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SMEs' Construction of Climate Change Risks: The Role of Networks and Values

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Abstract

In this paper we explore how SME managers' network relations and values may be related to their construction of climate change (CC) as a business risk and responsibility. The paper takes a social-constructionist approach the topic of small business managers' understanding and response to climate change risks. From this perspective, the paper investigates how the personal values held by managers, as well as the social structure, and particularly the networks in which they are embedded and participating enable and constrain the way in which they understand and enact climate change risks for their business.

Keywords

Business networks, personal values, climate change, small and medium sized enterprises

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1. Introduction

In this paper we explore how the network relations and personal values of managers of small and medium sized enterprises (SMEs) may be related to their construction of climate change (CC) as a business risk and responsibility. Climate change is currently seen by many as one of the greatest social and economic challenges facing the world today (e.g. DEFRA 2009; Parry et al 2007; Stern 2006) and is a key focus of international, European and UK policy. Business organisations are accorded a major role in both mitigation of climate change, e.g. through the reduction of greenhouse gas emissions, and adaptation to its consequences, in terms of minimising risks that arise directly from climate change to themselves and in terms of helping society as a whole to adapt, for example through the provision of energy efficient appliances or other technologies. At the same time, there are business growth opportunities in terms of 'green' technologies and products.

Small and medium sized enterprises (SMEs) are an integral part of modern economies, in terms of employment, technological and economic innovation and as contributors to greenhouse gas emissions. While the role of small and medium sized firms in efforts to address climate change has been somewhat neglected in the past (Bradford & Fraser 2008; Revell & Blackburn 2007; CCC 2008) they constitute 99% of UK businesses, provide 43% of private employment (BERR 2007) and may account for 20% of total UK carbon emissions (AXA, 2008). This makes SMEs a highly important group of social actors, in terms of their economic, their social and their environmental impact. It suggests a clear need to address the collective impact of SME activity on sustainability in general and climate change in particular (Gadenne et al. 2009; Revell & Blackburn, 2007). Government policy in the UK attempts to involve SMEs mostly in voluntary schemes for energy and carbon efficiency (for example through the efforts of the Carbon Trust in the UK[2]). On the other hand, many SMEs may be highly vulnerable to the consequences of climate change and many have been found to be inadequately prepared for these challenges (Crichton 2006; Clemo 2008).

CC risks are a key sustainable development issue for SMEs in terms of both mitigation and adaptation (Gadenne et al., 2009; Vickers 2009; Revell & Blackburn, 2007):

- Reducing energy consumption and green house gas (GHG) emissions as an important aspect of mitigation
- Technological and social innovation as an important role in helping societies to adapt to the consequences of climate change.

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[2] The Carbon Trust describes itself as "a not-for-profit company providing specialist support to help business and the public sector boost business returns by cutting carbon emissions, saving energy, and commercialising low carbon technologies", www.carbontrust.co.uk, accessed 21 June 2011)

- Increasing their own resilience to the consequences of climate change to reduce the risk to their own survival, thereby safeguarding important social benefits in terms of job creation, innovation, diversity, social cohesion and growth.

SMEs thus face important environmental and regulatory risks related to climate change. Understanding how they make sense of and deal with these risks is a matter of considerable importance not only for SME management as such, but also from the perspective of societal needs and public policy. Apart from the importance of their contribution, a research focus on SMEs provides an interesting mid-level analytical perspective, between large corporations on the one hand and individuals on the other hand, both of which are more common levels of reference in academic research on the socio-economic implications of climate change and in public policy making. The behaviour of small firms can be closer to that of individuals than that of large corporations, particularly where owner-managers have a strong strategic and operational influence on the business (Hamann et al. 2009; Heugens et al. 2008). However, SMEs are also linked into the supply chains of large corporations and the environmental management systems of these larger firms often require some kind of pro-environmental engagement from their suppliers.

However, past research has shown that they are often slow to engage with these challenges. Many SMEs need to change radically if we are to meet statutory targets on carbon emissions and deal with the inevitable consequences of climate change. SME managers often seem to find it difficult to relate climate change to their own businesses (Purvis et al., 2000; Crichton 2006), even though many of them express concern about climate change (Crichton 2006). There are, however, environmentally pro-active SMEs, whose managers seem better able to relate climate change to their own business behaviour. We know from other contexts that networks are important to the way in which SME managers make sense of their environment (Skyrme 2002; Blundel 2002) but this is currently not well understood with respect to environmental issues, particularly climate change. Similarly, there is evidence that personal values play an important role in how SME managers respond to ethical and environmental issues (Spence 1999; Vives 2006) but this has not been linked much to other aspects of the social construction of environmental issues, such as social structure.

