



LUND UNIVERSITY

The Potential Catalytic Role of Green Entrepreneurship – Technological Eco-Innovations and Ecopreneurs' Acts – in the Structural Transformation to a Low-Carbon or Green Economy: A Foucauldian Discursive Approach

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Entrepreneurship, New Venture Creation

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Abstract

Green entrepreneurship – technological eco–innovations and ecopreneurs’ acts – has recently received much attention from European policymakers as one promising response to the challenges of sustainable economic development due to its potential to catalyze and build a low–carbon or green economy. This topical relationship between green entrepreneurship and sustainable economy has also gained increasing interest among scholars. Indeed, green entrepreneurship has been socially constructed as having a catalytic role in reshaping the sociotechnical landscape of the economy and engendering cultural changes and institutional developments associated with ecological modernization. This is predicated on the assumption that ecopreneurs bring about qualitative changes in enterprise structures, strategies, and practices. However, academic research on this relationship has put emphasis on individual ecopreneurs – although earlier work in technology studies has debunked the notion of lone entrepreneurial heroes in the development of new technologies, neglecting the wider sociotechnical context in which ecopreneurs operate. In this study, it is argued that ecopreneurs do not act in isolation with respect to sustainable economic change. It is moreover postulated that this relationship as part of mainstream debate on economic development and as an evolving hegemonic discourse is constructed in the light of culturally–specific and historically–contingent epistemic conceptions about the economic, technological, social, and political changes. Hence, it is important not to conceive of this relationship as something ahistorical, paradigmatic, universal, neutral, and apolitical–economic or the product of an epistemic understanding.

Grounded in a discursive theoretic approach, the aim of this study is to carry out an analysis of the social and epistemic construction of green entrepreneurship in relation to sustainable economy and its economic–political implications. I employ a Foucauldian approach to discourse and discourse analysis to examine a set of research documents – empirical material. The analytical approach consists of six steps: (1) discursive constructions, (2) interdiscursivity, (3) epistemic setting, (4) cultural frames and shifts, (5) discursive–material selective framing, (6) and political practice and knowledge/power relationship.

The relationship between green entrepreneurship and sustainable economy as a scholarly discourse highlights the lone ecopreneurial heroes and reinforces new social relations. Apart from reconstructing the ecopreneurs’ image, the discourse reconstitutes their relations to society in such that they are assigned new missions and ascribed vital roles for building a low-carbon/green economy. The discourse also awards highlight to policymakers/governments. It constitutes all these actors into the prime definers of the constructed economic reality. Moreover, the discourse has grounds from which it has emerged and evolved, building on a set of established discourses and thus changing economic and cultural reality. Unsurprisingly, the discourse as an object of knowledge is a matter of *episteme*, a subset of the order underlying European culture in current historical period. As knowledge claims, it is episteme–conditioned and historically–restricted – hence the need for being open to interrogations yet to come that may fundamentally reconfigure, or lead to abandoning, the current convictions. Furthermore, the discourse is shaped by the prevailing cultural frames and the emerging cultural shifts. In addition, the technological orientation of green entrepreneurship is the product of a selective framing of discursive and material dimensions. Therefore, green entrepreneurship technologization can be conceived as specific business practices which depend on the agency of ecopreneurs and other economic actors promoting technological eco–innovations and on hegemonic discourses on technology for sustainable development and environmental and technology policy and regulation governing the low-carbon/green economy. It is hence not paradigmatic but rather the outcome of social processes. Finally, the discourse is affected by political practice in relation with climate change, low–carbon/green economy, and ecological modernization, as well as by knowledge/power relations established in European society. These two influences determine, expand - and will probably maintain – the success of the relationship under study.

Keywords: discourse, episteme, green entrepreneurs/hip, ecopreneurs, technological eco–innovations, low–carbon/green/sustainable economy, transformation, green and energy efficiency technologies, ICT, environmental, economic, political, social, ecological modernization, European society, Foucault

1. Introduction

Like other industrialized countries around the world, European countries are facing an enormous challenge: to intensify efforts for expanding and sustaining economic opportunities and, concomitantly, address growing environmental pressures. Given European society's unique relation to new ICT and technology and their associated transformational effects for economic and sustainable development (see ISTAG 2003, 2006, 2008, 2012), technological eco-innovations – supported by policy – are socially constructed as being a positive force in building a low-carbon/green economy. This entails drastic shifts to existing technological regimes in order to prevent unsustainable use of energy and mitigate concomitant environmental impacts associated with economic activities. To realize the potential for a greener economy, widespread, 'radical changes to the sociotechnical landscape of politics, institutions, the economy, and social values' (Smith 2003) are required.

There is mounting evidence that economic development has been, over the past few decades, oblivious to the risks of environmental crises, causing ecological deprivation: unprecedented levels of greenhouse gases (GHG) and climate change. The intensity and exponential growth of economic activities is associated with intensive use of energy and concomitant GHG emissions, which cause climate change. Hence, scientific opinion and public debate has led to a consensus on the need for urgent action to drastically mitigate GHG emissions. Climate change and its effects call for major changes in the global economic and industrial systems if the world is to achieve a sustainable state. In other words, if contemporary society is to make progress on the pressing environmental issue of climate change, one unavoidable response is a fundamental, global transformation to a low-carbon/green economy – the way energy is produced and consumed. Concerns over climate change and ecological scarcities due to environmentally-inefficient economic activities are expected to have a significant impact on economic policies. Indeed, the multidimensional effects of such activities 'have induced 'policy-makers and scientists to emphasize the urgent need to move toward a more environmentally-sustainable development path by encouraging the adoption of sustainable practices and "cleaner technologies"' (Farinelli et al. 2011, p. 46). One approach that is gaining increasing prevalence and moving into the mainstream of economic development is green entrepreneurship – technological eco-innovations. This is often cited as an important conduit for instigating a transformation to sustainable technological systems, hence ecopreneurs coming to the fore. They 'are

increasingly seen as being in the vanguard of a shift to a new form of capitalist development that can help to address fears over...climate change' and its concomitant adverse environmental effects (Gibbs 2009). Some accounts went beyond to conclude – as an optimistic view – that it is upon the shoulders of heroic ecopreneurs that the salvation of civilization rests (Homer–Dixon 2006; Brown 2006). In the current issue, they are seen as a promising source of economic structural or bottom–up change and precursors to a green or zero–carbon economy, as they tend to destroy existing conformist technologies and replace them with sustainable alternatives. There is a growing perception that 'the centripetal movement of ecological interests, ideas and considerations' in business practices, technological innovations, and institutional developments can have a significant impact on 'environment–induced processes of transformation...in the core practices and central institutions' (Mol 2002) of European economy. And the potential catalytic role of green entrepreneurship in the structural transformation to a low–carbon/green economy is argued to emanate from 'the interactive dynamics of change in technologies, institutions and business strategies' (Parrish & Foxon 2009).

However, academic research (and discourse) on green entrepreneurship in relation to sustainable economy has put emphasis on the role of the individual acts of ecopreneurs in engendering micro–scale qualitative changes in business strategies, practices, and structures – which have been asserted to equate to macro–scale changes in economic institutions and social structures and practices, neglecting the wider sociotechnical landscape in which ecopreneurs operate. Predicated on the assumption that ecopreneurs do not act in isolation, I argue that the lone ecopreneurs catalyzing large–scale transformations to a low–carbon/green economy is discursively misconstrued. I moreover postulate that the mainstream debate on green entrepreneurs/hip having a catalytic role in reshaping the sociotechnical landscape of the economy and engendering institutional developments and cultural changes associated with sustainable development/ecological modernization is an evolving hegemonic discourse that is being constructed in the light of culturally–specific and historically–contingent (epistemic) conceptions about the economic, technological, political, and social changes. This discursive hegemony is grounded on the assumption that the relationship in question is becoming embedded in the European culture such that it appears inconsequential to ask about its assumptions – uttering nonsense. In this account, the discursive relationship derives from socio–scientific knowledge, which is assumed to be a matter of *episteme*, 'what European society considers and values to be knowledge' (Bibri 2013), a space of knowledge in which configurations are grounded on a set of

historically–conditioned and thus perennially changing – claims, assumptions, values, and truths basic to how the whole European culture decides and justifies what is certain of, to draw on Foucault (1972). Foucault’s use of episteme has been asserted to equate to the concept of ‘macroshift’ developed by Laszlo (2001), a leading modern system theorist known for his notable work on ‘Navigating Transformation to a Sustainable World’. However, predicated on the assumption that it is not a product of an epistemic understanding, the discursive relationship should not be conceived of as something ahistorical, paradigmatic, universal, and apolitical–economic. Nevertheless, there has to be some kind of positive force inherent in this discursive relationship becoming increasingly powerful as a way of thinking and acting in the so–called ‘evolving sustainable economic world’. In addition, focusing on how this relationship as an economic discourse is constructed in a dialectical interplay between ‘discursive selectivity (discursive chains, identities and performance) and material selectivity (the privileging of certain sites of discourse and strategies of strategic actors and their mode of calculation about their “objective interests”, and the recursive selection of these strategies)’ (Sum 2006, p. 8) within the European economic and temporal context is deemed crucial to understand why it is being translated into concrete innovation projects and business strategies and practices or why institutional and socio–political orientation is legitimated with reference to it.

Set against the preceding background and grounded in a Foucauldian discursive theoretic approach, this study aims to examine the social and epistemic construction of green entrepreneurship in relation to sustainable economy and its economic–political implications. The intent is twofold: to reveal the falseness or exaggerated claims of the lone ecopreneurial hero in relation to sustainable economy and to uncover the multidimensional situatedness of this relationship. By taking on this line of discursive inquiry and achieving its aim, the study contributes to the extant literature in several ways. First, the study elucidates why this relationship as an understanding of the world at some point predominates, while other understandings become unimportant. Second, the study draws on Cultural Political Economy (CPE), an approach to investigating societal transformations (and capitalism restructuring) (Sayer 2001; Jessop & Sum 2001; Jessop 2007, 2008; Sum 2006) to shed light on how ‘economic imaginaries discursively constitute economic objects’ and position specific subjects (entrepreneur and economic actors) in particular ways ‘with different...material interests’ and ‘their role alongside material mechanisms in reproducing and/or transforming economic and political domination’ (Sum 2006, p. 2). In other words, the study provides insights into understanding how meanings of economic

objects produced through discourse are a crucial basis for economic and political (inter)action. Third, the study contributes with new philosophically-grounded alternative views to challenging the common academic approach to, or the prevalent view of, the ‘ecoentrepreneur as hero’, and highlights the implications of the broader sociotechnical context for facilitating the link between green entrepreneurship and sustainable economy. To the best of my knowledge this has not been carried out from a discursive perspective so far. Finally, the discursive approach to this study shares the common aim of conducting and maintaining a critical research of social power of institutions (access to scientific knowledge and discourses) and to formulate normative viewpoints on sustainable economic development from which a critique of social power can be put into ‘use in concrete, utilizable social analysis’ (Dorfman 2004) – i.e. be made with an eye on the epistematic understanding of, and the possibilities for, economic transformations to sustainability.

The remainder of this research paper proceeds as follows. In section 2, a set of relevant conceptual and theoretical frameworks are discussed and elaborated on, and a review of literature on green entrepreneurship and related issues and discourses is carried out. Based on this review, the research questions are formulated. Section 3 focuses on the research methodology, including the description and theoretical anchorage of the proposed analytical framework. Section 4 presents the results of the analysis of the empirical material. Section 5 provides a summary of the findings along with reflections and theoretical discussions. Finally, section 6 and 7 provide and discuss implications for practice and future research, respectively.

2. Conceptual and Theoretical Frameworks and Literature Review

Before beginning my discursive approach to green entrepreneurship in relation to sustainable economy, to elucidate the subsequent discussion I shall begin by defining what entrepreneurship, sustainability and green entrepreneurship, technological eco-innovation, and discourse are, as well as succinctly explaining the conceptual linkage between the key constructs and academic discourses that are of relevance to the study. I moreover review recent studies relating to the topic under study.

2.1. Entrepreneurship/Innovation: Definitional Issues and Key Characteristics

The concept of entrepreneurship has been thoroughly researched and profusely discussed. Entrepreneurship has taken on many definitions in the literature based on different perspectives – see Nadim and Seymour (2007) for a comprehensive overview. The working definition for this study is based on the Schumpeterian approach which relates or equates innovation to entrepreneurship. Schumpeter (1934) sees entrepreneurship as an engine of innovation and economic growth. His basic assumption is that economic growth results from innovations – to be implemented by entrepreneurs – in the form of new products, processes, structures, and markets. Therefore, both innovation and entrepreneurship thrive on major discontinuities (e.g. climate change and associated cultural shift) (Chick 2011). Green entrepreneurship draws on Schumpeter’s (1934) notion of ‘creative destruction’ or ‘disruptive innovation’ in entrepreneurship research. Scholars (e.g., Gibbs & O’Neill 2012; Gibbs 2009; O’Neill, Hershauer & Golden 2009) employ this Schumpeterian notion to describe the role sustainability or green entrepreneurs’ acts could play in promoting the transformation to a sustainable economy. As the economy shifts particularly from one technological epoch to another, entrepreneurship is widely acknowledged as a vehicle for economic and societal transformation (Schumpeter 1934, 1942). Indeed, technological innovations embody a morphing power in that they change how the economy and society function. They represent new configurations of knowledge and hence have significant intended and unintended effects within wider social context. ‘Society tends to become what technology dictates’, being as technology does (Schindehutte, Morris & Pitt 2009). By entailing some level of scientific discovery and advancement, technological innovations ‘are very meaningful innovations’ (Hisrich & Shepherd 2012).

Entrepreneurship is primarily driven by self–interested profit–seeking logic (Casson 2003; Shepherd & DeTienne 2005), whereas ‘sustainability–driven entrepreneurship’ employs ventures as a means to both contribute to environmental sustainability and satisfy the entrepreneurs’ quality–of–life interest (Parrish & Foxon 2009). However, sustainability entrepreneurial businesses are said to operate in a manner that runs counter to the commonly perceived entrepreneurial behavior (Hart 2006). Also, sustainability entrepreneurs are seen as being different from conventional entrepreneurs in terms of organizing logic (Tilley & Parrish 2006; Hendrickson & Tuttle 1997). As ‘a subset of sustainability

entrepreneurs' (Gibbs 2009), ecopreneurs are driven by their own individual environmental values, rather than mere profit-making gain (Linnanen 2002).

2.2. Sustainability and Green Entrepreneurship and Technological Eco-Innovation

Much of the broader literature on sustainability entrepreneurship is theoretical and analytical. Work on sustainability entrepreneurship (e.g., Parrish 2007; Parrish & Foxon 2009; Parrish & Tilley 2009; Gibbs 2009; O'Neill, Hershauer & Golden 2009) tends to either attempt to empirically investigate and describe the phenomenon or focuses on normative prescriptions for how it can materialize. From this prescriptive literature, sustainability entrepreneurship could be understood as those entrepreneurial activities that primarily aim at making a substantial contribution to sustainable development. Scholars have posited that sustainability entrepreneurship could fulfil a key catalytic economic function (Parrish & Foxon 2009) – greening the economy, which is the focus of this discursive study. In this context, a key implication postulated by scholars studying sustainability entrepreneurship entails that the latter is positioned as a critical factor for the transition to a sustainable economy (Ibid). However, holistically combining the environmental, economic and social strands of sustainability, sustainability entrepreneurship serves as an umbrella term for green or eco-entrepreneurship. Ecopreneurs may though differ much less from sustainable entrepreneurs (Gibbs 2009). 'Ecopreneurs [or green entrepreneurs] 'identify environmental innovations and their market opportunity and successfully implement these innovations resulting in new products and service' (Chick 2009, p. 141). For what green entrepreneurship/ecopreneurship is several definitions have emerged (e.g., Walley & Taylor 2002; Chick 2009; Farinelli et al. 2011; Gibbs & O'Neill 2012). From these definitions, green or eco-entrepreneurship can be understood as the act of operationalizing innovations pertaining to sustainable, alternative technologies with the primary intention of promoting and contributing to a low-carbon/green economy. An entrepreneur or a venture qualifies as green or eco-driven if they merge business opportunities, activities, and intentions with ecological awareness and considerations to create value, shifting the patterns of economic development into greener ones.

