into consideration the needs of all the company’s stakeholders – shareholders, customers, employees, business partners, governments and local communicates (SustainAbility, 2003)”. John Elkington proposed that the TBL was able to measure and quantify an organisation’s economic activities and performances that had a direct impact on society and the environment. Furthermore, ‘a company should expand its traditional accounting and performance framework to encompass its ecological and social impact, in addition to its financial impact’ (Green Marketing, 2011). A positive TBL can increase social, human and environmental capital, without disrupting profitability and shareholder value (Savitz, 2006). The TBL can be perceived as a type of scorecard that attempts to measure the balance between economic, environmental and social aspects - the 3P’s.

2.2.1 Three Dimensions of Sustainability

This next section will analyse the important 3Ps, which make up the TBL – People, Planet and Profit. To remain viable, businesses and companies must now incorporate and pay greater attention to these 3P’s. They effectively measure and capture an entities ecological, economic and societal values (Langdon, 2010). Each P will be briefly explained and its connection to the TBL.

**People**

It is imperative for a sustainable business to value its workforce - hiring, developing and training the ‘right’ people that complement the business initiative. People reflect the behaviour of the business, in both social and ethical issues; human resource management is critical to this. A TBL entity implements good working conditions towards labour and the surrounding community in which it conducts operations. Reciprocal social structures are an important element within the TBL. The “up streaming” of profits back to the original producer encourages further business and trust. It is fundamental for workers to feel a sense of ownership and responsibility for their work. A TBL entity does not disadvantage, endanger or exploit any constituencies. A TBL business would never exploit children, and would monitor supplier and contractors labour practices, ensuring they are appropriate while maintaining an acceptable standard that does not seek to exploit or take advantage of any person’s situation. Fair salaries, tolerable working hours and conditions are the basics that must be benchmarked at an appropriate level. Furthermore, the continuous investment into staff is very important. Support in health care, insurance and training programs proposes a learning environment.
Sustainability is crucial to the planet’s longevity. If it is not already obvious, it is time for businesses to realise that unsustainable practices run the risk of losing their people – both employees and customers – and profit (Langdon, 2010). A TBL entity strives to benefit the natural order, or at least do no harm to the environment, and endeavours to eliminate their environmental (ecological) footprint as much as possible. Moreover, a TBL initiative does not conduct business operations nor produce harmful or destructive products – it considers the natural environment and biodiversity. Crals and Vereeck (2005, p.174) explain, “Environmental care, chain management, eco-efficiency, clean products, sustainable technology development, sustainable industry fields and eco-design are concrete examples of these issues”. Businesses that adopt a mission to protect the environment face a profit maximisation dilemma. Entities that fully integrate environmental consciousness essentially align their profit strategy with environmental protection initiatives. In contrast, these initiatives reduce profit maximisation; the business is constrained by the adoption of environmental integration efforts. Government regulation/ legislation and the individual’s self-regulation have direct impact in the result of profit outcomes.

The computation of the TBL economic value differs to the traditional corporate accounting profit measure. Profit is the economic value created by the organisation after deducting the costs of all inputs, including the cost of the capital tied up. While it is this traditional understanding of profit that enabled a starting point for the computation of TBL economic value, the TBL calculation of the sustainability framework encompasses the ‘real’ economic benefit enjoyed by the host society. Therefore, the TBL economic approach must account for other entities ‘profits’ which must be understood as social benefits.

There has been much criticism associated with the TBL, especially how sustainability is measured. Slapper and Hall (2011) outline that depending on the entity, the type of project or geographical scope, determines what measures are to be included in sustainability efforts. The predetermined set of measurements will rest with key stakeholders and experts. Kayes and Skykes (2009) determine that once an entity has established a baseline of current performances, the TBL allows for better decision making regarding the relative cost and benefit of sustainability measures. It is through obtaining these measurements that has ignited criticisms towards the calculating process of the TBL and the argument for how to equally weight the 3P’s, which do not have a common unit of measure. Profits are measured in dollars, although there is no defined measuring unit for social capital, environmental or ecological health (Slapper & Hall, 2011). Numerous authors have proposed applying a dollar measurement to social welfare and environmental damage. However, it is questionable how to apply a monetary value measurement across social and environmental issues such as endangered species, nuclear disasters and soil degradation. The Indiana Business Research Centre’s Innovation Index proposed to calculate the TBL through a universally accepted accounting method, with the opportunity to compare “performance between companies, cities and development projects” (Slapper & Hall, 2011, p.4). However, the question remains, how are the index components equally weighted? How do you measure each P?

The ill-defined measuring metrics have played a direct role in companies losing sight of their sustainable intentions, an opportunity to report inaccurate TBL performances. Pojasek (2009) propositions entities measuring the TBL have “provided a smokescreen behind which firms can avoid truly effective and environmental reporting and performance”. A recent study conducted by Kaushik (2012) discovered that the TBL is a mechanism boosting organisational credentials that input into an organisations cognitive validity, a status boost, which develops and builds upon their brand reputation. Firms adopt the TBL to satisfy the public’s call for greater sustainability efforts - effectively reducing the possible rough treatment if the entity does not portray a sense of social and environmental responsibility. We propose that entities must re-affirm the true meaning of the TBL – a sustainability measurement tool to harmonise
the traditional financial bottom line with greater consciousness of the planet and people (Elkington, 1999) – and move away from this approach of account reporting and more towards a philosophy that incorporates the TBL within the entities DNA - an organisational cultural shift. Below in table 2.2.2, Savit (2006) proposes examples of economic, environmental and social performance measures that if managed appropriately can create good, positive publicity and exposure. These measurements go beyond the accounting department and facilitate data from the marketing and human resources departments.

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<tr>
<th>Economic</th>
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<td>Air quality</td>
<td>Labour practices (e.g.</td>
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<td>Revenue by sector</td>
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<td>unemployment rate, female</td>
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<td>contributing to gross</td>
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<td>state product)</td>
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<td>Jobs created (e.g. job</td>
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<td>Product responsibility</td>
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Table 2.2.2 TBL Measurements (Savit, 2006).

1997- Present

Since 1997, streams of academic research have included greater focus of environment and social dimensions. This next chapter will analyse the importance of Ecopreneurship and Social Entrepreneurship. Each theories importance to sustainability and sustainable development will be investigated and the concepts role in defining and conceptualising Sustainable Entrepreneurship.

2.3 Ecopreneurship

There is no doubt that the publication of the Brundtland Report, in 1987, ensued greater awareness economic growth is causing on the Earth’s biodiversity. The increasing attention of Ecopreneurship first began in the early 1990’s when a more “explicit examination of environmental entrepreneurship began to emerge” (Schaper, 2005, p.12). In “the early 1990’s there was an increase in business opportunities offered by emerging alternative lifestyle choices, new environmental legislation and the recognition of the competitive advantages of business from the ‘green’ agenda” (Holt, 2010, p.238). During this period new businesses, especially ‘green’ micro organisations (start-ups) were encouraged to create more sustainable business models, with their processes reflecting greater concern for environmental and, and latterly more social issues (Cohen, 2006; Larson, 2000, cited in Holt, 2010).

Escalating costs, regulations, the Corporate Social Responsibility (CSR) agenda, economic instruments and organisations enhanced efficiency were all key drivers affecting the adaptive push towards global sustainability (Balabanis et al., 1998; Bansal & Roth, 2000, cited in Dixon & Clifford, 2007). Throughout the late 20th century entrepreneurs have realised the opportunity to explore new forms of business creation and operation, with sustainability as the key driver behind such business initiatives (Holt, 2010). “Eco-entrepreneurship, as it generates benefits to sustainable development, might be best created by
smaller, faster moving firms usually characterised by start-up businesses” (Randjelovic et al., 2003, p.241). Hart and Milstein (1999, p.25, cited in Dixon & Clifford, 2007) predict that entrepreneurs will consider sustainable development as, “one of the biggest opportunities in the history of commerce”.

### 2.3.1 The Emergence of Ecopreneurship

Ecopreneurship and entrepreneurship entail different conceptualisations. Entrepreneurs - in the traditional sense, play a decisive role as engines of change in market-based economies (Schaper, 2002). ‘Traditional’ entrepreneurs only generate social value as a by-product of economic value, and are accountable for introducing disruptive innovation through new ideas or adaptation of previous market offerings. Furthermore, entrepreneurs recognise or discover gaps in the marketplace, satisfy unmet needs or identify an unsolved problem. The opposite is true for mission-driven individuals - Ecopreneurs or Social Entrepreneurs.

Entrepreneurship is a discipline that still, to this date, appears to have no precise definition. For the purpose of this paper we consider one of the most cited founding fathers of entrepreneurship, Joseph Schumpeter. Schumpeter’s view (1962; 1934) is that entrepreneurship is an innovative process of creating market disequilibria, which in turn leads to imitation. Entrepreneurs bring new combinations to the economy, new products, new methods, new markets, new resources and new organisational forms (Schumpeter 1950 & 1961 cited in Nguyen & Boberg, 2010). Davidsen (2004) notes authors like Drucker (1985) and Bull & Willard (1993) favour a Schumpeterian view. They associate entrepreneurship with innovation and change-oriented behaviour. Moreover, Bull and Willard (1993) include task-related motivation, expertise, and expectation of gain for self.

Political and social institutions control the market process and influence an entrepreneur’s economic and non-economic motivations and behaviours. Formal (formation of environmental agencies and regulations governing environmentally harmful activities) and informal (individuals attitudes towards protecting the environment) institutions influence the behaviours of a more responsible entrepreneur: Ecopreneur (Nguyen & Boberg, 2010). “The existence of Ecopreneurs results from changes in behavioural patterns and social institutions concerned with protecting the environment” (Nguyen & Boberg, 2010, p.2). Throughout the process, entrepreneurs scan the market, recognising problems, wants and needs, effectively transforming the existing status quo. Cohen et al., (2008) advocates that there is a relationship between entrepreneurship and venture ideas, and possibilities in the environment.

Ecopreneurship has an extensive theoretical background, with a number of similar terms respectfully holding close association to entrepreneurship behaviour conducted through an environmental lens (Schaltegger, 2005). Adapted from Holt (2010), she listed the following terms that incorporate this aspect of entrepreneurship through the environmental lens; eco-entrepreneurship (Randjelovic et al. 2003), environmental entrepreneurship (de Bruin and Lewis, 2005; Schaltegger, 2005), Enviropreneurship (Menon and Menon, 1997), green entrepreneurship (Berle, 1991) and green–green businesses (Isaak, 1997). For the purpose of this paper, we propose the later terms are synonymous with Ecopreneurship.

### 2.3.2 Ecopreneurship Definition

Isaak (2002, p.81) defines Ecopreneurship as, “A person who seeks to transform a sector of the economy towards sustainability by starting up a business in that sector with a green design, with green processes and with a life-long commitment to sustainability”. Isaak (2002) pays homage to the efforts of an entrepreneur who starts up a business with ‘green’ initiatives from day one, with strong commitment to transforming a sector of the economy towards becoming more sustainable and environmentally responsible.

Kirkwood and Walton (2010) also base their definition on ideas from Isaak (2002), and Walley and Taylor (2002), they define Ecopreneurship as “Entrepreneurs who found new businesses based on the principle of sustainability - Ecopreneurs are those entrepreneurs who start for-profit businesses with strong underlying green values and who sell green products or services”. Moreover, Dixon and Clifford (2007) substantiate that Ecopreneurship represents the triple drivers: environmental, social and economics
dimensions. Pastakia (1998, p.157) states “individuals or institutions that attempt to popularise eco-friendly ideas and innovations either through the market or non-market routes may be referred to as Ecopreneurs”. ‘Usually the Ecopreneur has a “raison d’etre” that exceeds their desire for profits and often this is associated with making the world a better place to live’ (Linnanen, 2002). Furthermore, Linnanen (2002) proposed the idea that Ecopreneurs can be classified according to two criteria: (1) their desire to change the world and improve the quality of the environment and life; and (2) their desire to make money and grow as a business venture (Linnanen, 2002, cited in Rodgers, 2010).

Ecopreneurs are effectively decisive change agents, enabling the world to change its path (Cohen & Winn, 2007), are highly motivated in making a difference and displacing unsustainable means, an important transitional role in sustainability. Cohen and Winn (2007) advocate market imperfections produce environmental degradation; Ecopreneurs are motivated to fill a market need, which is the result of a market imperfection. The ‘traditional’ entrepreneur may see opportunities beyond resource limitations and identify business prospects missed by others; it is the Ecopreneur who assess the potential and availability of resources through an environmental commitment and vision that peruses an eco-friendly initiative (Keogh & Polonksy, 1998). Ecopreneurs are visionaries, with the ability to foresee a “demand for fundamental innovations in traditional markets. The challenge is to be economically successful with the supply of products and services that change - on a purely voluntary basis - consumption patterns and market structures, leading to an absolute reduction of environmental impacts” (Shaltegger & Wagner, 2010 p.8)

2.3.3 Ecopreneurship: Push Vs Pull

Traditional firms and start-ups introducing eco-friendly initiatives differ in strategy. Whilst established corporations are realising the importance to take steps being environmentally friendly, we believe they are executing push strategies, whereby governments, regulatory agencies, stakeholder’s and/ or lobby-groups impel policy and guiding principles to act environmentally conscious. Incumbents are effectively complying with external authoritative, administrative bodies and customising their CSR policy to adhere to such push promotions. In the eye of the customer, they are not necessarily viewed as an active demonstration of an entity to become ‘greener’, rather simply complying to regulation with a ‘Greenwashing’ facade. Such measures tend to result in the progressive greening of organisations rather than a big bang move towards global sustainability (Hart and Milstein, 1999). In contrast, Ecopreneural start-up efforts can act as ‘pull’ factors; indirectly enticing established firms to address unsustainable business practices and proactively applying public pressure to go ‘green’. By implementing ‘pull’ strategies, an entity can be seen as actively taking a stance towards becoming ‘greener’ and potentially building a competitive advantage over less ‘green’ firms, which may also lead to positive brand image and associations. We consider an Ecopreneur has the ability to shape its organisational values, culture and message from the outset; they can embed a green initiative from the company’s inceptions and attract price inelastic customers.

2.3.4 Our Synopsis

We argue that Ecopreneurs adopt a screening and surveillance approach to the market, using the available resources, realising ideas that are based on solving an environmental problem, with the motivation to introduce a successful solution that will create financial turnover and influence market structures and even creative destruction. Consumers are losing confidence in large corporations, demanding higher expectations for incumbents to exhibit more social and environmental responsibility (Webb et al., 2008). As consumers are demanding more environmentally friendly goods, Ecopreneurs are realising market opportunities for sustainable products and services (Kirkwood & Walton, 2010). Entrepreneurs may effectively bring new combinations to the economy - i.e. new products, methods and markets. However, it is the Ecopreneur who plays a critical role in the development process, constructing environmentally friendly products, processes, and services toward the sustainable development objective - “development
that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.43).

2.4 Social Entrepreneurship

The previous chapter explored Ecopreneurship – introducing business initiatives that are driven by the action of popularising eco-friendly ideas and innovation (Pastakia, 1998) with the objective to change the world and improve the quality of the environment and life (Linnanen, 2002). We note that it is impossible to change the world, and quality of life, without acting socially responsible. Dixon and Clifford (2007) touched upon this social dimension within their definition of Ecopreneurship, and other authors skirt across the importance of acting in a sustainable manner. It is here that Social Entrepreneurship plays a crucial role in sustainable development and therefore is embedded in the conceptualisation of Sustainable Entrepreneurship. Keeping to our chronological structure the introduction of Social Entrepreneurship materialises, investigating the emergence, definitions and available resources to a Social Entrepreneur.

2.4.1 Emergence of Social Entrepreneurship

Social Entrepreneurship was first investigated in the 1990’s (Galaskiewicz, 1985; Waddock & Post, 1991; Selsky & Smith, 1994), and since then, authors have sought to find a definite definition and understanding, which continues to this day, a similarity that is shared with Ecopreneurship and ‘traditional’ entrepreneurship. Just as Ecopreneurship, Social Entrepreneurship has seen increased attention in scientific literature and other media (Miar & Noboa, 2006; Peredo & McLean, 2006). Zahra et al., (2008) proposed four key reasons why Social Entrepreneurship has emerged in society, and therefore promoted greater public awareness 1.) Global wealth disparity, 2.) Movement of corporate social responsibility, 3.) Market, institutional and state failures, and 4.) Technological advances and shared responsibility. Furthermore, this can be explained by the growth in the number of non-profit organisations in the American market which increased 31 percent between 1987 and 1997 to 1.2 million, exceeding the 26 percent rate of new business formation (The New Non-profit Almanac & Desk Reference, 2002 as cited by Austin, Stevenson and Jane Wei-Skillern, 2006). These statistics are not only true for the American market but also for the Australian market. A research conducted by Opportunity International Australia (2012) illustrated that Social Entrepreneurship has grown 37 percent in the past five years, making it one of the fastest growing sectors of in the Australian economy. This increased attention in practice and literature could also derive back to the Brundtland Commission and its call for sustainable development. Another reason could be the financial crisis that has hit the world, which could lead to higher social concerns for the less fortunate groups in society.