1.2. Aims of the Paper

This paper aims to provide a theoretical framework to explain the role of personal values and embeddedness in personal, professional and business networks in SME managers' understanding of and response to climate change. This is an important topic academically, in terms of increasing our understanding of how key environmental risks and challenges are constructed by an important sector of the economy and society and how the construction of these risks and challenges is filtered, enabled and constrained by social structure and individual characteristics. Further research into this area will

also be of benefit to public and private policy makers charged with encouraging greater SME engagement with climate change challenges.

2. SMEs and climate change risks

As a first step in our endeavour to develop a theoretical framework to study SME managers' understanding of and response to climate change we discuss the notion that environmental phenomena in general, and climate change in particular are socially constructed. From a social-constructionist perspective climate change is not merely a physical phenomenon with social and economic implications but a developing and shifting social idea (Hulme 2009); risks are understood to be socially and culturally constructed (Douglas and Wildavsky 1982), embedded in social structure (Short 1984) and influenced by local socio-political contexts and individual and collective values (Baxter and Eyles 1999); and organisational learning is best understood not as a linear process of knowledge acquisition and dissemination but as a process of sensemaking implying an ongoing recognition of the meaning and interpretation of events by others (Sparrow 2001). From this perspective, the paper will discuss how individual values and social structure, particularly industry context and business, professional and social networks enable and constrain managers' understanding and enactment of climate change issues for their business. In this section of the paper we will first discuss how climate change is socially constructed. We will then look at the differences between larger firms and SMEs in terms of their engagement with environmental and social issues before concluding the section with a short review of the existing literature on SME engagement with environmental issues.

2.1. The social construction of climate change

Rather than seeing environmental and climate change issues as an objective reality which social actors perceive with varying degrees of accuracy, in this paper environmental and climate change risks are considered to exist through social organisation (Adams 1995; Stallings 1990). Although there often are external objective conditions for risks, risks as understood and enacted by humans are embedded in social structure (Short 1984) and culture (Adams 1995; Douglas and Wildavsky 1982). In this sense "climate change is not simply a fact waiting to be discovered…or a problem waiting for a solution… [it] is an unfolding story of an idea and how this idea is changing the way we think, feel and act" (Hulme 2009: xxviii).

In this sense, natural phenomena such as climate change are not simply given, but their existence and relevance is cognitively, symbolically and normatively constructed by social actors (Hannigan 1995) to frame social practice differently for different actors. Humans act upon images of natural reality and are dependent on certain environmental constructions and discourses to be able to express themselves and act (Hajer 1995). As natural phenomena are constituted through socio-cultural processes from which they cannot be plausibly separated, there can be no simple demarcation between objective

scientific and lay knowledge (Macnaghten and Urry 1998). The main tasks in the social construction of environmental issues concern the definition of potential problems and of the action necessary to ameliorate them (Hannigan 1995). Understanding the business related risks emanating from climate change is therefore less a linear process of acquiring and using information but an iterative, socially and culturally mediated process of sensemaking (Hulme 2009). Individuals are continuously and actively involved in making sense of their experiences based on mental models that emerge from social interaction, where sensemaking is a key managerial and organisational activity consisting of assigning meanings to experiences, most commonly through story telling (Weick 1995).

While there increasingly appears to be some scientific agreement that anthropogenic climate change exists and will have tangible consequences for human activity, from the lay person's perspective climate change is intangible and difficult to grasp, thereby requiring fairly high sensemaking efforts. This sensemaking is made more complex by the fact that there are a number of different discourses and accounts available, by the disparity between scientific and lay discourses, and by the politicisation of the climate change debate (Hulme 2009).

There is little existing research on SME managers' construction of climate change specifically and what there is tends to be fairly general, focusing on SME managers seeing climate change as an abstract concept and not something with much relevance to their own business (Purvis *et al* 2000; Crichton 2006). From a social constructionist perspective, the question is less one of whether SME managers understand climate change 'correctly', in line with scientific expertise, or respond 'appropriately' to it, but what their own understanding of climate change is, how it is developed and what actions it might engender. If lay people's understanding is given a more privileged role in CC research, then the challenge is to understand their sensemaking of climate change 'from within' and take seriously their perceptions of the phenomenon and how it may or may not affect their understanding of their own business risks. This is important from a policy perspective, too. In order to develop policies to address climate change it is important to gain an in-depth understanding of how sectors of society understand the phenomenon and what it means to them. Policies based on an outside, 'expert' view on how people 'should' respond to the climate change, which often fail to take seriously lay person's own experience of these phenomena are unlikely to succeed, at least in a deeper way.