Technological eco-innovation, a concept which has recently emerged to contribute to sustainable development, entails the development of ecologically-driven products (e.g. green technologies) and processes (e.g. energy efficient processes). The term is used to, drawing on the concept of 'eco-

innovation' (Fussler & James 1996; James 1997), describe innovative technological products and processes which significantly decrease environmental impacts as well as respond to consumers' needs and provide business value. The term eco-innovation 'is often associated with renewable energy'; however, the shift to a green economy remains contingent on much more than technological eco-innovation (Farinelli et al. 2011).

Ecopreneurs struggle to survive (Farinelli et al. 2011), as they typically face incumbent firms and deep-rooted business relationships in more established markets. For such firms to maintain their dominance, they preclude changes in existing institutional structures and dominant technologies and undertake limited investment in low-carbon technologies (Stenzel & Frenzel 2008). This relates to what is termed 'carbon lock-in' (Unruh 2000) of dominant carbon-based technological regimes underlying energy production and usage, which enable incumbent firms to reap huge profits from their adoption, creating hurdles in transitioning to a more sustainable economy or shifting to the adoption of low-carbon alternative technologies. Indeed, 'innovative experiments in alternative, sustainable technological niches' face challenges 'in the context of a dominant, unsustainable technological regime' (Smith 2003, p. 128). These niches foster 'sociotechnical configurations, which grow and displace incumbent regime activities' (Berkhout, Smith & Stirling 2003, p. 9), nevertheless.

2.3. Green Entrepreneurship Discourse and Environmental and Societal Discourses

The concept of discourse can be used with different meanings in different contexts. But, in many cases, it entails that language is structured according to particular patterns of statements used by people as a way to talk about and understand different aspect of the social world as well as to take part in different spheres of social life. Discourses are thus based on an interlacing of concrete language use and practice – in other words, they constitute the conditions of social practices. Foucault defines discourses as 'practices which form the object of which they speak' (Foucault 1972, cited in Neergaard & Ulhøi 2007, p. 219). Specifically, it is: '[A] group of statements which provide a language for talking about – a way of representing the knowledge about – a particular topic at a particular historical moment... But since all social practices entail meaning, and meanings shape and influence what we do – our conduct – all practices have a discursive aspect' (Foucault 1972, cited in Hall 1997, p. 44). Borrowing from Foucault, discourse has been described as 'a group of claims, ideas and terminologies that are

historically and socially specific and that create truth effects’ (Alvesson & Due Billing 1999, p. 49). Similarly, Hajer (1995, p. 44) describes it as ‘a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities’. Common to these (and all) definitions is that discourses have some kind of social consequences. In this sense, they have ‘power implications in that they form what is held as knowledge or truth’ (Neergaard & Ulhøi 2007, p. 220). Furthermore, regardless of the contextual focus of discursive studies, discourse analysis ‘cannot be used with all kinds of theoretical frameworks; crucially, it is to be employed together with its theoretical and methodological foundations. In it, theory and method are intertwined as a basis for its use in empirical studies’ (Bibri 2013, p. 18). Accordingly, a theoretical framework relevant to this study is discussed as part of next section. Discourse analysis does not entail a unitary conceptual and theoretical framework.

2.3.1. Green Entrepreneurship in Relation to Sustainable Economy as Discourse

Based on the above reasoning, the relationship between green entrepreneurship and sustainable economy represent a discourse, entailing a set of visions, claims, concepts, ideas, categorizations, and stories that are – being – reconstructed, transformed, and challenged in economic practices (e.g. venture designs, enterprise structures, business strategies and operations, eco–innovation projects, etc.). As a discursive field, this relationship represents a cluster of discourses on the relationship between entrepreneurship and ecological sustainable development. The paradigm of sustainability has recently transformed many established discourses and enabled their coexistence and interaction. In European society, a myriad of such discourses are present simultaneously. Green entrepreneurship can be said to be set within such wider socially dominant discourses as sustainable development, sustainable information society – ICT for societal transformation (see Appendix A for a detailed description), and ecological modernization (see below). These are also seen as hegemonic discourses because they have are so embedded in the European culture that it seems unimportant to question their assumptions. However, what is common to these discourses is that technological changes are constructed as having the potential to provide sustainable solutions for environmental problems and thus catalyze sustainable economic transformations.

2.3.2. Ecological Modernization Discourse

Ecological modernization is an academic and environmental discourse. It posits ‘the centripetal movement of ecological interests, ideas and considerations in social practices and institutional developments’, which ‘results in ecology–inspired and environment–induced processes of transformation and reform going on in the core practices and central institutions of modern society’ (Mol 2002, p. 93). In other words, it envisions a process of the progressive transformation of central institutions and practices of modern society towards mitigating, avoiding, or solving ecological crisis (Gibbs 2009), which can be attained without abandoning the path of modernization (Mol & Spaargaren 1993). This is predicted on the assumption that capitalist system with its drive for innovation, supported by regulation, has the capability to develop a green economy through market mechanisms (Beveridge & Guy 2005; Gibbs 2009). Barry and Doran (2006) contend that it should be seen as a ‘jumping off’ point for more drastic changes to a green economy and policy.

There are different dimensions of ecological modernization, of which five are linked to this study, namely, to draw on Murphy (2000): (1) entrepreneurs, technology, and the transformation of society (Huber 1985), (2) macroeconomic restructuring (Janicke et al. 1989; Simmonis 1989), (3) climate change politics (Weale 1992; Gouldson & Murphy 1996, 1998), (4) institutional reflexivity and the transformation of society (Mol 1995), and (5) cultural politics and discourse (Hajer 1995; Dryzek 1997). As to the first strand, entrepreneurs and other economic actors are considered as key actors in achieving the transformation advocated by ecological modernization (Huber 1985; Mol 1995). As regards the second strand, later work drawing on Huber’s ideas puts emphasis on technological and sectoral configurations in the restructuring of economies. Gibbs (2009, p. 66) states, ‘an ecological modernization approach would involve both structural change at the macro–economic level, through broad sectoral shifts in the economy, and at the micro–economic level: for example, through the use of new and clean technologies by individual firms’. Gouldson and Murphy (1997, p. 75) state, ‘...ecological modernization seeks structural change at the macro–economic level... In particular, it seeks to shift the emphasis of the macro–economy away from energy and resource intensive industries towards service and knowledge intensive industries’. Concerning the third strand, the focus is on ‘the changing nature of environmental policy, regulation and decision–making’, i.e. the associated choices should be gauged against what is in line with ecological modernization (Murphy 2000). In relation to

the fourth strand, ecological modernization as an empirical phenomenon ‘can be interpreted as the reflexive (institutional) reorganization of industrial society in its attempt to overcome the ecological crisis’ (Mol 1995, p. 394). Finally, the emphasis is on the examination of the construction of environmental issues in broader social contexts. Hajer (1996, p. 256), asks: ‘... why certain aspects of reality are now singled out as “our common problems” ...’

In general, a plethora of issues in ecological modernization are subject of much debate. One of which is its scope as to whether it entails technological progress and associated facets of policy and the economy. Well contended is ecological modernization becoming a mainstream source of policy initiatives given that it amalgamates technological innovations and institutional developments (Barry & Paterson 2003; Barry and Doran 2006). Also contentious is whether ecological modernization should rely on government involvement (e.g., Huber 1985), entrepreneurship (e.g., Gibbs 2009), or free markets (e.g., Murphy 2000).

2.4. Conceptual Linkages between Relevant Constructs and Discourses

Given the complexity and multiplicity of the constructs and discourses associated with this study, it is considered necessary and useful to elucidate how they are conceptually and discursively interlinked. This is also important for the reader to understand their relevance to the topic under study. Most of the constructs and discourses referred to in this study relate to ecological modernization as an umbrella theory and a wider academic discourse. In one of its current use, ecological modernization is synonymous with sustainable development. Hence, they both envision a process of achieving a balanced socio–ecological system as a long–term goal of sustainability. Ecological modernization signifies a modernist approach to sustainability (Walker & Shove 2007). And green entrepreneurship represents ‘the paradigm of ecological modernization [and hence sustainable development] in action’ (Gibbs 2009, p. 69). Indeed, sustainability is viewed as a key component of green entrepreneurship ‘to motivate its basic approach’ (Schlange 2002). As notions, green entrepreneurship and sustainable development/ecological modernization converge on many points. Green entrepreneurship having a catalytic role in the economic transition to sustainable economy is argued to emanate from ‘the interactive dynamics of change in technologies, institutions and business strategies’ (Parrish & Foxon 2009). As a process of change, sustainable development is where ‘...the direction of investments, the

orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human...aspirations' (WCED 1987). Ecological modernization entails an amalgamation of technological innovations, institutional developments, and economic practices based on ecological thinking (see Barry and Paterson 2003, Mol 2002). And all these concepts have been promoted and seen as a panacea for environmental problems and concerns (see, e.g., UN 2010; Senge et al. 2007; Hart & Milstein 1999; Murphy 2000). In all, the central guiding purpose of green entrepreneurship is to make a significant contribution to sustainable development/ecological modernization. The role of green entrepreneurship in engendering shifts in economic practices 'can be set within...ecological modernization, at the heart of which is a relatively optimistic view of the potential for technological change to lead to solutions for environmental problems' (Gibbs 2009, p. 63). Put differently, there is an 'intersection between the entrepreneurship and ecological modernization/sustainable development agendas and the creation of sustainability entrepreneurship', which 'draws on the long-standing concept of creative destruction...so that it becomes the driving force for the establishment of a holistic and sustainable economic-environmental-social system' (Ibid, p. 65). Particularly, 'ecological modernization is essentially a realist perspective on the "green economy"' (Gibbs 2009, p. 67), to which green entrepreneurship – technological eco-innovations – can function as a significant catalyst. Sustainable development is thus the core of (technological) eco-innovation, which 'is often associated with renewable energy' (Farinelli et al. 2011) and energy efficiency. It denotes 'renewable resources should be used wherever possible and that non-renewable resources should be husbanded... This intergenerational aspect...suggests a confluence of diverse social, environment, and economic objectives and raises a number of important questions' (Hall, Daneke & Lenox 2010, p. 440). Further, new ICT supports innovative approaches to sustainable development (ISTAG 2003); it is at the core of energy efficiency technologies and integrates with renewable solutions, which significantly contribute to a low-carbon/green economy (GeSI 2008; Griffiths 2008). Here a low-carbon economy is one that emits a minimal output of GHG, and a green economy is one that substantially mitigates environmental risks and resource scarcities. They are both based on sustainable development and knowledge of low-carbon and green economics, respectively. An ecological modernization approach entails structural change on the micro-economic scale through the use of ICT-based and green technologies by individual companies (Gibbs 2009).

This discursive study sets out to analytically engage with the general perception of technological eco-innovations and ecopreneurs' acts having a catalytic role in the process of transitioning to a low-carbon/green economy. Hence, I shall not enter into a theoretical/critical discussion as to the unsettled issues pertaining to the adverse environmental effects of green and energy efficiency technology. Such issues are usually taken up as part of such discursive strategies as framing, rhetoric, and discursive mechanisms in discourse analysis, which are not within the scope of this study.

Based on the above theoretical discussion, the following questions can be formulated:

Q1: How are the economic objects and their associated subjects (inter)discursively constructed?

Q2: What are the orderly epistemic and historical structures that underlie and determine the discourse on green entrepreneurship in relation to sustainable economy?

Q3: What kinds of cultural frames, cultural shifts, and macro-processes do shape the discourse?

Q4: Why is it that green entrepreneurship becomes technological-oriented?

Q5: In what ways do political action and knowledge/power relationship affect the discourse?

3. Research Methodology

To answer the above research questions, methodological design entails a qualitative approach because the study is interpretive in nature. Specifically, I employ a discourse analysis approach as a form of textual and contextual analysis that focuses on scholarly/academic content. Positioned in the area of green entrepreneurship in relation to sustainable economy, this study is concerned with knowledge constructions and the wider social, cultural, economic, political, and historical contexts, in which such constructions are given meaning and form and thus shape societal practices. Here the term 'construction' is used instead of 'representation' because green entrepreneurship in relation to sustainable economy as an economic vision is becoming hegemonic, both construed and constructed, to draw on Jessop (2004) and (Fairclough 2005). This relationship has gone from representation to construction through a resonance with material practices, such as enterprise structures, business strategies, innovation projects, institutional rules and actions, and so on.

This study uses a Foucauldian approach to discourse and discourse analysis. Foucault's theory of discourse has been employed to examine sustainability discourses, environmental discourses, ecological modernization discourse, and ICT for sustainability discourse (Dobson 1996; Jacobs 1999; Lele 1991; Hajer 1995; Forsyth 2003; Luke 1999; Bibri 2013), thanks to the integration of environmental thinking with critical social theory through recent interdisciplinary thought (e.g., Ross 1994; Wilson 1992).

3.1. The Purpose and Value of Using Discourse Analysis

This discursive research views the scholarly content in a macro-context of institutions and ideologies (philosophies). The purpose of using discourse analysis in this study is twofold. First is to understand why/how green entrepreneurship in relation to sustainable economy as an understanding at some point predominates, while others understandings become inconsequential. This relates to social constructionist worldview which posits that we are fundamentally cultural beings and our knowledge about, and views of, the world (Burr 1995) are 'the products of historically situated interchanges among people' (Gergen 1985, p. 267). In adhering to this worldview, Foucault (1972) asserts that knowledge and its discourses are socio-culturally and historically specific. Thereby, our epistemic understanding of the world is constantly reconfigured and perennially changing. Second is to understand the social implications of particular ways of talking in a particular social context, a discursive approach which is based on the variations, regularities, and contexts pertaining to what is being uttered (Bibri 2013). In this sense, this study seeks to deduce how meanings on green entrepreneurship in relation to sustainable economy are constructed in scholarly documents and applied in the European society. In all, as a trans-disciplinary analytical approach, discourse analysis can be carried out through exploring patterns in and across statements and the context in which these statements are formed and given meanings (Ibid). Foucault (1972) made it clear that he refers to the material that brings about a certain type of statements (Neergaard & Uihøi 2007).

In this study, discourse analysis ought to say something about how green entrepreneurship in relation to sustainable economy as a discourse engineers and shape economic-political actions. As I will try to exemplify below, this discursive relationship generates social and political consequences. In this way, ecopreneurs and (green economy) policymakers acquire the social knowledge that shapes their actions.

3.2. A Foucauldian Discourse Analysis (FDA) Approach

In my analysis, to iterate, I shall use a discourse analysis approach informed by the work of Michel Foucault (1972, 1973, 1991). This approach aims ‘at a more abstract mapping of the discourses that circulate in society in a particular historical epoch’, ‘is concerned with language and its role in the constitution of social life’, and ‘explores the way in which discourses may shape historical subjectivities’ (Bibri 2013, p. 27): links between discourses and identities. There are mainly four reasons why it is relevant to adopt a Foucauldian discursive approach to studying the link between green entrepreneurship and sustainable economy. See Appendix B for more details.

3.3. Analytical Framework and Matching FDA with the Material: Six Research Steps

Discourse analysis constitutes a constellation of various approaches into orientating a construal of action in documents or texts. Therefore, ‘there are no hard-and-fast or standard approaches to reading texts or identifying discourses, but rather a multiplicity of procedural choices – a set of selected analytical techniques – which provide different insights into the text and, thus, different outcomes’ (Bibri 2013, p. 28). Put differently, ‘...there is no clear consensus as to what discourses are or how to analyze them. Different perspectives offer their own suggestions...’ (Phillips & Jørgensen 2002, p.1) Besides, Foucault’s theories of discourse require adaptation to the research material and translation into an analytical framework – a practical, methodological use. Thus, I set out six research steps (described separately below) to guide the analysis: discursive constructions, interdiscursivity, epistemic setting, cultural frames and shifts, discursive–material selective framing, and political practice and knowledge/power relationship. That is, I identified a set of dimensions of the scholarly content that are most important in the construction of its overall meaning and that should be examined.