Social Entrepreneurs measure success by creating social capital, social change and addressing social needs. In contrast, ‘traditional’ business entrepreneurs measure (basic) performance on return, and profit - they are ‘for’ the economy, and Social Entrepreneurs are ‘for’ social change (Bornstein, 2004 p.15). Social Entrepreneurs question the status quo, are motivated to improve the world, and strive to exploit new market opportunities with societies economic, health and environmental concerns embedded in their venture actions, providing innovative solutions. Although many similarities exist between ‘traditional’ entrepreneurship and the Social Entrepreneurship, the latter differs from the former because the venture’s mission and performance measurement systems are completely different and influences entrepreneurial behaviour (Austin et al., 2006). Moreover, Austin et al. (2006, p.2) state the existence of social-purpose organisations emerge when there is a social-market failure, i.e., commercial market forces do not meet a social need, such as in public goods (Weisbrod, 1975, 1977) or in contract failure (Nelson & Krashinsky, 1973). Lumpkin, Moss, Gras, Kato and Amezcua (2011), suggest that both ‘traditional’ and Social Entrepreneurs have a lot in common, and many entrepreneurial processes remain the same or are affected only slightly. What do differ are the autonomy, competitive aggressiveness and risk-taking dimensions.
This makes sense as a social entrepreneur does not focus on quick economic profits, but rather on social improvement and well-being, which does not go well with high-risk taking.

2.4.2 Defining Social Entrepreneurship

In this short introduction it can be seen that Social Entrepreneurship has very different meanings to different people, leading to confusion in the literature, a notion that Zahra et al. (2008) have made as well. To get a clear understanding of the concept, we will discuss several key definitions of Social Entrepreneurship and investigate differences and similarities.

Leadbetter (1997) found that profit making is not the primary goal of a Social Entrepreneur and that generated profits from market activities should be used for the benefit of a specific disadvantaged group. Mair and Marti (2006) advocate that ‘while economic value creation is seen as a necessary condition, it is more important to ensure financial viability and business longevity’. The understanding that profit is less important, or that the social aspect is balanced at least equal to profit comes back in various definitions. Business schools have done so by incorporating the double bottom line, balancing both social (people) and economic (profit) returns on investment (Fuqua School, 2005 cited in Zahra et al., 2009). Clearly, the double bottom line derives from the TBL. However, there is more to Social Entrepreneurship than balancing profit and social goals.

Dees (1998) defined that Social Entrepreneurs “play the role of change agents in the social sector, by adopting a mission to create and sustain social value (not just private value), recognising and relentlessly pursuing new opportunities to serve that mission, engaging in a process of continuous innovation, adaptation, and learning, acting boldly without being limited by resources currently in hand, and exhibiting heightened accountability to the constituencies served and for the outcomes created”. Dees’ (1998) focus is thus on the social value, without being strained by the available resources. However, in later work Dees (2003) changed his understanding of Social Entrepreneurship, to “one that emphasises innovation and impact, not income, in dealing with social problems”. Dees’ understanding of Social Entrepreneurship has evolved along the developments in defining ‘traditional’ entrepreneurship, which encompasses the ability to create new opportunities. “The entrepreneur always searches for change, responds to it, and exploits it, states Dees (2003).

Moving along the entrepreneurial traits, Dees (2003) his understanding of Social Entrepreneurship has an emphasis on innovation and impact, meaning that Social Entrepreneurship is about introducing a novel, innovative technology or approach aiming to create social impact. This view is consistent with the Schumpeterian thoughts on entrepreneurship, which has been linked to social innovators (Casson, 2005; Certo & Miller, 2008). The focus on innovation is thus predominant in entrepreneurship literature, and as discussed in Ecopreneurship literature as well. For the same reason, it has also found its meaning in Social Entrepreneurship literature. Other authors have made this same notion (Mort, Weerawardena & Carnegie, 2002; Tan, Williams & Tan, 2005). In his influential book on Social Entrepreneurship Bornstein (2004) supports business entrepreneurs are for the economy and Social Entrepreneurs are for social change. They are “the driven, creative individuals who question the status quo, exploit new opportunities, refuse to give up and remake the world for the better,” (2004, p. 15). Other authors have adopted this new paradigm of ‘making the world better’. Chell (2007), puts the focus on ‘changing the world’ as a driver for Social Entrepreneurs. This is rather an ideology that is very true for Ecopreneurs as well. The association of Social Entrepreneurship with non-profit organisations is easily made but the term should not be limited to this group. Jiao (2011) for example finds that Social Entrepreneurs respond to complex societal needs and that this person is not constrained to typically non-profit organisations. Social Entrepreneurial leaders operate in large and small; new and old; religious and secular; non-for profit, for profit, and hybrid organisations (Austin, et al., 2006; Jiao, 2011). Thus, Social Entrepreneurship will not be defined by legal form, as it has many forms and can be conducted in various ways.
As has become clear, Social Entrepreneurship is about creating social impact. But what is this social impact? Tan et al. (2005) have asked themselves this same question. In their research, they aimed to determine what the drivers for Social Entrepreneurs are. Their answers is found in social profits, resembling social impact: “To make profits for society or a segment of it by innovation in the face of risk, that involves a segment of society with the altruistic objective that benefits accrue to that segment of society” (2005, pp. 17). Altruism is the concern for the welfare of others, which comes in different degrees according to Tan et al. (2005). This means the primary goal of a Social Entrepreneur should be to generate profit for society and possibly him/ herself as well. Moreover, they conclude that the segments of society (consumers), which a Social Entrepreneur needs, are not necessarily the ones he seeks to benefit. Thus, the benefits or profits of Social Entrepreneurship are not mere economic, they are, as most other authors have underlined as well, the social impact and social wealth.

2.4.3 Available Resources

Social Entrepreneurs have to use, and rely on a full complement of resources and innovative methods to execute their social change initiative. Dees (2003) mentioned that the available resources do not restrain a Social Entrepreneur from achieving their social objective. Mair and Martí (2006, p.37) view Social Entrepreneurship as “the innovative use and combination of resources to pursue opportunities to catalyse social change and/or address social needs”. Social Entrepreneurs need to acquire substantial resources including, human, social and financial capital to not only accomplish their mission, but also to ensure such resources are sustaining the organisation’s longevity. Acquiring the necessary resources will assist in the construction, maintenance and growth of the social enterprise; however, obtaining the required resources can be the most challenging aspect to the change process as competition for resources is often intense.

Human capital (resources) defined by Coleman (1990), Becker (1993), and Davidsson and Honig (2003) as cited by Jiao (2011, p.135) is “the range of valuable knowledge and skills a person has accumulated over time”. Social Entrepreneurs must have the skills to utilise their accumulated knowledge and integrate this into their activities. Understanding the customer needs is essential to Social Entrepreneurship. Acquiring knowledge about the customer ensures Social Entrepreneurs can tailor innovative methods and satisfy these needs. “A social entrepreneur mainly focuses on the idea and then integrates the resources to realise it” (Jiao, 2011, p.136). Moreover, Jiao (2011) goes on to state, “The integrating capabilities contribute to the development of Social Entrepreneurship activities, which is the underlying mechanism of social transformation. Therefore, knowledge and the ability to integrate resources, which are elements of human capital, play an important role in the process of Social Entrepreneurship”.

Social capital also known as a social network is very important to a social entrepreneur. It is vital for the Social Entrepreneur to build strong relationships and partnerships with established firms, high profile companies, stakeholders, investors, and customers. Collaboration will improve the likelihood that the innovative idea will be executed. Bornstein (2004 as cited in Jiao, 2011) described that “networks make big differences in the process of Social Entrepreneurship” and that social networks play a very important role in the outcome of a Social Entrepreneurs venture.

Financial capital is usually obtained through governments, NGO’s and charitable foundations, which are recognised as the traditional sources of funding for these Social Entrepreneurs (Teegen et al., 2004, cited in Zahra et al, 2009). Other financial sources may also include donations from the general public or wealthy individuals (Angel Investors), company donations and venture capitalists (VC). Financial consultants, who may not attribute in monetary terms, may possibly provide free financial advice.
A key strategy for Social Entrepreneurs is to obtain vital resources and market respect to execute their social initiative. Social Entrepreneurs must differentiate their social initiative against other competing entrepreneurs. Not only do Social Entrepreneurs need to differentiate themselves from other worthy causes, but also they must “Effectively manage the web of complex and evolving relationships between their organisations, donors, professional employees, and volunteers as they pursue their social missions” (Zahra et al., 2009, p.526). A Social Entrepreneur who is able to leverage “the resources and capabilities of for-profit and not-for-profit organisations can generate mutually beneficial outcomes (Pearce and Doh, 2005, cited in Zahra et al., 2009, p. 526)). Public institutions consider the partnership of a Social Entrepreneurship enterprise as a positive association to the company and a win-win outcome. We agree with Mair and Marti (2006) that Social Entrepreneurship require effective management of the available combinations of resources, and that a Social Entrepreneur must work within the confines of their human, social and financial capital/ resources to pursue social change opportunities.

2.4.5 Our Synopsis

To present a definition that encompasses the above, we agree with Zahra et al.’s (2009) definitions. Their research, which reviewed over 20 academic definitions of Social Entrepreneurship, proposes a definition that combines various aspects we discussed above, not letting loose of the entrepreneurial dimensions: “Social Entrepreneurship encompasses the activities and processes undertaken to discover, define, and exploit opportunities in order to enhance social wealth by creating new ventures or managing existing organisations in an innovative manner,” (2009, p. 519).

2.5 Ecopreneurship & Social Entrepreneurship Similarities

It is evident that Ecopreneurship and Social Entrepreneurship are two interconnected concepts; it is the similarities between the two concepts that Sustainable Entrepreneurship derives from. Social Entrepreneurship has been described as incorporating a double bottom line within the company's mission - balancing the economic and social returns on investment. The same is true for Ecopreneurship, which as described earlier considers environmental dimensions ahead of economic returns and benefits as described earlier. Schaltegger and Wagner (2011, p. 226) agree with this view and state: “Even though the historic trajectories of these types (Eco- & Social Entrepreneurship) differ, it seems that the underlying motivations for the activities are very similar and this seems to make likely a convergence of these currently rather independent literatures”. Despite this, significant less attention has been devoted to Sustainable or Sustainability Entrepreneurship as a concept integrating environmental and social aspects and thus the TBL (Larson, 2000; Kyrö, 2001; Strothotte and Wüstenhagen, 2005; Cohen et al., 2008; Cohen and Winn, 2007). Both theories aim to solve either an environmental or societal problem and entail entrepreneurial means to reach their objectives, through the introduction of innovative products, services and processes. Both Eco- and Social Entrepreneurs recognise market gaps and unmet consumer needs, although their actions incorporate the blending of value across the economic, social or environmental spectrum - TBL (3P’s).

2.6 Sustainable Entrepreneurship

So far the report has developed an in-depth analysis into the foundations of sustainability/ sustainable development, and the important Sustainable Entrepreneurial research concepts that have spun off - Ecopreneurship and Social Entrepreneurship. It is now important to conceptualise Sustainable Entrepreneurship, the latest entrepreneurial sustainable development to reach scientific research, and as we consider a much needed promotion in this current economic climate. Our aim is to determine the importance of Sustainable Entrepreneurship to sustainable development by collecting a comprehensive list of the most important definitions to date. This list will lead on to the important concepts that are evident throughout the definitions.
2.6.1 Sustainable Development and the shift towards Sustainable Entrepreneurship

Sustainability has ‘become a multidimensional concept that extends beyond environmental protection to economic development and social equity’ (Gladwin et al., 1995 cited in Choi & Gray, 2008). There is the assumption that change will come from entrepreneurs introducing sustainable products, processes and services that will sustain the nature, the sources of life support, and communities (Shepherd & Patzelt, 2010). Hall et al., (2010) state, “Entrepreneurship is increasingly being cited as a significant conduit for bringing about a transformation to sustainable products and processes”. Sustainable Entrepreneurs embody greater consideration to not only transform either sustainable products and/ or processes - they ‘create profitable enterprises, while achieving specific environmental/ and or social objectives’ (Choi & Gray, 2008). Moreover, Shepherd & Patzelt, (2010, p. 142) state “Sustainable Entrepreneurs bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society”. These non-economic goals are key to the differentiation between ‘traditional’ entrepreneurship and Sustainable Entrepreneurship. Non-economic goals benefit people and society, whereas economic profit is central to the traditional definition of entrepreneurship, with the environment and society lacking consideration or an afterthought. The continuing environmental degradation is offering greater opportunities for Sustainable Entrepreneurs to exploit, which will be later explored in further detail. Sustainable Entrepreneurship represents a different breed to entrepreneurship. Sustainable Entrepreneurs are shifting towards a more ecologically sustainable environment and economy, leading “to the biggest opportunity for enterprise and invention in the industrial world” (The Economics, 2001 cited in Dean & McMullen, 2007). It is time that Sustainable Entrepreneurship is given greater consideration in literature, as the new environmental economy is upon us.

2.6.2 Defining Sustainable Entrepreneurship

We have gathered eight definitions of Sustainable Entrepreneurship with the aim to identify similarities and differences and find which aspects are important according previous research. In table 2.6.2 we have outlined these definitions and ranked them by published year - keeping inline with our chronological approach to this report.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Sustainable Entrepreneurship Definition</th>
</tr>
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<tbody>
<tr>
<td>Gerlach (2003, p. 3)</td>
<td>“Innovative behaviour of single or organisations operating in the private business sector who are seeing environmental or social issues as a core objective and competitive advantage”.</td>
</tr>
<tr>
<td>Crals and Vereeck (2005, p. 1)</td>
<td>“The continuing commitment by business to behave ethically and contribute to economic development, while improving the quality of life of the workforce, their families, local communities, the society and the world at large, as well as future generations. Sustainable Entrepreneurs are for-profit entrepreneurs that commit business operations towards the objective goal of achieving sustainability”.</td>
</tr>
<tr>
<td>Dean, &amp; McMullen (2007, p. 58)</td>
<td>“The process of discovering, evaluating, and exploiting economic opportunities that are present in market failures which detract from sustainability, including those that are environmentally relevant”.</td>
</tr>
<tr>
<td>Cohen and Winn (2007, p. 35)</td>
<td>“The examination of how opportunities to bring into existence future goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences”.</td>
</tr>
<tr>
<td>Choi and Gray</td>
<td>&quot;Create profitable enterprises and achieve certain environmental and/or social&quot;</td>
</tr>
</tbody>
</table>
objectives, pursue and achieve what is often referred to as the double bottom-line or triple bottom-line”.

Hockerts & Wüstenhagen (2010, pp 482) “The discovery and exploitation of economic opportunities through the generation of market disequilibria that initiate the transformation of a sector towards an environmentally and socially more sustainable state”.

Schaltegger & Wagner (2011, pp. 224) “An innovative, market-oriented and personality driven form of creating economic and societal value by means of break-through environmentally or socially beneficial market or institutional innovations”.

Shepherd & Patzelt (2011, pp. 142) “Sustainable Entrepreneurship is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society”.

Table 2.6.2: Sustainable Entrepreneurship Definitions

The definitions presented in table 2.6.2 provide valuable insights into the development of Sustainable Entrepreneurship. The above definitions provide an overview identifying the various attributes and key traits that have developed overtime. One can note that since 2003 to 2011 Sustainable Entrepreneurship definitions have developed overtime to encompass four defining attributes of Sustainable Entrepreneurship - 1) Balancing environmental and social concerns 2) Economic gains, 3) Market failures and disequilibria, and 4) Transforming Sectors towards sustainability. In section 2.6.3 we will discuss these four areas of Sustainable Entrepreneurship separately.

2.6.3 Sustainable Entrepreneurship

Balancing Environmental, Social & Economic Concepts

Deriving from these definitions, we can conclude that Sustainable Entrepreneurship has a considerable conceptual overlap of other streams of research - namely Ecopreneurship and Social Entrepreneurship. Sustainable Entrepreneurship is a balancing act of strategically managing and orienting environmental and social objectives and considerations, with entity specific financial goals steering the business objective. No business, company or venture operates on a desert island; it is embedded in an economic, social, cultural and ecological environment (Crals & Vereek, 2005). Sustainable Entrepreneurship attempts to find the right balance within these environments. Sustainable Entrepreneurs improve the quality of their processes while ensuring their environmental and social impact is limited and minimised (Choi & Gray, 2008). As can be seen above, six out of the eight definitions explicitly mention environmental and social aspects. Ecopreneurship does not incorporate the development of non-economic gains for individuals, communities and societies at large (Shepherd & Patzelt, 2011); therefore Ecopreneurship is not synonymous to Sustainable Entrepreneurship. Economic dimensions are dependent on the individual, and the business objective. Ecopreneurship is an entrepreneurial action that targets the sustainability and preservation of the natural environment. Sustainable Entrepreneurship encapsulates an environmental problem and strives to transform a sector towards an environmentally sustainable state by solving the particular environmental goal. This is directly linked to Ecopreneurs efforts to act environmentally friendly with the introduction of ‘green’ products, processes and services. Sustainable Entrepreneurs aim to create impact through creating environmental value (Pascual et al, 2011).

Sustainable Entrepreneurship encompasses Social Entrepreneurships core objectives, creating social impact, solving societal problems and enhancing social wealth. Our above conceptualisation of Social Entrepreneurship illustrates that these entrepreneurs are creative individuals, driven by questioning the
status quo, that refuse to give up, with the objective to exploit new opportunities and to make the world a better place (Bornstein, 2004). Societal development is aimed at non-economic gains for individuals, communities and societies. In contrast to Ecopreneurship, Social Entrepreneurship is not motivated nor does not include sustaining the current state of the nature, sources of life support, and community (Shepherd & Patzelt, 2011). Sustainable Entrepreneurship embodies the objective to enhance social wealth, with the goal to create profit, and to ensure financial viability to pursue other opportunities that may arise to be exploited outside the realm of the social objective.

Besides environmental and social objectives, Sustainable Entrepreneurs are for-profit entrepreneurs. In entrepreneurship literature making a profit is central (Venkataraman, 1997). As can be seen in table 2.6.2, this concept has been adopted in various definitions of Sustainable Entrepreneurship. Crals and Vereeck (2005) clearly define Sustainable Entrepreneurs as for-profit entrepreneurs. Shepherd and Patzelt (2011, p.142) include the concept of gain as an important aspect of their definition: “Gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society”. An individual or company profit is very important to sustain the business itself and can serve to be reinvested in the sustainable goals of the company.

