



## Sustainable venture capital – catalyst for sustainable start-up success?

N.M.P. Bocken <sup>a, b, \*</sup><sup>a</sup> Design for Sustainability/ Product Innovation Management, Industrial Design Engineering, Delft University of Technology, Landbergstraat 15, 2628 CE Delft, The Netherlands<sup>b</sup> Institute for Manufacturing, Department of Engineering, University of Cambridge, Cambridge, CB3 0FS, United Kingdom

## ARTICLE INFO

## Article history:

Received 28 September 2014

Received in revised form

9 May 2015

Accepted 21 May 2015

Available online 30 May 2015

## Keywords:

Sustainable entrepreneurship

Sustainable business model

SMEs

Impact investment

Sustainable innovation

Scaling

## ABSTRACT

To address global sustainability challenges, major investments are required in sustainable businesses that deliver triple bottom line results. Although interest in sustainable businesses is on the rise, these businesses are not yet widespread. Venture capital investment has a key role to play in the development of sustainable start-ups. The research area of 'sustainable' venture capital is still emerging. More research is required to understand how venture capital can support the development of sustainable businesses. This paper provides insight into how venture capitalists can contribute to sustainable business success, by investigating their role, motivations, investment theses, and barriers and enablers to success of sustainable ventures. The following question is investigated: How can sustainable venture capitalists contribute to the success of sustainable start-ups? Interviews were conducted with an expert sample of leading sustainable venture capitalists and other key stakeholders in sustainable entrepreneurship. It was found that next to financial support, venture capitalists provide triple bottom line business advice and network support. Key success factors include business model innovation, collaborations and a strong business case, whereas failure factors include a lack of suitable investors, a strong incumbent industry and a short-term investor mind-set. Sustainable start-ups should focus on triple bottom line business model innovation, find opportunity in new technology and funding platforms and develop multiple business cases to create success beyond the 'green customer base'. Sustainable venture capitalists can help prove the success of sustainable business formats, mitigate financial risk through co-investments and exercise patience by balancing financial with social and environmental returns.

© 2015 The Author. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

## 1. Background

Entrepreneurship has been recognized as a major conduit for sustainable products and processes, and new ventures are viewed as an answer to many social and environmental problems (Hall et al., 2010; Pacheco et al., 2010). Venture capital has a key role in nurturing entrepreneurship and new ventures. As such, venture capital may be viewed as an important catalyst to develop sustainable businesses (Bürer and Wüstenhagen, 2008) – those that contribute positively to the environment and society while generating a profit. Already in 2003, the Journal of Cleaner Production dedicated a Special Issue on “Financing Cleaner Production” (Huhtala, 2003) emphasising the importance of the role of finance

in promoting cleaner production and sustainability in businesses more broadly. One of the common misconceptions has been that “sustainability costs money” and it is a capital cost without return (Huhtala, 2003). In this paper, the focus is on gaining insight on the role of venture capitalists as supporters and promoters of sustainable businesses and the potential barriers and opportunities associated with this.

A growing population, paired with changing consumption patterns creates significant pressures on health, wellbeing and the natural environment (Royal Society, 2012). To create a sustainable global society, the development of billions of people needs to be addressed; the cost of externalities need to be internalised; agricultural output will need to be doubled without increasing resource use; deforestation need to be halted while increasing yields; and carbon emissions need to be halved worldwide while delivering a tenfold improvement in resource use (WBCSD, 2013). The UN World Commission on Environment and Development chaired by Gro Brundtland (WECD, 1987) already advocated the need for sustainable development: to meet the needs of current generations without

\* Institute for Manufacturing, Department of Engineering, University of Cambridge, Cambridge, CB3 0FS, United Kingdom. Tel.: +44 (0) 1223 766141, +31 (0) 15 278 45 21.

E-mail addresses: [nmpb2@cam.ac.uk](mailto:nmpb2@cam.ac.uk), [n.m.p.bocken@tudelft.nl](mailto:n.m.p.bocken@tudelft.nl).

compromising future generations' ability to satisfy their needs. It created a global agenda for change, proposed long-term strategies for sustainable development, encouraged cooperation and achievement of joint objectives and advocated the need for international action. This shows that the challenges to business are significant: across industries, businesses are increasingly confronted with environmental and social challenges while stakeholders expect firms to meet a triple-bottom line of economic, environmental and social value creation (Elkington, 1997), rather than mere short-term profit requirements (Hockerts and Wüstenhagen, 2010).

Current incremental solutions largely allow businesses to operate in a less unsustainable way, but the increasing severity and pressure of global challenges requires a different approach (Ehrenfeld, 2008). A fundamental change of businesses and business models is required. Business models, through the value proposition (product/service offering), creation and delivery (e.g. partners and activities), and value capture (cost and revenue streams), will need to include a wide range of stakeholder concerns, and the environment and society need to be regarded as important stakeholders to tackle our key global issues (Bocken et al., 2013). According to Russo (2003), those companies that seek to protect and enhance their supply of natural (and social) capital will gain a competitive advantage in the coming decades. Hence, 'sustainability' can also be viewed as a business opportunity. A survey by MIT Sloan Management Review and The Boston Consulting Group (2013) amongst more than 2600 executives, managers and thought-leaders across the world, showed that the portion of respondents reporting to profit from sustainability went up to 37% and nearly 50% of companies have changed their business models as a result of sustainability opportunities.

Venture capitalists are key in the emergence of businesses: they can make start-ups grow faster, create more value and generate more employment and innovation (Keuschnigg, 2004). Venture capitalists may be viewed as the 'gate keeper' to the emergence of

new businesses, as their role is to select venture ideas presented to them by entrepreneurs (Marcus et al., 2013). They influence entrepreneurship by acting as 'scouts', identifying and selecting future potential and as 'coaches' who can help realise that potential (Baum and Silverman, 2004). The venture capitalist's investment thesis includes the ventures that fit the investment portfolio, and therefore, the rationales for making investments (Kaplan and Strömberg, 2001). Venture capitalists typically invest in 'riskier' businesses and support start-ups financially through their expertise and networks, typically after angel investors or 'friends and family' have made their initial investment in the business and before banks or private equity, which might find investment too risky (Fig. 1). The hope is to make a profitable deal through mergers and acquisitions or initial public offerings (IPO), where the venture capitalist typically sells its shares in a venture (Gompers and Lerner, 2001). The relationship between venture capital and entrepreneurs is long-term and therefore important. Marcus et al. (2013) refer to timelines of up to 10 years between raising money and exiting (i.e. selling the business) whereas 'clean' or sustainable investments are often stretched beyond this.

This research investigates the role of the specific niche of sustainable venture capital investors in encouraging sustainable entrepreneurship. These investors deliberately invest in sustainable businesses, because they are aware of the opportunity and necessity of creating business with triple bottom line returns. This paper investigates the following question: *How can sustainable venture capitalists contribute to the success of sustainable start-ups?*

## 2. Literature review

Although literature has emphasised corporate sustainability practices in large businesses, the area of sustainable start-ups and entrepreneurship has received increasing interest with contributions

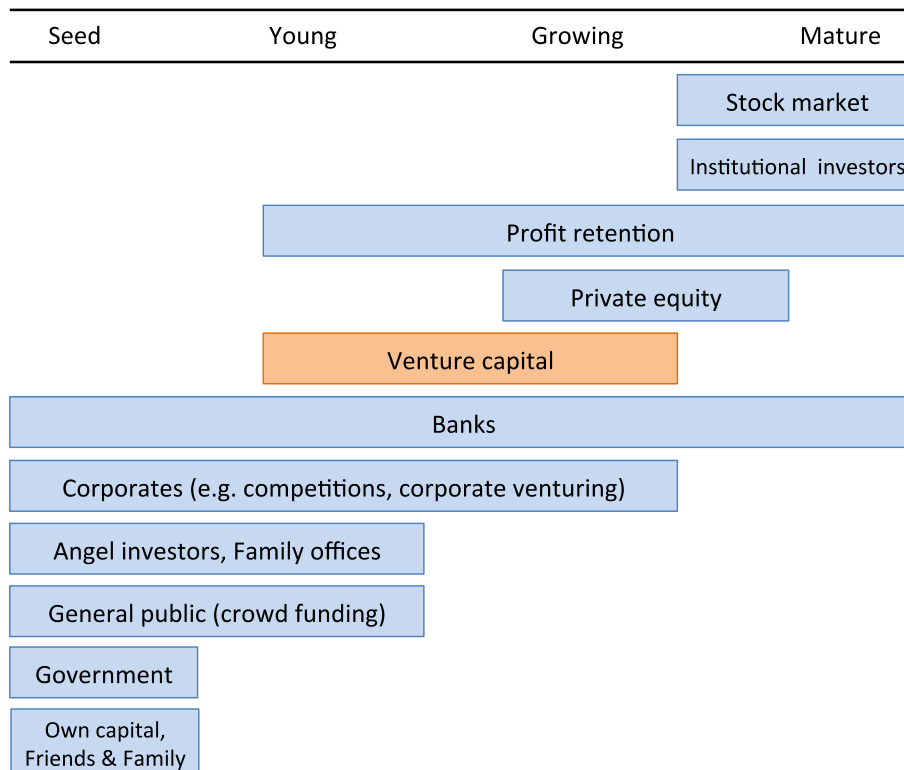


Fig. 1. The role of venture capital and emerging roles of other actors in growing businesses. Adapted from Marcus et al. (2013).

from key authors, such as [Hockerts and Wüstenhagen \(2010\)](#), who compared sustainable new entrants to incumbent firms and [Parrish \(2010\)](#), who investigated sustainability-driven entrepreneurship. Venture capital as a source of capital is relatively new compared to other sources of investment ([Gompers and Lerner, 2001](#)). Although the research strands of cleantech venture capital and ‘sustainable’ venture capital are even newer, they have received increasing interest in the literature. Key literature strands are reviewed next.