3.3.1. Discursive Constructions

This stage of analysis is concerned with the ways in which discursive objects and their associated subjects are constructed based on the central research question. Discourses contribute to building the image of different types of actors (Fairclough 1995b) and to the constitution and reconstitution of social identities and social relations (e.g., Phillips & Jørgensen 2002). Discursive and material

selectivity can be used as devices to strengthen new social relations, as it privileges a certain discourse and its associated practices and filter out contrary ones (Sum 2006). A critical step to understand and deconstruct the discourse function is to pinpoint both explicit and implicit objects (Bibri 2013). Also, the same discursive object (and its associated subject) may be constructed in varied ways, and discursive constructions can be situated within wider discourses regulated by the main discourse (Ibid).

3.3.2. Interdiscursivity

This stage involves a closer examination of earlier discursive constructions of reality and how they impacted green entrepreneurship in relation to sustainable economy as subsequent constructions of economic reality. The document is informed by various discourses – in other words, different discourses operate in a particular document, taking up or recontextualizing former discourses by building on and refining previous established meanings. Fairclough (2005b) conceptualizes these relations as ‘orders of discourse’ or ‘intertextuality’ In Foucault’s (1972) meaning, interdiscursivity, whereby a discourse relates, implicitly or explicitly, to other discourses, signifies relations between heterogeneous discursive entities (e.g. disciplines, fields). As a consequence of these interrelations, the individual discourse reproduces and transforms social and cultural reality. Phillips and Jørgensen (2002, p. 7) state, ‘...by combining elements from different discourses...concrete language use can change the individual discourses and thereby, also, the social and cultural world’.

3.3.3. Epistemic Setting (Space of Knowledge)

In this stage, I look at some epistemic surrounds of the formation of the social knowledge underlying the discourse of green entrepreneurship in relation to sustainable economy. An episteme order entails a set of systems of thought or scientific forms of knowledge specific to a given culture and time of history. This epistemological field constitutes ways of thinking, reasoning, making decisions, and taking and justifying actions. Episteme as a pre-cognitive space is a subset of the ‘positive unconscious of knowledge’ or the orderly structures underlying a particular culture in a particular period of history (Foucault 1972). Foucault asserts that knowledge, whether theoretical or silently invested in practice (empirical), is fundamentally situated on several scales, and always a matter of what he termed ‘episteme’, the space of order within which knowledge is constituted – ‘on what historical *a priori*, and

in the element of what positivity, ideas could appear, sciences be established, experience be reflected in philosophies, rationalities be formed, only, perhaps, to dissolve and vanish soon afterwards' (Foucault 1970, p. xxi–xxii). This implies that the historical *a priori* grounds the epistemological field which in turn shapes the settings of possibility for socio–scientific knowledge and its associated discourses.

3.3.4. Cultural Frames and Shifts

This stage examines the relevant cultural frames and shifts associated with green entrepreneurship in relation to sustainable economy. Frames means in this context cultural or shared constructs. Equated to social representations, which are cultural–specific, societal–conventionalized, and prescriptive: they represent a force, a combination of structures and traditions, which shapes the way we think and what we ought to think (Moscovici 1984), cultural frames are shared forms of representing and understanding the world. Fisher (1997) conceives of cultural frames as ‘socio–culturally and cognitively generated patterns which help people to understand their world by shaping other forms of deep structural discourse.’ They are perennially transformed through cultural shifts. Cultural frames and shifts and their shaping patterns are linked to the historical *a priori*, of which episteme is a subset.

3.3.5. Discursive–Material Selective Framing

This stage looks at selective framing as to discursive and material dimensions relating to technological green entrepreneurship: discursive construal of material processes, use of certain meta–discourses in discursive objects, and favoring particular discursive chains. According to Entman (1993, p. 55): ‘Framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation...’ This stage also involves CPE perspectives on discourses and hegemony and crises as path–shaping moments (e.g., Jessop 2004; Sum 2004, 2006), as well as links between green entrepreneurship in relation to sustainable economy and green politics and economic processes of regulations.

3.3.6. Political Practice and Knowledge/Power Relationship

The final stage of analysis explores the interaction between the discourse as an object of knowledge and political action and power. Foucault (1991) posits that while political practice does not alter the meaning and form of discourses, it shapes the conditions of their appearance, assimilation, and functioning. Moreover, Foucault (1991, cited in Gordon 2000, p. i–xli) asserts that there is constant articulation ‘of power on knowledge and of knowledge on power. We should not be content to say that power has a need for a certain discovery, a certain form of knowledge, but we should add that the exercise of power creates and causes to emerge new objects of knowledge and accumulates new bodies of information...The exercise of power perpetually creates knowledge and, conversely, knowledge constantly induces effects of power’. In addition, Foucault’s conception of knowledge/power relation suggests that knowledge is useful and essential to the exercise of power because of its practical use rather than its correctness or erroneousness (Gordon 2000). Furthermore, seeing power as a constitutive and productive force, Foucault (1980, p. 19) states, ‘What makes power hold good, what makes it acceptable, is simply the fact that it does not only weigh on us as a force that says no, but that it traverses and produces things, it induces pleasure, forms knowledge, produces discourse. It needs to be considered as a productive network which runs through the whole social body...’

3.4. Selection of Research Documents – Empirical Material

Recent years, noticeably from 2009 and onward, have witnessed a growing interest in green entrepreneurship in relation to sustainable economy as an emerging field of research and practice. This relationship entails environmental, economic, and social dimensions. The focus of this study is on the environmental dimension: the role of green entrepreneurship in the transition to a low-carbon/green economy. This a key criteria against which the selection of research documents for analysis was done, in addition to the analysis scope, date of publication, and document availability – scant is ‘the academic discourse on sustainable development within the entrepreneurship literature’, and ‘few rigorous studies exploring the link between sustainable development and entrepreneurship have been published in mainstream entrepreneurship journals’ (Hall, Daneke & Lenox 2010, p. 440). With the above in mind, a computer search was carried out on a combination of either of the words forming the following relationship between: ‘sustainability/green/eco-entrepreneurship and sustainable/low-

carbon/green economy'. The sources used to gather applicable research documents included electronic/online databases and academic publications about the topic, with an emphasis on the leading, peer-reviewed journal articles from entrepreneurship research journal: *Greener Management International*. This is the main entrepreneurship journal where studies on the link between green entrepreneurship and sustainable economy are published. In view of critical discourse moments, these documents were published between 2009 and 2012, a period which witnessed a growth of interest in writings on the topic and, thus, the construction of the economic discursive relationship under examination. These documents cover a wide variety of dimensions of sustainability/green entrepreneurship – economic, scientific, technological, social, cultural, and political. In addition, given the diversity of themes of green entrepreneurship (e.g. green business operations, sustainable supply chain management, eco-product design etc.), it was decided to examine particularly those documents dealing with technological eco-innovations, as these are the most critical enabler for a low-carbon/green economy; indeed, they also relate to those themes. Besides, when using discourse analysis, it is necessary to delimit the material for analysis and considered ideal not to use sample of documents of too large a size. In view of the latter, I decided to use some relevant chapters from the most notable books on the topic that were published between 2009 and 2012 as well, in an attempt to extend the empirical material and hence inform some aspects of the analysis. Ultimately, I settled for five research documents as units of analysis. A list of the documents used is presented in table 3.1. Of relevance to mention also is that the context of the reference documents for green entrepreneurship in relation to sustainable economy is situated – produced, interpreted, and applied in European society – in order to engage analytically with it. All in all, discourse analysts choose certain documents and decide how to delimit, situate, and analyze them, as they intend to achieve certain objectives and effects (e.g., Phillips & Jørgensen 2002; Terre Blache & Durrheim 1999).

Doc. Type	Title	Author(s)	Pub. Date
Journal article	Sustainability Entrepreneurship and Equitable Transitions to a Low-Carbon Economy	Parrish B.D. and Foxon T.J.	2009
Journal article	Sustainability Entrepreneurs, Ecopreneurs and the Development of a Sustainable Economy	Gibbs D.	2009
Book chapter	Green Entrepreneurship: a Sustainable Development Challenge	Chick A.	2009
Journal article	Green Entrepreneurship: the Missing Link towards a Greener Economy	Farinelli, F et al.	2011
Book chapter	Green Entrepreneurship: Building a Green Economy?	Gibbs D. and O'Neill K.	2012

Table 3.1: Research documents analyzed

3.5. Methodological Reflections – Limitations and Philosophical Assumptions

Like other qualitative studies, this study is associated with some limitations. The analysis of discourse, the approach to the topic, the selection of certain documents, and the circumscription of empirical data are fundamentally interpretive work. This implies a situation where subjectivism may involve various forms, depending on the analyst. In some cases, the analyst's influence becomes elusive, ambiguous, and intricate, as it entails a complex set of intertwined factors: intellectual, social, cultural, ethical, and philosophical perspectives manifested in his/her perception, preconception, position, values, and assumption, which shape his/her process of construction as an ontological element. This relates to the premises of constructivism worldview (e.g., Schwandt 1994; Guba & Lincoln 1994) that: (1) reality is specific and local in such a way that it varies between (groups of) individuals in terms of the paradigm the constructor employs for constructing reality – i.e. the present discursive work may not be replicable in the same exact way by other (groups of) individuals applying other models of thought; (2) reality is not merely discovered, but rather actively constructed, and what constitutes it is contingent upon particular actor and his values; (3) and reality is socio–culturally constructed. Particularly, the analyst's position is likely to have implications for determining his/her perception of reality and thus the research outcomes; the underlying premise is that there exist 'always other positions in terms of which reality would look different' (Phillips & Jorgensen 2002) from the one the analyst espouses with respect to the study. However, 'there is no single unitary reality' (Bibri 2013) out there, irrespective of how an analyst perceives it. Nevertheless, I have strived to provide quality results by seeing reality through theories with trans–disciplinary approach – the fusion of a set of theories with a result that exceeds the sum of each. In all, an utterly impartial discourse analysis is impossible. But like all discourse analysts, my primary intent is to achieve what I set out to achieve, not to be preoccupied with the issue of verifiability, a bias which is inherent in qualitative analyzes, keeping in mind that my interpretive work is open for counter–interpretation.

There are various paths one can follow to produce a good quality interpretive work. In terms of the construction of my proposed methodological tool – employing a Foucauldian discursive approach, I have endeavored, in the attempt to resist to the inevitable closure associated with 'systematization', to shun 'essentializing' the inquiry method, which has helped me to preclude 'the intellectual straitjacketing and circumscription of thought' as a consequence of the 'hegemony of theory' (Graham

2005). By being aware of, following social constructionist epistemology approach, the discourse analysts sharing some assumptions about social reality that may permeate the process of research in the form of methodological frames, I attempted to adopt a multiperspectivism, by merging elements from CPE and Critical Discourse Analysis (CDA) with FDA, with the aim to provide a broader understanding of green entrepreneurship in relation to sustainable economy as a socio–technological phenomenon. Multiperspectivism has also implications for the selection of theoretical frameworks that privilege and support a multifaceted, unified analysis. Furthermore, reflexivity can also be useful to mitigate potential biases when carrying out discourse analysis. It has indeed proven to be invaluable in this regard. Reflexivity is ‘a key to methodological approach’ (Schwandt 2000, p. 198). In this account, I tried to explore the discourse in question as a new meaning system by distancing myself from the material; to be cognizant of potential ‘taken–for–granted understandings...articulated in the material’ by seeing things through theoretical approaches; and to ‘treat discourses as socio–culturally constructed systems of representations that could have been different’ (Bibri 2013). Despite reflexivity may not be a panacea to eschew biases and limitations, being aware of these issues provide a basis for pursuing methodological–theoretical rigor in discourse examination. Arguably, ‘a rigorous application of both method and theory generates well–founded arguments and legitimizes produced knowledge’ (Ibid, p. 34). Besides, the present attempt of practicing social criticism or carrying out discourse analysis is far from claiming or telling the ‘truth’ in any sense; rather, it is about inviting the reader to explore a different perspective on the way we categorize or ‘discourse’ the world and how this shapes our knowledge and understanding of it.

4. Analysis – Study of the Empirical Material

Having, up to this point, set out a research agenda, circumscribed the empirical material to be analyzed, and decided how it is to be examined so as to answer the research questions that underpin this study, now I shall proceed with the analysis.

4.1. Discursive Constructions

The emphasis here is on the ideational aspect of the discursive–material analysis. The discursive selectivity privileging green entrepreneurship in relation to sustainable economy is employed as a

device to reconstitute identities, reinforce new social relations, and make some aspects more salient in the formulation of discursive chains. Worth noting in the research documents' portrayal of economic and social actors are the following aspects: the emphasis on the individual acts of ecopreneurs and the repetitive reference to policymakers/governments; the highlight awarded to representing ecopreneurs and ecopreneurship (see Appendix C for a set of illustrative quotations), and the fact that the documents' account of green entrepreneurship-enabled sustainable economy follows the views of ecopreneurs as well as policymakers/governments quite closely, constituting them into the prime definers of the constructed economic reality.

Moreover, addressing economic-induced environmental crisis is contingent upon the development and use of sustainable, alternative technologies at the micro- and macro-economic levels, supported by regulatory frameworks. '...the transition to a green economy requires the simultaneous integration of top down incentives-regulations and bottom-up solutions' (Farinelli et al. 2011, p. 45). There is indeed a role for eco-technology and environmental policy in influencing green entrepreneurs, with the aim of building a low-carbon/green economy. A green economy 'needs to be driven by entrepreneurs that respond to policy incentives through innovation in...technology' (Ibid, p. 42). See Appendix G for more relevant quotations. Low-carbon/green strategies of new enterprises are said to show the reflexivity of individual and group entrepreneurs in the face of environmental risks. Ecopreneurs have 'high desire to change the world' and 'are not driven by mere commercial gain, but by their own individual values, not least a concern for the environment' (Gibbs 2009, p. 71-72).

4.2. Interdiscursivity

The aim of examining how the discursive relationship operates in the research documents can be achieved by illustrating how it relates to other established discourses, and how it functions on various occasions. The emergence and functioning of the discursive relationship builds on a number of established discourses, which entail significant discursive constructions of reality that have impacted, and continue to impact, the reality construction of green entrepreneurship as having a catalytic role in the structural transformation to a low-carbon/green economy. Among the key discourses operating in the documents and regulated by the main discourse are: sustainable development, ecological modernization, entrepreneurship/innovation, ICT for sustainable development, green economy,

globalization, capitalism, and policy/politics. See Appendix D for a set of quotes showing interdiscursivity.

In analytical terms, ecopreneurship is seen as having a key role in reshaping economic institutions and technological structures and in engendering cultural changes advocated by ecological modernization, as ecopreneurs bring about qualitative changes in business strategies and practices and market structures – that is ‘a shift in the practices and operations of contemporary capitalism’ (Gibbs 2009, p. 64). Put differently, it sets ecological modernization in motion through eco-oriented technological innovations, enterprise structures and operations, and institutional and market niches, which leads to a kind of environment-induced macro-scale processes of transformations in central economic and institutional practices. There is a growing perception that ecological modernization can lead to economic structural changes through green entrepreneurship – global green transformations of businesses and industries. ‘Ecological modernization is essentially a realist perspective on the “green economy”’ (Gibbs 2009, p. 67) and green entrepreneurship plays a key role in catalyzing the green economy. ‘An ecological modernization approach would involve...structural change...at the micro-economic level: for example, through the use of new and clean technologies by individual firms’ (Ibid, p. 66). With this being in its remit, green entrepreneurship epitomizes a shift to a new business paradigm which stimulates a re-adjustment of economic and industrial development to the environment – a basic assumption of ecological modernization.