Choi and Gray (2008, p. 559) state, “Sustainable Entrepreneurs create profitable enterprises, but also achieve environmental and social objectives”. Hockerts and Wüstenhagen’s (2010) view coheres to this: “Social and/or environmental objectives are at least as important as economic objectives (2010, p. 483)”. Other studies confirm this; Schaltegger & Wagner (2011) for example found that small and young firms are better at integrating sustainability performance into business objectives.

Sustainable Entrepreneurship encompasses both environmental and social objectives, with the goal to be profitable and economically viable. This proposes a competitive advantage over Ecopreneurs and Social Entrepreneurs as they are restricted and by definition limited to focusing only on one core sustainable issue - either environmental or social - that may or may not be financially driven.

In summary, we argue that an entrepreneurial activity can only be labelled sustainable, and therefore satisfy sustainable development, if there is an equal blending of the 3Ps within the business initiative. Sustainable Entrepreneurship, which as we know derives from sustainable development, with the aim to approach each ‘P’ with equal weight and consideration, therefore sustainability, is at the core of Sustainable Entrepreneurship.

We can thus expect Sustainable Entrepreneurs to highly value non-economic gains besides economic gains. Looking at literature concerning the TBL and the definitions in table 2.6.2, it very likely Sustainable Entrepreneurs set the non-economic goals (environmental and social concerns) equally higher to their economic goals.

Fig 1.0 Sustainable Entrepreneurship is the blending of People, Planet & Profit.

Market Disequilibria and Market Failures

The identification of opportunities is an important notion in scientific literature concerning entrepreneurship. Sustainable Entrepreneurship research follows this same reasoning, as four out of the eight authors in table 2.6.2 have incorporated the identification or exploitation of opportunities into their definitions (Dean, & McMullen, 2007; Cohen and Winn, 2007; Hockerts & Wüstenhagen 2010; Shepherd...
It is evident that opportunity recognition for a Sustainable Entrepreneur targets an environmental or social imperfection, which they aim to solve, as exemplified by Schaltegger & Wagner (2011). A number of recent papers follow Schumpeter's (1943) notion of market disequilibria, argue that new sustainability pressures create various types of market failure, opening up opportunities for new entrants (Cohen & Winn, 2007; Hall & Vredenburg, 2003; Hart & Milstein, 1999; Hart & Christensen, 2002; Senge & Carstedt, 2001, among many others). Hockerts and Wüstenhagen’s (2010, p. 482) paper explicitly draws on the Schumpeterian notion: “entrepreneurship is an innovative process of creating market disequilibria (Eckhard & Shane, 2003; Shane & Venkataraman, 2000) which in turn lead to imitation”. These authors identify Sustainable Entrepreneurship as a way by which market failures such as environmental and social disruptions can be alleviated, deriving from the strong economic literature stream that promotes the resolving of market failures (e.g., Coase, 1974; North and Thomas, 1970; Demsetz, 1970) and correcting of negative externalities (Pigou, 1912). Indeed, the entrepreneurial economic literature offers considerable insights into how sustainable development may be achieved. Cohen and Winn (2007) have developed this understanding as they identified four types of market imperfections (i.e., inefficient firms, externalities, flawed pricing mechanisms and information asymmetries) which contribute to environmental degradation and providing significant opportunities for the creation of radical technologies and innovative business models: “These opportunities establish the foundations for an emerging model of Sustainable Entrepreneurship, one which enables founders to obtain entrepreneurial rents while simultaneously improving local and global social and environmental conditions” (Cohen and Winn, 2007, p. 29). Dean and McMullen (2007, p.58) have continued on this notion: “Environmentally relevant market failures represent opportunities for simultaneously achieving profitability while reducing environmentally degrading economic behaviours. In other words, some market failures which result in environmental damage provide entrepreneurial opportunities whose exploitation promise profit and improvements in social welfare”. We can thus expect Sustainable Entrepreneurs to have identified opportunities that derive from environmental and social market disequilibria/ failures. With their start-ups, they aim to solve these sustainability-related problems.

Transformation of Industries towards Sustainability

Recent research into the transformation of sectors towards sustainability has derived from the identification of sustainability-related market failures as opportunities for Sustainable Entrepreneurs. Hockerts and Wüstenhagen (2010) have conceptualised this understanding. Hereby they specify between start-ups and incumbents, which have different roles and impacts in the transformation process. Hockerts and Wüstenhagen (2010, p. 482) state: by linking Sustainable Entrepreneurship to the transformation of an industry towards sustainable development, we respond to Cohen and Winn's call for going beyond research on ‘corporate greening’ initiatives and their impact on firm performance”. In their theoretical research, Hockerts and Wüstenhagen (2010) set out how the transformation of an industry towards sustainability takes place.

- **First stage:** A sustainable entrepreneur (who is highly motivated idealist) launches a sustainability innovation and initiates the transformation of an industry towards sustainability.
- **Second stage:** The Sustainable Entrepreneur grows their business and is followed by incumbents that catch up with the growing trend. The transformation of an industry towards sustainability continues.
- **Third stage:** Business minded Sustainable Entrepreneurs emerge with start-ups backed up by professional investors. These understand their market niche well and are able to implement both product innovation as well as process innovation. These Sustainable Entrepreneurs achieve profitable growth and will extend market share, while defending it against incumbents.
- **Fourth Stage:** In this maturity stage, mass-market brands see the growing competitive threat from the Sustainable Entrepreneurs and will try to gain market share as well, taking the transformation of an industry towards sustainability further.
Throughout the whole cycle, costs have decreased and are now efficient, completing the cycle. Schaltegger and Wagner (2011) strengthen this notion, stating that start-ups and incumbents need to sort out of which type of sustainability innovation they engage in (radical or incremental). Doing so they could excel in their activities, which is contributes to the transformation of industries to sustainability. Ultimately, when an industry has gone through the life cycle, the process could start over again, as new Sustainable Entrepreneurs identify new opportunities in sustainability niches contributing in solving sustainability-related problems. From this theory we can expect Sustainable Entrepreneurs to target market niches with innovative solutions to a sustainability-related problem, initiating the transformation of an industry towards sustainability. This concept is backed up with various examples; however, research conducted in ‘the field’ is lacking support.

For the purpose of this report, we define Sustainable Entrepreneurship as: *Start-ups that introduce an innovation, with the aim to solve a sustainability-related market failure, which initiates the transformation of an industry towards sustainability.* Sustainable Entrepreneurial start-ups embody a motivation to solve sustainability-related problems through the introduction of innovative products, processes and services. These innovations can make an impact by initiating the transformation of an industry towards sustainability and their sustainable objectives are equally important as the economic objectives or even more important.

### 2.7 Gaps in Sustainable Entrepreneurship literature

Hall, Daneke, and Lenox (2010) point out that many studies aiming to contribute to the Sustainable Entrepreneurship literature have focused on sustainable development or the concern for corporate-sustainability/ CSR. The latter are often practices incumbents are engaged in, and not start-ups. There has not been so much focus on Sustainable Entrepreneurship regarding start-up initiatives. Another gap in current literature is that past studies have mainly been conceptual and theoretical based. Hockerts and Wüstenhagen (2010) expressed the need for a qualitative approach in future research: “additional insights can be gained from comparative studies of sustainable entrepreneurial initiatives in both small and large firms, by doing case studies (2010, p. 489)”. In addition to the above research gaps, Shepherd & Patzelt (2011) have made a call for research which contributes to determining the characteristics of Sustainable Entrepreneurs, including prior knowledge, focused attention and motivation.

As the field of entrepreneurship is still emerging, it comes as no surprise that there is still much unclear conceptualisation regarding the definition and core assumptions of Sustainable Entrepreneurship (Shepherd & Patzelt, 2011; Hockerts and Wüstenhagen 2010). Therefore, this research will follow the call for an explorative research - taking the form of multiple case studies - which will give insight on how Sustainable Entrepreneurship theories and definitions hold in practice.

### 3. Research Methods

This chapter provides an overview of our research methods and argues the reasoning behind our research approach. Scientific literature about Strategic Entrepreneurship is still emerging and there has
not been a focus on practical case study research. For the purpose of this research we credit Huberman and Miles (1994) Qualitative Data Analysis 2nd Ed. as an important piece of text that has provided us proficient guidelines for structuring our qualitative research.

3.1 Qualitative Research vs. Quantitative Research

“Qualitative research is conducted through an intense and/or prolonged contact with a ‘field’ or life situation” (Miles & Huberman, 1994, p. 6). Moreover, these contacts are often reflective and concern the normal ‘everyday life’ of individuals, groups or organisations. ‘Qualitative data can take the form of words, and also still or moving images’ (Huberman & Miles, 1994). “The words are based on observation, interviews or documents. These data collection activities typically are carried out in close proximity to a local setting for a sustained period of time” (Miles & Huberman, 1994, p.9). Qualitative data has been advocated as the best strategy for discovery, exploring a new area and developing hypotheses. In addition, it is a strong approach to see whether specific predictions hold up. Important with qualitative research is that the researcher attempts to capture the perceptions from the inside. A main task is to explicate how people in a particular setting come to “understand, account for, take action, and otherwise manage their day-to-day situation” as explained by Miles and Huberman (1994, p. 7).

Sieber (1973, cited in Miles & Huberman, 1994), states, “quantitative data can help with the qualitative side of a study during design by finding a representative sample and locating deviant cases. It can help during data collection by supplying background data, getting overlooked information, and helping avoid “elite bias”. Linking qualitative and quantitative data can, for instance, provide richer detail and development in analysis, and to initiate new lines of thinking through attention to surprises or paradoxes - providing fresh insight’ (Miles & Huberman, 1994). However, we argue for practical, exploratory research, whether the linkage of quantitative and qualitative data is required for a research that is based on exploring life experiences, presuppositions, assumptions, motivations, challenges, critical moments and perceptions.

We chose to use a qualitative research approach. A resounding feature to qualitative data is its richness and holism. Qualitative data provides “thick descriptions that are vivid, nested in a real context, and have a ring of truth that has strong impact on the reader” (Huberman & Miles, 1994). Qualitative data offers more than a ‘snapshot’ of the ‘what’; it allows assessing causality as it plays out in a particular setting (Huberman & Miles, 1994). A qualitative study has an inherent flexibility that presents confidence for the research to really understand what has been going on (Huberman & Miles, 1994).

Following our qualitative research approach, this research adopts inductive reasoning. We do so as deductive reasoning would lead us to derive invalid consequences of our assumptions and conclusions, even though our analysis points out they are valid. In other words, the nature of our research requires an inductive approach as the phase in which Sustainable Entrepreneurship research currently is does not permit a deductive approach.

3.2 Case Study

Case studies are the most suitable type of research to be able to fulfil the research goal of this paper. Yin (1989, p. 23) defined case study research as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used”. Case study research is known to be very suitable for explanatory, descriptive and exploratory research (Blumberg, Cooper & Schindler, 2008). We are aware that large sample sizes and quantitative research are very valuable as well as they allow to statistically test hypotheses and either accept or decline them. However, as explained before, this paper has identified and aims to fill in the gap in current literature that calls for exploratory research. A
suggestion in current Sustainable Entrepreneurship research (Hockerts & Wüstenhagen, 2010) is a longitudinal comparative case study research. We are aware this would be a very beneficial research approach, however due to the limited timeframe, we have chosen an explorative case study research. Miles and Huberman (1994, p. 25) state that qualitative researchers can struggle with questions like; “what is my case and where my case leaves off”. A case is a phenomenon of some sort occurring in a bounded context. Multiple-case sampling adds confidence to findings. By looking at the range of similar and contrasting cases, a single-case finding can be understood and it can be grounded by specifying how, when and why, it carries on as it does (Miles & Huberman, 1994, p. 29). To provide a meaningful and credible research, we have focused upon one specific industry, which eases the path for identifying similarities, trends, challenges and impacts and allows a better generalisation of our results.

### 3.3 Data Collection

Formal data collection is necessary to ensure that data gathered is both defined and accurate and that subsequent decisions based on arguments embodied in the findings are valid (Sapsford, 2006). Data collection included both primary and secondary data sources.

#### 3.3.1 Primary Data

Primary data was collected through semi-structured interviews. Executing semi-structured interviews ensured the participants answered our predetermined customised questions, and covered our prescribed themes, while still making sure our interviews were open and would deliver quality, usable and relevant data. Interviews were administered face-to-face or by virtual communication (i.e. Skype meeting). Following the completion of the interview, transcripts were written, extracting key quotes to support our analysis. Our aim was to show a direct correlation to the data collected and our proposed themes.

#### 3.3.2 Participants

This study was limited to a small sample size of five start-up ventures that specialise in renewable energy solutions and products (mobile solar & urban wind/ solar technologies). The CEO, owner(s) and/ or founder(s) were requested for the interviews. Participants had diverse nationalities (Canadian, Dutch and American), and were all fluent in English.

Prior to conducting each interview, extensive background research was conducted into the entrepreneur’s business start-up. A web search was made, searching for key terms, such as ‘sustainable start-up,’ ‘green wind start-up entrepreneur,’ ‘renewable green energy start-up,’ ‘urban wind green entrepreneur’. A number of the entrepreneur’s start-up websites were stumbled upon through various forum links and industry web pages. After reviewing each business website, and an extensive Internet search, we as researchers had an open discussion about whether to continue to find more information about the entrepreneur and start-up to determine if they would be a worthy case study participant. Participants were selected based on the research developed in the theoretical background. The entrepreneur had to satisfy both environmental and social dimensions, giving our research the best opportunity to explore Sustainable Entrepreneurship theory in a real life practical business sense.

‘Cold’ emails were sent out to the businesses that had the best ‘fit’ with our theoretical background and research objective. The participants who replied to the initial ‘cold’ email were most probably going to be interviewed, as the number of respondents who had time to partake in the research was limited.

#### 3.3.3 Interviews

Four out of the five interviews were conducted via the virtual communication tool, Skype. The other interview was conducted in a face-to-face meeting outside the participant’s office. Initial contact was made through email, specifying our goal to speak with the founder(s), owner(s), or CEO. A customised
email address was created to offer greater credibility to our research, with the objective to increase the response rate and interest from the contacted businesses. Within the email, the research objective, company selection reasoning, and the entrepreneur’s requirements were explained. Upon receiving acceptance to participate in the research, Skype addresses were exchanged and an agreed interview time was scheduled. The duration of each interview lasted between 60-75 minutes.

3.3.4 Sample Choice
To provide meaningful case studies, research was aimed at entrepreneurial start-ups generally recognised as successful. In all cases this means that the entrepreneur, or their start-up have been elected and honoured with national and international awards concerning sustainability, innovation, social and environmental value, as well as entrepreneurship. Permission was granted from our participants to record the interview, allowing for greater data analysis and detailed transcripts to be written.

3.4 Secondary Data
Secondary data included a wide variety of academic sources, and included both qualitative and quantitative data. Journal articles, published books, industry related websites and material received from the participants themselves (product brochures, business plans).

3.5 Data Analysis
We collected data from five case studies, making this a multiple-case study research. To provide valuable empirical analysis, we conducted cross-case analyses. Cross-case analysis enhances generalisability, which allows deepening understanding and explanation (Miles & Huberman, 1994). We have used a mixed strategy approach for our data analysis. This mixed strategy is for one part case-oriented according to Yin’s (1984) replication strategy: studying one case in depth, followed by successive cases to identify patterns found matches with previous cases. Furthermore, we have used the variable-oriented strategy (Miles & Huberman, 1994) to look for themes that cut across our cases and locate recurring themes.

3.6 The Quality of the Results
To assess the quality of this research and its results, we will discuss objectivity, validity, reliability and generalisability - key quality criteria elements of qualitative research.

Objectivity examines if the researcher has been “explicit and as self-aware as possible about personal assumptions, values and biases, affective states” (Miles & Huberman 1994, p.278). Moreover, the issue here is whether the study is replicable by others. To ensure objectivity we have included in the appendix each set of customised interview questions. The questions are leading questions, for the purpose to have an open, semi-structured interview.

Validity has no single agreed upon definition. In general it refers to whether research findings make sense, are credible, accurate and most importantly, results are consistent. It can also be considered a truth-value that is often assessed with reliability. Warner (1991, cited in Miles & Huberman, 1994) also speaks of ‘natural’ validity - the idea that the events and settings studies are uncontrived, unmodified by the researchers presence and actions. As our research contains only five case studies, a small sample size, external validity may be argued as a dilemma. As authors of this study we have made a conscious effort to construct transferable theory from the research, to be applicable to other settings of different contexts, nature and time. (Miles & Huberman, 1994). Miles and Huberman (1994, p.278) underlie the issue of reliability, determining whether the “study is consistent, reasonably stable over time and across researchers and methods”. Reliability is a means of quality control. Interview questions were written to ensure relevancy to the study design. Moreover, a teacher review was conducted before questions were...
asked to participants. The formulated questions hold no restraint over future repeated studies and are adaptable over different points in the same time and over time.

Generalisability is also known as external validity, transferability, and fittingness. The term is a statistical framework, which refers to the applicability of research findings across other contexts. Firestone (1993 cited in Miles & Huberman, 1994) suggests three levels of generalisation: from sample to population, analytic, and case-to-case transfer. We consider that it is difficult to propose generalisability, as our exploratory research is not congruent with any other prior practical study. However, findings of this research proposes interesting insights to transferable case studies, and would be very much possible. Entrepreneurs considering exploring ‘green’ business ideas, especially in the renewable energy industry, would value such research. This thesis provides insights for researchers extending the current sustainable development research into a practical sphere. Moreover, Entrepreneurs exploring sustainable business ideas, either social or environmentally, would value such research.