### 2.1. The emergence of sustainable innovation

Innovation and corporate sustainability research has focused on large companies, which have the administrative systems and corporate reputation motives for sustainability reporting ([Bos-Brouwers, 2010](#)). Smaller sized organisations are resource scarce, have a lower degree of formalization and lack of public visibility and reporting priorities, but a dynamic, entrepreneurial style of management and the closeness of the owner/manager to the innovation process can drive sustainable innovations ([Bos-Brouwers, 2010](#)). Indeed, start-ups are viewed as an answer to many social and environmental problems ([Hall et al., 2010](#); [Pacheco et al., 2010](#)). Start-ups have a key role to play in the emergence of sustainable businesses, innovations and business models, for example as described by the [EU \(2012\)](#): “( ... ) SMEs, and especially start-ups, can be the ideal incubators for eco-innovation, and can bring to market new, less environmentally damaging products, services and processes”. The early stages of a business determine the business model, strategy and the product/service offering. Choices made in the early phases determine an important part of the sustainability impacts ([Herstatt and Verworm, 2001](#); [Bocken et al., 2014](#)).

There is an opportunity to focus on start-ups as the source of sustainability and sustainable business model innovation. For example, in a relatively short period of time, companies such as Zipcar (car sharing) and Airbnb (home and room rental; [Chase, 2012](#)) have become very popular, sometimes even to the extent that they are outgrowing incumbents’ business sizes. In only a few years time, Airbnb has grown to become nearly as large as traditional hotel groups (measured by number of rooms), claiming a large part of the market for short-term business and holiday stays ([Chase, 2012](#)). These business models, encouraging sharing of space (cars, houses) are claimed to be more sustainable than their incumbent competitors. It is estimated that every Zipcar takes six privately owned vehicles off the road and 60% of its members drove less than 1000 miles per year saving 829 L of petrol per Zipcar member ([Zipcar, 2014](#)). Robin Chase, one of the Zipcar founders claimed that when people pay cars by the hour, they typically drive 80% less ([Chase, 2012](#)). Moreover, car-sharing models may encourage the right behaviours with companies involved, such as reparability, fuel efficiency and durability ([Bocken et al., 2014](#)). A study commissioned by Airbnb and executed by Cleantech Group ([Airbnb, 2014](#)) found that in Europe, Airbnb guests use 78 per cent less energy than hotel guests. Although these are studies done by the companies concerned, this shows their potential to disrupt existing business models.

### 2.2. Sustainable entrepreneurship

Sustainable entrepreneurs seek to manage the “triple bottom line”: they balance economic health (economy), social equity (people) and environmental resilience (planet) through their entrepreneurial behaviour ([Elkington, 1997](#); [Kuckertz and Wagner, 2010](#)). Through sustainable entrepreneurship, nature, ecosystems and communities are to be sustained, whereas gains to individuals, the economy, and society need to be created ([Shepherd and Patzelt, 2011](#)). Research on

sustainable entrepreneurship has evolved from and combined two distinct research strands: environmental and social entrepreneurship. Sustainable entrepreneurship refers to “entrepreneurial activities that contribute positively to sustainable development and the objectives derived from it” ([Kuckertz and Wagner, 2010](#)).

The skill sets and motivations of sustainable entrepreneurs typically differ from conventional entrepreneurs and are inherent to the type of business. According to [Hockerts and Wüstenhagen \(2010\)](#), sustainability start-ups differ from conventional start-up companies in their pronounced value-based approach and intention to initiate social and environmental change in society. [Lans et al. \(2014\)](#) developed a framework for sustainable entrepreneurship competencies, and identified the following key traits of such entrepreneurs: embracing diversity and interdisciplinarity, foresighted thinking, interpersonal competence, normative competence and systems thinking competence. According to [Parrish \(2010\)](#), sustainable entrepreneurs generally apply the following principles: an organisational purpose focused on maximising human and natural resources, synergies and ‘benefits stacking’ (rather than economic profit maximisation), a focus on satisfying multiple stakeholder needs (not one objective), a focus on quality of outcomes (rather than quantity) and allocation of benefits across those who contributed positively to the enterprise (not just to those with most power) ([Parrish, 2010](#)). [Kirkwood and Walton \(2010\)](#) found the following motivators for eco-entrepreneurs: green values, earning a living, passion, being your own boss and seeing a gap in the market, which is similar to conventional entrepreneurs, except for the green values. Sustainable entrepreneurs’ thus have specific motivators and require specific skills related to delivering the business purpose and organisational outcomes.

### 2.3. Finance and sustainability

Sustainable investing has its roots in socially responsible investing, cleantech investing, and more recently, impact investing. Cleantech investors invest in environmentally benign technologies (e.g. alternative energy, water purification; [Parker and O’Rourke, 2006](#)). [Wüstenhagen and Teppo \(2006\)](#) and [Bürer and Wüstenhagen \(2008\)](#) conducted surveys with cleantech venture capitalists on energy policy risks, while [Bürer and Wüstenhagen \(2009\)](#) investigated policy preferences of cleantech venture capitalists. Ethical or socially responsible investors ([O’Rourke, 2003](#)) focus on social benefits (e.g. health; [Berry and Junkus, 2013](#)). There has been an interest in the religious origins of social investing (e.g. [Entine, 2003](#); [Louche et al., 2012](#)) profiling private socially responsible investors ([Nilsson, 2008](#)), socially responsible investor behaviour ([Rosen et al., 1991](#); [Berry and Junkus, 2013](#)) and assessing performance of socially responsible funds (e.g. [Cortez et al., 2012](#)).

Social investing and clean(tech) investments each received attention in the academic literature, whereas sustainability investing or ‘impact investing’ ([Bugg-Levine and Emerson, 2011](#)) is relatively new. Impact investors are moving into a space, which may be referred to as “sustainability investments”, investments in products, processes and technologies with triple bottom line benefits ([Global Impact Investing Network, 2013](#)). Impact investments are made with the intention to generate measurable social and environmental impact alongside a financial return ([Global Impact Investing Network, 2013](#)). The area of impact investing appears mainly in the grey literature and popular press (e.g. [Monitor Institute, 2009](#)). An example is micro-finance: loans in the developing world for small entrepreneurial activities (building on [Yunus et al., 2010](#)), which contribute to societal development in an economically and environmentally sustainable way. ‘Sustainable’ venture capital has received less attention in the literature,

although there are contributions in related areas (e.g. Juravle and Lewis, 2009; who investigated sustainable investment).

### 2.3.1. Venture capital and sustainability

Sustainable venture capitalists have the difficult tasks of identifying businesses, which have the potential to generate economic returns while creating positive environmental and social impacts. Rather than maximising economic returns, the triple bottom line (Elkington, 1997) needs to be considered, which creates challenges for investors. Geobey et al. (2012) for example describe the challenges of setting boundaries and integrating a heterogeneous range of factors (e.g. social, environmental). Investors may use an exclusionary (e.g. filtering out 'bad' products such as weapons) or inclusionary approach (e.g. assigning points to positive efforts), although Berry and Junkus (2013) found that investors prefer a more holistic approach to selecting firms who display overall positive behaviour. This is in line with venture capitalists' vision of what fits their portfolio: the investment thesis. In the sustainability sphere, an investment thesis refers to how a specific investment will create impact (Rockefeller Philanthropy Advisors, 2009). An example of this might be "To finance companies ( ... ) that add cultural value and benefit people and the environment ( ... )" (Monitor Institute, p. 29 on Triodos Bank). Sustainable venture capitalists thus use the investment thesis as a broad guideline to create a balanced sustainable investment portfolio.