In addition, the idea of green entrepreneurship in relation to sustainable economy draws on the Schumpeterian paradigm in the sense that if economic growth results from innovation, which is equated to entrepreneurship, (and that this economic growth has been unsustainable), then green innovation/entrepreneurship may lead to sustainable economic growth. ‘In classic Schumpeterian terms, an environmental gale of creative destruction is said to be creating the basis for a new form of capitalism based on new innovative activities’ (Ibid, p.65).

4.3. Epistemic Setting (Space of Knowledge)

Researchers focusing on the link between green entrepreneurship and sustainable economy tend to overlook the continuity of the historical evolution of knowledge and multiple actors’ strategies and

actions that provide the infrastructural setting for this link to materialize. The basic idea is that this link as a discourse may dissolve or vanish due to new imminent discontinuities or unexpected global changes. However, the discourse of green entrepreneurship in relation to sustainable economy derives from an episteme that constitutes a subset of the order underlying European culture in this period of history. This episteme constitutes the systematic structures, the primary system of fundamentals that underlie the making of knowledge which causes to emerge this discourse as a historical event and a cultural manifestation – the link is discursively constructed in the economic, socio-political, and temporal contexts of European society. Obviously, constituting a space of knowledge, it entails not only the appearance of this discourse and a plethora of other (environmental) sustainability-induced ideas, but also the establishment of a number of sciences, philosophies, and rationalities (e.g. ecological science, environmental science, climatology, ecological/green economics, green rationalism, green ICT, clean and green technology, ecological modernization, etc.) in current historical period. These thought systems and rationalities as part of the epistemological field is conditioned by historical rules and principles or what Foucault labels the ‘positive unconscious of knowledge’, manifested in, among others, the scientificity and objectivity of knowledge. Put differently, the order underlying European culture in this period of history involves science and the scientific discourse as, respectively, the ultimate form of rational and objective thought and the basis for legitimacy in knowledge- and decision-making. Evidently, ecopreneurship – technological eco-innovations – and green rationalism should appear as part of the configurations within the space of knowledge – episteme – privileged by European culture in this epoch. These configurations are giving rise to the diverse forms of empirical research and knowledge. The mechanisms linking micro-scale technological eco-innovations/ecopreneurship and macro-scale economic transformation towards a sustainable economy need to be discussed in theoretical and empirical studies (Parrish & Foxon 2009).

Furthermore, one can relatively easy discern the function of historical *a priori* (scientificity and technologization) as situated and reconfigured in ‘what European society considers and values to be knowledge, from episteme to episteme’ (Bibri 2013) (e.g. ICT, techno-eco-innovation, ecological modernization, etc.), as it tends to be stable enough to be noticed. These forms of knowledge constitute the primary definer of the discourse of green entrepreneurship in relation to sustainable economy and related practices, institutions, and artefacts. In addition, examples of episteme shifts associated with this discourse are numerous and easy to pinpoint. Among which include: the shift from conceiving of

entrepreneurship/innovation as driven only by self-interested or ruthless profit-seeking logic towards seeing it as a vehicle for addressing environmental concerns; the shift from entrepreneurship as an engine of innovation and economic growth to a catalyst to economic transitions to a more sustainable economy; the shift from carbon-based technologies to sustainable technologies; and so on. These exemplars of shifts are brought up by sustainable development paradigm, coupled with the advances in computing (ICT), industrial technology, and green sciences and rationalities. By and large, the role of green entrepreneurship in the transition to a sustainable economy emanates from the evolving dynamics of change entailing economic behavior and policy, technological regimes, and social structures. The co-evolution of ‘ongoing, iterative dynamics involving technologies, institutions and business strategies’ ‘builds on previous work in evolutionary economics’, which argues ‘that it is fruitful to analyze interactions between processes at macro, meso and micro scales’ (Parrish & Foxon 2009, p. 50–51).

Falling under the current episteme of European culture, the discourse of green entrepreneurship in relation to sustainable economy has materialized in more recent years: the concept only entered the public mainstream during the late 2000s. It has become established as people and social practices – individual entrepreneurial activities and socially anchored and institutionalized actions – relate to it in different context (e.g., Gibbs & O’Neill 2012; Koester 2010; Hall, Daneke & Lenox 2010; Parrish 2010; O’Neill, Hershauer & Golden 2009; Parrish & Tilley 2009). As a result, the discourse is circulating freely in European society as a valid way of thinking about economic practices, institutions, and policies (e.g. eco-venturing/ innovating, green-oriented business strategies, eco-technology policies, green institutional niches, etc.). However, as in the very nature of discourses, it may become powerful or cease to exist, depending on the states of stability: long-lasting or provisional, emerging from the dynamics of change in business practices, institutional structures, and technological regimes, to draw on co-evolutionary theoretic approach. Thus, the discursive relationship may vanish or persist as a way of thinking and acting. Driven by green entrepreneurship, green economy might risk become a ‘new vehicle for developed countries governments to re-package their economic interests in the guise of the new language of “sustainable economic development”’ (Farinelli et al. 2011, p. 42) However, at present, this relationship is increasingly prevailing, as business and institutional structures and practices are progressively being transformed in ways that embody that relationship. This is because low-carbon technologies are breaking through to the mainstream probably due to their

potential to solve the bottlenecks associated with the dominant technological regimes. Green enterprises are ‘increasingly playing an essential role in bringing solutions to global sustainability challenges’ (Ibid, p. 44). However, ‘many of the reports on the green economy today are similarly skeptical about the ability of the market to address environmental concerns and to provide enough stimuli to incentivize green innovations’ (Ibid, p. 44).

Governmental institutions as agents are postulated to operate within and shape the parameters generated by the dominant configuration of knowledge and the ensuing practices and structures. ‘Scholars have explored the ways in which...sociopolitical legitimacy [i.e. the degree to which social actors accept business activities, industries, and technologies as desirable or proper under established, socially constructed system of, norms, rules, beliefs, values, and sensibilities (Suchman 1995)] conditions the activities of entrepreneurs..., but also the ways in which these actors’ strategic actions can work to reshape the institutional bases of this legitimacy’ (Parrish & Foxon 2009, p. 51). Governments internalizing environmental externalities of economic growth, promoting technological eco-innovations, and supporting green entrepreneurs is contingent upon changes to social norms and values: the behavior of businesses, industries, investors, and civil-society. ‘[S]pecific institutional solutions are not assumed to be ‘optimal’, especially in the context of high levels of risk and uncertainty, and they depend on the wider institutional frameworks in which they are embedded’ (Ibid, p. 50). ‘A lesson to be learned from past attempts to promote a green economy is that not all types of government interventions manage to fostering green entrepreneurship and innovation’ (Farinelli et al. 2011, p. 45). Nevertheless, it is assumed that it is in the remit of institutions to facilitate the use of green and energy efficiency technologies and infrastructures, through regulatory frameworks and incentive instruments as well as the social norms that regularize the use of these technologies and infrastructures. The basic premise is that ‘governance and a conducive institutional framework reduce the uncertainties for green entrepreneurs’ (Ibid, p. 45). Governmental and institutional endeavors to further reinforce the low-carbon/green economy are likely to be lessened, if not abandoned, due to societal or market factors, and consequently the level of investment being undertaken to promote low-carbon energy technologies shrinks or decreases. ‘Indeed, it may be that existing sociotechnical contexts close down spaces for alternative approaches’; although ‘sustainable technological ‘niches are important sources of innovation that may offer solutions for tensions in existing sociotechnical regimes..., the “adaptation process is confined by structures within the existing, mainstream regime”’

(Gibbs 2009, p. 69). Although niche markets for green technologies ‘contribute to more sustainable consumption and production patterns, they will not lead to a global transformation towards a green economy until they reach the masses’ (Farinelli et al. 2011, p. 42). In discursive terms, discursive positions and constructions pertaining to green entrepreneurship in relation to sustainable economy will overtime become recurrent and start sedimenting, respectively, and thereby changes to arguments and/or new alternative views will emerge and the established discursive positions will be questioned and challenged. Therefore, ‘the future is not predetermined, but open to alternatives which can be shaped by social practices’, where people act upon new objects of knowledge over and over and transform and challenge discourses (Bibri 2013). In this account, ‘...ecopreneurship will form the basis of new forms of environmental progress within the economy if companies’ “core business deals with environmental solutions and environmentally superior products and if their innovations substantially influence the mass market”; they should ‘exert significant market influence by gaining a large market share or by influencing competitors and other market actors...to adopt superior environmental solutions’ (Gibbs 2009, p. 74) In all, the discursive relationship may cause to emerge new objects of knowledge that will be applied to economic reality again – but within the limits of the episteme and the institutional apparatus (and their technologies such as institutions, rules, and artefacts) of European culture in this period of history, to draw on Foucault (1972).

4.4. Cultural Frames and Shifts

Cultural frames constitute a part of the order underlying European culture (historical *a priori*), of which episteme as a pre-cognitive space is a subset. Indeed, they are socio-cognitively and historically generated patterns which shape various forms of structural discourses as ways to understand the world or social reality – e.g. economic aspects of it. They are also reconstructed and challenged in discourses, as they exist within and through these discourses. In this account, it is essential not to conceive of green entrepreneurship in relation to sustainable economy as an ‘isolated island’. Rather, this link is the product of culturally-conditioned framework as to how its underlying concept and practice have evolved in relation to social processes and socio-political institutions. In other words, it has in part brought to existence through dominant cultural frames, conventionalized by societal actors and attuned to their values and material interests, especially in relation to ICT and technological innovations and their perceived role in enabling and catalyzing societal transformations. ICT has a key role in European

society's future economic and sustainable development (e.g., ISTAG 2006). The recent advance of new ICT 'has drastically modified the...methods used by enterprises to [ecologically] innovate' and 'new technologies impact or change the dynamics of [eco-]innovation' (Farinelli et al. 2011, p. 46). An ecological modernization/sustainable development approach entails structural change on the micro-economic scale through the use of energy efficiency technology and green technologies by individual companies (Gibbs 2009). In fact, ICT is seen as holding an enormous potential for catalyzing a greener economy: it enables significant energy improvements/savings and GHG emissions reductions and integrates with green/renewable energy technologies, as well as has the capability to decouple the economic development from environmental degradation (resource inputs and use) due to its potential to generate value-added (i.e. supply chains management, business functions, and enterprise infrastructure development) in the form of harnessing knowledge and manipulating information instead of devouring energy. Therefore, cultural frames associated with the role of ICT-innovations in economic development have shaped the structural discourse of green entrepreneurship in relation to sustainable economy. This is evident in the vision for the catalytic role of green entrepreneurship in the transition to a low-carbon/green economy (see, Parrish & Foxon 2009). As to the green and clean technologies, they are taken up in the analysis phase that looks at the technological orientation of green entrepreneurship (see next section).

The discursive relationship in question is not only shaped by prevalent cultural frames, but also by new cultural shifts associated with ecological modernization/sustainable development. Such shifts have shaped, and continue to shape, existing cultural frames, which are in turn reshaping that relationship. 'Challenges are also coming from the macro level, through cultural changes relating to the recognition of the increasing threat posed by climate change...and the incorporation of these concerns into regulatory and fiscal incentives... and into changes in private and commercial norms and behavioral patterns' (Parrish & Foxon 2009, p. 52). '...radical shifts to sustainable technological regimes entail concomitantly radical changes to the sociotechnical landscape of politics, institutions, the economy and social values' (Gibbs 2009, p. 68). The 'wider economic and social contexts' affect ecopreneurs and their activities (Gibbs & O'Neill 2012, p. 75). In all, energy efficiency and green and clean technologies as innovative technological niches occupied by ecopreneurs entail parallel cultural and socio-political shifts. The tensions generated by such niches 'are a product of changing circumstances in the wider "sociotechnical landscape", where new trends, such as current increased environmental

awareness, climate change policy and shifts towards a low-carbon economy, challenge existing technological regimes' (Gibbs 2009, p. 68). Put differently, 'the political measures...involve a number of progressively more sophisticated steps that shift from a narrow focus on processes and individual firms through to broader cultural shifts in the socioeconomic structure' (Ibid, p. 67) Hence, it is important to recognize the interplay between green entrepreneurship in relation to sustainable economy and other macro-scales and the links to green politics and economic processes of regulation (technology and environmental policy in support of eco-innovation), to draw on the CPE approach. Therefore, the attributes of the material practices of institutions and social actors are crucial to constructing the new economic reality, predicated on the assumption that they determine whether discursive construal pertaining to the relationship in question becomes a durable material construction.

Dialectically, ecopreneurs affect the economic and social structures that surround them. They are said to reshape economic institutions and engender cultural shifts associated with ecological development through innovation in low-carbon energy technologies as well as bringing about qualitative changes in business strategies, structures, and operations. Challenges to sociotechnical regimes 'are currently coming from the micro level, through the development of a wide range of low-carbon technologies... and their application in business strategies to meet user needs in particular niches' (Parrish & Foxon 2009, p. 52). Technological eco-innovations are reconfiguring the broader sociotechnical landscape and providing insights for policymakers into pathways for the transformation of institutions and economic practices to mitigate or avoid environmental crisis. This continues to evolve as the eco-innovations and eco-venturing practices developed are becoming increasingly adopted, and their influence keep on gathering momentum towards replacing unsustainable technological regimes – with an optimistic view of a complete transformation of these regimes. Alternative, low-carbon technological 'niches are seen as "nurturing sociotechnical configurations, which grow and displace incumbent regime activities"' and 'offer lessons for policymakers in any transition to ecological modernization' (Gibbs 2009, p. 68). It remains to be seen if these changes will be fully realized and maintained and sustainable technological niche activities will go mainstream. A central question 'is the extent to which ecopreneurial activity does represent an exemplar of the shift towards a new business paradigm of ecological modernization or merely the exploitation of niche markets that will remain small-scale?' (Ibid, p. 74) To realize a full potential of sustainable technologies depends on whether or

the extent to which they will solve the bottlenecks and fiascos inherent in the existing technological regimes – and provide business value.

4.5. Discursive–Material Selective Framing

From a CPE perspective, which underlies the analysis in this subsection, a central question would be why it is that green entrepreneurship becomes technological. Attention would be directed to those material trends or environmental crises affecting economic development, including rising levels of GHG emissions, carbon-based technological systems, and energy-intensive industries. European society seeks to become a green economy as a part of a global climate change mitigation strategy, especially those European countries that are heavily industrialized. The concept of a green economy denotes compliance with sustainable development ethos, mitigation of GHG emissions, use of low-carbon/renewable energy sources, and improvement of energy efficiency across economic sectors. In terms of the discursive aspects of the analysis, ecological, technological, and industrial crises as material processes get interpreted discursively – on the basis of the extant social and cultural frames pertaining to technology and its transformational effects for European society's future economic and sustainable development. Solutions are framed accordingly – i.e. the European economy is completely dependent on ICT and technological innovations, and decision and policy-makers place huge expectations on such innovations. Indeed, energy efficiency and green technologies are seen as a panacea for economic-induced environmental crises as highlighted by Parrish and Foxon (2009), Farinelli et al. (2011), and Gibbs and O'Neill (2012). Sustainable economy transitions through green entrepreneurship 'will often make use of...physical technologies' – 'renewable energy technologies or more energy efficient processes' (Parrish & Foxon 2009, p. 59, 52). Consequently, related entrepreneurs' – eco-technology innovators' – actions are supported and legitimated. The question is whether technological eco-solutions are more likely to meet the goals of a low-carbon/green economy in actual practice or less technologically sophisticated solutions more likely to succeed. Indeed, 'crisis is never a purely objective process or moment that automatically produces a particular response or outcome. ...In short, crises are potentially path-shaping moments. Such path-shaping is mediated semiotically [or discursively] as well as materially. Crises encourage semiotic as well as strategic innovation' (Jessop 2004, p. 167). From this viewpoint, environmental crisis caused by unsustainable technological, economic, and industrial development has enthused green entrepreneurship in relation to

sustainable economy and low-carbon technologies as strategic innovation. However, a bias in strategic innovation interest may lead to ignoring alternative avenues of promising sustainable economy.