3.7 Renewable Energies

To be able to answer our research questions, we have chosen to focus on second-generation renewable energies - wind and solar energies and technologies - providing off-grid energy solutions. The reason to do so was based on our assumption to find a high number of entrepreneurial start-ups who aim to solve a sustainability-related problem. Even without advanced knowledge about the energy industry, one can easily understand that current practices of extracting and burning fossil fuels is unsustainable. Such practices emit high amounts of CO2 that is believed to have an impact on global warming. Also, the extraction of fossil fuels is highly inefficient and environmentally unfriendly. Moreover, these resources will run out at a certain point in time, making them highly unsustainable. Renewable energies offer means to solve and counter some of these problems, producing energy in an environmentally and socially responsible manner, decreasing CO2 levels and solving issues like pollution, and creating accessibility to affordable clean energy. Currently, wind and solar energy are advancing rapidly in the industry life cycle. Some of the first wind energy pioneers are now established incumbents (i.e. Danish incumbent Vestas) providing energy to on grid customers. As the industry life cycle predicts, new entrepreneurial innovations should be ready to grasp the opportunities left open by incumbents. One of these niches is the off-grid energy market, which allow individuals, companies, communities and social environments in rural and urban setting to be self-sustaining in terms of energy supply. Our case studies are all to be found in this niche. An extensive overview of this industry can be found in the appendix of this report.

4. Empirical Data Analysis
This study entails an empirical analysis of five renewable energy companies. The analysis aims to answer our research questions and to provide a good practice for future sustainable energy companies. For the purpose of this chapter, we refer to the business/company name as synonymous with the entrepreneur. As we interviewed the founders, owners and CEO’s for the cross-case analysis, we consider any business/company strategy to be directly linked to that of the entrepreneur’s motives and decision-making practices.

4.1 Case study companies

All entities aim to supply off-grid electricity, both fixed and mobile technologies, to both residential and commercial customers, in rural and urban environments, by means of wind and solar power. Table 4.1 presents a short overview of the five case studies our research has investigated. Further details concerning the companies this research studies can be found in Appendix 2.

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Type of Renewable Energy</th>
<th>Business Development Stage</th>
<th>No. Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powerhouse Wind</td>
<td>Dunedin, New Zealand</td>
<td>Wind (Turbine)</td>
<td>Prototype - in search of investment</td>
<td>4</td>
</tr>
<tr>
<td>The Archimedes</td>
<td>Rotterdam, Netherlands</td>
<td>Wind (Spiral-turbine)</td>
<td>Expecting first deliveries in July 2012</td>
<td>4</td>
</tr>
<tr>
<td>Solar Sisters</td>
<td>Bristol, USA</td>
<td>Solar Mobile Products</td>
<td>Fully operational</td>
<td>15</td>
</tr>
<tr>
<td>Cleanfield Energy</td>
<td>Ontario, Canada</td>
<td>Wind (VAWT)</td>
<td>Fully operational</td>
<td>11</td>
</tr>
<tr>
<td>Urban Green Energy</td>
<td>New York, USA</td>
<td>Wind (VAWT) &amp; Solar</td>
<td>Fully operational</td>
<td>150+</td>
</tr>
</tbody>
</table>

Table 4.1: Case study overview

The Archimedes is a Dutch R&D driven urban wind company founded in mid 2006. The small start-up is the owner and developer of The Archimedes BV, a 1.5kW and 2.0kW urban wind turbine. Messrs Mieremet and Richard Ruijtenbeek founded The Archimedes, with financial support from the Dutch government (SenterNovem). The company’s turbines are sold to produce “clean” energy for households and businesses. The products are based on the 3P principle and products are calculated on the total cost of ownership by which the best possible eco-balance with life-cycle assessment is delivered. Richard Ruijtenbeek has been Innovation Manager for the city of Rotterdam, engaged in public environment, climate neutral parking space, floating cities. Ruijtenbeek is also a seminar speaker for congresses and workshops concerning green and sustainable development, specialized in the Triple Helix, combining government, business and knowledge institutes.
Co-founders Mihail Stern, Alexander Trica and Toni Verrelli established **Cleanfield Energy** in Canada in 2002. The company is a subsidiary of Cleanfield Alternative Energy Inc., which is listed on the TSX Venture Exchange. **Cleanfield Energy** technology focuses on the research, development and distribution of renewable energy solutions for the urban environment, specifically in commercial settings. The company possesses inverter technologies, which it currently sells as a complete sustainable solution with its 3kW VAWT, packed in new industrial building projects. The company's vision is to be recognised as an international leader in supplying high quality and innovative, renewable energy solutions to markets globally. Toni Verrelli has been the President and Director of Cleanfield since 2002. Verrelli has been involved in the renewable energy industry for the past ten years and the environmental industry since 1995. Verrelli is a member of the Canadian Wind Energy Association, Small Wind Committee and the recipient of the 2009 Scotiabank ICCT Environmental Leadership Award.

Mr. Bill Currie founder of **Powerhouse Wind** is a New Zealand based developer of small-scale wind turbine technology. The company is in the processes seeking investment to support pre-commercialisation of the company’s first commercial product, the Thinair 102. The Thinair 102 is a 2kW rated, one blade wind turbine designed for domestic and small-scale commercial use. **Powerhouse Wind** has successfully designed, built and tested first prototypes and second-generation field test units, secured provisional sales for pilot commercial production and testing, and have received significant interest from international distributors and manufacturers. Currie has always had a strong personal interest in wind turbine solutions, and has a long-standing belief in local energy solutions and “living in the cycle of what the sun delivers”. Currie views the development of **Powerhouse Wind** a “personal and societal challenge”.

Ms. Katherine Lucey established **Solar Sister** in 2009. It is a non-profit start-up targeting a market driven business model. **Solar Sister** eradicates energy poverty by empowering women with economic opportunity. **Solar Sister**s combine the breakthrough potential of mobile solar technology with a deliberately woman-centred direct sales network to bring light, hope and opportunity to the most remote communities in rural Africa. Using an Avon-style distribution system, **Solar Sister** creates access to clean energy technologies, which replaces the dependability on burning kerosene, and allows children to continue to learn when it gets dark and families to socialise and entertain without breathing in toxic fumes. **Solar Sister** provides ‘entrepreneurial’ African women with a ‘business in a bag’, a start-up kit including inventory (full range of mobile solar products), training and marketing support. The women become their own boss, selling environmentally friendly light solutions while creating sustainable businesses that are profitable. Lucey started the non-profit start-up after a 20-year career as an investment banker. Lucey retired from banking and turned her attention to finding a sustainable solution to the energy poverty that causes suffering to a quarter of the world’s population. Lucey determined that a practical, grass roots, locally generated solution was needed.

Mr. Nick Blitterswyk founded urban Green Energy (UGE) in 2007. **UGE** is an international wind turbine supplier and designer of vertical axis wind turbines (VAWT’s). **UGE**’s focus is on providing high performance, high quality, and attractive urban energy renewable products to customers around the world at an affordable price – **UGE** listens to the customers (both B2B and B2C) needs and develops problem-solving solutions. A recent partnership with General Electric (GE) has put **UGE** on the map and is now considered a serious contender in the small wind energy industry. The company has grown fast and has installations in approximately 60 countries, including with several government agencies and Fortune 100 companies. **UGE** is a market leader in the small wind turbine industry. The company has combined solar power as a complimentary energy source within its range of wind products. The combination of both wind and solar energies has been implemented as rechargeable electric vehicle station units. Blitterswyk, co-founder, grew up on Vancouver Island in Western Canada where his parents were the caretakers of a nature reserve. Two years after his graduation from college, in 2006, Blitterswyk was becoming increasingly dissatisfied with the renewable energy industry. Blitterswyk set out to challenge the
conventional mentality and make industry-leading innovations that are raising the standard for renewable companies all over the world.

4.2 Exposure to a Need for Change

What is evident throughout the five case studies is that all our entrepreneurs have encountered some sort of antecedent exposure to an environmental concern; leading to our belief that prior exposure to a sustainability related issue has resulted in these entrepreneurs to pursue their business initiative.

Firstly, Currie - co-founder of Powerhouse Wind - stated, “I noticed the outlook on the energy supply side was not good”. Currie previously worked at a geothermal power station, on the North Island of New Zealand. He considered this a defining period which exposed him to the need for greater sustainability, and self-sufficiency, regarding energy consumption. It was evident throughout the interview that his time at the power station exposed him to green energy production that seeded his thought for developing his own small wind turbine business.

Secondly, Lucey was exposed to a need for social change during her time as Chief of Operations for Arzu Inc., a non-profit organisation working to empower women in Afghanistan, providing employment and social benefits. “During my professional career, I got insight into the fundamental need for sustainable energy, which is widely available” - “I saw what it means when a house does not have any access to light, it limits your capabilities” Lucey said. This was Lucey’s eye opening exposure, supplying light to individuals to better their lives. When asked about why she was drawn to supplying transportable light products to developing nations and targeting women specifically, she said, “a small change can have a huge positive impact”. Ms. Lucey was exposed to both the need for women empowerment with the solution being access to clean light renewable solar light. The combination of empowerment and sustainable energy lead her to pursue an innovative business model - a market based approach.

Thirdly, Verrelli has been involved in the renewable energy industry for the past ten years and the environmental industry since 1995, seven years prior to the establishment of Cleanfield Energy. When asked about his sustainable angel investment background in sustainability, he stated, “It was a magazine which focused on environmental issues and policies” - “Back then in the mid 90’s, when the environment was not on top of mind, however, I started developing a strong passion for the environment, and I saw this was only going to get bigger and more important as the years go along”. It is evident that Verrelli’s experience in the magazine ignited a spark to get involved with renewable energy and start a business that had a fundamental objective to change the environment. Verrelli also noted, from a business standpoint, “My family was in the construction industry as builders, so I always had the entrepreneurial background, understanding construction, understanding what an entrepreneur has to go through. So coupling that with my marketing background and passion for the environment that how everything came about”.

Fourthly, Ruijtenbeek’s exposure to the importance of the sustainability of the environment can date back to his university bachelor degree in Project Management and Build Environment. He also has been Innovation Manager for the city of Rotterdam, engaged in public environmental issues. Ruijtenbeek’s notes that his co partner, who was an engineer and inventor “came up with the idea and we’re friends so we joined each other”. His exposure to a need for change was supported by his social capital, with his co-partner and their desire to build a product that would allow “everybody to have cheap electricity around the world”.

Lastly, Blitterswyk grew up on Vancouver Island in Western Canada, where his parents were the caretakers of a nature reserve. Ever since, Blitterswyk has been passionate about preserving the beauty of the Earth. He actually classified his parents as ‘hippies’, instilling an environmentally conscious mindset from his early years growing up. Two years after his graduation from college, in 2006, Blitterswyk was uncomfortable at his present job - an actuary for JP Morgan Stanley - and decided to start UGE as a side
During the first week of work… something was missing” he said. Becoming increasingly dissatisfied with the renewable energy industry, Blitterswyk set out to challenge the conventional mentality and make industry-leading innovations that would raise the standard for renewable companies all over the world. When Blitterswyk referred back to his old job at JP Morgan Stanley, he was disappointed that his role was not changing the world, “Not making a difference - what’s missing here”. It was evident throughout the interview that Blitterswyk always had a strong passion for the environment, and the start-up of UGE is the result of this life long appreciation for sustaining the Earth’s biodiversity.

Concluding, this analysis indicates the likeliness that a Sustainable Entrepreneurs’ prior exposure to a sustainability related issue has a high positive influence upon starting their entrepreneurial initiative. These exposures can take various forms. Some of the entrepreneurs in this analysis grew up in an environment with a great appreciation for natural environmental concerns. Others, developed prior knowledge to sustainability related issues in their working experiences. This finding is in accordance with various earlier research literature. Firstly, Shepherd & Patzelt (2011, p. 152) state “Attention is often directed to aspects of the environment based on the individual’s prior knowledge (Rensink, 2002) and motivation” (Tomporowski & Tinsley, 1996). Shepherd & Patzelt (2011) name this ‘focused attention’. This understanding is in accordance with research by Shane (2000), who found that entrepreneurs discover opportunities related to the information that they already possess. Inline with previous research, this analysis indicates that prior knowledge to a sustainability-related topic (environmentally or socially) leads to a focused attention, which contributes positively to some individuals discovering and pursuing opportunities that solve sustainability-related problems. Prior knowledge is closely related to the development of motivations, therefore the next paragraph will analyse the motivations of Sustainable Entrepreneurs.

4.3 Motivations

Deriving from their early exposure and awareness to a need for change the entrepreneurs interviewed have developed strong motivations to make an environmental and/ or social change. Our analysis has confirmed this is a reoccurring theme, presented within the five entrepreneurs. The previous paragraph has presented the entrepreneur’s backgrounds and exposure to environmental and social issues, which we will discuss shortly.

Currie saw a need to change the way energy was being consumed; he wanted people to be able to generate their own energy - off-grid solutions - and move away from the reliance of coal burning stations. When questioned about why he decided to pursue off-grid wind technology he said, “It seems like a really interesting challenge… a personal challenge… a societal challenge”. Currie went on to explain, “Energy companies are keeping people as ignorant as possible about their power, I think we’re just getting to the stage now of understanding where it is coming from and how better we can use our energy”. Furthermore, he determined that as the price of power continues to increase, ‘people are becoming more motivated to look to renewable energy sources and producing their own electricity’. Here we note that Currie was heavily motivated by a challenge to introduce an innovative product and allow customers to take greater ownership of their energy production and consumption - great self-sustainability.

Looking at Ruijtenbeek’s motivations - he states, “We believe that everybody has the right for cheap energy and if you want to you can live off the grid. Our mission is to realise this”. It is clear he is driven with the Sustainable Entrepreneurship motivations one should expect. Moreover, Ruijtenbeek states he and his co-founder started the company with the goal to provide this energy across the globe, not only in the Western world but also in Africa and other developing countries. The engineers have developed plans to manufacture a cheap turbine using recycled materials targeted at the developing markets. Verrelli’s motivations are a combination of benefiting the environment and becoming a successful entrepreneur: “It
was an opportunity to leave a legacy behind. As an entrepreneur, I was driven to be successful, take care of my family. I saw an opportunity to benefit myself financially and help the environment and people, it is a combination”. Verrelli was motivated as he saw he could “empower people to produce their own power”. Moreover, Verrelli conducted various surveys and market research before he started **Cleanfield Energy** with his co-founders, which led him to see his motivations could be realised from both an environmental as well as a business perspective by means of VAWT’s.

As has become apparent in the previous chapter, Lucey developed strong motivations for social change during her professional career. While working in Afghanistan and Africa she saw with her own eyes how small changes can have big impacts, “It is not until you get to live without electricity when you understand the need and the opportunities it gives you, if you have power”. Lucey explained to us how 1.6 billion people on the earth do not have access to electricity and that 70% of this figure concerns women and girls. “They burn candles and kerosene for dim, unsafe, unhealthy light,” she said. Moreover, the families which Lucey targets need to pay up to 40% of their income on kerosene to get access to light, a greater percentage of the family income in comparison to the Western developed world. “We want to disrupt this pattern” states Ms. Lucey, when asked about her motivations, determined to make a positive effect with her non-profit initiative.

The CEO of **UGE**, Blitterswyk, said he had a real desire to work in clean technologies as he saw there is a need for change, deriving back from his environmental background. He combined his business skills with his passion, successfully launching the VAWT. Moreover, it is not just his passion. Blitterswyk has been able to make this a dominant aspect of the company culture, “Within the company there is this common mission of making the Earth a better place”.

Leading from this analysis, it is evident Sustainable Entrepreneurs are highly motivated to solve environmental and/ or social related problems (sustainability-related problems). The development of these motivations can be linked to the prior knowledge (Shane, 2000) and focused attention (Shepherd & Patzelt, 2011) these individuals have gathered. Sustainable Entrepreneurs have developed strong motivations to solve sustainability-related problems, which increase the likeliness for such an individual to exploit an opportunity that aims to solve these sustainability-related problems. As introduced in our theoretical background, environmentally degrading market failures have been increasingly connected to Sustainable Entrepreneurship (Dean & McMullen, 2007; Cohen & Winn, 2007; Hall & Vredenburg, 2003; Hart & Milstein, 1999; Hart & Christensen, 2002; Senge & Carstedt, 2001, among others). The notion is that Sustainable Entrepreneurs identify and exploit economic opportunities that are present in environmentally and socially degrading market failures. Therefore, we argue a Sustainable Entrepreneurs’ prior knowledge and focused attention increases both the likeliness to identify a sustainability related market failure, and motivations to solve these.

### 4.4 Balancing The Triple Bottom Line

The various theories and definitions on Sustainable Entrepreneurship have incorporated the TBL as an essential element, arguing that Sustainable Entrepreneurship aims to implement an equal balance of the TBL dimensions. This paragraph will analyse to what extend a TBL balance is predominant in the case studies of this research, looking at internal practices as well as the external market impact. It will start with analysing non-profit Solar Sister, then the for profit wind energy companies to follow.

**Solar Sister**

**Solar Sister** is an enterprise distributing compact mobile solar powered light products (i.e. lamps, torches, reading lights). Being a non-profit Solar Sister has a heavily weighted focus towards the social aspect, benefitting families and communities in rural Africa, with an indirect benefit to the environment, something that may not be so obvious at first sight. When asked how she perceives her entrepreneurial
behaviour Lucey said, “I consider myself to be a social entrepreneur”. The non-profit identity does not mean there is no concern about the economic aspect: “(Lucey’s) Our goal is to have a financially sustainable program...it is market based. There is no giving away of anything. This allows us to reach more people and scale it (the organisation) up”. Even though Lucey has a high focus on the social impact, it is one of the most well balanced ventures concerning the TBL. Firstly, the innovative business model allows women in rural Africa to start their own business, generating a sustainable and self-fulfilling income. Secondly, it allows people who have limited or no access to electricity and light to acquire a clean and durable product, which provides a renewable source of light, and the ability to charge phones or connect small electrical devices. Third, it replaces need to buy and burn (expensive) kerosene to produce light – a habitual process. Burning kerosene is certainly not environmentally friendly, nor is it sustainable. Solar Sister aims to disrupt this conventional habit, as the Solar Sister entrepreneurs sell environmentally friendly products with both social and environmental advantages coupled together. Lucey highlights another social impact, stating, “Much of the income our entrepreneurs create goes into school fees”. This direct re-investment into their children’s education is a clear indication and evidence of a social benefit, with both short-term and long-term benefit.