### 2.3.2. Other actors who support young and growing businesses

A venture capitalist may act as an individual as part of a venture capital firm, but governments, corporations, the general public and incubators may also be active in the growth phase of sustainable firms. The government can operate directly as a venture capitalist – the US Small Business Innovation Research programme being an example (Moore and Wüstenhagen, 2004) and indirectly through policies to make investments in sustainable ventures attractive (Moore and Wüstenhagen, 2004) or business competitions and centres to attract 'blended value' venture capital (i.e. economic, social and environmental; Isaak, 2002). Business incubators, sometimes dubbed 'accelerators' (Hansen et al., 2000) provide support to starting businesses, in exchange for a fee or equity. Most incubators offer basic services, funding and office space, whereas the more advanced ones also offer a network of business connections (Hansen et al., 2000). *Corporate Venture Capital* refers to equity investments of large corporations in entrepreneurial ventures, which originated outside the corporation (Napp and Minshall, 2011). Corporate venturing has particular challenges. For example, Venture capitalists operate best locally whereas large corporates operate globally (Giesler, 2011). New forms of financing are emerging, where the public can collectively fund a new venture. The online request for resources from a distributed audience often in exchange for a reward is referred to as *crowdfunding* (Gerber and Hui, 2013). It allows founders to fund their efforts by drawing on contributions from a large number of individuals using the Internet (Mollick, 2013). Compared to conventional venture capital, the relation between entrepreneurs and funders is detached. Hence, Gerber and Hui (2013) suggest facilitating face-to-face meetings and forums to strengthen these connections and 'mimic' the venture capitalist-entrepreneur relationship. This shows that venture capital might take various forms.

## 2.4. Success and failure of sustainable start-ups

The success and failure of 'young firms' has received significant attention in the literature. Success and failure of start-ups in general and social and cleantech ventures have individually been

analysed in the literature, but sustainable businesses have not yet received significant attention.

General reasons for failure of start-ups include: the uncertainty and information asymmetry associated with young firms compared to incumbent firms and equity from outside investors that may be wasted by the managers, who do not bear the cost; and, if the firm raises debt, the manager may increase risk to undesirable levels (Gompels and Lerner, 2001). The entrepreneur and team evidently have an important role to play: based on a literature review, Fabian and Ndofor (2007) found that personality and goals of the entrepreneur and favourable conditions (e.g. economic climate) influence new venture performance. Franke et al. (2008) found that venture capitalists make trade-offs when evaluating the team: for example, who in a team can compensate for a weakness elsewhere? Furthermore, starting venture capitalists often focus on individual team members' qualifications, whereas experienced ones focus more on team cohesion (Franke et al. (2008)). Venture capitalists themselves may be an 'enabler' as suggested by Baum and Silverman (2004), because they can reduce information gaps, use multiple stages of financing, take seats on boards of investors, and take compensation in the form of stock options in return (Gompels and Lerner, 2001). As Moore and Wüstenhagen (2004) describe, venture capitalists often work as coaches or partners with entrepreneurs at a very early stage to help shape and accelerate the development of a company.

In the field of social ventures, Sharir and Lerner (2006), based on a study of 33 social ventures, identified the following contributors to success: the entrepreneur's social network; dedication and composition of the team; managerial experience; capital at the founding stage; acceptance of the idea in the public discourse; ratio of volunteers to salaried employees; cooperation with public and non-profit sectors; and market readiness. Weber and Kratzer (2013) found that social networks contribute to the social enterprises' success. Moreover, Hochberg et al. (2007) found that better-networked venture capital firms are typically better at selecting future successful firms and helping firms to survive. Furthermore, the underlying business models of social entrepreneurs determine social and financial success (Weber and Kratzer, 2013). Networks and collaborations appear particularly important for social ventures.

In the field of cleantech, Wüstenhagen and Boehnke (2006), similar to Weber and Kratzer (2013), found that business model design is an important enabler for the emergence of sustainable energy, whereas the fact that carbon emissions reductions are not rewarded, capital intensity, long lead times and the power of incumbents are main barriers. Leete et al. (2013), researching renewable energy, found that the following are important barriers and enablers: regulatory environment; financial support mechanisms; technology; the investment timeframe; human skills; infrastructure and supply chain. Boehnke and Wüstenhagen (2007) identified success factors for combined heat and power, the main ones including product quality and performance; technical services; fair price; know-how/reliability; reputation of business/technology; delivery value chain; marketing/information; product range; and environmental benefits. Investment considerations, the business model, regulation and incumbent firms thus are important factors in cleantech.

In the area of sustainability, Juravle and Lewis (2009) found four tactics that pioneers have employed to promote sustainable investment: making the business case for sustainable investment; forming coalitions with mainstream investors; industry networking and gaining credible expertise. They also found that market short-termism, organisational contexts dominated by a lack of moral engagement, and disempowerment of sustainable investment teams may impede success. Armstrong et al. (2014), in the area of sustainable service-based models in the clothing industry, found that the attributes contributing most to positive perceptions of these models included environmental benefits and emotional aspects, whereas



negative perceptions were most driven by a lack of trust in the service provider and perceived barriers to ease of use (e.g. technological requirements). The business case, collaboration and moral considerations are important factors in sustainability investment.

Understanding of the key success and failure factors of sustainable businesses and the specific role of sustainable venture capital is still an emerging research area and more work is required to understand how they could become more widespread.

### 2.5. Research gap: sustainable venture capital and sustainable business

The research area of the role of sustainable venture capital in the success of sustainable businesses is still nascent. However, it can build on related areas, such as cleantech: [Wüstenhagen and Teppo \(2006\)](#) conducted a qualitative study on types of venture capitalists in the energy sector, [Isaak \(2002\)](#) discussed “ecopreneurs”, those who create ‘green’ businesses to transform industry towards sustainability; and [Bürer and Wüstenhagen \(2009\)](#) conducted a survey on energy policies cleantech venture capitalists prefer. [Marcus et al. \(2013\)](#) define research challenges including: what role should venture capital play to help transform our economy and society in a more sustainable direction? This paper focuses on the emergence of start-up sustainable businesses and the key role of “sustainable venture capitalists”, those that invest in businesses, which deliver triple bottom line benefits. This research investigates the following research question: *How can sustainable venture capitalists contribute to the success of sustainable start-ups?*

## 3. Methods

Several deductive research studies have been conducted on cleantech and the role of venture capital (e.g. [Bürer and Wüstenhagen, 2009](#)) and on sustainable entrepreneurship specifically (e.g. [Kuckertz and Wagner, 2010](#)). However, understanding of the role of sustainable venture capitalists in encouraging sustainable entrepreneurship is still evolving. Sustainable entrepreneurs have quite different motivations and skill sets compared to ‘conventional’ ones ([Parrish, 2010](#)). It is expected that sustainable venture capitalists encounter specific challenges and opportunities. In this paper, an inductive research method is used to investigate the role of venture capital investors in contributing to sustainable start-up success. This grounded theory approach can elicit new knowledge from the data itself ([Glaser and Strauss, 1967](#)), because it is less restricted by former theoretical frameworks imposed ([Bryman, 1998](#)) and allows the richness of qualitative data to be fully exploited ([Leete et al., 2013](#)). Two rounds of interviews were conducted: open interviews (nine in total), followed by semi-structured interviews (26 in total) with an expert sample of those involved in the area of sustainable venture capital and entrepreneurship. The collection of the primary data took place between March and September 2013. The following sections describe the method and design in detail.

### 3.1. Research sample

To better understand the impact of venture capital on sustainable entrepreneurship, sustainability venture capitalists, sustainability entrepreneurs, venture capitalists on accelerator platforms and

influencers (think tanks, consultants) were interviewed. The selected venture capitalists may not be described as the ‘typical idealist’ but rather, a ‘pragmatic idealist’: they have a profit-making motive, although their investment thesis includes triple bottom line driven businesses (see [Fig. 2](#)). These venture capitalists may be referred to as ‘sustainability’ or ‘sustainable venture capitalists’ (this group does not generally refer to themselves as ‘impact investors’ because of a clear profit motive). This particular group of investors is still relatively small but very aware of others working in the field. Hence a snowballing technique, where interviewees suggest others to interview ([Reed et al., 2009](#)), was used to identify interviewees. The interviewees are by no means ‘muesli eaters’ (a term used by an interviewee) but are aware of the opportunity and necessity of creating business with triple bottom line returns. Entrepreneurs in sustainable businesses were interviewed to understand their relation with venture capitalists. Venture capitalists working for ‘accelerator platforms’ and key ‘influencers’ were also interviewed as they were identified as key actors in this field through the snowballing technique.

### 3.2. Research method and design

Between January and September 2013 primary data were collected through interviews conducted with stakeholders involved in growing sustainable businesses. Similar to the approach by [Leete et al. \(2013\)](#), there were two phases of data collection, followed by a third phase of data analysis:

- **Phase one** consisted of open interviews and attendance of industry events to refine the research themes and questionnaire for Phase two of the research.
- **Phase two** consisted of interviews with stakeholders involved in the process of scaling sustainable businesses. These interviewees included investors, entrepreneurs, business accelerator platforms (platforms supporting the growth of young firms by identifying and funding start-ups and providing them business support and access to their networks) and influencers (e.g. think tanks, NGOs, leading consultancies).
- **Phase three** consisted of data analysis. The focus was on analysing primary data collected through the interviews, with some supplementary data (venture capital or accelerator platform websites or reports shared by the interviewees) supplementing the analysis.