Therefore, the orientation of technological green entrepreneurship has been likely by the discursive use of technological, economic and industrial-induced environmental crisis as material processes. A discursive construal of the nature of this multidimensional crisis takes place and the selection of technological eco-innovation strategies over others is framed within or formulated against that construal. The recent advance of new ICT ‘has drastically modified the...methods used by enterprises to [ecologically] innovate’ and new ICT ‘impact on or change the dynamics of [eco-] innovation’ (Farinelli et al. 2011, p. 46). Existing sociotechnical contexts are assumed to open spaces for sustainable technological niches ‘at times of tension when new trajectories are actively being sought, as with the current concerns over climate change and the need to reduce carbon emissions’ (Gibbs 2009, p. 69). Subsequently, however, eco-technological innovations get institutionalized in, and conventionalized by, European society and thus embedded in the culture. ‘...policy-makers and scientists...emphasize the urgent need to move toward a more environmentally-sustainable development path by encouraging the adoption of ...“cleaner technologies”’ (Farinelli et al. 2011, p. 46). In the event of this construal-formulation scheme, technological green entrepreneurship should not be treated as something ahistorical, apolitical-economic, unbiased, and universal, as what I would label ‘the pressing techno-economics of necessary re-adaptation to the environment’. Rather, it ought to be conceptualized as a hegemonic discourse that is constructed in view of culturally-specific and historically-contingent conceptions about the economic, technological, political, and social changes in this epoch. The technological green entrepreneurship (in relation to sustainable economy) has been constructed through the interlacing of diverse sociotechnical regimes – a wider sociotechnical landscape – and their associated discourses and narratives which search for assigning meaning to the current environmental crises triggered by unsustainable economic, technological, and industrial development by construing them in terms of past failures (economic-techno-industrial systems inefficiencies) and future possibilities (energy efficiency and green technologies), to draw on a CPE approach (e.g., Jessop 1998). Green entrepreneurship technologization as a discourse embraces a wide-ranging understanding of the environmental pressures European economies are attempting to address and constitute also the determining context for suggested technological eco-solutions.

Another interesting question, which expands on the shaping role of cultural frames, would be the link between green entrepreneurship and the ‘low-carbon/green economy’ or the ‘sustainable economy’ as particular economic visions. This entails several issues relating to discursive selectivity. First, these visions are being reconstructed and recontextualised in European economic contexts. Second, the meta-discourses, such as ‘ICT for sustainable development’, ‘ecological modernization’, and economic visions play a role in the discursive selection of green entrepreneurship technologization. Third, scholars/academics and policymakers explicitly mention such meta-discourses when attempting to justify and legitimize technological green entrepreneurship. Fourth, these actors form discursive chains that co-produce, filter in, select, and privilege certain objects of green politics and economy. This points to how the discourse on the necessity of green entrepreneurship becoming technological – and hence a catalyst for a sustainable economy – is being selected and retained in diverse sociotechnical contexts, such as institutions, politics, and the economy, through material mechanisms and practices. In all, why technological green entrepreneurship as a micro-discourse is being translated into concrete projects and strategies and why institutional, organizational, and policy orientation is being legitimated with reference to this discourse can be understood by looking at how this micro-discourse is selectively framed in a dialectical interplay between material and discursive dimensions.

4.6. Political Practice and Knowledge/Power Relationship

In European society, technological eco-innovations have a quite advantageous governmental and institutional support as well as an adequate body of successful practices. Today’s state-of-the art in green, clean, and energy efficiency technologies is viewed as noteworthy and the increasing level of R&D into the next generation of these technologies is projected to yield further advances. A number of established industry players are increasingly investing in low-carbon energy technologies. Moreover, these technologies are gradually breaking through to the mainstream as to their adoption. And, more importantly, they appear in many policy documents and political argumentations. Unsurprisingly, they are not components closed in the ‘ivory tower’ of technology and science community. Rather, they are affected by the changing circumstances taking place in the sociotechnical landscape of politics – i.e. political practices relating to low-carbon/green economy, climate change, and ecological modernization. They are also influenced by the significant intended and unintended effects they induce due to knowledge/power relations established in European society. The understanding of this intricate,

three-dimensional relationship is then essential to understand the recently materialized relationship between green entrepreneurship and sustainable economy as a new economic discourse.

4.6.1. Knowledge/Power Relationship and Green and Energy Efficiency Technologies

The appearance and success of green entrepreneurship as having a catalytic role in the process of transitioning toward a low-carbon/green economy has much to do with the power effects that are induced by the body of knowledge combining environmental sustainability and technological innovations. The exercise of this power has first created such objects of knowledge as green and energy efficiency technology, which both entail the uses of ICT. This knowledge has in turn induces new power effects, and the exercise of power generates new objects of knowledge, namely green entrepreneurship and low-carbon/green economy, and then their relationship. There is then a clear interrelation between green entrepreneurship – green and energy efficiency technologies – as knowledge and power.

Considering Foucault's conception of knowledge/power relation, the scientificity of technological innovations – involving an array of hard and applied sciences – may explain the success of green entrepreneurship in relation to low-carbon/green economy. In this sense, green entrepreneurship draws from sustainability, environmental sustainability indicators (a discursive element of sustainability), computer science (or ICT), and industrial technology, which have legitimization capacity due to their association with the scientific discourse, one of the major sources of legitimacy and authority in knowledge- and decision-making. Sustainability as a scientific discourse embodies a remarkable morphing and constitutive power – it has reshaped the sociotechnical landscape of the economy and produced new institutional bodies, by creating new social, scientific, and technological realities. '...they [governments] encourage consumption by both individuals and organizations of environmentally friendly products and services owing to scientifically proven sustainability advantages' (Farinelli et al. 2011, p. 45). Environmental sustainability indicators are regarded as objective measurement tools (Bosch 2002). '[A]dvanced ICT monitoring and control services and solutions' enable 'to improve energy efficiency across the economy', and 'ICT plays a vital role in gathering data on climate change...; in modelling the climatic phenomena and in providing the necessary simulation and visualization tools to be integrated into decision support systems' (ISTAG

2008, p. 1). And industrial technology is based on engineering (applied science) to make production processes of mechanisms and machines (e.g. renewable energy technologies such as solar panels, wind turbines, and hydropower systems) more optimal and efficient due to the application of optimization theory, software applications, and industrial procedures. The scientific quality or effect of these fields enables green entrepreneurship knowledge not only to exercise power, but also to establish a link between diverse discourses, such as sustainable development, green/ecological economics, ecological modernization, and so on, and the scientific discourse. The emergence and success of green entrepreneurship is thus associated with the exercise of power for the view of having a scientific-based catalytic function in the transition toward a low-carbon/green economy due demonstrably to the potential of low-carbon technologies in enabling substantial energy savings and GHG emissions reductions. It can thus be said that green entrepreneurship in relation to sustainable economy is being successful for it is practically useful to the exercise of power, since the latter provides guidance to understanding its success.

Furthermore, the growing demands for, or the increasing adoption of, low-carbon energy technologies and thus the increasingly growing eco-venturing activities demonstrate the productive and constitutive force of green entrepreneurship. In addition to constituting knowledge, discourses, institutional bodies, and subjectivities, green entrepreneurship induces satisfaction and fulfillment. ‘Green enterprises are increasingly successful in proving...that sustainability is...an opportunity to increase revenues...while protecting the environment’ (Farinelli et al. 2011, p. 42). ‘Combined with new demands from consumers for more environmentally friendly products and services, the changing shape of national and global economies is leading to new forms of entrepreneurship’ (Gibbs & O’Neill 2012, p.1). At both the micro- and macro level, entrepreneurs’ ‘investments in green innovation do not just generate private profits but also (create) large positive externalities for society and the environment as a whole, especially when they do not contribute only to the creation of a small niche market, but have the potential to be scaled up to reach the sustainable transformation of an entire industry’ (Farinelli et al. 2011, p. 42). In all, the evolving expansion of green entrepreneurship demonstrates increasing returns to the adoption being applied to low-carbon technologies and supportive institutions. Technologies and institutions are thus benefiting from the provisioning of technological eco-products in response to new market niches and consumers’ behavior. Moreover, they are exhibiting positive feedbacks as to the adoption of low-carbon technologies and regulatory and fiscal frameworks in many European

countries. This occurs ‘such that the more a technology or institution is adopted, the more likely it is to be further adopted. Mechanisms behind this phenomenon include scale, learning, adaptation and network effects, which stimulate further adoption of a particular technology or institution’ (Parrish & Foxon 2009, p. 52). Combining economic development with environmental policy-making as a process is already ‘at work in countries such as...the Netherlands, Germany, Sweden and Denmark’ (Gibbs 2009). The development of new, integrated policy approaches link energy efficiency and low-carbon measures with the adoption of alternative, sustainable technologies. In addition to entrepreneurial ventures operating in clean, green, and energy efficiency having proven to be successful, they play a key role for economic growth in terms of job and wealth creation. Green entrepreneurship has ‘the potential for growth and job creation’ (Farinelli et al. 2011, p. 42). Existing policies supporting ecopreneurial activity has ‘developed...because of the potential gains in employment and output from new enterprises’ (Gibbs 2009, p. 75)

In all, the power of knowledge provides the conditions of possibility for the economic-political. It is in the power of discourse – green entrepreneurship in relation to sustainable economy – that a new economic-political reality is being created with new institutions and subjects and associated practices. It remains to be seen if this discursive relationship will evolve to the extent that it becomes difficult to imagine a low-carbon/green economy without green entrepreneurship.

4.6.2. Political Practice and Green Entrepreneurship/Technological Eco-Innovation

A shift to sustainable technological regimes is unlikely to emerge, progress, and function without political actions. There is an interaction between the discourse of green entrepreneurship in relation to sustainable economy and political action. As a corollary of its dynamic interaction with this discourse, politics forces the appearance, development, and application of this discourse. Here I intend to explore only some of the key facets of the operations that link the creation and development of this discursive relationship and politics.

The first mechanism utilized by political action that promotes and makes function this discursive relationship is the creation of regulatory and fiscal instrument and incentives (e.g. energy efficiency obligations, market-based instruments, tax exemptions and reductions, carbon emission trading

schemes for green and energy efficiency technology adoption, etc.). However, since innovative and appropriate policy and regulatory frameworks are necessary to achieve market change and alter economic behavior, governments need to construct the most cost-effective approaches. '[N]ew policy instruments...require in-depth cost-benefit analysis' (Chick 2011, p. 143). Especially, some critical views argue that low-carbon technologies are not always practical, thereby the role of policy to induce market change and encourage green economic behavior.

Government involvement in green entrepreneurship endeavors is a second mechanism by which political action forces the emergence and insertion of green entrepreneurship. This is manifested such actions as funding technological eco-innovations, promoting green technology entrepreneurial ventures, providing positive incentives to markets, nurturing the establishment of sustainable economy, encouraging consumption of environmentally friendly products, greening environmentally-unfriendly sectors, and stimulating debates over the need to go carbon-neutral as to economic activities. See Appendix E for a set of quotes exemplifying the impact of political action on green entrepreneurship.

Finally, political action contributes to mainstreaming green entrepreneurship in relation to sustainable economy by accumulating and preserving related body of knowledge as well as disseminating and teaching green entrepreneurship principles. This is increasingly carried out inside of sustainability entrepreneurship research centers and institutions, across European countries, and in specific research spheres, such as green entrepreneurship and ecological/green economics. The interest in ecopreneurship 'is spilling out into the broader entrepreneurship text and teaching. Initiatives designed specifically to promote and foster ecopreneurship are mushrooming, as evidence not only by the business schools introducing modules and units into environmental entrepreneurship in higher educational institutions' (Chick 2011, p. 146).

5. Conclusion and Discussion

The aim of this study was to perform a discourse analysis of the social and epistemic construction of green entrepreneurship in relation to sustainable economy. In this section, I present a brief summary of the results and how they answered the research questions, reflect on the results and their significance to the research issues, and discuss the results in the light of concepts and theories presented earlier.

Based on the analysis of the empirical material my findings show that the relationship between green entrepreneurship and sustainable economy as a scholarly discourse highlights the lone ecopreneurial hero and reinforces new social relations. Apart from building the ecopreneurs' image, the discourse reconstitutes their relations to society in such that they are assigned new missions and ascribed vital roles for catalysing and building a green/sustainable economy. The discourse also awards highlight to policymakers/governments. It constitutes all these actors into the prime definers of the constructed economic reality. These findings are consistent with the theoretical perspectives on the function of discursive practice (e.g., Phillips & Jørgensen 2002) and on discursive-material selectivity (Sum 2006). Heroic ecopreneurs or the lone ecopreneurial hero appears ubiquitous in the discourse under study. Earlier work within technology studies (e.g., Bijker 1997), however, has debunked the notion of lone actors or entrepreneurial heroes, a common approach to academic account, in the development of innovative technologies due to its impact on a neglect of the multiple social actors and factors that shape and support innovation/entrepreneurship. While the individual acts of ecopreneurs do have a role in reshaping technological regimes in terms of innovating or operationalizing technological innovations that may change business structures and practices, their influence and their power of imposing their green views are unlikely to be felt without 'concomitantly radical changes to the sociotechnical landscape of politics, institutions, the economy and social values' (Smith 2003). In all, discourse of the lone ecopreneurial heroes as to innovation and economic change – shifts in business structures, strategies, and practices – is misconstrued.

The discourse has grounds from which it has emerged and evolved, building on a set of established or hegemonic discourses which entail significant discursive constructions of reality that have impacted green entrepreneurship in relation to sustainable economy. Specifically, the empirical material takes up and recontextualizes former discourses, by drawing on and refining previous established meanings. Moreover, the discourse embodies a new way of thinking about economic, technological, and institutional practices and developments, through new combinations of earlier discourses – i.e. merging various elements thereof and transforming economic reality. These two related findings concur with the theoretical perspective on the function of interdiscursivity/intertextuality as to social and cultural change (e.g., Fairclough 2005b; Phillips & Jørgensen 2002). Indeed, it is argued that ecopreneurship contributes to restructuring economic institutions and stimulating cultural shifts (e.g., Parrish 2007). Thereby, the research focus is on eco-innovations and the interplay between economic, political,

institutional, and cultural factors which nurture such innovations (Olsthoorn & Wieczorek 2006; Weber & Hemmelskamp 2005; Huber 2004) and thus ecopreneurship.

Unsurprisingly, the discourse as an object of knowledge is a matter of episteme, a subset of the order underlying European culture in this period of history. It is thus episteme-conditioned and historically-restricted as knowledge claims – hence the necessity for being open to questionings yet to come that may reconfigure or result in discarding the current convictions. This result is consistent with Foucault's (1972) conception of episteme as a subset of historical *a priori*. Episteme order (and the arrangement of discourses within) is based on conditioning rules and principles specific to each historical epoch (Foucault 1984), and hence discourses may 'dissolve and vanish soon after' they appear (Foucault 1970). Foucault's (1984) concern with epistemic limits is of relevance to historical analysis – and thus espousal of on-going, permanent philosophy of questioning what is might be taken for granted as universalized knowledge or obligatory moral actions – under particular pre-cognitive and sociopolitical legitimacy settings – to see whether these alleged absolutes are perchance specific, contingent, and produced by virtue of arbitrary forms of constraint in the form of instances of discourses as historical events that function as true in articulating particular ways of thinking and acting for they form what is held as knowledge according to specific regimes of truth. As an issue that arises from the ethical *raison d'être* of the green venture, ecopreneurs are entrepreneurial, albeit perhaps rejecting being thought of as such and their commitment to changing the world, for this is considered to possess connotations of materialism and profit-seeking (Isaak 2002; Friedman & Phillips 2003). However, Foucault (1984) contends that it is not possible to gain access to holistic knowledge of what may represent our historical limits, nor transcend historical contingency and thus see things from an ahistorical perspective due to the fact that, considering our rejection of impartial and universal analyses, we are not shaped significantly by grander, more general structures, and, subsequently, the possibility of transcending the experience we possess of our limits is always restricted and determined, thereby the inescapability of starting all over again. The whole premise is that green entrepreneurship in relation to sustainable economy entails perspectives and knowledge claims that are associated with biases and confines that need to be challenged, questioned, dismantled, and corrected in the quest for holisticized/systemic theoretical and practical knowledge. Indeed, the contingency grounding our understanding of sustainable world has implications for ruling out alternatives of thinking and acting in that world. One corollary of this conception is that scientific

knowledge should not be inherently 'superior' than other forms of knowledge, as Foucault (1972) argues, especially when it comes to sustainability as a universal manifestation of a genuine realization of our historical socio-cognitive biases and mistakes. Philosophers, however, posit that the shifts in knowledge configuration, from episteme to episteme – historical period to historical period – ought not to be conceptualized as a sort of evolutionary progress towards better system of thought or understanding manifesting a history of its growing perfections, but rather a mere pragmatic understanding, what can socially be valued and considered as knowledge. What is needed – as an optimistic note – is rather an 'epistematic' understanding of the sustainable world, by means of contrasting and learning from different epistemological fields. Such an understanding 'is necessary for the achievement of a (macro)evolutionary aim – to shift modern philosophy and science to – to shift modern scientific knowledge 'to an evolutionary higher (in complexity of organization) *epistematic* level, by creating a system of basic principles...capable of meeting the great challenges of our time, including the universalization of scientific knowledge with respect to a person's wellness' (Konstantin 2006, p. 3). Especially, there is no straightforward solution for the current complex and multidimensional environmental problems, and they require universally integrated political programs and scientific consensus as well as the engagement of individuals, organization, and communities as users of multiple forms of energy. The environmental implications of unsustainable energy use constitute an issue with political, economic, scientific, social, and historical dimensions. Otherwise we will open up a new space for constituting ourselves anew in the light of new contingencies that will shape us, and thereby new discourses will be constructed, reconstructed, transformed, and challenged in social practices as a result of everyday making of history.