Concluding, Lucey has a strong focus on social improvement, and she considers herself to be a Social Entrepreneur. However, analysing her initiative it becomes clear Solar Sister has high economic (for society) and environmental impacts as well, making Solar Sister the most balanced business concerning People, Planet and Profit. However, from our theoretical background it derives that Sustainable Entrepreneurs are for profit entrepreneurs (Crals and Vereeck, 2005; Cohen and Winn, 2007; Dean & McMullen, 2007; Choi and Gray, 2008; Hockerts & Wüstenhagen, 2010; Schaltegger & Wagner, 2011; Shepherd & Patzelt, 2011). This leads to the conclusion that non-profit organisations and thus Lucey, is not a Sustainable Entrepreneurs. Despite this, we make the notion that non-profits like Solar Sister, who work with a market driven approach, are very beneficial in generating sustainability.

Wind Energies
During our analysis we noticed the wind energy companies have a foremost focus on the environmental impact due to the nature of their product(s). Moreover, two resounding aspects shone through - empowering people to produce their own clean energy and to solve a customer initiated environmental problem - a solution based approach. Both Currie and Verrelli were heavily motivated to empower individuals to produce their own clean electricity. Ruijtenbeek has similar motives, aiming to provide affordable renewable energy across the globe. Their core business strategy is in a sense an environmental objective. They understood that if they were to be selling environmentally friendly products, they had to be seen in the public eye as acting environmentally friendly. Currie mentioned that once the business was up and running he wants to, ‘Provide people transparency into the products embodied carbon, and embodied energy’. Moreover, Currie stated, “With a product like this you have to do the right thing, and be seen doing the right thing”. The development process of the Powerhouse Wind product - Thinair 102 - highlights the importance to produce a machine that is maintainable, has a long life and has consideration into the unit’s total life cycle costs. The Thinair 102 is a modular innovation design, enabling the user complete ownership and control of the machine.

Blitterswyk is heavily focused on solving environmental problems, offering customer solutions, instead of pitching a product, which most wind turbine manufacturers do. As mentioned above, Currie and Verrelli are driven by the environmental objective to sell small wind turbine units to individuals (residential and commercial), with the goal to provide of-grid energy solutions. Blitterswyk’s environmental objective is different. Blitterswyk sells his wind turbines to three key customer groups - residential, commercial and institutional. An effective strategy Blitterswyk uses is to offer green environmental solutions to the telecom industry, local governments (outdoor lighting), emerging markets and electric vehicle recharging stations - a combination of both wind and solar technology (partnership with General Electric).

When asked about his TBL balance, Blitterswyk stated, “Within the company there is this common mission of making the Earth a better place” - “I want to say their all equal” - “Start a company with the
right mission and make it successful, that’s the best I can do”. Even the company's slogan states ‘Be
great, be green and have fun’.
UGE’s manufacturing plant is based in Chendge, outside Beijing, China. Upon visiting the plant
Blitterswyk encountered that there was no waste management processes implemented. Blitterswyk was
shocked by this and later discovered that it was quite common in China to actually bury the trash, even
recyclable material. “This is not what we are about” he said after realising that the plant had no recycling
stations installed. He later contracted a recycling company to pick up the trash and dispose of it in an
environmentally friendly manner. UGE has employed a full time sustainability specialist to ensure
internal and external operations are conducted with the environment in mind. UGE has a green team,
focusing on sustainability related issues. Blitterswyk makes a concerted effort to instil an environmentally
conscious working environment, stating, “We are always looking at ways of how to be greener and so
on”. The UGE headquarters in New York took part in the 42nd annual Earth day. Limiting the use of
disposable (polystyrene) coffee cups, re-using or eliminating plastic bags, reducing the office total trash to
one bag and conserving energy by turning off unnecessary electronics. This is not only an environmental
benefit, but encourages a corporate cultural – social dimension – to own greater personal awareness of
acting with the environment in mind. We consider Blitterswyk to be quite environmentally conscious with
a number of effective tools implemented in the company.

If we look at how the social dimension resonates throughout the wind energy companies, our analysis
demonstrates that it is the least developed lever of the TBL. It is evident that the wind energy companies,
social concerns are by no means as great as Solar Sister. Several wind energy companies’ demonstrate
and implement social concerns but it is not their most important focus. We noticed, as these companies
are just starting up, they focus their attention to their core strategy and product development, which are
the economic and the environmental concerns. As UGE is the most developed company, it is more
apparent that as they continue to grow and expand, they have shifted focus to deal with implementing
various social aspects and benefits within the business objective. We determine that the direct social
impact these companies have is rather weak during their start up phase, however as the companies
develop and become profitable businesses they start to balance the TBL more equally. Apart from
actively engaging in providing social benefits, we argue they are indirect social impacts linked to the
business activities of the wind energy companies. These derive indirectly from improving the
environment, which aim to make the world a better place to live, decreasing greenhouse gases and
pollution, educating the public, which all provide benefits to society.

So far we have argued that the wind energy entrepreneurs mainly focus on making environmental
impacts, where social impacts are rather implicit. However, what are the economic dimensions? What are
the financial motivations for each entity? – The main objective for the wind energy companies is to
realise a profit, maintaining security for future endeavours and longevity of the business itself.
Blitterswyk explains the importance of making a profit: “To make the business successful you need to
make a profit. You cannot scale up and make a real difference if you do not make a profit”. Blitterswyk
aims for growth and knows he needs a solid base and black figures to do so. During our interview it
became apparent he has a very high drive to succeed: “I have never been paid a salary here. I just love
what I do”.

Analysing Cleanfield Energy’s CEO, Verrelli’s view on this matter, he wants to be successful with his
business. And to be successful, Verrelli aims to generate profits. As can be read in paragraph 4.3, he saw
an opportunity to benefit himself financially, along with helping the environment and people. The other
entrepreneurs replied correspondingly regarding profit making. Ruijtenbeek expressed profits are
important after a long start-up phase and R&D investments: “We have worked for five years,
bootstrapping and investing our own money into the business. So it is not only about sustainability but
also about making a living and being able to invest back into the company.” Currie argues likewise.
Being still in the pre-commercialisation stage, he highly values the aim to establish a profitable business:
‘Making sure the business survives is the first thing you have to worry about’. However, he acknowledged quick return on investments is not his aim but ‘Ultimately we have to be profitable’.

### 3P Balance

The main focus for the wind energy companies is to make a profit, followed by an environmental impact, whereas their social impact is less evident and considered to be implicit. UGE, being the fastest growing and well-developed company of this analysis, has put most efforts in realising a TBL balance. UGE strives to create a pleasant, fun, and lively working environment (organisation culture and labour practices are social dimensions). Employees participate in social events and extend their infectious environmentally conscious practices within the surrounding community.

Despite UGE’s internal social examples, the direct social impact the wind energy companies make is rather indirect. The companies interviewed mainly aim to solve environmentally related problems, disrupting the usage of fossil fuels and decreasing pollution and emission of greenhouse gases. This will indirectly cause these companies to make the world a better place to live, ensuring sustainability of our planet. Although the wind companies were unable to realise an equal balance between People, Planet and Profit we argue as they develop and grow and become stable they shift their attention to creating a greater balance. Solar Sister has a strong focus on social improvement, and Lucey considers herself to be a Social Entrepreneur. However, analysing her initiative it becomes clear Solar Sister has high economic (for society) and environmental impacts as well, making Solar Sister the most balanced business concerning People, Planet and Profit. Still, Solar Sister is a non-profit organisation, wherefore the firm does not adhere to the various definitions of Sustainable Entrepreneurship.

From our analysis we conclude that, depending on the core product, a Sustainable Entrepreneur will focus the sustainability concerns towards one area. Which is environment in the case of these renewable wind energy companies. This understanding is in line with Hockerts & Wüstenhagen (2010) who state that such entrepreneurs will invest all their resources and attention in optimising one particular environmental or social issue. Reasons for this are the limited resources, which is inline with our analysis. Despite these findings, Hockerts & Wüstenhagen (2010) state that a Sustainable Entrepreneur will set social and/or environmental objectives at least as important as economic objectives, which is contradicted by our analysis. We conclude that the highest concern for a Sustainable Entrepreneur is to become and remain profitable. This is important as start-ups often face financing difficulties. Without the outlook of running a profitable business, the whole aim to solve a sustainability-related problem is useless as the entrepreneur’s solution by itself becomes unsustainable. Therefore, this analysis indicates that a Sustainable Entrepreneur values the economic dimension (company turnover and profit) highest, as it guarantees the ability to realise the individual motivations to solve a sustainability-related problem, being either social and/or environmental. In other words, although a Sustainable Entrepreneurs’ individual motivation is to solve a sustainability-related problem, social and/or environmental, the main (first) goal is to make a year on year profit, which guarantees the sustainability and longevity of the business, and thus the ability to realise the sustainability motivations. Moreover, as Sustainable Entrepreneurs develop their businesses and become profitable overtime, they will shift their focus towards creating a better balance of the TBL.

The above analysis paragraphs have given valuable insights into the characteristics of Sustainable Entrepreneurs. This and subsequent paragraphs entail challenges Sustainable Entrepreneurs face.

### 4.5 Financing

Our cross-case analysis revealed that four of the start-ups had difficulty with finding the right funding, which is not exceptional for any other start-up. Only Solar Sister did not face this challenge as it receives capital from a social funding program initiated by a multinational enterprise. The profit driven start-ups used bootstrapping strategies and managed to attract government funding. Obtaining third party funding
was a difficult challenge. Our analysis indicates that external third party investors are cautious regarding investing in sustainable initiatives due to the long-term perspectives these start-ups pursue and therefore slow unattractive return on investments (ROIs). Currie exemplifies this: “Our business would take two years to become profitable – on a high-risk investment – it was hard to change the Angel Investor's mindset”. So far, Powerhouse Wind has not been able to acquire external funding, outside their initial government grant, and has relied on bootstrapping: “We have had to fund our start-up out of our own pockets and with our own free time”. Ruijtenbeek faced similar problems: “At our start we had a kind of naïve view. Believing in our product, we thought funding would not be very hard. We completely underestimated how hard it was going to be, to raise investments”. Moreover, one of the early investors withdrew during the 2008-2009 crisis. Cleanfield Energy also had difficulties with acquiring the right amount of capital at the right moments. Verrelli and his co-founders’ strategy aimed for significant growth, taking the company public in 2006 was a logical step. “A major challenge is finding the right funding and the right amount of money. When you don’t have capital, raising money is very challenging. When you do have capital you got to get out there and raise more capital”.

From our analysis, it became apparent that Blitterswyk was the entrepreneur with the least difficulties financing his business. However, Blitterswyk did use bootstrapping techniques. Firstly, Blitterswyk’s prior work experience at JP Morgan Stanley – a global leader in financial services – is clear evidence of someone who is proficient with numbers and understands risk. Secondly, Blitterswyk was able to leverage his own personal network into a competitive advantage. With his wife, and mother-in-law (co-partners) being Chinese citizens this facilitated the establishment of a manufacturing plant in Chendge, China. UGE actually pays no leasing fees for this commercial property, a considerable advantage lowering overheads. Moreover, UGE was given a Chinese government grant to help speed up production. “Without my family connection in China, it would not have been possible what we've done”, stated the entrepreneur. One can thus argue that without this advantageous network, UGE would not have had the immediate success other entrepreneurs may wish for.

This analysis shows that, like many entrepreneurial start-ups, external financing is difficult to attain. Shepherd & Patzelt (2011) elaborate it could be that financiers use different policies towards Sustainable Entrepreneurs, however much research remains to be done on this topic. This analysis slightly indicates that, due to their long-term focus and high risks, Sustainable Entrepreneurs have higher difficulties in obtaining external financing. This is in accordance with findings of Lovdal and Neumann (2011) who suggested that entrepreneurial firms in the marine energy industry, another renewables niche, are more dependent on specialised investors, as these have higher knowledge regarding renewables, and thus are better to evaluate the return on investment risks.

4.6 Breaking through Customer Unawareness

Our analysis has discovered that it is challenging for our entrepreneurs to break through established customer perceptions. Its determined that potential customers need to be educated about the many implicit and explicit benefits these product have. Ruijtenbeek explains: “Our customers mainly buy our product because of the looks, they prefer a turbine that produces less energy as long as the looks are better. So they do not buy because of sustainability, they do not care, which has really shocked us.” Ruijtenbeek also said he found it challenging to persuade customers with a stable net, as they take the electricity they use for granted. “A lot of customers, with a stable energy net, do not mind where they get their electricity from, as long as they can watch their soccer games on TV and can live as they are used to do”. It appears only a limited percentage of the (Western) population is willing to pay for sustainability 1) 50 years plus customers, 2) highly educated customers interested in green or sustainable living, 3) people who already have a green mindset.” Looking at the total population Ruijtenbeek admits this is a very low percentage.
Verrelli also acknowledges that environmental issues are new for a lot of people. On Greenfield Energy’s website Verrelli states: “It’s certainly a new topic for a lot of people”. He also believes people are increasingly becoming aware about what renewable energy products can do. Verrelli is especially positive regarding the youth generation and their greater awareness of environmental issues. He notes, due to their tertiary education and the fact they are growing up with turbines makes a considerable differences. “One turbine may only eliminate a certain amount of greenhouse gas. However, people see a turbine, which creates a great awareness and it educates. It may not affect a person in their current 30s or 40s, or older, but it does affect the youth”, explains Verrelli. “The youth is growing up with turbines. That is what is happening, and you feel good about that. Kids today understand renewable energy, they understand wind. They do science projects concerning wind, to me that is a good feeling.” Therefore, Verrelli is very confident about the impact wind and other renewable energies are going to have in the future. “With the current education system (referring to Canada) it is going to be easier to make a difference in the world in the near future.” Verrelli ends his assert with a strong statement: “It is tough for today, but it is here for tomorrow.”

From these two cases we can understand that the small wind turbine industry is a difficult emerging market to be in. However, the entrepreneurs are confident about the rising awareness that change is needed.

UGE has been confronted with this issue as well. Although, Blitterswyk believes moving away from technical specs and adopting a customer-focused approach can take the unawareness away for a great part. Combining the VAWT with solar energy is an important step for this as well. “One might ask how many products do you have? I can list a dozen different things. But what I would say now is that we have three solutions, targeting telecoms, residential’s and institutions (energy generation and outdoor lighting),” explains Blitterswyk. Blitterswyk seems to understand his market very well: “I really focus on solving a problem when pitching the product. I think as much as a customer likes to have a product, they do not want to buy the product as much as they want a solution,” elaborates Blitterswyk. As an entrepreneur the company and himself have evolved into this: “This year, at our first meeting in January, we set the strategy to focus on solutions, what we call ‘delivering happiness to our customers’. Making sure what we’re doing makes a lot of sense”.

Our case study companies operate in a young market and aim for customers who are difficult to persuade. The case studies indicate Sustainable Entrepreneurs have to breakthrough a certain unawareness level of the current market regarding the need for change and better ways to use the resources available.

Breaking through a certain pattern and making people aware of alternatives is challenging. Not only was this evident for the wind energy companies, but also a similar challenge arose for Solar Sister. In rural Africa the woman are the ones responsible to buy kerosene at the local market, used to generate light. The women have the buying power to make a change, although Lucey found it difficult to sell the idea of a high initial cost ($15 for a solar lamp), with long-term economic benefits. “This was the behaviour we wanted to disrupt. However, there was a gap in knowledge between our (technical) product and the woman we wanted to target, as technical matters are supposed to be dealt with by man”. With the innovative approach Solar Sister has developed, the non-profit was able to break through this bilateral pattern of purchasing kerosene. Besides this challenge, Ms. Lucey had to break through the almost fixed way of how aid and non-profit organisations work, which Lucey believes do not make a sustainable and long-term impact: “There is so much aid and development, and all of them work in a similar way. Basically, they gather woman in a classroom and teach them a certain course. The women get a certificate and their done. No durable solutions or lasting effects”, explains Lucey. “This is a really strong pattern which we had to break through. We do not want to offer a training, where women go home and do nothing with what we have learned them. Offer them a business opportunity is our approach, we
are here to help but do not force it”. Lucey explains there are a lot of women who see this same opportunity and become a Solar Sister. However, the Solar Sister’s (the entrepreneur) need to have the same long-term view as Lucey does, making sure her non-profit initiative generates a lasting impact.

This analysis highlights a challenge, not yet broadly discussed in current research on Sustainable Entrepreneurship. Customer perceptions and unawareness for alternative sustainable products remain a considerable challenge for Sustainable Entrepreneurs. Keeping in mind the overall sustainable products market can be considered a market niche and one still emerging, this will very likely change over time. The entrepreneurs in our research confirm this and are therefore optimistic about an increase in customer awareness for ‘the need for change’. Dean and McMullen (2007, p. 67) underline this notion, stating “Although the market for products that are differentiated by their environmental characteristics has been rather small as a percentage of total demand, the absolute magnitude of such consumers is substantial and subject to change over time.” Another important notion made by Dean & McMullen (2007) is the lack of customer information on the environmental impacts of products, prevents them from purchasing products introduced by Sustainable Entrepreneurs. This leads them in arguing “customer imperfect information regarding product or service attributes presents opportunities for entrepreneurial action if entrepreneurs can inform customers regarding product or service attributes” (Dean & McMullen, 2007 p. 69).