### 3.3. Identifying interviewees

Sustainable venture capitalists, entrepreneurs and other leading thinkers (influencers) involved in financing, establishing and influencing the development and growth of sustainable businesses were identified and invited for interviews using snowball sampling. [Table 1](#) includes the overview of interviewees who participated in this research. The snowballing technique led to a mixed USA/Europe sample. In Phase two, more USA interviewees were recruited than in the exploratory phase. Although the distributions across geographies may be viewed as a limitation of the study, this distribution reflected the snowballed sample and no notable differences in responses across geographies were observed.



Fig. 2. Research sample in this paper: ‘pragmatic idealists’.

**Table 1**

The number of interviewees who participated in this research. Notes.<sup>1</sup> Two of the interviewees worked mostly in private equity.<sup>2</sup> One interviewee worked with non-profits predominantly.

		Invited	Agreed	Completed	Type	Geographies
Phase 1	Venture capitalist	6	6	6	4 face-to-face; 2 phone/Skype	4 Europe, 2 USA
	Influencer	3	3	3	3 face-to-face	3 Europe
	<i>Sub total</i>	9	9	9		
Phase 2	Venture capitalist <sup>1</sup>	13	11	10	5 face-to-face; 5 phone/Skype	9 USA, 1 Europe
	Venture capitalists on accelerator platforms <sup>2</sup>	8	7	7	2 face-to-face, 5 phone/Skype	6 USA, 1 Europe
	Influencer	5	5	5	2 face-to-face; 3 phone	4 USA, 1 Europe
	Entrepreneur	6	4	4	3 face-to-face; 1 phone	3 USA, 1 Europe
	<i>Sub total</i>	32	28	26		
	<b>Total</b>	<b>41</b>	<b>37</b>	<b>35</b>		

### 3.4. Phase one – open interviews

Between January and June 2013, nine open interviews took place with investors and influencers in Europe and the USA involved in sustainability investments. During the open interviews (20 m – 1 h 30 m and on average 50 m), the area of sustainable entrepreneurship and the role of ‘sustainability venture capitalists’ in encouraging sustainable entrepreneurship were discussed. Interviewed organisations included a cleantech and a sustainability venture capital firm (both USA), a corporate venture capital firm (Europe), two European non-profit organisations (one involved in environmental protection and sustainable finance, and one involved in encouraging sustainable business development), a sustainability think tank (Europe) and three interviews with venture capital investors at a cleantech and sustainability investment event in the United Kingdom (March and April 2013). These were all interviewed once, except for a venture capitalist whose work was most closely linked to the research agenda and agreed to contribute for a more formal interview and make

introductions to other venture capitalists. The findings from the open interviews were used to narrow down the research themes and develop research questions for the semi-structured interviews.

### 3.5. Phase two – semi-structured interviews

Between June and September 2013, 26 semi-structured interviews took place. The interviewees can be categorised as: *venture capitalists*; *venture capitalists on accelerator platforms* (platforms supporting the growth of start-ups); *influencers* (think tanks, business advisors) and *entrepreneurs* (those who have established sustainability ventures). They were typically sent a 3-page overview including the background of the project, research approach and personal details on the author. The research themes are included in Table 2. During all but four interviews (two venture capitalists, an influencer and one entrepreneur) a semi-structured interviewing schedule was used. Interviews on average took 45 m, but ranged between 30 m and 1 h 20 m.

**Table 2**

Semi-structured interview schedule.

Theme	Sub themes	Key questions
Introduction	<ul style="list-style-type: none"> <li>How they got involved/Role in organisation</li> <li>Vision</li> </ul>	<ul style="list-style-type: none"> <li>How did you get involved in your organisation?</li> <li>Why did you get involved in this? What is/was your vision?</li> </ul>
Successful and failed sustainable businesses	<ul style="list-style-type: none"> <li>Investment thesis and views on exit strategies</li> <li>Characteristics</li> <li>Successful examples/Failed examples. Reasons for success/failure</li> <li>Novelty of the business model – customer segments and value proposition (value proposition); channels, customer relations, key resources and partnerships (value creation), revenue streams and cost structure (value capture) (see Bocken et al., 2013)</li> </ul>	<ul style="list-style-type: none"> <li>What is your investment thesis?</li> <li>What are examples of sustainable businesses that were successful? Why were these successful?</li> <li>What are examples of sustainable businesses that failed or did not achieve scale? Why did this happen?</li> <li>Were any particular elements of the business model novel?</li> </ul>
Investing in sustainable businesses	<ul style="list-style-type: none"> <li>Actors involved at different stages of financing the venture</li> <li>Actors involved in achieving scale (e.g. growing customer base)</li> <li>Successful and failed collaborations</li> </ul>	<ul style="list-style-type: none"> <li>Who has an important role to play in financing sustainable businesses? For instance:</li> <li>What is the role of venture capital?</li> <li>What is the role of multinationals</li> <li>What is the role of government?</li> <li>What are examples of cases when venture capitalists, start-ups and multinationals worked well to help scale up sustainable businesses?</li> <li>What are examples of successful and failed partnerships to develop and grow sustainable businesses?</li> </ul>
Investor support and start-up needs: gaps	<ul style="list-style-type: none"> <li>Guidance at stages of business progress</li> <li>Difference in support between conventional and sustainability start-ups</li> </ul>	<ul style="list-style-type: none"> <li>What guidance do start-ups need at various stages of business progress?</li> <li>Is there a difference in support/guidance needed between “conventional” and “sustainability” start-ups?</li> </ul>
Future	<ul style="list-style-type: none"> <li>Selection of start-ups, selection criteria</li> <li>Role of different actors – multinationals, venture capital, other investors</li> </ul>	<ul style="list-style-type: none"> <li>How should venture capitalists select start-ups that deliver sustainability? Which criteria should they use?</li> <li>What should the role of multinationals be in sustainable business models? What should the role of start-ups be?</li> </ul>

### 3.6. Phase three – Data gathering and analysis

During the interviews, comprehensive notes were taken to transcribe the outcomes. Immediately after the interviews, these transcribed records were reviewed and finalised (e.g. typos removed) to develop an accurate interview report. Interviewees were contacted for clarification if further detail was required (e.g. specific data, supporting documentation). By ensuring prompt transcriptions, concerns related to imperfect memory and mixing interviews were avoided (Leete et al., 2013).

For *Phase one*, the main themes were collated from the nine open interviews, by identifying the common patterns across the transcribed interviews. These were used to develop the interview schedule for Phase two. For *Phase two*, the interview responses from the 26 semi-structured interviews and supplementary data (venture capital, accelerator and company websites and reports to gain further insights in the purpose of the companies and particular investment theses) were reviewed and written up, by sentence or paragraph (Miles and Huberman, 1994; Corbin and Strauss, 1990). Each of these sentences or cohesive paragraphs was assigned an initial low-level label. These were re-categorised into medium-level labels (low-level labelled pieces of text, which in some way belong together; e.g. reasons for success, failure) and then matched against high-level themes from the open interviews (e.g. successful and failed cases). Regular comparisons of similarities and differences between the findings were conducted to achieve consistency and precision, as suggested by Corbin and Strauss (1990). This was done multiple times to ensure all key pieces of text were coded and collated under each relevant theme. Further themes in addition to those from the semi-structured questionnaire were identified and added during the coding process (e.g. the personal motivation of interviewees). As part of *Phase three*, the data from Phase two were collated to identify the most important themes across the interviews. At this stage, the text was coded according to the following themes: motivation, personal vision, investment thesis, reasons for success, reasons for failure and the role of specific actors (e.g. venture capitalists, government). The number of lowest coded pieces of text per theme, were counted to identify the most important findings, although the ‘fringe findings’ were also captured as can be seen from Section 4. The consistency and logic of the outcomes of the coding process were checked by a colleague for reliability.

## 4. Findings

This section presents findings from the rounds of interviews and data analysis.

### 4.1. Findings from the open interviews

The investor events (March–April, 2013, London) showed that investors are getting more risk averse. The business case and proven sales – which are hard to achieve for a young business – are becoming increasingly important to venture capitalists. Some venture capitalists, in particular in cleantech were pessimistic, asserting, “*cleantech is dead*” (venture capitalist). However, there is a belief that there is money in new areas, compatible with sustainability: “everything with a ‘social’ element is getting more important, and the sharing economy, and apps ( ... ) this is where the money is now” (venture capitalist). The role of large companies was emphasised by interviewees. For example: “*My interest is in making use of large sums of money from large corporations [ ... ] to fund small companies with an interest in environment and society*” (venture capitalist). Language is important: “*The investment world*

*uses ‘sustainable’ to indicate ‘profitable’ or financially sustainable. Different wording is needed here*” (venture capitalist).

The broad themes identified from the open interviews included: a growing interest in ‘sustainability investments’ (beyond cleantech); the importance of aligning investment with business language; the need for collaboration (e.g. corporate and NGO); the emergence of a new type of investing (e.g. crowdfunding) and the need to understand successful as well as failed cases. These themes fed into the semi-structured interview schedule used for Phase two of this research.