The discourse is shaped by both the prevailing cultural frames and the emerging cultural shifts. This finding relates to Fisher's (1997) conceptualization of cultural frames. Also, green entrepreneurship activities are linked to economic, technological, political, and social contexts where they take place – i.e. it represents micro-scale patterns that are shaped by macro-scale material processes, but it also shapes these processes. This is consistent with the theoretical perspective on the dialectical relationship between discourse and social structures: green entrepreneurship is influenced by and influences the surrounding, evolving economic and social structures (e.g., Walley & Taylor 2002). However, in relation to information society and thus ICT, cultural frames may well limit historical actors' understanding of complex environmental problems and thus the possibilities of creating more suitable

solutions, as they are said to be prescriptive – i.e. ‘they impose themselves upon us’ in a force which shapes how we think and ‘decrees what we should think’ (Moscovici 1984, p. 9).

The technological orientation of green entrepreneurship is the product of a selective framing of discursive and material dimensions, namely biased discursive construal pertaining to environmental, technological, and industrial crises; contextual reconstruction of economic imaginaries, use of certain meta-discourses, and favoring certain discursive chains. There are also links to macro-processes of green-political-economy policy and regulation. These results coincide with the CPE theoretical perspectives on economic visions and their translation and institutionalization, respectively, into concrete economic strategies and projects and in particular practices and structures. The basic argument is that possible unconventional strategies for addressing economic-induced environmental problems other than technological-oriented ones can still be devised, but they have been discredited probably because they would entail a strange switch to make under the constraints of high-level cultural frames/constructs associated with ICT and technology. From a social constructionist perspective, ‘none of such constructs could have existed without society; and they could have been constructed differently had the society so chosen’ (Bibri 2013, p. 40). This also relates to the conception of choice in discourse advanced by Fairclough (1995b): alternative constructions of reality could have possibly been made. In all, green entrepreneurship technologization can be conceived as specific business practices which depend on the agency of ecopreneurs and other economic actors promoting technological eco-innovation and on hegemonic discourses on ICT and technology for sustainable development and on the environmental and technology policy and regulation of the low-carbon/green economy. Therefore, it is not paradigmatic, but rather the outcome of social processes involving diverse factors and actors.

The discourse is affected by political practice in connection with low-carbon/green economy, climate change, and ecological modernization, as well as by knowledge/power relations established in European society. These two influences determine, expand – and will probably maintain – its success. This finding is in line with Foucault’s (1991, 1980) conceptions of the interaction between political action and discourses, knowledge/power relationship, and power as a productive force. Worth noting is that the different mechanisms used by political action to promote, develop, and expand green entrepreneurship in relation to sustainable economy point toward changes to the landscape of

institutions, social rules systems, interacting with shifts in sustainable technological regimes: ‘interconnected systems of artefacts, institutions, rules and norms’ (Berkhout, Smith & Stirling 2003), engendered by the actions and networks of actors within these institutions. This is consistent with the theoretical perspectives on discourses reshaping social structures due to their power implications. In relation to the morphing power of technological eco–innovations, the premise is that the creation of innovative technological products creates new economic and social realities. The acceptance of green (and energy efficiency) technologies is enabled by economic trends, such as consumption patterns (climate–friendly energy) and energy savings, affecting organizations. This coincides with earlier studies (e.g., Schindehutte, Morris & Pitt 2009). Eco–technological products are active forces in that they change how society functions – human creations with power over humans. Technologies lead to capabilities and trigger intentions (Ibid). Technological eco–innovations create new consumers by offering advancement in energy products. Innovation–oriented philosophy asserts that consumers prefer product offerings that provide advanced value and performance – the technological superiority (Kodama 1995, cited in Schindehutte, Morris & Pitt 2009). According to Renewable Energy Policy Network for the 21st Century (REN21) (2010), a collaborative endeavor of 500 authors and reviewers, from the end of 2004 through 2009, renewable energy capacity grew at annual rates of 10–60 percent worldwide for many renewable technologies. REN21’s Renewable Global Status Report provides a comprehensive overview of ‘renewable energy markets, industries, and policy frameworks’, which ‘have evolved rapidly in recent years’ (REN21 2010). Low–carbon technologies are being rapidly commercialized (Sawin & Moomaw 2009). In all, eco–technologies being released in society remain subject to several forces and processes that may alter their path in surprising directions (see Schindehutte, Morris & Pitt 2009).

6. Implications for Practice

This discursive study provides some implications for practice and research. When it comes to practical implications, political action need to move beyond promoting and legitimating green entrepreneurship to work closely on actively reshaping the socio–technological landscape of the economy and institution in ways that auspiciously expedite and sustain the discursive hegemony of green entrepreneurship over economic development. This entails optimal mobilization of ecopreneurs, especially ‘visionary champions’, ‘innovative opportunists’ (Walley & Taylor 2002, p. 33), and ‘bioneers’ (Schaltegger

2002). One way forward is to develop effective financial mechanisms to stimulate green venture creation and support sustainable technology-based spin-offs from established universities and companies, especially renewable energy technologies. Also, public policy-makers should continuously assess the impact that funding instruments coupled with tax incentives at start-up can have on promoting and mainstreaming green entrepreneurship. Moreover, state-owned institutions, which operate with government subsidies (Berger & Udell 2006), need to adjust their mandates as to supplying funds to ventures operating in alternative energy sectors. This might improve funding to green ventures in principle, adding to the fact that the lending mandates of these institutions ‘do not necessarily require that the funding be used to finance positive net present value projects, or that loans be repaid at market rates’ (Ibid, p. 2954). Also, some of their funds can be directed for political purposes (e.g., Sapienza 2004) – e.g. building a green economy. Indeed, the degree of transformation to sustainable economy that green entrepreneurs can bring about depends on the levels of public (and private) financial support provided to green entrepreneurs in a given European country. A key aspect of the European states is their enabling and supporting role in promoting technological eco-innovations. Actually, a widespread green entrepreneurship and eco-venturing orientation could accelerate the overall process of transitioning to a low-carbon/green economy, which is attuned to existing environmental and technology policy that support eco-innovation at European level. The experiences of ecopreneurs are moreover of import as to informing the construction of policy frameworks, by drawing on their expertise and know-how in ecopreneurship. Lastly, sustained efforts from politics to support green entrepreneurship are necessary to challenge the dominance of incumbent players, which act to preclude changes in institutional rules, and encourage them to undertake investment in sustainable energy technologies, thereby becoming incrementally more environmentally involved. Political action is instrumental in challenging dominant unsustainable technological regimes.

7. Implications for Research

My hope is that this study will provide the grounding for further in-depth qualitative and empirical research on the link between micro-scale eco-innovation/ecopreneurship and macro-scale economic transitions toward a green economy and on the historical and epistemic limitations of technological green entrepreneurship in building a green economy. However, an under-researched area is the role of public funding schemes in supporting green entrepreneurial ventures. Worth investigating is the extent

to which the financial community (e.g., banks, venture capitalists, business angels, and crowd-funding) has become mature to finance technological eco-innovations and green entrepreneurs have become aware of the available financial opportunities. It is of equal value to examine the difficulties surrounding green venture designs or market creation for green business ideas as well as the challenges facing ecopreneurs. Another fertile area of research is comparative approaches (e.g. cross-country) as to the variety of financing programs established by different European governments for promoting eco-technology-based ventures. This can be of importance for policymakers and investors/funders of green entrepreneurship initiatives and innovation projects. Moreover, detailed studies are needed on assessing the practicality of low-carbon technologies and examining the key societal factors determining the long-termism and degree of this practicality. In fact, there is a need of empirical studies on green ventures and eco-innovations from a wider perspective, rather than studying individual small-scale, scattered cases. Of significance, additionally, is to enhance the understanding of how ecopreneurs and their activities result from the interplay between internal and external dimensions; how the visionary champions kind of ecopreneurs enforce their green views; and how particular individuals are shaped by external factors. Beveridge and Guy (2005) point out the little understanding we have of these issues.

Furthermore, in-depth studies are needed to solidify the scientific knowledge of the link between green entrepreneurship and sustainable economy. Especially, the existing literature is weighty on speculation and feeble on both empirical evidence and theory building – extant frameworks, typologies, hypotheses, interplays, and interdisciplinary models have poor explanatory power. Thus, thorough empirical and theorizing endeavor is of import for the link between green entrepreneurship and sustainable economy to have academic buy-in and practical relevance in relation to the future form of capitalist/economic development. I would additionally suggest that future research agenda for green entrepreneurship could delve into the trade-off between the socially perceived benefits of low-carbon technologies and their actual adverse environmental impacts before they reach the stage of massive use, if at all. The environmental effects of green and energy efficiency technologies are a subject of much debate – unresolved issues. Green technology is rejected as an attempt to preclude environmental degradation and unsustainable use of (material and energy) resources (e.g., Huesemann & Huesemann 2011), and energy efficiency technology is associated with intricate tradeoffs and interplays between direct, indirect, systemic, and rebound effects (e.g., Bibri 2013). This calls for intensified studies on

the downsides of low-carbon technologies, and future research to investigate these issues and how to tackle them is thus warranted to pave the way for a more holistic and strategic thinking, by opting for upstream solutions for addressing the rather complex, multidimensional issue of climate change. The main argument is that focus only on technology in green entrepreneurship may lead to underestimating and ignoring the negative effects of the development of the new and green technologies needed for an economy to be sustainable.

References

- Alvesson, M & Due Billing, Y 1999, *Kön och organization*, Studentlitteratur, Lund.
- Backhaus, N 2003, *The globalization discourse, institutional change and livelihood strategies*, Department of Geography, University of Zurich, Winterthurerstr.
- Barboza, N 2000, 'Educating for a sustainable future: Africa in action', *Prospects*, vol. 30, no. 1, pp. 71–85.
- Barry, J & Doran, P 2006, 'Refining green political economy: from ecological modernization to economic security and sufficiency', *Analysis & Critic*, vol. 28, pp. 250–75.
- Barry, J & Paterson, M 2003, 'The British state and the environment: new labor's ecological modernization strategy', *International Journal of Environment and Sustainable Development*, vol. 2, no. 3, pp. 237–49.
- Berger, AN & Udell, GF 2006, 'A more complete conceptual framework for SME finance', *Journal of Banking & Finance*, vol. 30, pp. 2945–66.
- Berkhout, F, Smith A & Stirling, A 2003, 'Socio–technological regimes and transition contexts', *SPRU Electronic Working Paper Series* 106.
- Beveridge, R & Guy, S 2005, 'The rise of the eco–preneur and the messy world of environmental innovation', *Local Environment*, vol. 10, no. 6, pp. 665–76.
- Bibri, SE 2013, 'A Foucauldian–Faircloughian discursive analysis of the construction of ICT for sustainable urban development in the European information society', Master Thesis, Malmö University.
- Bijker, WE 1997, *Of Bicycles, bakelites and bulbs: toward a theory of sociotechnical change*, MIT Press, Cambridge, MA.
- Bosch, P. 2002. 'The European Environment Agency focuses on EU–policy in its approach to sustainable development indicators', *Statistical Journal of the United Nations*, vol. 19, pp. 5–18.
- Brown, L 2006, *Plan B 2.0: rescuing a planet under stress and a civilization in trouble*, W. W. Norton, New York
- Burr, V 1995, *An introduction to social constructivism*, Sage, London.
- Campbell, CA 1992, 'A decision theory model for entrepreneurial acts', *Entrepreneurship Theory and Practice*, vol. 17, no. 1, pp. 21–7.

- Casson, M 2003, *The Entrepreneur: an economic theory*, Edward Elgar, Cheltenham.
- Chick, A 2009, 'Green entrepreneurship: a sustainable development challenge', in R Mellor, G Coulton, A Chick, A Bifulco, N Mellor & A Fisher (eds.), *Entrepreneurship for everyone: a student textbook*, Sage Publications, London, pp. 139–150.
- Dasgupta, P 2007, 'The idea of sustainable development', *Sustainability Science*, vol. 2, no.1, pp. 5-11.
- Dean, TJ & McMullen, JS 2007, Toward a theory of sustainable entrepreneurship: reducing environmental degradation through entrepreneurial action, *Journal of Business Venturing*, vol. 22, no. 1, pp. 50–76.
- Dobson, A 1996, 'Environment sustainabilities: an analysis and a typology', *Environmental Politics*, vol. 5, pp. 401–28.
- Dopfer, K & Potts, J 2004, 'Evolutionary Foundations of Economics', in JS Metcalfe & J Foster (eds.), *Evolution and Economic Complexity*, Edward Elgar, Cheltenham.
- Dorfman, B 2004, *Culture, media, theory, practice perspectives*, Aalborg University Press, Aalborg.
- Dryzek, J 1997, *The politics of the earth: environmental discourse*, Cambridge University Press, Cambridge.
- Entman, RM, 1993, 'Framing: toward clarification of a fractured paradigm', *Journal of Communication*, vol. 43, no. 4, pp. 6–27.
- Fairclough, N 2005a, 'Critical discourse analysis', *Marges Linguistiques*, vol. 9, pp. 76–94.
- Fairclough, N 1995b, *Critical discourse analysis, the critical study of language*, Longman, London, New York.
- Farinelli, F, Bottini, M, Akkoyunlu, S & Aerni, P 2011, Green entrepreneurship: the missing Link towards a Greener Economy, *ATDF Journal*, vol. 8, no. 3/4, pp. 42–48.
- Fisher, K 1997, 'Locating frames in the discursive universe', *Sociological Research Online*, vol. 2, no. 3, pp. U40–U62.
- Forsyth, T 2003, 'Social framings of environmental science', *Critical Political Ecology*, pp. 77–102.
- Foucault, M 1970, *The order of things: an archaeology of the human sciences*, Random House, New York.
- Foucault, M 1972, *The archaeology of knowledge*, Routledge, London.