Our analysis points towards a confirmation of this notion, as Blitterswyk stated that when he did his prior market research he saw other small wind companies of which he thought he could outperform them, by introducing better products and do better marketing. This also relates back to Hockerts and Wüstenhagen (2010) their concept of industry transformation towards sustainability, as explained in our theoretical background. In this process they argue that at a certain time, more business minded Sustainable Entrepreneurs emerge with start-ups backed up by professional investors. Looking at the small wind entrepreneurs we interviewed, Blitterswyk resembles this notion, due to his product and his customer focused approach where he markets his product as a solution based approach, instead of just products. However, an increase in customer awareness would be very welcome, as it could speed up the transformation of industries towards sustainability and increase the number of Sustainable Entrepreneurs to arise.

4.7 Good Practices
This chapter will look at various common or outstanding strategies and tools these companies have used to develop and grow their businesses. All paragraphs after 4.7.2 focus on UGE as we consider this start-up to be an extreme case, which derives from its rapid growth and quickly acquired market leader position

4.7.1 Patents
The four wind energy companies this research covers have introduced or are developing technological innovations, which require considerable R&D investments. Besides the actual turbine, the companies also engage in software development, which improve the efficiency and possibility to charge batteries. Blitterswyk explained he finds IP protection almost a minimal requirement if you are introducing novelties and building and developing your company. Verrelli, has applied for US, Canadian and European patents, of which the last two are still pending. He explained that patents are not only for protection, “We have been able win some bids due to our patents, so they are also used from a sales and market stand point”. Moreover, Greenfield Energy makes use of trade secrets. Ruijtenbeek explains his company focuses development: “We are a purely R&D based company. We outsource the production and we outsource the selling of our product by agents. So we own the IP, and protect it by patents”. The turbine from Powerhouse Wind is also patented, which aims to protect a novel teetering hub in the turbine according to founder Currie. According to Griliches (1990) patents have been found to be a good indicator for innovative activity as they are granted for inventions, which are novel and inventive. Also,
considering start-ups, a patent is very often the key element around which the entrepreneur sets their entire business (Stephan, 2009), as various entrepreneurs we interviewed have a still limited, narrow product portfolio, this corresponds to our findings.

4.7.2 Cooperating with Universities

Two of the companies we investigated, Greenfield Energy and The Archimedes, worked closely together with universities, staff and students. Verrelli highly values the cooperation with a knowledge institution, as his company worked together with The University of Timisoara in Romania. “Universities are great to work with. They are early technology adopters and provide a lot of valuable feedback, ranging from noise studies, aerodynamics, up till technical engineering”. Ruijtenbeek also promotes collaboration with knowledge institutions, as The Archimedes has cooperates with the university of Delft and the University of Busan. As Ruijtenbeek himself worked for the Rotterdam city council, is a teacher and an entrepreneur he values the Triple Helix, which promotes collaboration between these three groups. “Working together is beneficial for everybody. Students bring great knowledge and new insights. We aim for the result, we do not care how things get done”.

The Triple Helix epitomises that universities, industry and governments (local, state and national) can play an enhanced role in innovation and increasingly knowledge-based societies (Etzkowitz & Leydesdorff, 2000). Looking at the benefits Sustainable Entrepreneurs can deliver to society, the environment and industries as a whole, Sustainable Entrepreneurship could be the perfect aim for a renewed development Triple Helix formations. We therefore suggest that future research could focus on this matter, looking if there are examples to be found of successful Sustainable Entrepreneurship deriving from a Triple Helix, and the future potential of the Triple Helix for Sustainable Entrepreneurship.

4.7.3 Internationalisation

Born Globals are firms that adopt an international or global approach right from their birth (Madsen and Servais, 1997). Firms that are classified as Born Globals are often high technology firms, an aspect that is shared with the renewable energy industry. Born Globals can be noted as early adopters of internationalisation. Knight and Cavusgil (2004, p. 124) define Born Globals as “business organisations that, from or near their founding, seek superior international business performance from the application of knowledge-based resources to the sale of outputs in multiple countries”. Here we note that entrepreneurs are able to utilise their knowledge to leverage their business strategy towards an international objective, with the goal to sell their goods globally. Madsen and Servais (1997, p.579) define Born Globals, along the same lines as Oviatt and McDougall (1994) as “firms that seek to derive significant advantages from the use of resources from or the sale of outputs to multiple countries/ continents right from their legal birth”. It is evident to see here that both highly regarded definitions refer back to the use and application of available resources and an internationalisation strategy at the outset of business development. A key aspect of Sustainable Entrepreneurship is the ability to manage and exploit the available resources at hand; to execute their sustainability related solution. Blitterswyk’s social capital played a big role in the company’s ability to establish internationalisation. His close family network enabled him to set up a plant in China, with capacity to ship his renewable wind energy solutions globally. Moreover, unexpected, sales were international right away as well. “We expected that probably 80% of our sales would come from the US”. However, Blitterswyk highlighted that out of the first ten orders, seven or eight came for outside UGE’s home country (America). His first sale actually came from Australia. Acknowledging that customers were purchasing UGE products around the world, and valuing UGE products over other competitors, Blitterswyk realised that this was important to the development of the company and a central market strategy, he states, “Based on that, we started realising that was real key”.

Research by McKinsey & Co (1993) ‘specify this concept of Born Global, with management viewing the world as their marketplace from the outset and see the domestic market as a support for their international business’. When considering UGE, Blitterswyk did not intend to have international success so early,
although when international orders were received, and now understanding his products had international appeal, he successfully implemented a strategy to build up a distribution network across 50 countries. Being Born Global facilitated benefits for scaling up production and releasing lower production costs: “The small wind turbine industry is a small market where ‘global’ really helps, in the sense of realising economies of scale”, stated Blitterswyk. This strategy has worked out, as the company is now market leader in the small wind industry. Moreover, it grew to about 200 employees within a five-year time span. Due to its fast internationalisation UGE can be considered a real Born Global. This early internationalisation strategy has also been reported by Lovdal and Neumann (2011), earlier referred to in this analysis due to their study on entrepreneurial firms in the marine energy industry. They found that start-ups operating in this renewable energy industry, adopted early internationalisation as a strategy to overcome the need for capital and supportive political schemes, and allowed them to exploit foreign resources.

4.7.4 Organisational Culture

Deriving from the extreme case UGE, this analysis considers organisational culture development as an important good practice for Sustainable Entrepreneurs. In the field of organisational development, guiding and steering organisations through their evolution, by enhancing cultural elements that are perceived to be essential, has been a major point of interest, along with the “unlearning” of cultural elements that are viewed as unwanted (Argyris, Putnam, & Smith, 1985; Argyris & Schon, 1978; Beckhard & Harris, 1987; Hanna, 1988; Lippitt, 1982; Walton, 1987 derived from Schein, 1990). From our analysis this seems especially useful for Sustainable Entrepreneurship, where strong motivations exist to achieve sustainability, either social or environmental by means of operating a business. To make this evident, UGE has introduced various tools to enhance an organisational culture, which aims to get all ‘noses into the same direction’ for achieving sustainability. An example of this is the company slogan, “Be great, be green and have fun”. Blitterswyk, actually jokes about the order of his company slogan, sometimes saying it’s ‘Have fun, be green, be great’. Moreover, UGE’s slogan can be taken along the same line, as the slogan Google adopted in its early years, which stated don’t be evil. One can argue that many companies have sort like slogans but do not really live up to it, this seems not to be the case with UGE. Blitterswyk stated: “Within the company there is this common mission of making the Earth a better place”. The ‘be green’ and ‘have fun’ aspect really shone through to be predominantly present within the company. Blitterswyk amplified this further: “One thing is that we focus on culture, so we get people to work for us with the right reason”, stated Blitterswyk. Adding up to this, Blitterswyk referred to a video about Steve Jobs in the early 80’s, where Jobs resounds that salaries should not be the key issue when you hire new employees, they really have to work for you because of what you are, what you do and what you stand for. Blitterswyk admitted UGE is not fully there yet, however he stated, “The pay should not be the reason, they should love what they are doing and feel they make a difference”.

5. Discussion

This chapter discusses the contribution this research has made to current literature concerning Sustainable Entrepreneurship. Moreover, it will address various topics this research has found to be important and inspiring for future research.

This research contributes to the field of Sustainable Entrepreneurship in several ways. Firstly, it has provided an extensive overview of the theoretical development of Sustainable Entrepreneurship. Secondly, this research has explored the Sustainable Entrepreneurship in ‘the field’, by interviewing several Sustainable Entrepreneurs. This has given valuable insights into the Motivations and Opportunity Recognition of these entrepreneurs, the Challenges they face and various Good Practices, which Sustainable Entrepreneurs should consider when starting their business ventures. Our findings contradict
and support previously developed concepts and theories in several ways. Therefore, this research provides various building blocks for future researches to develop the still emerging field of Sustainable Entrepreneurship. In figure 2.0 the understandings of this research have been visualised.

**Fig 2.0 Key Drivers of Sustainable Entrepreneurship**

The first important contribution of this research concerns opportunity recognition and motivation development by Sustainable Entrepreneurs. This research indicates that prior knowledge and focused attention contribute significantly to opportunity recognition in sustainability-related market failures, along with the motivations to solve these sustainability-related market failures. The sustainability-related market failures concern environmental and social imperfections. These are the first important stages that give rise to new Sustainable Entrepreneurs, as can be seen in figure 2.0. These findings confirm and are in line with predictions by Shepherd & Patzelt (2011), and findings of Shane (2000), concerning prior knowledge focused attention. Moreover, it supports Dean, & McMullen (2007) their work on opportunity exploitation deriving from sustainability-related market failures.

Secondly, this research has found new insights in how Sustainable Entrepreneurs blend the TBL into the foundations of their start-ups, which contradicts previous research in several ways. Various scholars proposed that Sustainable Entrepreneurs would equally blend the Triple Bottom Line into the foundations and business objective within their start-up. Implying, the sustainable goals of the entrepreneur are equally important as making a profit (Crals and Vereeck, 2005; Choi and Gray, 2008; Hockerts & Wüstenhagen, 2010). However, this research has found the main concern for a Sustainable Entrepreneur is to become and remain profitable, above the Sustainable Entrepreneurs’ objective motivations, either social or environmental, even though these triggered the start-up initiation in the first place. Without the outlooks of running a profitable business, the whole aim to solve a sustainability-related market failure abolishes as the entrepreneur’s solution by itself becomes unsustainable. In other words, although a Sustainable Entrepreneur's individual motivation is to solve a sustainability-related market failure, social
or environmental, the main goal and ambition is to make a year on year profit, which guarantees a self-profit, the sustainability of the business, and thus the ability to make a positive environmental or social impact. When the business grows and becomes profitable, the focus of the Sustainable Entrepreneur will shift towards creating a better balance and blending of the TBL dimensions.

Moreover, this research has found strong indications that a Sustainable Entrepreneur will firstly focus on one sustainable aspect of the Triple Bottom Line, either environmental or social. The core product, process, service or solution of the Sustainable Entrepreneur, and thus the focus of the Sustainable Entrepreneur herself/his determines which dimension of the TBL will acquire the main attention. As the start-up develops and becomes profitable, the Sustainable Entrepreneur will have the ability and resources to better address both social and environmental aspects simultaneously. This leads into the blending of a balance between Profit, Planet and People, and a reconsideration of current products, processes, services or solutions. Once the blending has become internalised, and incorporated into the start-ups goods, the entity can be considered a sustainable venture by this stage. The Sustainable Entrepreneur has made, and continues making, a significant positive impact to the transformation of an industry towards sustainability. After the completion of the cycle, we suggest the Sustainable Entrepreneur will engage in addressing another sustainability-related market failure, either, diversifying product and service offerings or starting another socially and environmentally responsible venture.

**Future research**

This research has given various important and valuable insights into the development of Sustainable Entrepreneurship in theory, besides identifying challenges Sustainable Entrepreneurs face; ‘good practices’ can help Sustainable Entrepreneurs consider making important contributions towards a sustainable future. Still, there are important research topics that need to be addressed in future research. Firstly, future research could dive into the blending and balancing of the TBL by Sustainable Entrepreneurs. Next, the challenges we identified indicate it would be beneficial to increase individual awareness in the market place towards sustainable alternatives. We propose there is a major role in this challenge for governmental bodies and legislation, not only by subsidies but also by educating and informing the marketplace. Continuing on this notion, we propose that Triple Helix formations, universities, industry and government, could enhance Sustainable Entrepreneurship. Future research could investigate how this is possible and how education, business and legislations can work together, addressing and solving sustainability-related market failures.

6. **Conclusions**

This research has provided a chronological overview of how the scholarly field of Sustainable Entrepreneurship has come about. Moreover, it has mirrored previous works on Sustainable Entrepreneurship into practice, with the aim to offer various building blocks for the development of Sustainable Entrepreneurship in scientific literature. We have identified Characteristics, Challenges and have opted various 'good practices', which can help the next wave of sustainable entrepreneurs to realise their sustainable goals.

We argued that an entrepreneurial activity could only be labelled sustainable, and therefore satisfy sustainable development, if there is an equal blending of the 3Ps within the business initiative. Sustainable Entrepreneurs have developed strong motivations to solve sustainability-related problems, which increase the likeliness for such an individual to exploit an opportunity that aims to solve these sustainability-related problems. Sustainable Entrepreneurs’ prior knowledge and focused attention increases both the likelihood to identify a sustainability related market failure, and motivations to solve these. It is challenging for Sustainable Entrepreneurs to break through established customer perceptions.
Potential customers need to be educated about the many implicit and explicit benefits these entrepreneurs attempt to bring to the market. It seems many external groups do not have this same level of awareness. The relatively long-term ROI perspectives and the high risk, when considering renewable energy solutions, makes it very challenging for these entities to attract financing. This financing issue derives from high customer unawareness towards available sustainable alternatives. An increase in customer awareness would be very welcome, as it could speed up the transformation of industries towards sustainability and increase the number of Sustainable Entrepreneurs to arise.

A Sustainable Entrepreneur will focus the sustainability concerns towards one area. Our analysis contradicted previous research that a Sustainable Entrepreneur will set social and/ or environmental objectives at least as important as economic objectives. The highest concern for a Sustainable Entrepreneur is to become and remain profitable. Sustainable Entrepreneurs value the economic dimension (company turnover and profit) highest, as it guarantees the ability to realise the individual motivations to solve a sustainability-related market failure, being either social and/ or environmental. Sustainable Entrepreneurs’ individual motivation is to solve a sustainability-related problem, social and/ or environmental, the main (first) goal is to make a year on year profit. Sustainable Entrepreneurs develop their businesses and become profitable overtime; they will shift their focus towards creating a better balance of the TBL.

A number of strategies and tools have been used to develop and grow Sustainable Entrepreneurial businesses. Our research determined that patent ownership is key to business success and a good indicator for innovative activity. We consider Sustainable Entrepreneurship to be the perfect aim for a renewed development, Triple Helix formation. Moreover, being Born Global facilitated benefits for scaling up production and releasing lower production costs. Start-ups operating in this renewable energy industry, considered a niche, adopted early internationalisation as a strategy to overcome the need for capital and supportive political schemes, and allowed them to exploit foreign resources.

Sustainability and sustainable development is slowly gathering momentum in public discourse, and greater attention and reverence in academic research. While there still appears to be no consensus defining sustainability, which has lead to hampered discussion, this should not impede nor hinder a greater call toward dialogue of how to ultimately change the world, and for the global economy to consider what type of individual will address environmental and social issues simultaneously. We consider ‘traditional’ entrepreneurship still necessary and vital to the continuing development of disruptive innovation and market change, however, a new breed of entrepreneur – Sustainable Entrepreneur - must now achieve greater focus.
Appendix

A1. Renewable Energy industry overview

This section gives an overview of the current energy industry, and has taken the IEA 2012 report as an important source for information.

Energy Industry Overview

In their 2010 report, the International Energy Agency (IEA) expects the worldwide electricity demand to more than double between 2007 and 2050. The IEA states that “ongoing dependence on fossil fuels (especially coal) continues to drive up both CO2 emissions and the price of fossil fuels. Oil prices, for example, are assumed to reach USD 120 per barrel (in 2008 prices) by 2050”. By introducing to two scenarios the IEA puts its efforts into creating a better energy supply. The Baseline scenario, which expects demand to increase by 151% refers to the 2030 goals by the World Energy Outlook in 2009 which predicts a rough doubling of Energy-related CO2. In contrast, their BLUE Map scenario (with several variants) is target-oriented: it sets the goal of halving global energy-related CO2 emissions by 2050 (compared to 2005 levels) and examines the least-cost means of achieving that goal through the deployment of existing and new low-carbon technologies. This scenario sees an increase of 117% in electricity demand. For sure is that the increase in demand is not spread equally across regions. Those regions that currently have small electrical demands will see the largest growth. For several years, the IEA has been hammering on an energy revolution, based on widespread deployment of low-carbon energy solutions.

Renewable Energy

According to the International Energy Agency (2007) there are three generations concerning the commercialisation of renewable energy. The first technologies include biomass, hydroelectricity, geothermal power and heat. Second-generation are market ready and being deployed at the present time. These include: Solar heating, Photovoltaics, wind power, solar thermal power stations, and modern forms of bioenergy. The third-generation technologies require high R&D inputs in order to be able to deliver a product that is cost efficient on a global scale. These include biomass gasification, biorefinery technologies, hot-dry-rock geothermal power, and ocean energy. The IEA states that the future electricity mix is highly uncertain, being subject to a wide range of factors. Therefore the IEA has developed several scenarios, which show what the percentage of ‘renewables’ could be in 2050.