2.2. Differences between SMEs and larger firms

SMEs differ from larger firms in terms of their engagement with social and environmental issues, which is why research based on theoretical frameworks developed for large firms will not fully capture the SME perspective. SMEs rarely have codified social or environmental policies (Spence, 2007; Hamann et al., 2009) although this does not necessarily mean that they do not engage with these

issues. Owner-managers often have greater freedom of decision making than managers in a large firm (Hamann et al., 2009) and their personal responsibility and motivations are important in the strategic direction of the business, which can lead to greater engagement with social and environmental issues (Hamann et al., 2009; Vives, 2006; Jenkins, 2004; Spence, 1999; Longenecker et al., 1989). On the other hand, SMEs are often highly dependent on a small number of customers and suffer from greater constraints in financial and managerial resources (Hamann et al., 2009; Spence, 2007; Biondi et al., 2000; Gerrans and Hutchinson, 2000; Hillary, 2000; Netherwood, 1998; Tilley, 1999) which would limit their ability to invest in environmental or social measures.

Yet, it is dangerous to assume homogeneity of small firms across regions, sectors, cultures and ownership structures (Jenkins, 2004). Small business engagement with environmental and social issues is highly sensitive to sector context (Spence, 1999) and may depend on the competitive value that can be expected from pro-environmental change (Cambra-Fierro et .al., 2008). In addition, the personal characteristics of SME managers will also make a difference. Where owner-managers have strong ethical and environmental convictions, small businesses – rather than being reticent and reactive in their environmental engagement – may be sustainability pioneers. We can thus distinguish a third group of small businesses: social and ecological entrepreneurs (sometimes called *ecopreneurs*). Ecopreneurs adopt environmentally responsible business practices (Schaper, 2002), create green businesses in order to radically transform the sector in which they operate (Isaak, 2002) and/or want to make a living while at the same time solving environmental problems (Bennet, 1991).

The particular characteristics of small business and their owner-managers mean that theoretical models developed for larger firms are often inappropriate. Due to the different role they play in their organisations and their social and local embeddedness, SME managers may construct their environment differently from the managers of larger firms and the way in which they construct business issues may have a stronger impact on how their business is run. However, construction of climate change is also likely to vary significantly between different SMEs and their managers, depending on firm size and sector, regional and/or national culture, and the main motivations why these firms are in business.

2.3. SME engagement with environmental and climate change issues

Research into SMEs' pro-environmental engagement remains far less extensive than similar research into larger firms (Carr 2003; Spence and Rutherfoord 2003) but a certain body of work has been built up over the last decade. Much existing research into SMEs' pro-environmental engagement has been motivated by an objectivist concern to determine the extent, as well as motivations for and barriers against such engagement. The findings have mostly suggested that the business case for pro-environmental activity is not widely accepted among SMEs (Gadenne et al. 2009, Simpson et al. 2004;

Revell and Blackburn 2007; Ackroyd 2002; Purvis et al. 2000; Hillary 2000). External pressures such as regulation (Simpson et al 2004; Bradford and Fraser 2008; Environment Agency 2007; Gadenne et al. 2009) or customer pressure are seen to be common drivers (Masurel 2007; Dawson et al. 2002; Stohs and Brannick 1999), and values and beliefs held by managers are often considered to be the most important motivations (Vives 2006; Sarbutts 2003; Vyakarnam et al. 1997). The most important barriers were found to be scarce managerial and financial resources (Biondi et al. 2000; Gerrans and Hutchinson 2000) as well as low levels of eco-literacy and limited access to environmental information (Williamson et al. 2006; Hillary 2000; Tilley 2000).

While such previous research has made a valuable contribution to knowledge in identifying these motivations and barriers it has nearly all been undertaking from an outside perspective, i.e. that of the academic or policy maker trying the encourage SMEs to do something. Little research has been undertaken to gain an in-depth understanding of how these businesses themselves understand environmental issues, how these understandings arise and how they are then enacted through business behaviour. However, limited in-depth research into environmental understandings in larger businesses suggests that managers' interpretation of and response to environmental issues is complex and significantly shaped by their social and institutional context (Schaefer 2007; Bansal and Roth 2000). It is therefore reasonable to assume the SME managers' environmental understandings will be similarly shaped by their context.