- Foucault, M 1973, *The order of things: an archaeology of the human science*, Vintage Books, New York.
- Foucault, M 1980, 'Truth and power', in C Gordon (eds.), *Power/knowledge, selected interviews and writings 1972–1977*, Harvester Wheatsheaf, Hemel Hempstead.
- Foucault, M 1991, 'Politics and the study of discourse', in G Burchell, C Gordon & P Miller (eds.), *The Foucault effect: studies in governmentality*, The University of Chicago Press, Harvester Wheatsheaf, pp. 53–72.
- Friedman, AL & Phillips, M 2003, 'Mission-oriented entrepreneurs', *Proceedings of Small Business and Entrepreneurship Development Conference*, 3–4 April 2003, University of Surrey.
- Fuchs, C 2005, *Sustainability and the Information Society*, ICT&S Center: Advanced Studies and Research in Information and Communication Technologies & Society, University of Salzburg.
- Fussler, C & James, P 1996, *Driving eco-innovation: a breakthrough discipline for innovation and sustainability*, Pitman Publishing, London.
- Gergen, K 1985, 'The social constructionist movement in modern social psychology', *American Psychologist*, vol. 40, no. 3, pp. 266–75.
- Gibbs, D 2009, 'Sustainability entrepreneurs, ecopreneurs and the development of a sustainable economy', *Greener Management International*, vol. 55, pp. 63–78.
- Gibbs, D & O'Neill K 2012, Green entrepreneurship: building a green economy? – evidence from the UK, in S Underwood, R Blundel, F Lyon & A Schaefer (eds.), *Social and sustainable enterprise: changing the nature of business (Contemporary Issues in Entrepreneurship Research, Volume 2)*, Emerald Group Publishing Limited, pp.75–96.
- Global eSustainability Initiative (GeSI) 2008, *SMART 2020: enabling the low carbon economy in the information age*, viewed 02 September 2009, [http://www.theclimategroup.org/assets /resources/publications/Smart2020Report.pdf](http://www.theclimategroup.org/assets/resources/publications/Smart2020Report.pdf)
- Gordon, C 2000, 'Introduction', in P Rabinow (eds.), *Michel Foucault power – essential works of Foucault 1954–1984*, The New Press, New York, pp. i–xii.
- Gouldson, A & Murphy, J 1996, 'Ecological modernization and the European union', *Geoforum*, vol. 27, no. 1, pp. 11–27.
- Gouldson, A & Murphy, J 1997, 'Ecological modernization: economic restructuring and the environment', *The Political Quarterly*, vol. 68, no. 5, pp. 74–86.

- Gouldson, A & Murphy, J 1998, *Regulatory realities: the implementation and impact of industrial environmental regulation*, Earthscan, London.
- Graham, LJ, 2005, 'Discourse analysis and the critical use of Foucault', Paper presented at *Australian Association for Research in Education 2005 Annual Conference*, 27 November –1 December 2005.
- Griffiths, M 2008, 'ICT and CO2 emissions', *Parliament Office of Science and Technology Post-note*, no.319, pp. 1–4.
- Guba, EG & Lincoln, YS 1994, 'Competing paradigms in qualitative research', in NK Denzin & YS Lincoln (eds.), *Handbook of qualitative research*, Sage, London, pp. 105–117.
- Hajer, MA 1995, *The politics of discourse: ecological modernization and the policy process*, Clarendon Press, Oxford.
- Hajer, M. 1996., 'Ecological modernization as cultural politics', in S Lash, B Szerszynski & B Wynne (eds.), *Risk, environment and modernity: towards a new ecology*, Sage, London.
- Hall, JK, Daneke, GA, & Lenox MJ 2010, 'Sustainable development and entrepreneurship: past contributions and future directions', *Journal of Business Venturing*, vol. 25, no. 5, pp. 439–448.
- Hall, S (eds.) 1997, *Representation: cultural representations and signifying practices*, The Open University, Sage Publications, London.
- Hamilton, K & Clemens, M 1999, 'Genuine savings rates in developing countries', *World Bank Econ Review*, vol. 13, no. 2, pp. 333-356.
- Hart, J 2006, 'The New Capitalists: is it possible to make money and really make a difference?', *Utne* vol. 135, pp. 39–43.
- Hart, S & Milstein, M 1999, 'Global sustainability and the creative destruction of industries', *Sloan Management Review*, vol. 41, no. 1, pp. 23–33.
- Heberle, LC 2006, *Sustainable urban development: local strategies as global solutions: local sustainable urban development in a globalized world*, viewed 5 November 2012 http://www.ashgate.com/pdf/SamplePages/Local_Sustainable_Urban_Development_in_a_Globalized_World_Intro.pdf
- Hendrickson, LU & Tuttle, DB 1997, 'Dynamic management of the environmental enterprise: a qualitative analysis', *Journal of Organizational Change Management*, vol. 10, no. pp. 363–82.
- Hisrich, RD & Shepherd, MP & 2012, *Entrepreneurship*, McGraw–Hill International, Boston.

Homer-Dixon, T 2006, *The upside of down: catastrophe, creativity, and the renewal of civilization*, Random House, New York.

Hopwood B, Mellor, M & O'Brein, G 2005, 'Sustainable development: mapping different approaches', *Sustainable Development*, vol. 13, no. 1, pp. 38–52.

Huber, J 1985, *The rainbow society: ecology and social politics*, Fisher Verlag, Frankfurt am Main.

Huber, J 2004, *New technologies and environmental innovation*, Edward Elgar, Cheltenham.

Huckle, J 1996, 'Realizing sustainability in changing times', in J Huckle & St Sterling (eds.), *Education for sustainability*, Earthscan, London.

Huesemann, MH & JA Huesemann 2011, *Technofix: why Technology won't save us or the environment*, New Society Publishers.

Isaak, R 2002, 'The making of the ecopreneur', *Greener Management International*, vol. 38, pp. 81–91.

ISTAG 2003, *Ambient Intelligence: from vision to reality (for participation – in society & business)*, viewed 23 October 2009, http://www.ideo.co.uk/DTI/CatalIST/istag-ist2003_draft_consolidated_report.pdf

ISTAG 2006, *Shaping Europe's future through ICT*, viewed 22 March 2011, <http://www.cordis.lu/ist/istag.htm>

ISTG 2008, *Working group on 'ICT and Sustainability (including Energy and Environment)*, viewed 20 March 2012, <http://www.cordis.lu/ist/istag.htm>.

ISTAG 2012, *Towards horizon 2020 – Recommendations of ISTAG on FP7 ICT work program 2013*, viewed 15 March 2012, http://cordis.europa.eu/fp7/ict/istag/reports_en.html.

Jacobs, M 1999, 'Sustainable development as a contested concept', in A Dobson (eds.), *Fairness and futurity*, Oxford University Press, Oxford.

Jacobsson, S & Bergek, A 2004, 'Transforming the energy sector: the evolution of technology systems in renewable energy technology', *Industrial and Corporate Change*, vol. 13, no. 5, pp. 815–49.

James, P 1997, 'The Sustainability circle: a new tool for product development and design', *Journal of Sustainable Product Design*, vol. 2, pp. 52–57.

James, P 1997, 'The Sustainability circle: a new tool for product development and design', *Journal of Sustainable Product Design* vol. 2, pp. 52:57.

Keijzers, G 2002, 'The transition to the sustainable enterprise', *Journal of Cleaner Production*, vol. 10, pp. 349–59.

Janicke, M, Monch, H, Ranneburg, T & Simonis, U 1989, 'Economic structure and environmental impacts: east west comparisons', *The Environmentalist*, vol. 9, no. 3.

Jessop, R 1998, 'The narrative of enterprise and the enterprise of narrative: place marketing and the entrepreneurial city', in: TH All & P Hubbard (eds.), *The Entrepreneurial city: geographies of politics, regime and representation*, John Wiley & Sons, Chichester, pp. 77–99.

Jessop, R & Sum, NL 2001, 'Pre-disciplinary and post-disciplinary perspectives', *New Political Economy*, vol. 6, no. 1, pp. 89–101.

Jessop, R 2004, 'Critical semiotic analysis and cultural political economy', *Critical Discourse Studies*, vol. 1, no. 2, pp. 159–174.

Jessop, R 2007, *State power: a strategic-relational approach*, Polity Press, Cambridge.

Jessop, R 2008, 'Cultural political economy of competitiveness and its implications for higher education', in R Jessop, N Fairclough & R Wodak (eds.), *Education and the knowledge-based economy in Europe*, Sense Publishers, Rotterdam, pp. 13–39.

Jöst, F 2002 'Sustainable development: the roles of science and ethics', in M Faber, R Manstetten & J Proops (eds.), *Ecological economics: concepts and methods*, Edward Elgar, Cheltenham, pp. 75–92.

Koester, E 2010, *Green entrepreneur handbook: the guide to building and growing a green and clean business*, CRC Press, Hoboken.

Laszlo, E 2001, *Macrosift: navigating the transformation to a sustainable world*, Berrett-Koehler Publishers, San Francisco.

Lele, S. 1991. 'Sustainable development: a critical review', *World Development*, vol. 19, pp. 607–621.

Linnanen, L 2002, 'An insider's experiences with environmental entrepreneurship', *Greener Management International*, vol. 38, pp. 71–80.

Luke, T 1999, 'Eco-managerialism: environmental studies as a power/knowledge formation', in Living with nature, *Environmental politics as cultural discourse*, Oxford University Press, Oxford, pp. 103–120.

McManus, P 1996, 'Contested terrains: politics, stories and discourses of sustainability', *Environmental Politics*, vol. 5, pp. 48–73.

- Mol, APJ 1995, *The refinement of production: ecological modernization theory and the chemical industry*, CIP–Data Koninklijke Bibliotheek, The Haag.
- Mol, APJ 2002, ‘Ecological modernisation and the global economy’, *Global Environmental Politics*, vol. 2, no. 2, pp. 92–115.
- Molnar, D, Morgan, AJ & Bell, DVJ 2001, *Defining sustainability, sustainable development and sustainable communities*, Working paper, Sustainable Toronto Project, University of Toronto.
- Moscovici, S 1984, ‘The Phenomenon of social representations’, in R Farr & S Moscovici (eds.), *Social representations*, Cambridge University Press, Cambridge, pp. 3–69.
- Munda, G 1997, ‘Environmental economics: ecological economics, and the concept of sustainable development’, *Environmental Values*, vol. 6, pp. 213–233.
- Murcott, S 1997, ‘Definitions of sustainable development’, *AAAS Annual Conference, IIASA Sustainability Indicators Symposium*.
- Murmann, JP 2003, *Knowledge and competitive advantage: the coevolution of firms, technology and national institutions*, Cambridge University Press, Cambridge.
- Murphy, J 2000, ‘Ecological modernization’, *Geoforum* 31, pp. 1–8, Oxford Centre for the Environment, Ethics and Society, Mansfield College.
- Nadim A & Seymour, RG 2007, *Defining entrepreneurship activity: definitions supporting framework for data collection*, the University of Sydney.
- Neergaard, H & Ulhøi, JP 2007, *Handbook of qualitative research methods in entrepreneurship*, Edward Elgar Publishing, Massachusetts.
- Nelson, R 1995, ‘The co–evolution of technologies, industrial structures, and supporting institutions, and the making of comparative advantage’, *International Journal of the Economics of Business*, vol. 2, no. 2, pp. 171–84.
- Olsthoorn, X & Wiczorek, A (eds.) 2006, *Understanding industrial transformation, views from different disciplines*, Springer, Dordrecht.
- O’Neill, GD, Hershauer, JC & Golden, JS 2009, ‘The cultural context of sustainability entrepreneurship’, *Green Management International*, vol. 55, pp. 33–46.
- O’Rourke, A 2005, ‘Venture capital as a tool for sustainable entrepreneurship’, in Schaper M (eds.), *Making ecopreneurs: developing sustainable entrepreneurship*, Ashgate, Aldershot, pp. 122–38.

- Parrish, BD 2007, 'Sustainability entrepreneurship: design principles, practices, and paradigms', PhD thesis, University of Leeds.
- Parrish, BD & Tilley, F 2009, 'Sustainability entrepreneurship: charting a field in emergence', in M Schaper (eds.), *Making ecopreneurs: developing sustainable entrepreneurship*, Gower Aldershot.
- Parrish, BD and Foxon, TJ 2009, 'Sustainability entrepreneurship and equitable transitions to a low-carbon economy', *Green Management International*, vol. 55, pp. 47–62.
- Parrish, BD 2010, 'Sustainability-driven entrepreneurship: principles of organization design', *Journal of Business Venturing*, vol. 25, no. 5, pp. 510–523.
- Phillips, L & Jørgensen, MW 2002, *Discourse analysis as theory and method*, Sage, London.
- Redclift, M 2005, 'Sustainable Development (1987–2005): an Oxymoron Comes of Age', *Sustainable Development*, vol. 13, no. 4, pp. 212–227.
- Renewable Energy Policy Network for the 21st Century (REN21), 2010, *Renewables Global Status Report (GSR)*, viewed 5 January 2014, <http://www.ren21.net/REN21Activities/GlobalStatusReport.aspx>
- Roberts, P & Colwell, A 2001, 'Moving the environment to centre stage: a new approach to planning and development at European and regional levels', *Local Environment*, vol. 6, no.4, pp. 421–37.
- Ross, A 1994, *The Chicago gangster theory of life: ecology, culture, and society*, Verso, London and New York.
- Sapienza, P 2004, 'The effects of government ownership on bank lending', *Journal of Financial Economics*, vol. 74, pp. 357–384.
- Sayer, A 2001, 'For a critical cultural political economy', *Antipode*, vol. 33, no. 4, pp. 637–708.
- Sawin JL & Moomaw, WR 2009, *Renewable Revolution: low-carbon energy by 2030*, Worldwatch Report.
- Schaltegger, S 2002, 'A framework for ecopreneurship: leading bioneers and environmental managers to ecopreneurship', *Greener Management International*, vol. 38, pp.45–58.
- Schindehutte, M, Morris, MH & Pitt, LF 2009, *Rethinking marketing – the entrepreneurial imperative*, Pearson Education, New Jersey.
- Schumpeter, JA 1934, *The theory of economic development*, Harvard University Press, Cambridge.

Schumpeter, J 1942, *Capitalism, socialism, and democracy*, Harper, New York.

Schwandt, TA 1994, 'Constructivist, interpretivist approaches to human inquiry', in NK Denzin & YS Lincoln, (eds.), *Handbook of qualitative research*, Sage Publications, London, pp. 60–70.

Schwandt, TA 2000, 'Three epistemological stances for qualitative inquiry: interpretivism, hermeneutics and social constructionism', in NK Denzin & YS Lincoln (eds.), *Handbook of qualitative research*, Sage, London, pp. 189–213.

Senge, P, Lichtenstein, B, Kaeufer, K, Bradbury, H & Carroll, J 2007, 'Collaborating for systemic change', *MIT Sloan Management Review*, vol. 48, no. 2, pp. 44–53.

Shepherd, DA & DeTienne, DR 2005, 'Prior knowledge, potential financial reward, and opportunity identification', *Entrepreneurship Theory and Practice*, vol. 29, no. 1, pp. 91–112.

Simmons, U 1989b, 'Ecological modernization of industrial society: three strategic elements' *International Social Science Journal*, vol. 121, pp. 347–361.

Smith, A 2003, 'Transforming technological regimes for sustainable development: a role for alternative technology niches?', *Science and Public Policy*, vol. 30, no.2, pp. 127–35.

Stenzel, T & Frenzel, A 2008, 'Regulating technological change: the strategic reactions of utility companies towards subsidy policies in the German, Spanish and UK electricity markets', *Energy Policy* (in press).

Suchman, MC 1995, 'Managing legitimacy: strategic and institutional approaches', *Academy of Management Review*, vol. 20, no. 3, pp. 571–610.

Sum, NL 2004, *From 'integral state' to 'integral world economic order': towards a neo-Gramscian cultural international political economy*, CPE Working Paper.

Sum, NL 2006, *Toward a cultural political economy: discourses, material power and (counter)hegemony*, EU Framework 6, DEMOLOGOS project, workpackage 1.

Terre Blache, M & Durrheim, K 1999, 'Social constructionist methods', in M Terre Blache & K Durrheim (eds.), *Research in practice: applied methods for the social sciences*, UCT Press, Cape Town, pp. 147–172.

UN 2010, *Sustainable development: from Brundtland to Rio 2012*, Background paper prepared for consideration by the High Level Panel on Global Sustainability at its first meeting.