### 4.2. Findings from the semi-structured interviews

The transcription of the interview data in coded pieces of text led to over 2000 distinct data points. Each of these points was assigned a low-level label, which were grouped into medium-level labels and grouped according to high-level themes. As discussed in Section 3.5, multiple rounds of coding the data took place to collate the main results. From the coding exercise, high-level labels (e.g. successful sustainable businesses) and their medium-level labels (e.g. success factors) were developed. In the following sections, the results are structured according the following high-level themes: motivation, vision and investment thesis; reasons for success and failure of sustainable start-ups and the role of specific actors.

#### 4.2.1. Motivation, vision and investment thesis

The following dominant motivations were brought forward by the interviewees to get involved in the area of sustainable business, in order of prevalence:

1. Practical idealism – a belief that business can be used as a force for good and sustainability is good business (20 interviewees; 77% of sample)
2. Disagreement with the status quo: search for radical new approaches and making change by connecting small and large companies (8 interviewees; 31%)
3. Adding professionalism, mainstreaming and commercialisation of sustainable businesses (4 interviewees; 15%)
4. Emotion: care, fear, a personal epiphany (e.g. having a first child, witnessing large-scale pollution), sense of responsibility (3 interviewees; 12%)
5. A search for transparency (1 interviewee; 4%)

The dominant reasons shared across different interviewees thus included: practical idealism and disagreement with the status quo.

The *investment thesis* serves as a strong guideline for the types of ventures to invest in and venture capitalists spend a lot of time on getting this right. Although each investment thesis has its particular language, there are three overarching themes to the investment theses:

1. Focus on “doing good and doing well” (all venture capitalists)
2. Seeking a range of synergistic investment areas across the triple bottom line (e.g. health improvement, while reducing environmental impact) (seven venture capitalists).
3. Focus on areas where no money is going and being transformative and innovative in the investment thesis aims and language (three venture capitalists).

#### 4.2.2. Reasons for success and failure

From the analysis of the interview data, the following were identified as the main reasons for success and failure of sustainable businesses (Table 3).

**Table 3**

Reasons for success and failure identified. Note. These are displayed in order of prevalence.

Reasons for success	# (and %) of interviewees	Reasons for failure	# (and %) of interviewees
1. Innovation in the business model	8 (31%)	1. Lack of suitable venture capitalists and knowledge	9 (35%)
2. Forming credible collaborations and using networks	8 (31%)	2. Strong existing industry; not significantly better	8 (31%)
3. Focus on a strong business case (regardless of 'sustainability')	7 (27%)	3. Short-term mind-set	8 (31%)
4. Sustainably leads to good business	5 (19%)	4. "Start-ups fail" – failure is normal and healthy and there are many common problems for start-ups in general and unforeseen circumstances	8 (31%)
5. Creation of new demand	4 (15%)	5. Need for extra business rigour – environmental and societal benefits cannot be the only differentiator	5 (19%)
6. Formulation of a great team	4 (15%)	6. Not understanding the market	5 (19%)
7. Government and legislation	4 (15%)	7. Lack of resources or abundance of resources	5 (19%)
8. Attitude: ambition, hardworking and inspirational	3 (12%)	8. False analogies – e.g. to the quick-win format of "apps" (mobile phone applications)	5 (19%)
9. Systems thinking/changing the systems context	2 (8%)	9. Failed business model concept	5 (19%)
10. Investor patience – long-term thinking and gains	1 (4%)	10. Government – lack of international rules or not yet fit for purpose	4 (15%)
11. Speed to market	1 (4%)	11. Large incumbent companies – lack of continuity in business roles or lack of innovation capacity	4 (15%)
		12. Managing demand	4 (15%)
		13. Business structure	3 (12%)
		14. More talk than action/Lack of sense of urgency	3 (12%)
		15. Issues around IP	1 (4%)

As can be observed from Table 3, key success factors include: innovation in the business model (e.g. novel partnerships and value propositions), collaborations (across small and large companies, and industries) and a strong business case ('sustainability' alone is not enough). The main reasons for failure include lack of suitable investors and investor knowledge (about sustainability); a strong incumbent industry and not being significantly better, and a short-term investor mind-set. There is also a recognition that most start-ups fail (due to unforeseen circumstances and the fact that many 'just fail').

#### 4.2.3. Support and the role of specific actors

Besides financing, venture capitalists can support sustainable entrepreneurs in several ways. Two common types of support were identified from the interviews: the need for triple bottom line business advice (19 interviewees; 73%) and the use of the network (12 interviewees; 46%). As one entrepreneur commented: "Don't get me wrong, I was very happy with the money but I almost had to beg them for more business advice" ( ... ) "I needed support in every business aspect: strategy, business model, customers, marketing, hiring ( ... )" (entrepreneur). The network is also crucial, as entrepreneurs want to connect with other entrepreneurs with more experience, want to test ideas with 'experts' and want to find the right strategic fit with potential future customers or buyers of the business.

In addition, the interviewees shared their views on the roles of different actors in developing and supporting sustainable businesses (Table 4).

## 5. Discussion and conclusions

This paper investigates the role of sustainable venture capital as a catalyst for the emergence of sustainable start-ups. The implications of the results are discussed in this section, followed by a summary of the key conclusions.

### 5.1. The role of the sustainable venture capitalists

The motivators of the interviewees include: the prospect of sustainability as a business opportunity and the belief in a real need in creating sustainable businesses to tackle global sustainability

challenges. The interviewees are motivated by the view that business can be used as a force for good and a disagreement with the status quo. This has some similarity to a combination of motivators of green entrepreneurs observed by Kirkwood and Walton (2010) (green values and passion). However, disagreement with how business is done at present and practical idealism, were specific motivators identified in this research.

**Table 4**

The role of different actors in developing and supporting sustainable businesses.

Actors	Future requirements
Venture capitalists	<ul style="list-style-type: none"> <li>- More skilled 'sustainability investors' who are willing to accept slower capital and potentially lower economic returns in favour of social and environmental returns (9 interviewees; 35%)</li> <li>- Prove successful sustainable business investment formats (5 interviewees; 19%)</li> <li>- More investor money to the developing world (3 interviewees; 12%)</li> <li>- More project and programme financing (2 interviewees; 8%)</li> <li>- More smaller investments (2 interviewees; 8%)</li> </ul>
Entrepreneurs in start-ups	<ul style="list-style-type: none"> <li>- By challenging current businesses and business models start-ups could disrupt the market (5 interviewees; 19%)</li> <li>- Growing need for skilled 'sustainable entrepreneurs' (5 interviewees; 19%)</li> </ul>
Large companies	<ul style="list-style-type: none"> <li>- Be the driver of big changes/cultural shift by setting examples and being regenerative (5 interviewees; 19%)</li> <li>- Be an R&amp;D or manufacturing partner or a major customer (4 interviewees; 15%)</li> <li>- Provide start-up capital for new ventures, for example through competitions (2 interviewees; 8%)</li> </ul>
Government	<ul style="list-style-type: none"> <li>- Sustainable innovation enabling legislations (e.g. product-end-of-life legislation; pricing 'externalities' such as carbon emissions and waste) (5 interviewees; 19%)</li> <li>- Provide networks and contacts (3 interviewees; 12%)</li> <li>- Public-private partnerships and other types of financing (3 interviewees; 12%)</li> </ul>
Public	<ul style="list-style-type: none"> <li>- More new financing models such as crowdfunding and peer-to-peer (consumer-to-consumer) lending can support the emergence of sustainable businesses (4 interviewees; 15%)</li> </ul>



How can sustainable venture capitalists contribute to the success of sustainable start-ups? The key role of venture capitalists, in addition to the primary purpose of providing funding, is to use their business acumen to help start-ups develop a strong business case while creating positive impact on society (e.g. health) and the environment (e.g. significantly reduced waste and air pollution). The investment thesis works as a guideline of what these positive impacts (and/or negative impact reductions) of businesses should look like. The interviewees recognised that the power of incumbent firms provides an important barrier to a young firm's success and that most start-ups "just fail". The role of venture capitalists is to assist in providing business rigour, develop an understanding of the market and demand for a product or expertise (through their own or network's knowledge) and make early connections with large incumbent companies to gauge interest for product sales and acquisitions. This is not significantly dissimilar from 'conventional' businesses, except for the much needed and sought-after 'sustainability skills' coupled with businesses acumen. The interviewees also feel that sustainable businesses are also more likely to succeed, which shows the opportunity for developing such businesses.

## 5.2. Sustainable business success and failure and sustainable venture capital

The interviews gave insights in the key success and failure factors for sustainable businesses. Similar to the field of cleantech (Wüstenhagen and Boehnke, 2006; Weber and Kratzer, 2013), the business model is found to be an important enabler to success of sustainable businesses. Collaboration was also found to be a key success factor. Main sources for failure identified in this research include a lack of suitable venture capitalists (suitable risk capital), strong incumbent firms and short-term investment mindsets. These are not all different from 'conventional' industry sources of failure (e.g. in Gompels and Lerner, 2001), but other sources of failure identified in this research, such as the competition from 'quick-win' formats (such as 'apps') show the need for the development of new successful business formats for sustainable businesses. However, some apps (e.g. those that help consumers save energy) are compatible with sustainability.