3. The role of networks and individual values

From the discussion in the preceding sections, the question arises what influences SME managers' construction of climate change and why some SMEs seem more strongly engaged with the climate change debate and better able to relate CC risks to their own business activities. In this section we will discuss the role of network relations, the business sector context and personal values on managers' constructions of climate change, as is graphically represented in Figure 1
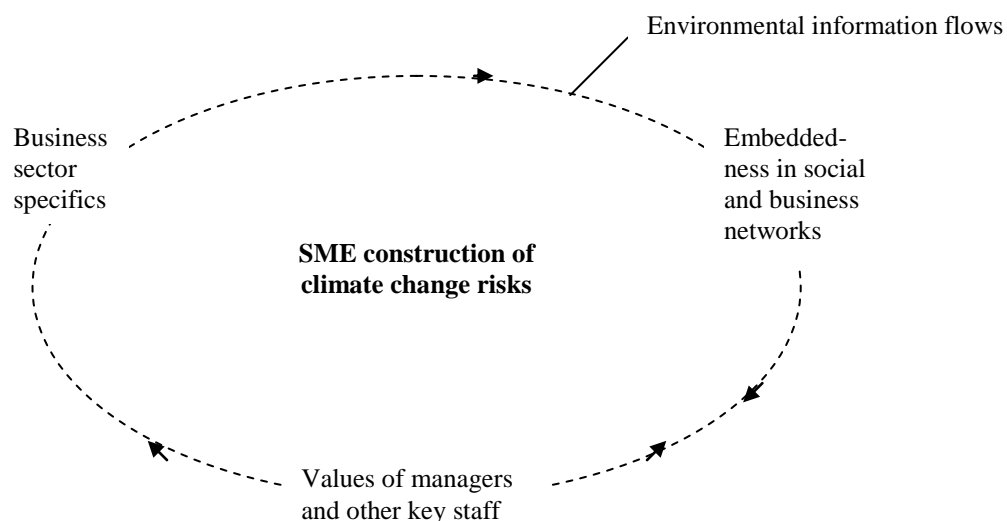
3.1. Networks

If we understand climate change risks as socially constructed then the social element of this construction becomes an important research question. Embeddedness in social structures will play a major role in filtering, enabling and constraining their constructions of climate change and other business and environmental risks. This is related to the question of environmental knowledge available to and accessed by SME managers but it is not a simple question of making information available in the expectation that this will raise awareness and engender action. As discussed above, the social construction of climate change is not simply, or even most importantly, a question of scientific knowledge findings its way into lay perceptions. Rather, it is an ongoing process where expert opinions are not necessarily privileged and in which individuals play an active role.

The literature on knowledge management in SMEs gives us some useful insights into the role of social structures in knowledge acquisition and use, which, according to Sparrow (2001), is not a linear transfer but a process of sensemaking implying an ongoing recognition of the meaning and interpretation of events by others. Knowledge management in SMEs is more commonly informal than formal (Hutchinson & Quintas 2010) and tends to rely strongly on networks and personal contacts (Skyrme 2002; Blundel 2002).

SMEs are embedded in a multiplicity of network relationships of varying degrees of formality (Shaw 2006). Social networks in particular play an important role in the creation of new entrepreneurial ventures and networking is often a key area of entrepreneurial activity (Johannisson 1998, Blundel 2002, Shaw 2006). At the heart of entrepreneurial networks, there are normally a small number of 'strong' ties that provide the entrepreneur with a shelter from the opportunism and uncertainty of the market (Dubini & Aldrich 1991) and lead to future benefits for their emerging firms in the form of 'human capital' – relevant experiences, skills and knowledge – and 'social capital' – being known and trusted by others. Informal networks have also been found to be highly effective in fostering organisational learning in SMEs (Chaston & Mangles 2000), particularly in sharing tacit knowledge and creating new management perspectives (Tell 2000). The value of informal networks in sharing knowledge is often rated higher than that of formal business support organisations (Shaw 2006). However, firms may be reluctant to share commercially sensitive information (Tunc Bozbura 2007). Trust in other network participants is therefore highly important for effective network sharing (Harding & Pawar 2001; Usoro et al. 2007) and open, horizontal networks may be best for providing a safe environment in which to share information about open-ended, uncertain issues (Harding & Pawar 2001). It is interesting to note that even environmentally interested SME managers in a small, exploratory study in the UK (Williams 2009) said they trusted climate change information from their business and personal networks more than information coming from official business support channels

(although it is also important to note that they felt the information from business networks was often somewhat more sceptical of the climate change message).

Due to the contested, uncertain and intangible nature of climate change, which requires a high degree of sensemaking from social actors, contacts through knowledge networks as well as personal contacts are likely to play an important role in the way in which SME managers attend to, understand and enact climate change risks. These knowledge networks may take a multiplicity of forms, such as local business clubs, relationships with customers and suppliers, personal contacts, and – at least to some extent – more formal exchanges through, for example, trade associations or business support organisations. Increasingly, networking through social media may also play a significant role. The way in which climate change is presented and discussed in these networks (or the absence of such discussion) will mesh with the cognitive models of individual managers (and their values and personalities) to produce a particular – albeit partially shared - construction and enactment of climate change in the personal and business behaviour of individuals. Thus a network with strong environmental discourse is likely to make SME managers more prone to attend to climate change information but the opposite will also be true. An analysis of managers' embeddedness in social structures and networks is therefore crucial to a deeper understanding of their sensemaking about climate change risk and their subsequent behaviours from within the manager's own perspective.