Baseline Scenario: 22%
Blue map scenario: 48%
Blue hi Ren.: 75% (high focus on renewable energy)
Blue hi Nuc.: 42% (high focus on nuclear power)

Currently, solar and wind power stand out as renewable energies. The ocean (waves, currents and tides) gives another promising way of generating energy. However, the IEA states that many of the most promising low-carbon technologies still have higher costs than the fossil-fuel incumbents. “It is only through technology learning from research, development, demonstration and deployment (RDD&D) that these costs can be reduced and the technologies become economic”. IEA applies for governments and industries to pursue energy technology innovation through a number of parallel and interrelated pathways. “Most new technologies will require, at some stage, both the ‘push’ of RD&D and the ‘pull’ of market deployment”.

The role of governments in developing effective technology policy is crucial: policy establishes a solid foundation and framework on which other stakeholders, including industry, can build. Where appropriate, policies will need to span the entire spectrum of RDD&D. In this way, governments can reduce the risk for other actors in the early phases of technology development and then gradually expose the technology
to greater competition, while allowing participants to realise reasonable returns on their investments as a low-carbon economy takes hold.

There are various indications that the essential change towards renewable energies is starting to happen (IEA, 2012). In 2008 wind and solar reached considerable levels, which stayed consistent in 2009 despite the economic crisis. In 2009, wind energy was the most installed energy generating technology in Europe. Similar developments have also arisen in other parts of the world. Currently, China ranks second and India fifth concerning the installations of renewable technologies. It also seems that nuclear power is undergoing a rebirth. Major expansions of nuclear capacity are planned in China, India and Russia. However, the recent nuclear power disaster in Japan could diminish this.

**Electricity networks**
The change in demand for energy requires considerable changes in the current electricity networks. Hereby, regional characteristics are increasingly important. The flexibility of smart grids (which integrate both electricity and thermal storage technologies) can balance the uneven generation and demand, and improve the management of peak loads and the delivery of off-grid energy. This will contribute to reducing CO2 emissions.

**Barriers**
The low price of fossil fuels remain the biggest hurdle and barrier for wide acceptance of renewable energy. This is certainly true for countries where the prices of fossil fuels prices have been kept below the actual world prices. due to government subsidies.

**Solar Power**
Solar power is the conversion of sunlight into electricity, by photovoltaic’s (PV) or indirectly by concentrated solar power (CSP). CSP technology shows strong growth in Spain and the United States since 2006. Capacities are near 1 gigawatt (GW). Moreover, various new projects will exceed 15 GW worldwide. PV uses solar panels, which consists out of a number of solar cells containing a photovoltaic material. PV is sees rapid growth, at the start of 2012 it represented 0.5% of the worldwide electricity demand, as estimated by the European Photovoltaic Industry Association (2012).

Costs of Solar energy are expected to start decreasing as more suppliers enter the market. The BLUE scenario of the IEA publication, 2008, predicts that CSP will supply 5% of world electricity by 2050. The IEA CSP Roadmap aims for a contribution of 12%.

**Wind Energy**
The capacity of wind energy is growing at 20-30% per year worldwide. Costs of the bigger on grid turbines have decreased significantly since the 1980s. However, since 2004 they have started increasing by 20 up to 80%. Various parts of the world are leading adopters of wind energy. In 2007, Denmark supplied its energy needs with about 20% deriving from wind energy. Spain noted 10% and Germany 6%/

To make on shore wind energy competitive, good sites with grid access are crucial. -The IEA Energy Technology in 2008 predicts that in 2050 wind energy can supply up to 12% of global demand. %.

**Small / micro turbines**
Small / micro wind turbines have in the past been considered mainly for off-grid applications. Recently a number of countries have shown renewed interest, including Canada, Ireland, Italy, Portugal, Spain, United Kingdom and United States. However, the market remains small and can be considered as niche. Still, these small turbines can provide a considerable and sustainable source of energy, being less dependent for on grid supplies.
A2. Case study company background

A2.1 Powerhouse Wind

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Business Overview:

Powerhouse Wind is a New Zealand based developer of small-scale wind turbine technology. The company is currently in the processes seeking investment to support commercialisation of the company’s first commercial product, the Thinair 102. The Thinair 102 is a 2kW rated wind turbine designed for domestic or small scale commercial use, featuring a unique single blade design and a series of technical advances designed specifically to meet market demand for an ‘appliance-like’ product that is quiet, reliable, efficient, automated, information rich, easy to maintain, competitively priced, aesthetically appealing and cost effective to manufacture.

Powerhouse Wind has successfully designed, built and tested first prototypes and second generation field test units, secured provisional sales for pilot commercial production and testing, and received significant interest from international distributors and manufacturers. Powerhouse Wind is seeking investment of NZ$480,000 in return for 35% of the issued share capital of the Company. The capital will be used to fund pilot production and sales of up to 40 units to lead customers in New Zealand, enabling further local testing and refinement and the production of export ready turbines and performance data to underpin the Company’s ongoing engagement with international partners over the next 12 months. Growth is projected to be organic, and product and process improvements funded from retained earnings. The Company has projected a breakeven/profit position by the end of year 2012/2013 and anticipates reaching a turnover of NZ$5010k by the end of year 2014/2015 based on direct sales in that year of 650 units. Beyond commercialisation of the Thinair 102, Powerhouse Wind aims to develop a series of turbines with capacity ranging from 1.5Kw to 15Kw, building on its intellectual property and market channels to become a leading developer, manufacturer and licensor of technology in the small-scale wind sector. There is also good potential to explore applications for Powerhouse Wind’s low speed high
torque axial flux alternator technology for other applications such as micro hydro or vertical axis wind turbines.

Founders Background: Bill Currie
Currie has always had a strong personal interest in wind turbine solutions. He lives in an off-grid house and has a long-standing belief in local energy solutions and “Living in the cycle of what the sun delivers”. After mechanical engineering training, Bill worked for New Zealand Electricity for 4 years. Following time working overseas, Bill did an MBA at Otago University, including a project for Fisher & Paykel Appliances, which evolved into 18 years of employment with the company. He worked on a number of roles starting with design engineering on the DishDrawer team, and concluding with responsibility for Engineering Services for all sites. Currie views the development of Power House Wind a “Personal and societal challenge”.

A2.2 The Archimedes

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<td><a href="http://www.dearchimedes.nl">http://www.dearchimedes.nl</a></td>
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Business Overview
Mieremet solutions and R.Ruijtenbeek holding is the owner of The Archimedes BV, which was started in mid 2006 and was founded by Messrs. M. Mieremet and R. Ruijtenbeek with financial support of the Dutch government (SenterNovem) for the development of a new innovative urban wind turbine. Mid-2012 the ‘LIAM’ self-starting urban wind turbines measuring 1.25 meters in length x 1.25 meters in width x 1.50 meters in height will be available to order through various partners. Besides this core product the company is now seeking to find new applications for their product. Recently the company has begun with the realization of 'The Archimedes Water turbine'.

The company’s turbines are sold to produce “clean” energy for households and public areas. The products are based on the 3P principle (People, Planet, Profit) and products are calculated on the Total Cost of ownership by which the best possible eco-balance with Life Cycle Assessment is delivered.

Founders Background: Richard Ruijtenbeek
Ruijtenbeek has Bachelor in Project Management and Build Environment. He has been Innovation Manager for the city of Rotterdam, engaged in public environment, climate neutral parking space, floating cities. In 2007 he founded The Archimedes along with a co-founder. Now he is also a speaker for seminars, congresses and workshops concerning green and sustainable development, specialized in the Triple Helix, combining government, business and knowledge institutes.

### A2.3 Solar Sisters

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#### Business Overview:
**Solar Sister** eradicates energy poverty by empowering women with economic opportunity. They combine the breakthrough potential of solar technology with a deliberately woman-centred direct sales network to bring light, hope and opportunity to even the most remote communities in rural Africa.

**Solar Sister** creates sustainable businesses, powered by smart investment in women entrepreneurs. Using an Avon-style distribution system, **Solar Sister** creates vital access to clean energy technology by building and extending the supply chain through women’s rural networks. **Solar Sister** provides the women with a ‘business in a bag’, a start-up kit of inventory, training and marketing support. The women become their own bosses, creating sustainable businesses. The women use their natural networks of family, friends and neighbours to provide the most effective distribution channel to rural and hard-to-reach customers (**Solar Sister, Light, Hope, Opportunity** (2012)).

#### Founders Background: Katherine Lucey: Founder & Chief Executive Officer

After a 20 year career as an investment banker with expertise in the energy sector, Katherine retired from banking and turned her attention to finding a sustainable solution to the energy poverty that causes suffering to a quarter of the world’s population. Katherine determined that a practical, grass-roots, locally
generated solution was needed. In addition to Solar Sister, Katherine has served as Chief of Operations for Arzu, Inc., a non-profit organization working to empower women in Afghanistan by providing employment and social benefits. Katherine is an Ashoka Changemaker. She currently serves on the board of Solar Light for Africa, a not-for-profit corporation that brings solar energy to rural communities in East Africa, as well as several local charitable committees supporting education and the environment. She holds an M.B.A. from Georgia State University and a Bachelor’s Degree in Journalism from the University of Georgia.

A2.4 Cleanfield Energy

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<td>Company Logo</td>
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**Company Profile**

In 2002, **Cleanfield Energy** was established in Canada by co-founders Mihail Stern, Alexander Trica and Toni Verrelli. The company's engineering team closely worked together with The University of Timisoara in Romania to develop its wind turbine. The company is a subsidiary of **Cleanfield Alternative Energy Inc.** which is listed on the TSX Venture Exchange. Currently, the company is technology focused on the research, development and distribution of renewable energy solutions for the urban environment. The company possesses inverter technologies, which it currently sells as a complete sustainable solution with its 3 kW vertical axis wind turbine. The company's vision is to be recognized as an international leader in supplying high-quality and innovative, renewable energy solutions to markets globally.

The 3 kW VAWT (V3) is designed to harness urban wind efficiently and effectively. The V3 aimed to be quiet and reliable. The turbine is currently installed in five countries including Canada, the US, Ireland, Slovenia and China.

**Co-founders background:** Toni Verrelli

Verrelli has been the President and a Director of Cleanfield since 2002. His senior management experience includes diverse private, public and non-profit organizations, with each experience revealing a solid record of accomplishment and leadership. Verrelli also founded 360 Marketing, a private marketing company primarily focusing on product brand development, integrated marketing programs, public relations campaigns and strategic planning.
Verrelli has been involved in the renewable energy industry for the past ten years and the environmental industry since 1995. Verrelli is a member of the Canadian Wind Energy Association, Small Wind Committee and the recipient of the 2009 Scotiabank ICCT Environmental Leadership Award.

A2.5 Urban Green Energy (UGE)

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**Company Logo**

**Business Overview**

Urban Green Energy (UGE) was founded in 2007 by Nick Blitterswyk and with his wife, Yun Liu, and her mother Xiangrong Xie, both co-founders of the business and Chinese citizens. Since the company’s inception UGE has quickly become a market leader and a worldwide wind turbine supplier and designer of vertical axis wind turbines (VAWT’s).

UGE focus is on providing high performance, high quality, and attractive products to customers around the world at an affordable cost – UGE listens to the customers needs and develops problem-solving solutions. UGE has extended the application for its wind turbines across off-grid and on-grid configurations.

Among these applications adhere wind turbines, outdoor lighting, monitoring, control and sitting, electric vehicle charging stations and telecoms solutions. A recent partnership with General Electric (GE) has put UGE on the map and is now considered a serious contender in the small wind energy industry. The company has grown fast and has installations in approximately 60 countries, including with several government agencies and Fortune 100 companies.

**Founders Background:** Nick Blitterswyk

Blitterswyk grew up on Vancouver Island in western Canada where his parents were the caretakers of a nature reserve. Ever since, Blitterswyk has been passionate about preserving the beauty of the earth. Becoming increasingly dissatisfied with the renewable energy industry, Blitterswyk set out to challenge the conventional mentality and make industry-leading innovations that are raising the standard for renewable companies all over the world.
Two years after his graduation from college, in 2006, Blitterswyk was uncomfortable at his job and decided to start UGE as a side project. Throughout this time, the founder has grown UGE into the world’s premier supplier of renewable energy solutions, with installations throughout the world. He is a strong believer in a happy, fun, and productive company culture. The UGE HQ in New York participated in the 42nd anniversary of Earth day. The office took part in signing an internal Sustainability Pledge (electronically) making an extra emphasis on being green and following some simple actions such as; limiting the use of disposable (polystyrene) coffee cups, re-using or eliminating plastic bags in the office, reducing the office total trash to one bag and conserving energy by turning off unnecessary electronics. Blitterswyk stated, “We have a green team focusing on sustainability related issues” and “we are always looking at ways of how to be greener.”

A3. Semi-structured Interview Questions
A3.1 The Archimedes: Open Questionnaire Questions

Interviewee Background:

1. Could tell us a bit about your professional background?
   - How long have you been at the company?
   - Your position?
   - Your previous work experience?
   - Education?

Company Background:

2. Can you please explain the company’s background?
   - Why/ how was it started?
   - History
   - Timeline & critical moments
   - Key events
   - What were the founder’s motivations behind starting the venture?

2.1 Did you write a business plan?
   - Was the plan the business plan intended to be flexible, with the opportunity to pursue alternative (attractive) prospects?
   - Why?

Continue with next questions if these are not covered during the company background talk:

2.1 Why were you attracted to the industry?
   - Was it because of a market failure?
   - Did you see a gap?
   - If so, was this gap driven by the advent of social or environmental objectives or possible improvements on current competitors sustainable offerings?

2.2 Can you please explain the hardest challenges in setting up the business?
   - How were these challenges overcome?
   - Your journey
   - For instance → did you face challenges in acquiring funding/ capital, social acceptance, or government support?
   - If you had your time over again, what would you have done differently? And why?

2.3 What type of financing sources have you used?
   - Angel Investors, Seed Funding, Family/ friends?
   - Support from other bigger companies?
   - Have you been approached or would you accept a takeover bid from a big company?

3. How important are your economic performances?
   - What are the investor’s demands on performance?
   - Are there certain milestones that had/ have to be met?
   - How does your revenue model work - What is your business model?
4. **How do you understand/perceive Sustainable development?**
   - In literature it is often described as a balance between people, planet and profit. How would you describe the company’s sustainable development balance?

**Institutional Roles:**

5. **What institutional players are affecting your business?**
   - How do you think this will affect your business in the future?
   - Are you able to give an example?
   - Do you see changes coming up?

6. **How does entrepreneurship in your industry differ from entrepreneurship in other industries?**
   - How would you explain your entrepreneurial activities?
   - How important are social and environmental considerations?

7. **We notice your mission statement is based on Albert Einstein’s notion on the ‘Universe’ – that everything is somehow connected. Why did you choose this mission statement?**
   - How does (company name) put this into practice?

8. **What strategies do you execute to handle competition?**
   - Has the company implemented barriers to warn off potential competitors?
     - Cost advantages?
     - Zoning?
     - Distributor agreements?

9. **Do you consider the market your operating in a niche market?**

10. **What impacts has the company had on the industry?**

11. **What characterises your organisational culture? What makes your company a special workplace?**
    - Informal setting?
    - Flat hierarchy?
    - Open door policy?
    - Cross-functional team units?

12. **What is the role of innovation for your company?**
    - Where do your new ideas come from?
    - How are they handled in the organisation?
    - How do you make sure the company is continually innovating?
    - How would you classify the type of innovation you introduce to the market?
    - Is it a gradual improvement on an existing innovation or a radical new idea?

13. **How does (company name) market such ‘Green’ and sustainability efforts?**
    - Member of any regulatory agencies?
    - Awards or achievements
‘Greenwashing’

14. Would you consider yourself an entrepreneur? (If yes) Why?

A3.2 Powerhouse Wind Questionnaire

Dear Bill,
Below you will find the questions we would like to ask you. As you will see the questions are quite open, you can dive into it as detailed as you like. But, let us first tell you a bit more about our background and research objectives.

We both study at Jonkoping International Business School in Sweden, taking part in the M.Sc. Strategic Entrepreneurship program. Currently we are in the last phase of our studies, completing a semester long thesis research project. Over the past year and a half we have been motivated to research entrepreneurship within the renewable energy sector and the creative and innovative sustainability efforts that have emerged from such entrepreneurial activities. Our focus is on understanding the need for these two broad concepts to gain greater recognition, and to further our knowledge in the rising sustainable/ renewable energy economy.

Our research aims to explore the theoretical concepts in scientific literature, and to explore the challenges and the differences between sustainable entrepreneurial start-ups, and established firms, and the assumed long-term impact these innovative start-ups could potentially pose upon the industry-lifecycle as a whole.

During our research we identified a number of innovative start-ups introducing wind, solar and ocean energy concepts. We identified Powerhouse Wind as an entrepreneurial start-up, with an innovative renewable wind concept - your one blade turbine, the Thinair102.

Being both ambitious we aim to have this research published in the scientific journal Management Decision.

James Bell (Australian) & Jelmer Stellingwerf (Dutch)

Interviewee Background:

1. Could tell us a bit about your professional/ personal background?
   - Have you always had a desire to work in the renewable energy industry?
   - Was there a spark moment? → While working for fisher & Paykel?

Company Background:

2. Can you please explain the company’s background?
   - Why and how was it started?
   - Timeline, critical moments and key events
   - How did you meet your business partners? (While working at Fisher & Paykel?)
• What were your motivations behind starting the venture? (Save the environment, a love for the work, financial reward?)
• Powerhouse Wind set out to design a high-volume, mass-market consumer product – manufacturing a wind turbine for the use in a domestic environment. Can you explain, who your target market is? Residential, commercial, retail?
• At what stage is the company at in realizing this goal?
• Does Powerhouse Wind manufacture the Thinair102? Or is this outsourced? (Locally, internationally)
• Would you consider your one blade a USP?
• Why a HAWT and not a VAWT?