### 5.2.1. Success

Within the current capitalist framework, the business model needs to significantly outperform the incumbent industry (31% of interviewees). To be successful, 'sustainability' in itself is not a unique selling point (27% of interviewees). Hence, the role of the venture capitalist is vital as the same experience and rigour needed to develop successful 'conventional' businesses applies to sustainable businesses. However, the added complexity is the need to satisfy triple bottom line performance. Examples of successful new businesses with novel (sustainable) business models mentioned by the interviewees include Zipcar (Chase, 2012), which delivers the functionality of car use rather than car ownership (Bocken et al., 2014) and SolarCity (2013), which sells energy contracts for renewable energy rather than solar panels to customers. Some examples of where 'sustainability sells' mentioned by the interviewees include Toms (2014), which works with a social enterprise-type of model, where a donation is made for shoes in the developing world for each pair of shoes sold, and Nest (2014), a smart aesthetically-pleasing thermostat. However, it is "difficult to get that right [that sustainability is cool]" (venture capitalist). To conclude, in the eyes of sustainable venture capitalists, the business model of a sustainable business needs to significantly outperform current incumbents' business models to ensure success and the financial business case of the new start-up needs to be strong

regardless of the environmental and social business case. This is also an important inhibiting factor to investment in sustainable start-ups.

### 5.2.2. Failure

Lack of knowledge and available venture capitalists with an investment thesis focused on sustainability were mentioned as a major cause of failure of sustainable businesses. A short-term mindset (interviewees quoted payback periods of 2–3 years, referring to 'apps') prevails amongst venture capitalists, according to the interviewees. However, sustainable businesses are typically and by definition developed with longer time lines in mind. Failure of sustainable businesses is linked to the investor focus on quick-win formats such as 'apps'. As one venture capitalist noted: "What has changed is what things are being compared to – energy is compared with technology now (when Apple started it cost a lot more to develop – the initial tech investments were huge! Money runs to the highest return (apps, tech)". This is an interesting point, which provides another insight into the struggle of sustainable businesses: the competition with quick-win business formats such as 'apps' and expectations of quick returns.

The interviewees mentioned a range of other reasons why young businesses fail, some of which were mentioned as relevant for all types of business. Similar to conventional ones sustainable businesses can 'just fail' because of unforeseen circumstances and other common start-up problems (e.g. too many of the same companies). Failure is also seen as normal and healthy. In addition, novel business models (unproven or badly 'copied' from other industries) lead to failure of sustainable businesses. Indeed, Wüstenhagen and Boehnke (2006) already viewed the business model as an important factor to consider for cleantech. Finally, not understanding the market (overestimating demand, not understanding customer needs) and an abundance or lack of resources (finance, people) are other sources of failure identified (also mentioned by Gompels and Lerner, 2001).

### 5.3. Implications

The influx of money into sustainability ventures needs to grow to tackle pressing global challenges (Royal Society, 2012; WBCSD, 2013). Entrepreneurial ideas need to sharpen up to develop successful sustainable businesses, which can become mainstream and new investment formats and skilled investors are essential. At present, the opportunity to invest in 'sustainability' seems overpowered by the success of 'quick-win investment formats', but there are opportunities for start-ups to overcome these barriers. However, an emerging group of venture capitalists is looking beyond 'quick-win formats' to invest in sustainable businesses that are economically viable, but also contribute positively at a societal and environmental level, for example, by focussing on health issues, saving carbon emissions or, even better, a synergistic combination of societal and environmental benefits. The motivations are diverse: some are motivated by the fear of the consequences of our global challenges such as climate change, and others predominantly see a business opportunity in doing good.

How can sustainable start-ups become more prepared and suited for venture capital investment? First, cases of successful start-ups quoted by the interviewees have business models that challenge existing ones. Innovation in the business model (e.g. selling a service rather than a product) is viewed as a key enabler to success. For example, renewable energy service contracts such as solar-energy sold as a service (e.g. SolarCity, 2013) mentioned by the interviewees, allow customers to keep their energy bills low, while reducing their carbon footprint. Second, sustainable

start-ups can find opportunity in the influx of investments in internet-based start-ups and apps. An example of an internet-based sustainable business is *Nest* (2014), a smart thermostat, referred to as the “Apple of the energy industry” by one of the interviewees, because of the team (ex-Apple) and the simple appealing design. Similar to social enterprise models (e.g. *Toms*, 2014) sustainable businesses can establish a profit generator and a social and environmental ‘impact generator’ as part of their business model to create impact while being financially viable. There is a need to expand the number of ‘win-win-win’ business model ideas, where manufacturers, suppliers, and customers can experience advantages, while creating environmental and societal benefits to serve as exemplars for businesses, as also argued in *Bocken and Allwood* (2012). Third, crowdsourcing and peer-to-peer lending (e.g. Kickstarter; *Gould*, 2011) platforms can create and prove the first customer base to make sustainable start-up more appealing for venture capitalists. These platforms could fulfil part of a venture capitalist’s role (capital), but do not provide the network and business advice. Finally, it is essential to develop successful sustainable business and investment formats to drive more investment in this space. The most successful sustainable ventures quoted by the interviewees have a clear business case, are not necessarily positioned as “sustainable” and give customers clear benefits: for example, *SolarCity* (2013) allows customers to keep their energy bills low, while reducing their carbon footprint, whereas *Zipcar* (2014) only mentions environmental impact reduction as one of the seven reasons to join its car club model.

Do venture capitalists inhibit or stimulate the development of sustainable start-ups? The interviewed venture capitalists interviewees are clearly driven by ideology as well as opportunity (Fig. 2). However, unlike philanthropists, venture capitalists invest in businesses – not in non-profit organisations – in return for shares in the business and this will limit their range of investments. Although other investors can fulfil the financing role of venture capitalists (e.g. angel investors, corporates, crowd funding, Fig. 1), venture capitalists still serve as the key linchpin in the investment process for sustainable innovation (*Keuschnigg*, 2004). A range of interviewees mentioned that the environmental and societal successes need to be significant, but the financial success needs to be too. Some important innovations with a positive societal and environmental impact therefore might never develop in the current system, because they lack the profit potential and do not fit the investment theses of venture capitalists. Although a range of venture capitalists has now adopted a sustainable investment portfolio, as found in the interviews, they will not invest if there is no clear financial return.

How can sustainable venture capital be encouraged? Sustainable venture capitalists balance financial against social and environmental returns when investing in sustainable start-ups; they seek to prove new investment formats and demonstrate that sustainable business is good business. Indeed, the interviewees see their own successful investments as a catalyst for conventional venture capitalists to move into the sustainability space. Potential slower financial returns and risk can be mitigated by diversifying the portfolio and co-investing with other investment partners, which is a conventional risk mitigating strategy for venture capitalists (*Gompels and Lerner*, 2001). Governments can create sustainability enabling innovation legislations (e.g. end of product life legislation) to drive innovation, create the infrastructures for people to live more sustainability, provide the support and seed funding for aspiring entrepreneurs and, more generally, stimulate ‘sustainability interests’ from an early age through education. Ultimately, binding global climate legislations can push significant change.

This paper reaffirms the need for specific skills for ‘sustainable entrepreneurs’ (*Parrish*, 2010) and finds that sustainable venture capitalists need to transfer this specific skill set to sustainable entrepreneurs: business acumen and an ability to deliver environmental and societal benefits through a business. Large multinational companies have the resources and networks to have a great impact and set examples (e.g. nature regeneration projects referred to as ‘net positive’; *Bocken et al.*, 2014) and serve as major customers, partners and eventually buyers of young businesses. Through collaboration and open innovation different actors can start to address key issues outside their company boundaries.