3.2. Business sectors

A firm's business sector is likely to impact on managers' construction of climate change risks. More generally, SME engagement with social and environmental issues has been found to be sector dependent (Spence 1999; Jenkins 2004). Different sectors will be exposed to different types and levels of CC risk. For example, a horticultural business is highly susceptible to severe weather events and while managers in such businesses may not view such risks explicitly in CC terms they are likely to see them as very real business risks and take some adaptive action against them. Conversely, an office based type of business in a location not very prone to flooding may be much less inclined to be concerned about climate change risks for their own business. Environmental entrepreneurs, whose competitive advantage relies on environmental innovation may also be more primed to think about wider environmental issues, such as climate change.

Business sectors with high exposure to environmental risks or who trade on environmental innovation may also generate stronger environmental discourses within their networks and their members may therefore be more strongly inclined to consider climate change risks. The nature of the business sector is therefore highly likely to interact with the nature of the networks that managers in that sector will be members of and with the way in which climate change is (or is not) discussed in these networks.

3.3. Values

In this final part of this section we discuss the role that personal values may play in SME managers' construction of climate change, and how values might interact with network relations. Values are enduring, normative beliefs about proper standards of conduct and preferred or desired results (Nystrom, 1990; Rokeach, 1979). Fritzsche & Oz (2007) found that altruistic or self-transcending values were positively related to managers' ethical decision making, whereas self-enhancing values were negatively related to ethical decision making.

Unlike managers and leaders of large firms, founders of small business organisations often build firms that are in line with their personal aspirations and philosophies. They often have greater strategic and operational discretion over their business, and it is usually within their power to disseminate their own vision to permeate organisational values and culture (Hamann et al., 2009; Heugens et al., 2008; Schein, 2004; Dawson et al., 2002). Thus, personal ethics and business ethics may be more closely aligned in SMEs than in larger firms (Jenkins, 2004; Spence, 1999; Werner, 2008; Vyakarnam et al., 1997). For these reasons Vives (2006) argues that ethics and religious values are the most consistent reasons behind socially responsible practice among SMEs, and Sarbutts (2003) suggests that SMEs may sometimes be better placed to adopt socially responsible practices than larger corporations. These considerations have been born out to some extent in empirical studies linking values and environmental engagement (Environment Agency, 2007; Cordano et al., 2009; Dawson et al., 2002; Flannery & May, 2000).

Values on their own may not be strong drivers of behaviour but they are likely to interact with other potential influences on managers' understandings of and response to climate change. In particular, pro-social and pro-environmental values may make managers more receptive to climate change information and more likely to relate such information to their own business. In an exploratory study Williams (2009) found that managers of environmentally pro-active SMEs responded differently to information about climate change, such as – for example – the film *An Inconvenient Truth*. While people with no significant pro-environmental values saw the film but did not relate it to their own lives, these environmentally inclined managers understood the message of the film to be related to their own behaviour and their businesses.

Values will also interact with the kind of network relations that managers are likely to form. This will be the most obvious in the case of eco-entrepreneurs, who may build a pro-environmental business on their own environmental values. In this case, they will also likely interact with other eco-entrepreneurs and will therefore be embedded in social structures where environmental values are held to be important and environmentally related information is readily available and will be related more easily to their own business context. Likewise, being in particular business and social context will shape the

values held by managers. For example, a manager operating in a business sector that has high exposure to environmental issues in general, and climate change threats in particular, will be more exposed to environmentally and climate change related discourses than managers operating in business sectors less affected. These discourses are likely to shape a managers' sensemaking and behaviour, and may have an influence on their secondary values.

In this sense, values are important filtering devices that make managers attend to particular types of information and possible act upon this. A manager with pro-environmental values will be more likely to attend to climate change related information and to build this into their own understanding of their business and how climate change affects it.

Conclusions

In this paper we have argued that SME manager's understanding of and response to climate change risks are socially constructed and filtered through their own values and the network relations in which they are embedded. Values interact with how managers will attend and respond to climate change related information and they will also partly shape the networks in which managers engage. The discourses circulating in important social, professional and business networks will significantly shape managers' exposure to certain types of information and how they respond to it. In short, a manager with somewhat pro-environmental values is more likely to notice and attend to climate change related information, to relate this information to their own business and to act upon this kind of information. In other words they will fit climate change related information into their sensemaking differently from managers with no or few pro-environmental values. Likewise, if managers are embedded in networks where climate change is talked and written about and considered to be an important issue for small businesses to consider, managers themselves are more likely to respond positively to such information and build it into their sensemaking. Managers are more likely to be engaged in network where climate change discourses are taken seriously if theirs is an industry with significant exposure to climate change risks and/or if they run an eco-entrepreneurial business.

There are some important academic and practical implications to the arguments outlined in this paper. One is that if research is to take seriously the socially embedded and constructed nature of lay social actors' – i.e. not scientific or risk analysis experts – understanding and enactment of pervasive but diffuse and intangible risks such as climate change, then a bottom-up approach, starting from the perspective of the actors in involved is necessary. Rather than asking whether or not the social actors in question – SME managers in our case – understand climate change 'correctly' and respond to it 'appropriately', we need to start by immersing ourselves in their understanding of the issues, how they come to hold these and how they enact them through their business practice.