Unruh, GC 2000, 'Understanding carbon lock-in', *Energy Policy*, vol. 28, pp. 817–30

Walker, G & Shove E 2007, 'Ambivalence, sustainability and the governance of socio-technical transitions', *Journal of Environmental Policy and Planning*, vol. 9, no. 3, pp. 213–25.

Walley, EE & Taylor, D 2002, 'Opportunists, champions, mavericks...? A typology of green entrepreneurs', *Greener Management International*, vol. 38, pp. 31–43.

Weale, A 1992, *The new politics of pollution*, Manchester University Press, Manchester.

Weber, M & Hemmelskamp, J 2005, 'Merging research perspective on innovation systems and environmental innovation: an introduction', in Weber, MJ Hemmelskamp (eds.), *Towards environmental innovation systems*, Springer, Berlin.

World Commission on Environment and Development (WCED) 1987, *Our Common Future (The Brundtland Report)*, Oxford University Press, Oxford/New York.

Wilson, A1992, *The culture of nature: North American landscape from Disney to the Exxon Valdez*, Blackwell, Cambridge and Oxford.

York, R & Rosa, EA 2003, 'Key challenges to ecological modernization theory institutional efficacy, case Study evidence, units of analysis, and the pace of eco-efficiency', *Organization Environment*, vol. 16 no. 3, pp. 273–288.

Appendix A: Sustainability, Sustainable Development, and Sustainable Information Society - ICT for Societal Transformation - Discourses

Sustainability Discourse: Much of the discourse around sustainability constructs it as comprising three dimensions: environmental, economic, and social, which ideally – in the fullest sense of sustainability – should be in balance to achieve its long-term goals. In a sustainable society, the environment, the economy, and equity (3Es) should be enhanced on the long-term basis (Bibri 2013). However, sustainability discourse entails many different perspectives and conceptualizations, including free market environmentalist, laissez-faire liberal, green reformist, green individualist, eco-feminist, and so on (e.g., McManus 1996; Huckle 1996). No one perspective is privileged over any other, yet one at some point gains prevalence, while others become discredited. All these perspectives are, at varying degrees, at work in green entrepreneurship in relation to sustainable economy as a discursive field.

In terms of sustainability dimensions, this study is concerned with environmental and economic sustainability - the environment and the economy are seen by many economists as one interlinked system (Hamilton & Clemens 1999; Dasgupta 2007). Environmental sustainability means living within the carrying capacity of the eco-system, i.e. sustaining its ability to meet current and future needs, by making decisions and taking actions that restore the quality of the environment and preserve its capability to support human life, or allow all people to live well, on the long-term basis. Economic sustainability entails identifying and implementing various strategies for employing current resources optimally or that make it conceivable to make the best use of their availability. The basic premise is to uphold the amount of consumption of these resources over the longer term in a way that is efficient and responsible, thereby shunning degrading capital stocks and providing long-term benefits.

Sustainable Development Discourse: Sustainable development is a process to attain the long-term goals of sustainability. It has emerged as a response to the environmental crises, triggered by the intensity and exponential growth of economic activities – that is, to address the environmental-damaging externalities of economic growth associated with the intensive use of energy and its concomitant GHG emissions. The concept has taken on many definitions in the literature. It is widely varied, much of a black box, highly contested, and an oxymoron (Hopwoodil, Mellor & O'Brien 2005; Jöst 2002; Molnar, Morgan & Bell 2001; Jacobs 1999; Murcott 1997; Munda 1997; Redclift 2005), so too is its operationalization (Heberle 2006). In the context of this study, however, it denotes 'renewable resources should be used wherever possible and that non-renewable resources should be husbanded... This intergenerational aspect...suggests a confluence of diverse social, environment, and economic objectives and raises a number of important questions' (Hall, Daneke & Lenox 2010, p. 440). Economic sustainable development signifies 'the will to follow a rational approach to economic policies...by integrating concern for environmental protection into decision making' (Barboza 2000). Therefore, the economy and the environment, once principally hypothesized as conflicting, separate and competing realms, can be reconciled in the light of the notion of sustainable economy.

Sustainable Information Society Discourse – ICT for Societal Transformation: Much of the discourse about information society constructs ICT as being a powerful catalyst for social transformations – e.g. a low-carbon/green economy. Sustainable information society ‘is conceived as a society in which new...ICTs...and knowledge are used in order to advance a good-life for all individuals of current and future generations. This idea is conceived in a multidimensional way, identifying ecological, technological, economic, political, and cultural aspects and problems’ (Fuchs 2005, p. 219). Discursive constructions and positions pertaining to ICT for economic and societal transformation are abundant and powerful. ICT is constructed as having a tremendous potential for addressing economic and societal challenges and enabling large-scale structural transformation (Bibri 2013). It is unleashing far-reaching economic and societal change, and is necessary ‘for bringing more advanced solutions for societal problems’ (ISTAG 2006). Major opportunities exist for new ICT to address environmental pressures and, in relation to improving Europe’s economy, support new approaches to sustainable development (ISTAG 2003). GeSI (2008, p. 7) states: ‘ICT provides the solutions that enable us to ‘see’ our energy and emissions in real time [so]...to make them more efficient’. A large part of the so-called low-carbon economy is attributed to ICT applications. ICT innovations have proven instrumental in improving energy efficiency and alleviating GHG emissions across the economy (e.g., GeSI 2008). Hence, ICT has a profound effect on many economic sectors. According to Griffiths (2008), there are various uses of ICT that could substantially improve energy efficiency and mitigate global GHG emissions, among which include: smart grid, smart industry, smart buildings, dematerialization, and integrated renewable solutions. The latter entails embedding ICT in green/renewable energy technologies, such as solar photovoltaics, wind turbines, hydropower systems, and so on, in the form of computing devices that monitor, model, and conserve the environment and thus mitigate the negative effects of anthropogenic involvement. Through ICT ‘the world can realize a green economy and make the transition to a low carbon economy’ (GeSI 2008, p. 3). Furthermore, it is widely accepted that ICTs could decouple the economic growth from environmental degradation because of its potential to, besides improving productivity through sophisticated processes, generate value-added in the form of manipulating information rather than energy.

Appendix B: Why a Foucauldian Discursive Approach? – Four Reasons

First, one of the main tenets of this discursive approach is that it posits that knowledge is culturally–contextual, historically–situated, and a matter of episteme – i.e. a body of social knowledge or a set of systems of thought that is constituted in a given period of history.

Second, Foucauldian discursive approach considers that various, simultaneous discourses (e.g. green entrepreneurship, green economy, sustainable development, ecological modernization, information society, policy, etc.) interact in each period of history. It is worth pointing out that sustainable or ecological technologies, as I will attempt to illustrate below, play a pivotal role in these interactional patterns, especially as they establish a linkage between the discourse of green entrepreneurship in relation to sustainable economy (and other related discourses) and the scientific discourse (e.g. computing, ICT, industrial technology, and environmental science), which is deemed as one of the main sources of legitimacy and authority as to knowledge production and decision– and policy–making, nowadays (see Bibri 2013).

Third, Foucauldian discursive approach postulates that discourses are in continuous dialectical interaction with power and political action – these are fundamental components of the production and use of knowledge. This interaction is particularly of import to understand why green entrepreneurship in relation to sustainable economy has emerged and is prospering.

Fourth, Foucauldian discursive approach states that truth effects are created within discourses as socially and historically specific constructions – ontological elements. Foucault adheres to the premise of social constructionism that our knowledge, views, and representations of the world are not mere reality reflections, and hence ought not to be treated as absolute or objective truths; rather, they are products of discourses or of how we categorize the world (Gergen 1985; Burr 1995). Thus, being constructed discursively, truth – or some aspects of it – is a historical event and a cultural manifestation. The extent to which a discursive truth can depict a true picture of reality depends very much on how it is constructed: sophisticatedly (scientifically) or simplistically (albeit meaningful), to draw on constructivistic worldview (e.g., Schwandt 1994), which posits that it is the paradigm in which the constructor operates that determines whether a construction is well–formed or malformed. Accordingly, a variety of sustainability entrepreneurship discourses are available to policymakers and entrepreneurs today, each represents a system, or carries with it a supporting body, of knowledge representing a rendition of truths based on how the constructors of those discourses see things. These discourses are contingent upon the socio–cultural, political, economic, and technological truth brought to the issue of sustainability entrepreneurship. Furthermore, in its relation to power, knowledge, and subjects, truth is postulated to be produced by various technologies of institutional apparatuses, such as the institutions, the systems of thought, and the artefacts. Foucault (1972, cited in Hall 1997, p. 49) states: ‘Truth isn’t outside power... [I]t is produced only by virtue of multiple forms of constraint... Each society has its regime of truth, its ‘general politics’ of truth; that is, the types of discourse which it accepts and makes function as true, the mechanisms and instances which enable one to distinguish true and false statements, ...the status of those who are charged with saying what counts as true’.

Appendix C: Discursive Constructions

Green entrepreneurs or ecopreneurs are constructed in the research documents as follow:

- They ‘are intrinsically motivated’ – sustainability–driven values, to contribute to, and ‘seek to develop business strategies that embody the values of’, ‘improved environmental quality’;
- represent ‘social activists, who aspire to restructure the corporate culture and social relations of their business sectors through proactive, ecologically oriented business strategies’;
- ‘combine environmental awareness with their business activities in a drive to shift the basis of economic development towards a more environmentally friendly basis’;
- ‘function as important catalysts to larger–scale...economic structural transformations toward sustainability’ or ‘are catalysts for change and innovation in society’;
- have a key role ‘in engendering a shift in the practices and operations of contemporary Capitalism’ or in the industrial systems to achieve a sustainable state of the economy as well as ‘cultural shifts...associated with ecological modernization’;
- ‘display a different mentality...than bottom–line profits and a concern for the longer–term implications of their business activities’ – these should have ‘positive effect on the natural environment and on economic sustainability’;
- occupy ‘environmentally sustainable niches that offer lessons for policymakers in any transition to ecological modernization’; introduce green technologies into the marketplace, making ‘it possible to turn ideas into a reality’; and, in all,
- hold the potential to constitute ‘a major force in the overall transition towards a more sustainable business paradigm’, acting as ‘agents of change’ to sustainable society and ‘consciously aim at insuring a more sustainable future’ (Parrish & Foxon 2009; Gibbs 2009; Chick 2009; Farinelli et al. 2011).

Green entrepreneurship or ecopreneurship is constructed as follow:

- It ‘can catalyze co–evolutionary changes to institutions and technologies, resulting in larger–scale socioeconomic transitions toward sustainability..., a low–carbon economy’;
- plays a role in ‘creating innovative enterprises that uniquely address the joint challenges of...ecosystems neglected by government services and strictly market–driven private enterprise’;

- is ‘positioned as a critical ingredient in the transition to a sustainable economy’ and ‘is succeeding in promoting technological and institutional changes which could serve to catalyze a transition to more environmentally...beneficial systems for meeting energy service demands’;
- and ‘has the potential to be a major force in the overall transition to a more sustainable business paradigm’; as well as ‘a major force in the overall transition towards a more sustainable business paradigm...’, ‘acting as ‘exemplary solutions for a social transformation’ (Parrish & Foxon 2009; Gibbs 2009; Chick 2011).
- Moreover, there is evidence that green entrepreneurship can build a green economy (Gibbs & O’Neill 2012).

Appendix D: Interdiscursivity

Below is a selection of excerpts of texts, which contain a set of identified discourses that relate to the discourse on green entrepreneurship in relation to sustainable economy.

Discourses: entrepreneurship/innovation, ecological modernization, sustainable development, and green economy.

There is an ‘intersection between the entrepreneurship and ecological modernization/sustainable development agendas and the creation of sustainability entrepreneurship’, which ‘draws on the long-standing concept of creative destruction in entrepreneurship research so that it becomes the driving force for the establishment of a holistic and sustainable economic–environmental–social system’ (Gibbs 2009, p. 65)

Discourses: ecological modernization, green economy, and ICT for sustainable development

‘An ecological modernization approach would involve both structural change at the macro–economic level, through broad sectoral shifts in the economy, and at the micro–economic level: for example, through the use of new [ICT] and clean technologies by individual firms’ (Ibid 2009, p. 66).

Discourses: ecological modernization, green economy, entrepreneurship, and capitalism.

‘...individuals seeking to combine environmental awareness with entrepreneurial action represent the paradigm of ecological modernization in action... Thus we are seeing the development of new business forms where a new generation of sustainable entrepreneurs or ‘ecopreneurs’ are seeking to combine environmental awareness with business success and conventional entrepreneurial activity’ (Ibid, p. 69).

Discourses: politics, entrepreneurship/innovation, and globalization.

‘Governments focus more on the creation of an enabling environment for large–scale innovations that contribute to the global green transformation of an entire industry rather than merely subsidizing green niche markets’ (Farinelli et al. 2011, p. 42).

Discourses: ICT for sustainable development, globalization, and entrepreneurship/innovation.

‘The recent advance of new information technologies and the globalization of economic processes have drastically modified the traditional methods used by enterprises to innovate’...New technologies, resources and markets impact on or change the dynamics of (green) innovation and management’ (Ibid, p. 46)

Discourses: capitalism, sustainable development, and entrepreneurship/innovation.

‘In this view ‘the current capitalist system is seen as having the capacity to develop sustainable solutions to environmental problems, that capitalism’s drive for innovation can be harnessed to realize environmental improvements’ (Gibbs 2009, p.66).

Discourses: entrepreneurship, green economy, and sustainable development.

‘The challenge for entrepreneurs is to develop strategies that meet the immediate needs of consumer demand while challenging the lock-in of dominant technologies, institutions and business strategies. This is where the unique values and motives that define sustainability entrepreneurship become important’ (Parrish & Foxon 2009, p. 59).

Discourses: entrepreneurship and policy.

‘... activities are regarded as more or less legitimate depending on the degree to which they conform to these larger institutional frameworks’ (Parrish & Foxon 2009, p. 50).

Discourses: entrepreneurship, globalization, and sustainable development.

‘Combined with new demands from consumers for more environmentally friendly products and services, the changing shape of national and global economies is leading to new forms of entrepreneurship’ (Gibbs & O’Neill 2012, p.1).

Discourses: entrepreneurship, sustainable development, and policy/politics.

A driver for change for ecopreneurs is to comply ‘with environmental improvement emerging as an outcome of government regulation and legislation’ (Gibbs 2009, p. 70).

Appendix E: Political Action and Green Entrepreneurship

‘...radical shifts to sustainable technological regimes...are unlikely to proceed (if at all) without parallel political actions’ (Gibbs 2009, p. 68–69).

‘Legislations, government regulations...all have a role to play in shaping the way...eco–business ...conducts its activities’ (Chick 2011, p. 147).

‘Governments...agree that there will be an increasing number of entrepreneurial opportunities in the future because of several factors’: ...’the “push” factors: regulations...and scarcity of natural resources’ and ‘the “pull” factors: consumer demand and green partnership’ (Ibid, p. 144).

There are ‘a number of tensions between policy intentions and (green) businesses’ experiences on the ground’ (Gibbs & O’Neill 2012, p. 75).

‘...governments focus more on the creation of an enabling environment for large–scale innovations that contribute to the global green transformation of an entire industry rather than merely subsidizing green niche markets’ (Farinelli et al. 2011, p 42).

‘Governments have also provided positive incentives to markets, channeling public expenditure into procedures of Green Public Procurement (GPP). In particular, the European Commission has set specific green criteria for public tendering procedures. Europe’s public procurers...can contribute significantly to foster the establishment of sustainable production and consumption. Given that they encourage consumption by both individuals and organizations of environmentally friendly products and services’ (Ibid, 45).

A driver for change for ecopreneurs is to comply ‘with environmental improvement emerging as an outcome of government regulation and legislation’ (Gibbs 2009, p. 70).

‘Innovative opportunists...who identify a green niche for economic exploitation...are mainly influenced by hard structural factors, such as regulation’ (Ibid, p. 72).

‘There may be a role for policy in influencing ecopreneurial start–up businesses with the aim of developing sustainable corporate cultures from the outset’ (Ibid, p. 75).