2.1 Did you write a business plan?
• Was the plan the business plan intended to be flexible, with the opportunity to pursue alternative (attractive) prospects?
• Can you recall how many times the BP was modified?
• What were the main objectives within the BP? (Financial ect.)

2.2 Why were you attracted to the industry?
• Environmental concerns?
• Market research → you spotted a niche? → Household wind generation
• Potential customers wanted to supplier their own energy (off-grid)?

2.3 Can you please explain the hardest challenges in setting up the business?
• How did you overcome these challenges?
• Looking back, what aspects would you have done differently?
• For instance → did you face challenges in acquiring funding/capital, social acceptance, or government support?

2.4 What type of financing sources have you used?
• Own money
• Angel Investors, Seed Funding, Family/ friends?
• Support from other larger companies?
• Have you been approached or would you accept a takeover bid from a larger company or VC?

3. How important are your economic performances?
• What are the investor’s demands on performance?
• Are there certain milestones that had/ have to be met?
• How does your revenue model work - What is your business model?

4. How do you understand/ perceive Sustainable development?
• In literature it is often described as a balance between people, planet and profit:
• How would you describe the company’s sustainable development balance?
• How important are social and environmental considerations?

Institutional Roles:

5. What institutional players are affecting your business? (National/ Local Government, Regulatory agencies, the general public ect.)
• Are you able to give an example?
• Have you encountered regulations that have hindered selling the product in specific markets? (Visual pollution, noise, height restrictions).
• If so, do you see regulatory changes in the near future?

6. How does entrepreneurship in your industry differ from entrepreneurship in other industries?
• How would you explain your entrepreneurial activities?
• Can you explain the key elements in being a successful entrepreneur? (Leadership, passion, drive, networking. . . .)

7. We notice that you have a patent for the ‘teetering hub’ design.
• Have you licensed this technology to any 3rd parties? Has this been considered?
• Which region does this patent cover? (NZ, AUS, US, Europe?)

8. What are your competitive advantages?
• Aesthetics?
• Reliability?
• Energy capture?

9. Do you work closely with Otago University or any other educational institutions/ science parks?

10. What characterises your organisational culture? What makes your company a special workplace?
• Relaxed atmosphere?
• Ability to work from home?
• Flexibility?
• Informal setting?
• Business location?

11. What is the role of innovation for Powerhouse Wind?
• Where do your new ideas come from?
• How are they handled in the company?
• How do you make sure the business is continually innovating?
• How would you classify the type of innovation you introduce to the market?
• Is it a gradual improvement on an existing innovation or a radical new idea?

12. How does Powerhouse Wind market such ‘Green’ and sustainability efforts?
• Are you members of any regulatory agencies?
• Awards or achievements
• ‘Greenwashing’

A3.3 Solar Sisters Questionnaire
Jelmer and I study at Jonkopging International Business School in Sweden, taking part in the M.Sc. Strategic Entrepreneurship program.

We are in the last phase of our studies, completing a semester long thesis research project. Over the past year and a half we have been motivated to research entrepreneurship within the renewable energy sector and the creative and innovative sustainability efforts.

Our focus is on understanding the need for these two broad concepts to gain greater recognition, and to further our knowledge in the rising sustainable/renewable energy economy.

We identified SOLAR SISTERS as an entrepreneurial start-up, with an innovative renewable solar concept – that is having resounding results towards healthcare, education & better nutrition.

So we would like to go through a number of questions that investigate your background, the company’s history, some key challenges and sustainability related issues.

**Interviewee Background**

*Katherine, could you please tell us a bit about your professional background?*

**Company Background:**

*Can you please explain the company’s background?*

We notice you used to work as Chief of Operations at Arzu Inc. - A company that is heavily focused on income generation opportunities, sustainable economic development and empowering women.

- Was it while working for Arzu you developed your idea to start Solar Sister?
  - What were your motivations behind starting the venture? Was there a particular defining moment?

- Why did you opt to use solar powered products and not other renewable energy sources? What were the motivating reasons behind this?
  - Was the decision to use solar power products motivated by the health and environmental issues of kerosene? The 30% household budget spent on candles and kerosene?
  - What has been your best selling product? We saw a video of a customer very pleased with the mobile charging unit, I imagine these have been a success.

  - How did this innovative business model come to fruition? Was it always your intension to steer away from micro-finance institutions and adopt an Avon-style women-driven business model?

  - How difficult has this been to communicate to your solar sisters?

  - Why such a large range of product partners?
  - What is the strategy behind this? Is cheaper better?
1. **Did you write a business plan?**
   - Was the plan the business plan intended to be flexible, with the opportunity to pursue alternative prospects?
     - Can you recall how many times the BP was modified?

2. **Why were you attracted to the industry?**
   - Were you driven by social or environmental objectives, or possible improvements on current competitors sustainable offerings?
   - Why were you attracted to the African market specifically?
     - Were you driven by a rapid need for change?
   - Have you considered other developing countries in the future to expand Solar Sisters social impact? For instance India?

3. **Can you please explain the hardest challenges in setting up Solar Sister?**
   - How did you overcome such challenges?
     - What help did you receive?
   - Did you face challenges in acquiring funding/ capital, social acceptance, or government support?
   - If you had your time over again, what would you have done differently? And why?

(We notice Solar Sister uses a strategy of micro-investment seed capital) –

4. **What type of other financing sources have you used?**
   - In 2009, you entered the idea of Solar Sisters in the Women, Tools, Technology Challenge supported by Ashoka Changemakers and ExxonMobil’s Women’s Economic Opportunity Initiative.
     - How important was this funding from ExxonMobil? Was it the crucial step to realising that this idea had legs?
   - Your own money?
   - Government grants?
   - Angel Investors, Family/ friends?
     - How important are the donations you receive?
     - How do you attract micro investors?
     - What is your strategy to gain awareness of Solar Sisters efforts?
     - Have any large organisations come on board as annual investors or partners?

5. **How important are your performances for your partners and investors?**
   - What are the investor’s demands on performance? - Are there certain milestones that had/ have to be met?
   - How reliant are you on the general public’s micro investment donations?
   - How do realize your 100% investment guarantee?

6. **How do you perceive Sustainable development?**
• In literature it is often described as a balance between people, planet and profit. How would you describe the company’s sustainable development balance?

• Is it possible to rank these social, environmental and economic dimensions in order?

Institutional Roles


• Have you encountered any resistance in realizing your initiative?
• Are you able to give an example?

7. Do consider yourself a sustainable entrepreneur? - What you are doing, does that differ from conventional entrepreneurial activities?

• How would you explain your entrepreneurial activities?
• Can you explain the key elements in being a successful entrepreneur? (Leadership, passion, drive, strong network).
• How important are social and environmental considerations today when setting up a business?

11. Do you work closely with any educational institutions or other external parties?

• How do you conduct your market research?

12. Have you seen competition from other non-profit initiatives?

• Have you seen signs that you have affected the kerosene business in the countries you operate in?
  o Have they responded in any way to your activities? (Price decreases)
    Are families in Uganda and Rwanda deterred by the fact that it will take 3 months to repay a solar light?

• Do you see other NGO’s as competitors?
• Has the company implemented barriers to warn off potential competitors?

13. Do you consider the market your operating in a niche market?

14. Has there been any negative outcomes with the introduction of these solar powered products? Eg. theft?

15. What characterises your organisational culture? What makes your company a special workplace?

• Flat hierarchy?
• Informal setting?
  o How do you attract other potential volunteers and employees?
16. What is the role of innovation for your company?
* Is it more processed based than sourcing new innovative products? Explain.
* Where do your new ideas come from?
* How do you make sure the company is continually innovating?
* How would you classify the type of innovation you introduce to the market?
* Is it a gradual improvement on an existing innovation or a radical new idea?

17. How does Solar Sister market the sustainability efforts?
* Member of any regulatory agencies?
* Awards or achievements

What does the future hold for Solar Sisters?
Can you explain some critical moments and key defining events? Would there be anything you would have changed?

A3.4 Urban Green Energy Questionnaire

Jelmer and I study at Jonkopging International Business School in Sweden, taking part in the M.Sc. Strategic Entrepreneurship program.

We are in the last phase of our studies, completing a semester long thesis research project.
Over the past year and a half we have been motivated to research entrepreneurship within the renewable energy sector and the creative and innovative sustainability efforts of these entrepreneurs.

Our focus is on understanding the need for these two broad concepts to gain greater recognition, and to further our knowledge in the rising sustainable/ renewable energy economy.

We identified Ubran Green Energy as an entrepreneurial start-up, with a very creative and innovative renewable wind concept – and we felt the company would be a great addition to our research.

So we would like to go through a number of questions that investigate your background, the company’s history, some key challenges and sustainability related issues.

Interviewee Background
Nick, could you please tell us a bit about your professional background?

*** How has your Earth week been going? We saw on your website that half the company’s employees are now using travel mugs for coffee, how’s the office adapting to this change? Not much trash around I’m sure!!

I’ve read that it was your childhood background growing up in Canada that had a resounding affect for your passion for the environment.
Can you explain how did you come from being an actuary to one of the co-founders of Urban Green Energy?

Was it knowledge of market imperfections that motivated you to be part of the renewable energy industry?

- I read on your website you wanted to make a change and challenge the conventional mentality of renewable energy.
  - How do you execute your efforts making renewable energy fun and exciting?
  - It’s well documented that a number of large firms have faced financial difficulty and even bankruptcy – do you believe there is a stigma in the market about renewable energy? And maybe its unreliability?

*Company Background:*

8. **Can you please explain the company’s background?**
- What professional background do your partners have? (Wife and Wife’s mother) Co-workers have?
- How did the engineering process begin? You brought in outsider engineers? Was this through your network?
  - How was the decision made to peruse VAWTS and not horizontal turbines? Research demonstrates that VAWT’s outperform HAWTS, especially in urban settings, was this the strategy, to sell and position your products in urban arenas and not necessarily open fields?
- Why did you opt to invest into wind powered products and not other renewable energy sources? Your product Sanya is a combination of wind and solar, but I guess, why wind? What were the motivating reasons behind this particular energy?
- I believe you own your own manufacturing facility in China. Owning your own manufacturing plant and having greater oversight of product control and consistency, how much of an advantage is this against competitors?
- A number of articles I have read determine that there’s little difference in technology among small turbine manufacturers and success is heavily dependent on execution and value adding. Solving a problem
  - How does UGE differentiate itself from competitors? What are your USP’s?
  - Do you consider UGE a market leader?
- **UGE supplies its turbines through an international network of distributors** →
  - How do you distribute your products around the world? From manufacturing in China → straight to your suppliers?
  - Have you had any major issues with loss of brand control with this distribution strategy?
  - How much reliance is on your international suppliers for maintaining quality control and pushing and selling Urban Green Products? Are there incentives to promoting your products?
- What has been your best selling product to date?
• Where do you see the biggest future growth? Is it residential or commercial markets? What strategies do you have for different regions?
  o And what about Fusion UGE Telecoms? Is this happening now?

• Your partnership with GE must have been a historic moment, do you see this also as the future, supporting electric vehicle infrastructure? Introducing hybrid installations and solutions?

• Wind and solar energy are both inherently variable. Do you see your products as complementary technologies, working towards self-sufficiency?
  o Do you build your own solar panels or outsource these?

9. **There is debate nowadays that entrepreneurs find business plan’s restricting and even a waste of time. How important was writing a business plan? And did you?**

• What was included in yours?

• Was the business plan intended to be flexible, with the opportunity to pursue alternative prospects?
  o Can you recall how many times the BP was modified?

10. **Why were you attracted to the industry?**

• Were you driven by social or environmental objectives, or possible improvements on current competitors sustainable offerings?

• When did you first ship internationally? What was the international strategy?

11. **Can you please explain the hardest challenges in setting up Urban Green Energy?**

• Can you explain some critical moments and key defining events? How did you overcome such challenges?
  o What help did you receive?

• You have 100-150 employees? You have experienced some rapid growth recently, how have you managed this? Ambidexterity…

• If you had your time over again, what would you have done differently? And why?

12. **What type of financing sources have you used?**

• Did you face challenges in acquiring funding/ capital?

• Did you utilise any bootstrapping techniques?

• Government grants available and utilised?

• Angel Investors, Family/ friends?

13. **How important are your performances for your partners and investors?**

• What are the investor’s demands on performance? - Are there certain milestones that had/ have to be met?

14. **How do you perceive Sustainable development?**

• In literature it is often described as a balance between people, planet and profit. How would you describe the company’s sustainable development balance?
Would you consider that your selling win-win solutions?
Any use of recycled materials?
How do you control the production of the turbines? Wastage, sourcing materials…. Do you audit?
Is it possible to rank these social, environmental and economic dimensions in order?

Institutional Roles


• Have you encountered any resistance in realizing your initiative?
• Are you able to give an example?

15. How would you describe your entrepreneurial spirit (social, eco, sustainable)? - What you are doing, does that differ from conventional entrepreneurial activities?

• How would you explain your entrepreneurial activities?
• Can you give advice to any future sustainable entrepreneurs out there?
• Can you explain the key elements in being a successful entrepreneur? (Leadership, passion, drive, strong network).
• How important are social and environmental considerations today when setting up a business?

11. Do you work closely with any educational institutions or other external parties?

• How do you conduct your market research?

12. Even though you are an international manufacturing company, with global demand, do you consider the market your operating in an untapped market, with plenty of growth?

13. What characterises your organisational culture? What makes your company a special workplace?

• Flat hierarchy?
• Informal setting?
  o How do you attract employees and interns?

16. What is the role of innovation for your company?

You have introduced ViewUGE – the remote monitoring solution, how did this come to fruition? What was the managerial decision behind offering your customers this live data stream? Are there future possibilities of connecting it to any social media platforms? Sharing..

* Was it a decision to educate your customers? Maybe spread positive word of mouth through social interaction, with customers posting their energy production?
* You also offer the customisation ability for your customers. On your first point of contact – your website - steering them through the process of selecting the right wind turbine set up for their specific needs. How successful has this been?

A couple of small start-ups have argued that the strength of a patent, is only as strong as the ability to defend it and go to court. UGE currently has patents pending on its designs.

- How do you value the strength of obtaining patents?
- Which countries have you applied for?

* Where do your new ideas come from?

* How do you make sure the company is continually innovating?

* How would you classify the type of innovation you introduce to the market?

* Is it a gradual improvement on an existing innovation or a radical new idea?

17. How does Urban Green Energy market the sustainability efforts?

* Member of any regulatory agencies?
* Awards or achievements

What does the future hold to UGE? Where can you see yourself in 5 years? What do you see as an essential strategy for any start-up company, coming into the urban renewable energy market?

A3.5 Cleanield: Open Questionnaire Questions

Interviewee Background:

1. Could tell us a bit about your professional background?
   - How long have you been at the company?
   - Your position?
   - Your previous work experience?
   - Education?

Company Background:

2. Can you please explain the company’s background?
   - Why/how was it started?
   - History
   - Timeline & critical moments
   - Key events
   - What were the founder’s motivations behind starting the venture?
2.1 Did you write a business plan?
   - Was the plan the business plan intended to be flexible, with the opportunity to pursue alternative (attractive) prospects?
   - Why?

Continue with next questions if these are not covered during the company background talk:

2.1 Why were you attracted to the industry?
   - Was it because of a market failure?
   - Did you see a gap?
   - If so, was this gap driven by the advent of social or environmental objectives or possible improvements on current competitors sustainable offerings?

2.2 Can you please explain the hardest challenges in setting up the business?
   - How were these challenges overcome?
   - Your journey
   - For instance → did you face challenges in acquiring funding/capital, social acceptance, or government support?
   - If you had your time over again, what would you have done differently? And why?

2.3 What type of financing sources have you used?
   - Angel Investors, Seed Funding, Family/friends?
   - Support from other bigger companies?
   - Have you been approached or would you accept a takeover bid from a big company?

3. How important are your economic performances?
   - What are the investor’s demands on performance?
   - Are there certain milestones that had/have to be met?
   - How does your revenue model work - What is your business model?

4. How do you understand/perceive Sustainable development?
   - In literature it is often described as a balance between people, planet and profit. How would you describe the company’s sustainable development balance?

Institutional Roles:

5. What institutional players are affecting your business?
   - How do you think this will affect your business in the future?
   - Are you able to give an example?
   - Do you see changes coming up?

6. How does entrepreneurship in your industry differ from entrepreneurship in other industries?
   - How would you explain your entrepreneurial activities?
   - How important are social and environmental considerations?

7. We notice your mission statement is based on Albert Einstein’s notion on the ‘Universe’ – that everything is somehow connected. Why did you choose this mission statement?
   - How does (company name) put this into practice?
8. What strategies do you execute to handle competition?
   - Has the company implemented barriers to warn off potential competitors?
     - Cost advantages?
     - Zoning?
     - Distributor agreements?

9. Do you consider the market your operating in a niche market?

10. What impacts has the company had on the industry?

11. What characterises your organisational culture? What makes your company a special workplace?
    - Informal setting?
    - Flat hierarchy?
    - Open door policy?
    - Cross-functional team units?

12. What is the role of innovation for your company?
    - Where do your new ideas come from?
    - How are they handled in the organisation?
    - How do you make sure the company is continually innovating?
    - How would you classify the type of innovation you introduce to the market?
    - Is it a gradual improvement on an existing innovation or a radical new idea?

13. How does (company name) market such ‘Green’ and sustainability efforts?
    - Member of any regulatory agencies?
    - Awards or achievements
    - ‘Greenwashing’

14. Would you consider yourself an entrepreneur? (If yes) Why?
References


64