Another implication relates to the fact that lack of information is one of the most frequently cited barriers to entrepreneurs taking up energy efficiency and other climate change related initiatives (CFIB 2007). While there may well be confusing information relating to climate change and a lack of answers to specific questions it could also be the case that managers' perception on the information available to them is strongly filtered through their own values and the networks in which the engage. If managerial values do not relate to climate change as an important challenge they may perceive a lack of information because they do not attend to the information available to them. It may even be that there is too much information available and in the absence of personal and network filters that privilege climate change information, managers may – subconsciously – choose not to attend to any of it.

This leads to equally important implications for public and private policy aimed at increasing SME managers awareness of and response to climate change challenges. It could be argued that all humans have some common values / desires / wants / needs as human beings. Marketing, for example, is very good at tapping into those, as is evidenced by the obvious – albeit environmentally problematic – rise of consumerism. A better social-scientific understanding of how SME managers make sense of greening and climate change may lead to social marketing approaches by which policymakers can 'market' climate change awareness to SME managers in a way that taps into SME managers own values and understanding of climate change. For example, not all managers will respond to the main stories currently used to engage them with climate change, such as win-win, business case arguments and energy security. Understanding more about where are managers starting from might help write new stories that more naturally build on that.

There are also possible implications for the managers of SMEs themselves, particularly those that might want to encourage more of their peers (and perhaps staff) to take climate change and/or other environmental issues seriously. Peer group interaction is in some respects more likely to encourage others to take these issues seriously than much well-meaning outside information which may not be as trusted. SME managers wishing to promote a sustainability culture within their own organisation and their sector may be best advised to encourage strong ties in networks that promote pro-environmental discourses and encourage discussion on how environmental challenges are related to business risks and challenges. Managers who feel they have insufficient understanding of climate change and other environmental issues might also find it useful to cultivate ties within networks where such issues are discussed and to engage in collective sensemaking on these questions.

References

Ackroyd, J. 2002 'Business Excellence Through Resource Efficiency: Raising awareness and Achieving Waste Reduction in SMEs Through a local Support Programme', paper presented at *Business Strategy & the Environment Conference*, Manchester, September 2002.

Adams, J. 1995, *Risk*, Routledge, London

AXA. 2008. 'SMEs Responsible for 110 million tonnes of carbon emissions each year', Press release (01.05.2008) downloaded from: http://www.axa.co.uk/axa4business/files/document/Carbon%20Calculator%20Press%20Release%20S ME%2001%2005%2008.pdf, accessed on 31.3.09

Bansal P. and Roth K. 2000. 'Why companies go green: a model of ecological responsiveness'. *Academy of Management Journal* **43**: 717–36.

Baxter, J & Eyles, J 1999, 'The utility of in-depth interviews for studying the meaning of environmental risk', *Professional Geographer*, 51 (2): 307-320

Bennet S.J. 1991. *Ecopreneuring*. Wiley: New York.

BERR 2007 Enterprise and Small Business statistics. BERR Website: http://www.berr.gov.uk/whatwedo/enterprise/enterprisesmes/index.html.

Biondi, V., Frey, M. & Iraldo, F. 2000. 'Environmental Management Systems and SMEs'. *Greener Management International*. Spring: 55–79

Blundel, R. 2002, 'Network evolution and the growth of artisanal firms: a tale of two regional cheese makers', *Entrepreneurship and Regional Development*, 14: 1-30

Bradford, J & Fraser, DG 2008, 'Local Authorities, climate change and small and medium enterprises: identifying effective policy instruments to reduce energy use and carbon emissions', Corporate Social Responsibility and Environmental Management, 15: 156-172

Cambra-Fierro, J., Hart, S. & Polo-Redondo, Y. 2008. Environmental respect: ethics or simply business? A study in the small and medium enterprise (SME) context. *Journal of Business Ethics*, 82: 645-656.

Carr, P. 2003. 'Revisiting the Protestant Ethic and the Spirit of Capitalism: Understanding the Relationship Between Ethics and Enterprise'. *Journal of Business Ethics*. 47: 7–16.

Chaston, I & Mangles, T 2000 'Business Networks: Assisting Knowledge management and competence acquisition within UK manufacturing firms'. *Journal of Small Business and Enterprise Development* Vol 7(2) 160-170

Clemo, K. (2008), 'Preparing for climate change: insurance and small business', *The Geneva Papers*, 33: 110-116

Committee on Climate Change (CCC) 2008, Building a low-carbon economy – The UK's contribution to tackling climate change: The First Report of the Committee on Climate Change, The Stationary Office, London: http://hmccc.s3.amazonaws.com/pdf/TSO-ClimateChange.pdf.