**Table 5**  
Summary of the key findings.

	Key findings
Motivators	<ul style="list-style-type: none"> <li>• Practical idealism</li> <li>• Disagreement with the status quo</li> <li>• Adding professionalism, mainstreaming and commercialising sustainable businesses</li> <li>• Emotion: care, fear, a personal epiphany</li> <li>• A search for transparency</li> </ul>
Investment thesis	<ul style="list-style-type: none"> <li>• Focus on “doing good and doing well”</li> <li>• Seeking a range of synergistic investment areas across the triple bottom line (e.g. health improvement, while reducing environmental impact)</li> <li>• Focus on areas where no money is going and be transformative and innovative in the investment thesis aims and language</li> </ul>
Reasons for success	<ul style="list-style-type: none"> <li>• Innovation in the business model</li> <li>• Forming credible collaborations and using networks</li> <li>• Focus on a strong business case (regardless of ‘sustainability’)</li> </ul>
Reasons for failure	<ul style="list-style-type: none"> <li>• Lack of suitable venture capitalists (‘risk capital’) and knowledge</li> <li>• Strong existing industry and not being significantly better</li> <li>• Short-term mind-set</li> <li>• “Start-ups fail” – failure is normal and healthy and there are many common start-up problems and unforeseen circumstances in general</li> </ul>
Venture capitalist support	<ul style="list-style-type: none"> <li>• Sustainable venture capitalists can support the development of sustainable businesses through the combination of ‘conventional’ and triple bottom line business advice.</li> <li>• Sustainable venture capitalists can support the development of sustainable businesses through the use of their network.</li> </ul>
Future	<ul style="list-style-type: none"> <li>• Venture capitalists will need to accept slower and potentially lower returns in favour of social and environmental benefits, to support the emergence of sustainable businesses.</li> <li>• Venture capitalists can contribute to the successful development of sustainable businesses by developing and proving successful investment formats.</li> <li>• Entrepreneurs can contribute to the development of sustainable businesses by challenging current businesses and business models.</li> <li>• Skills of sustainable entrepreneurship and venture capitalists will need to be developed to make sustainable businesses more widespread.</li> <li>• Large companies can stimulate the emergence of sustainable businesses by championing successes, acting as an R&amp;D partner or serving as a major customer.</li> <li>• The government can support sustainable businesses by creating innovation-enabling legislations, stimulating networking and engaging in public-private partnerships.</li> <li>• New forms of financing such as crowdfunding and peer-to-peer lending can facilitate the development of sustainable businesses.</li> </ul>

#### 5.4. Limitations and future research

The research was limited by a snowball sample of interviewees from Europe and the USA. Future research might include emerging countries, which have the opportunity to develop sustainable businesses and industries from the outset. A longitudinal analysis of the success of particular sustainable ventures over time could generate interesting results. Future research might investigate the potential of new types of financing such as crowdfunding for sustainability and the future role of alternative venture capitalists (e.g. corporates, general public). Some of the factors identified in this research, such as the motivators to get involved in scaling up sustainable businesses, such as a personal epiphany (e.g. having your first child) may be a subject of deeper psychological and sociological analysis to uncover how sustainable businesses might become more widespread. Finally, important areas of future research include the development of new business model formats that deliver triple bottom line returns, deeper understanding of the conditions under which slower returns are acceptable and government policies to stimulate sustainable entrepreneurship and finance.

#### 5.5. Conclusions

An emerging group of sustainability venture capitalists, 'pragmatic idealists', is emerging, looking to help develop businesses, which are successful across the triple bottom line. This paper contributed to the understanding of sustainable venture capital in the success of sustainable start-ups, by identifying motivators, investment theses, success and failure factors, and views on the future role of venture capitalists and other key actors such as governments and large companies. Table 5 summarises the findings of the empirical research, which can serve as a basis for future hypotheses and research.

Sustainable start-ups can find opportunity in sustainable business model innovation, new technology and funding platforms and develop the multiple business cases for their businesses to be successful beyond the 'green customer base'. Sustainable venture capitalists can help prove the success of sustainable business formats, but will also need to be patient in their expectations for returns and balance triple bottom line impacts in their key criteria for sustainable business success. Their financial risk can be mitigated through co-investments in ventures to diversify their portfolios. Legislation to stimulate the influx of sustainable innovation and investment, a shift in skills, and more broadly, a culture for sustainability, are necessary to facilitate the development of such new businesses, because the group of successful sustainability venture capitalists and entrepreneurs, and as a result, mainstreamed sustainable businesses, is still relatively small.

#### Acknowledgements

The author gratefully acknowledges the support and funding of the EPSRC Centre for Innovative Manufacturing in Industrial Sustainability (RG64858).

#### References

- Airbnb, 2014. New Study Reveals A Greener Way to Travel: Airbnb Community Shows Environmental Benefits of Home Sharing. Available at: <https://www.airbnb.co.uk/press/news/new-study-reveals-a-greener-way-to-travel-airbnb-community-shows-environmental-benefits-of-home-sharing> (accessed September 2014).
- Armstrong, C.M., Niinimäki, K., Kujala, S., Karell, E., Lang, C., 2014. Sustainable product-service systems for clothing: exploring consumer perceptions of consumption alternatives in Finland. *J. Clean. Prod.* 97, 30–39 (Special Volume: Why have 'Sustainable Product-Service Systems' not been widely implemented?).
- Baum, J.A.C., Silverman, B.S., 2004. Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups. *J. Bus. Ventur.* 19 (3), 411–436.
- Berry, T., Junkus, J., 2013. Socially responsible investing: an investor perspective. *J. Bus. Ethics* 112 (4), 707–720.
- Bocken, N., Allwood, J., 2012. Strategies to reduce the carbon footprint of consumer goods by influencing stakeholders. *J. Clean. Prod.* 35, 118–129.
- Bocken, N., Short, S., Rana, P., Evans, S., 2013. A value mapping tool for sustainable business modelling. *Corp. Gov.* 13 (5), 482–497.
- Bocken, N., Short, S., Rana, P., Evans, S., 2014. A literature and practice review to develop sustainable business model archetypes. *J. Clean. Prod.* 65, 42–56.
- Boehnke, J., Wüstenhagen, R., 2007. Business models for distributed energy technologies – evidence from German Cleantech Firms. In: 2007 Academy of Management Annual Meeting, Philadelphia, PA, USA.
- Bos-Brouwers, H., 2010. Corporate sustainability and innovation in SMEs: evidence of themes and activities in practice. *Bus. Strat. Environ.* 19 (7), 417–435.
- Bryman, A., 1998. Quantity and Quality in Social Research. Unwin Hyman, London, UK.
- Bugg-Levine, A., Emerson, J., 2011. Impact investing transforming how we make money while making a difference. *Innov.* 6 (3), 9–18.
- Bürer, M.J., Wüstenhagen, R., 2008. Cleantech venture investors and energy policy risk: an exploratory analysis of regulatory risk management strategies. In: Wüstenhagen, R., Hamschmidt, J., Sharma, S., Starik, M. (Eds.), *Sustainable Innovation and Entrepreneurship*. Edward Elgar Publishing, pp. 290–309.
- Bürer, M.J., Wüstenhagen, R., 2009. Which renewable energy policy is a venture capitalist's best friend? Empirical evidence from a survey of international cleantech investors. *Energ. Policy* 37 (12), 4997–5006.
- Chase, R., 2012. How Technology Enables the Shared Economy. Available at: <http://www.greenbiz.com/video/2012/05/02/how-technology-enables-shared-economy> (accessed June 2014).
- Corbin, J., Strauss, A., 1990. Grounded theory research: procedures, canons, and evaluative criteria. *Qual. Sociol.* 13 (1), 3–21.
- Cortez, M.C., Silva, F., Areal, N., 2012. Socially responsible investing in the global market: the performance of US and European funds. *Int. J. Financ. Econ.* 17 (3), 254–271.
- Ehrenfeld, J., 2008. Sustainability by Design. A Subversive Strategy for Transforming Our Consumer Culture. Yale University Press, New Haven, CT.
- Elkington, J.B., 1997. Cannibals with Forks: the Triple Bottom Line of 21st Century Business. Capstone Publishing, Oxford.
- Entine, J., 2003. The myth of social investing: a critique of its practice and consequences for corporate social performance research. *Organ. Environ.* 16 (3), 352–368.
- EU., 2012. Small Companies, Big Ideas. Available at: [http://ec.europa.eu/environment/ecoap/about-eco-innovation/policies-matters/eu/20121029-small-companies-big-ideas\\_en.htm](http://ec.europa.eu/environment/ecoap/about-eco-innovation/policies-matters/eu/20121029-small-companies-big-ideas_en.htm) (accessed September, 2014).
- Fabian, F.H., Ndofo, H., 2007. In: Lumpkin, T., Katz, J. (Eds.), *The Context of Entrepreneurial Processes: One Size Doesn't Fit All*. *Adv. Entrep.* 10, 249–280.
- Franke, N., Gruber, M., Harhoff, D., Henkel, J., 2008. Venture capitalists' evaluations of start-up teams: trade-offs, knock-out criteria, and the impact of VC experience. *Entrep. Theory Pract.* 32 (3), 459–483.
- Geobey, S., Westley, F.R., Weber, O., 2012. Enabling social innovation through developmental social finance. *J. Soc. Entrep.* 3 (2), 151–165.
- Gerber, E., Hui, J., 2013. Crowdfunding: motivations and deterrents for participation. *ACM Transactions on Computing-Human Interaction* 20 (6), 32. Article 34.
- Giesler, P., 2011. NVCA's vital call to arms. *Glob. Corp. Ventur.* Issue 009, February, P. 5.
- Glaser, B., Strauss, A., 1967. *The Discovery of Grounded Theory*. Aldine, Chicago, IL, USA.
- Global Impact Investing Network (GIIN), 2013. GIIN. Available at: <http://www.thegiin.org/cgi-bin/iowa/home/index.html> (accessed October 2013).
- Gompers, P., Lerner, J., 2001. The venture capital revolution. *J. Econ. Perspect.* 15 (2), 145–168.
- Gould, E., 2011. Start me up. *Tech. Rev.* 114 (1), 76–78.
- Hall, J., Daneke, J., Lenox, M., 2010. Sustainable development and entrepreneurship: past contributions and future directions. *J. Bus. Ventur.* 25, 439–448.
- Hansen, M., Chesbrough, H., Nohria, N., Sull, D., 2000. Networked incubators. *Hothouses of the New Economy*. *Bus. Rev.* 78 (5), 74–84.
- Herstatt, C., Verworn, B., 2001. The "Fuzzy Front End" of Innovation. Working Paper No. 4. Department of Technology and Innovation Management, Technical University of Hamburg.
- Hochberg, Y., Jungqvist, A., Lu, Y., 2007. Whom you know matters: venture capital networks and investment performance. *J. Financ.* 62 (1), 251–301.
- Hockerts, K., Wüstenhagen, R., 2010. Greening Goliaths versus emerging Davids – theorizing about the role of incumbents and new entrants in sustainable entrepreneurship. *J. Bus. Ventur.* 25 (5), 481–492.
- Huhtala, A., 2003. Special issue on cleaner production financing. *J. Clean. Prod.* 11 (6), 611–613.
- Isaak, R., 2002. The making of the ecopreneur. *Green. Manag. Int.* 38, 81–91.
- Juravle, C., Lewis, A., 2009. The role of championship in the mainstreaming of Sustainable Investment (SI): what can we learn from SI pioneers in the United Kingdom? *Organ. Environ.* 22 (1), 75–98.
- Keuschnigg, C., 2004. Venture capital backed growth. *J. Econ. Growth* 9 (2), 239–261.