Cordano, M., Marshall, R.S. & Silverman, M. 2009. How do small and medium enterprises go 'green'? A study of environmental management programs in the US wine industry. *Journal of Business Ethics.* published online 1 August 2009

Crichton, D 2006, Climate Change and its effects on SMEs in the UK. Downloaded from; http://www.axa.co.uk/aboutus/corporate_publications/climatechange_docs/AXA%20Climate%20Change.pdf.

Dawson, S., Breen, J. & Satyen, L. 2002. 'The ethical outlook of micro-business operators'. *Journal of Small Business Management.* 40 (4): 302-313

Department for Environment, Food and Rural Affairs (DEFRA) 2009, '*Climate Change Act 2008 – key provisions/milestones*. Defra Website: http://www.defra.gov.uk/Environment/climatechange/uk/legislation/provisions.htm.

Douglas, M & Wildavsky, A 1982, *Risk and Culture*, University of California Press, Berkeley CA

Dubini, P & Aldrich, H 1991 'Personal and extended networks are central to the entrepreneurial process.' *Journal of Business Venturing*, 6: 305-313.

Environment Agency. 2007. *SME-Environment Survey: UK Summary*. Downloaded from http://www.environment-agency.gov.uk/netregs/links/98674.aspx (accessed 21.4.09)

Flannery, B.L. & May, D.R.. 2000. An Empirical Study of the Effect of Moral Intensity on Environmental Ethical Decision-Making. *Academy of Management Journal*. 43: 642–662

Fritzsche DJ & Oz E. 2007. Personal values' influence on the ethical dimension of decision making. *Journal of Business Ethics*. **75**: 335-343

Gadenne, DL, Kennedy, J & McKeiver, D 2008, 'An empirical study of environmental awareness and practice in SMEs', *Journal of Business Ethics*, 84: 45-63

Gerrans, P.A. &. Hutchinson, W.E. 2000. Sustainable Development and Small and Medium-Sized Enterprises: A Long Way to Go. in R. Hillary (ed.), *Small and Medium-Sized Enterprises and the Environment: Business Imperatives* Greenleaf Publishing: Sheffield, 75–81

Hajer, M.A. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*, Oxford: Oxford University Press

Hamann EM, Habisch A & Pechlaner H. 2009. Values that create value: socially responsible business practice in SMEs: empirical evidence from German companies. *Business Ethics: A European Review*. 18(1): 37-51

Hannigan, J. 1995. *Environmental Sociology: A Social Constructionist Perspective*, London: Routledge

Harding, S. & Pawar. K.S., 2001 Know-how share and transfer in SME networks: A contingent approach. *Proceedings of the 7th International Conference on Concurrent Enterprising 27-29 June Bremen* (accessed via personal correspondence with www.knowledgeboard.com)

Henson, R 2006. *The rough guide to climate change,* Penguin Group, London

Heugens, P., Kaptein, M. & van Oosterhout, J. 2008. Contracts to communities: a processual model of organizational virtue', **Journal of Management Studies**, 45(1): 100–121.

Hillary, R (ed.) 2000, *Small and medium-sized enterprises and the environment: business imperatives*, Greenleaf, Sheffield.

Hulme, M 2009, *Why we Disagree about Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge

Hutchinson, V and Quintas, P 2008, 'Do SMEs do knowledge management? Or simply manage what they know?', *International Small Business Journal*, 26: 131-154

Isaak R. 2002. The making of the ecopreneur. *Greener Management International*. 38: 81–91

Jenkins, H 2004, 'A critique of conventional CSR theory: An SME perspective', *Journal of General Management*, 29(4): 37–57

Johannisson, B 1998, 'Personal networks in emerging knowledge-based firms: spatial and functional patterns.' *Entrepreneurship and Regional Development*, 10, 4: 297-312.

Longenecker JG, McKinney JA & Moore CW. 1988. 'Egoism and independence: entrepreneurial ethics'. *Organizational Dynamics*. **16**: 64-72.

Macnaghten, P. & Urry, J. 1998. *Contested Natures*, London: Sage

Masurel, E. 2007. Why SMEs invest in environmental measures: sustainability evidence from small and medium sized printing firms. *Business Strategy and the Environment*, 16: 190-201

Netherwood, A. 1998. Environmental Management Systems', in R. Welford (ed.), *Corporate Environmental Management: Systems and Strategies*, 2nd edition. London: Earthscan, pp. 37–60.

Nystrom PC. 1990. Differences in moral values between corporations. *Journal of Business Ethics*. **9**: 971–979.