- Kaplan, S., Strömberg, P., 2001. Venture capitalists as principals: contracting, screening, and monitoring. *Am. Econ. Rev.* 91 (2), 426–430.
- Kirkwood, J., Walton, S., 2010. What motivates ecopreneurs to start businesses? *Int. J. Entrep. Behav. Res.* 16 (3), 204–228.
- Kuckertz, A., Wagner, B., 2010. The influence of sustainability orientation on entrepreneurial intentions — investigating the role of business experience, sustainable development and entrepreneurship. *J. Bus. Ventur.* 25 (5), 524–539.
- Lans, T., Blok, V., Wesselink, R., 2014. Learning apart and together: towards an integrated competence framework for sustainable entrepreneurship in higher education. Special issue: higher education for sustainable development: emerging areas. *J. Clean. Prod.* 62, 37–47.
- Leete, S., Xu, J., Wheeler, D., 2013. Investment barriers and incentives for marine renewable energy in the UK: an analysis of investor preferences. *Energ. Policy* 60, 866–875.
- Louche, C., Arenas, D., van Cranenburgh, K.C., 2012. From preaching to investing: attitudes of religious organisations towards responsible investment. *J. Bus. Ethics* 110 (3), 301–320.
- Marcus, A., Malen, J., Ellis, S., 2013. The promise and pitfalls of venture capital as an asset class for clean energy investment: research questions for organization and natural environment scholars. *Organ. Environ.* 26 (1), 31–60.
- Miles, M., Huberman, M., 1994. *Qualitative Data Analysis. An Expanded Sourcebook*, second ed. Sage Publications Inc, Thousand Oaks, CA, USA.
- MIT Sloan Management Review, The Boston Consulting Group, 2013. *The Innovation Bottom Line. Findings from the 2012 Sustainability & Innovation Global Executive Study and Research Report*. MIT, MIT Sloan Management Review, Research Report Winter 2013.
- Mollick, E., 2013. The dynamics of crowdfunding: an exploratory study. *J. Bus. Ventur.* 29 (1), 1–16.
- Monitor Institute, 2009. *Investing for Social and Environmental Impact. A Design for Catalyzing an Emerging Industry*. Available at: [http://www.cdfifund.gov/what\\_we\\_do/resources/Investing%20for%20social%20and%20environmental%20impact%20Monitor.pdf](http://www.cdfifund.gov/what_we_do/resources/Investing%20for%20social%20and%20environmental%20impact%20Monitor.pdf) (accessed 21.10.13.).
- Moore, B., Wüstenhagen, R., 2004. Innovative and sustainable energy technologies: the role of venture capital. *Bus. Strat. Environ.* 13 (4), 235–245. Special Issue: Innovating for Sustainability.
- Napp, J., Minshall, T., 2011. Corporate venture capital investments for enhancing innovation: challenges and solutions. *Res. Technol. Manag.* 54 (2), 27–36.
- Nest, 2014. *About Us*. Available at: <https://nest.com/about/> (accessed March 2014).
- Nilsson, J., 2008. Investment with a conscience: examining the impact of pro-social attitudes and perceived financial performance on socially responsible investment behavior. *J. Bus. Ethics* 83 (2), 307–325.
- O'Rourke, A., 2003. The message and methods of ethical investment. *J. Clean. Prod.* 11 (6), 683–693 (Special Volume: Financing Cleaner Production).
- Pacheco, D., Dean, T., Payne, D., 2010. Escaping the green prison: entrepreneurship and the creation of opportunities for sustainable development. *Sustainable development and Entrepreneurship. J. Bus. Ventur.* 25 (5), 464–480.
- Parker, N., O'Rourke, A., 2006. *The Cleantech Venture Capital Report — 2006*. Cleantech Venture Network LLC. Available at: [http://www.juccce.com/documents/Financing/Clean%20Tech%20Investments/CapitalReport\\_Parker.pdf](http://www.juccce.com/documents/Financing/Clean%20Tech%20Investments/CapitalReport_Parker.pdf) (accessed October 2013).
- Parrish, B., 2010. Sustainability-driven entrepreneurship: principles of organization design. *J. Bus. Ventur.* 25, 510–523.
- Reed, M., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C., Stringer, L., 2009. Who's in and why? A typology of stakeholder analysis methods for natural resource management. *J. Environ. Manag.* 90, 1933–1949.
- Rockefeller Philanthropy Advisors, 2009. *Solutions for Impact Investors: from Strategy to Implementation*. Available at: <http://www.rockefellerfoundation.org/uploads/files/7ad1e157-82ca-4e09-8770-543f4e9e6226.pdf> (accessed November 2013).
- Rosen, B.N., Sandler, D.M., Shani, D., 1991. Social issues and socially responsible investment behavior: a preliminary investigation. *J. Consum. Aff.* 25 (2), 221–234.
- Royal Society, 2012. *People and the Planet*. Available at: <http://royalsociety.org/policy/projects/people-planet/report/> (accessed June 2014).
- Russo, M., 2003. The emergence of sustainable industries: building on natural capital. *Strateg. Manag. J.* 24, 317–331.
- Sharir, M., Lerner, M., 2006. Gauging the success of social ventures initiated by individual social entrepreneurs. *J. World Bus.* 41 (1), 6–20.
- Shepherd, D.A., Patzelt, H., 2011. The new field of sustainable entrepreneurship: studying entrepreneurial action linking “What is to be sustained” with “What is to be developed”. *Entrep. Theory Pract.* 35 (1), 137–163.
- SolarCity, 2013. Available at: <http://www.solarcity.com/> [accessed June 2014].
- Toms, 2014. *Welcome to Toms*. Available at: [www.toms.com](http://www.toms.com) (accessed June 2014).
- Weber, C., Kratzer, J., 2013. Social entrepreneurship, social networks and social value creation: a quantitative analysis among social entrepreneurs. *Int. J. Entrep. Ventur.* 5 (3), 217–239.
- Wüstenhagen, R., Boehnke, J., 2006. Business models for sustainable energy. In: Andersen, M., Tukker, A. (Eds.), *Proceedings of the Workshop of the Sustainable Consumption Research Exchange (SCORE!) Network: Perspectives on Radical Changes to Sustainable Consumption and Production, 20–21 April 2006, Copenhagen, Denmark*, pp. 253–258.
- Wüstenhagen, R., Teppo, T., 2006. Do venture capitalists really invest in good industries? Risk-return perceptions and path dependence in the emerging European energy VC market. *Int. J. Tech. Manag.* 34 (1/2), 63–87.
- World Business Council for Sustainable Development (WBCSD), 2013. *Vision 2050: the New Agenda for Business*. Available at: <http://www.wbcd.org/pages/edocument/edocumentdetails.aspx?id=219&nosearchcontextkey=true> [accessed October 2013].
- World Commission on Environment and Development (WCED; chaired by Gro Brundtland), 1987. *Our Common Future*. Oxford University Press, Oxford.
- Yunus, M., Moingeon, B., Lehmann-Ortega, L., 2010. Building social business models: Lessons from the Grameen experience. *Long. Range Plan.* 43 (2–3), 308–325.
- Zipcar, 2014. *Who Exactly Is the Car Club Type?*. Available at: <http://www.zipcar.co.uk/is-it> (accessed September 2014).