Parry, ML, Canziani, OF, Palutikof, JP, van der Linden, P.J. & Hanson, C.E. (eds) 2007, *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge UK

Purvis, M, Drake, F, Hunt, J & Millard, D 2000, 'The manager, the business and the big wide world' in S. Fineman (ed.) *The Business of Greening*, Routledge, London, 13-34

Revell, A & Blackburn, R 2007, 'The business case for sustainability? An examination of small firms in the UK's construction and restaurant sectors', *Business Strategy and the Environment*, 16, 404-420

Rokeach MM. 1979. From individual to institutional values: with special reference to the values of science. In *Understanding Human Values: Individual and Societal*. Rokeach MM (ed.). The Free Press: New York

Rutherfoord, R, Blackburn, R & Spence, L 2000, 'Environmental Management and the Small Firm: An International Comparison', *International Journal of Entrepreneurial Behaviour & Research,* 6(6), 310–325

Sarbutts N 2003, 'Can SMEs do CSR? A practitioner's view of the ways small and medium sized enterprises are able to manage reputation through corporate social responsibility', *Journal of Communication Management*, 7(4): 340–347.

Schaefer, A. 2007, 'Contrasting institutional and performance accounts of environmental management systems: three case studies in the UK water and sewerage industry', *Journal of Management Studies*, 44 (4): 506-535

Schaper M. 2002. The essence of ecopreneurship. *Greener Management International*. 38: 26–30

Schein, E. 2004. *Organizational Culture and Leadership* Jossey-Bass, San Francisco, CA

Shaw, E 2006, 'Small Firm Networking: An Insight into Contents and Motivating Factors', *International Small Business Journal*, 24(1): 5–29.

Short, JF 1984, 'The social fabric at risk: toward the social transformation of risk analysis', *American Sociological Review*, 49: 711-725

Simpson, M., Taylor, N. & Barker, K. 2004. Environmental responsibility in SMEs: Does it deliver competitive advantage? *Business Strategy and the Environment*, 13: 156-171

Skyrme, D. 2002, 'Knowledge Management: Approaches and Policies'. Downloaded from http://www.providersedge.com/docs/km_articles/KM_-_Approaches_and_Policies.pdf (29.4.2011)

Sparrow, J 2001, 'Knowledge Management in Small Firms', *Knowledge and Management* Vol 8 (1) 3-16

Spence, LJ 1999, 'Does size matter? The state of the art in small business ethics', *Business Ethics: A European Review*, July 8(3): 163–174.

Spence, L.J 2007, 'CSR and Small Business in a European Policy Context: The Five "C"s of CSR and Small Business Research Agenda 2007'. *Business and Society Review*. 112:4, 533–552

Spence, L.J., & Rutherfoord, R. 2003. 'Small Business and Empirical Perspectives in Business Ethics: Editorial'. *Journal of Business Ethics* 47, 1–5.

Stallings, R.A. 1990, 'Media discourse and the social construction of risk', *Social Problems*, 37 (1): 80-94

Stern, N 2006, *Stern Review on the Economics of Climate Change*, HM Treasury, London

Stohs, J.H., Brannick, T. 1999. Predictors of Irish Managers' Ethical Reasoning. *Journal of Business Ethics* 22(4), 311-326.

Tell, J. 2000 Learning Networks – a metaphor for inter organisational development in SMEs. *Enterprise and Innovation Studies* Vol 1(3) 303-317

Tilley, F. 1999. The gap between the environmental attitudes and the environmental behaviour of small firms. *Business Strategy and the Environment*, 8, 238-248.

Tunc Bozbura, F. 2007 Knowledge Management practices in Turkish SMEs *Journal of Enterprise Information Management* vol 20 (2) 209-221

Usoro, A., Sharratt M.W., Tsui, E & Shekhar, S. 2007 'Trust as an antecedent to knowledge sharing in virtual communities of practice'. *Knowledge Management Research & Practice* 5, 199-212

Vickers, I 2009, *SMEs in a Low Carbon Economy: Final Report for BERR Enterprise Directorate*. Retrieved from https://www.berr.gov.uk/files/file49761.doc

Vives A 2006, 'Social and environmental responsibility in small and medium enterprises in Latin America', *The Journal of Corporate Citizenship*, 21: 39–50.

Vyakarnam, S., Bailey, A., Myers, A. & Burnett, D. 1997. Toward an ethical understanding of small firms. *Journal of Business Ethics* 16(14): 1625-36.

Weick, K. E. 1995 *Sensemaking in Organisations.* Sage Publications, London.

Williams, S 2009, *SMEs and Climate Change: Understanding Manager Engagement*, Dissertation for Master of Research, Open University, Milton Keynes

Williamson, D., Lynch-Wood, G. & Ramsay, J. 2006. Drivers of Environmental Behaviour in Manufacturing SMEs and the Implications for CSR. Journal of Business Ethics, 67:317–330

Zhang, M., Macpherson, A. and Jones, O. (2006) 'Conceptualizing the Learning Process in SMEs: Improving Innovation through External Orientation', International Small Business Journal 24 (3): 299–323.