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The Business Case for Sustainability: A Small Firm Perspective

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To: Kingston University

Degree: Doctor of Philosophy

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the spine.

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I would like to thank all those who made this submission possible, including my supervisor, Professor Guy Robinson, and my co-authors Robert Rutherford, Professor Rob Blackburn, Dr. Brendan Barrett, Dr. David Stokes and Dr. Hsin Chen. I would particularly like to thank my father, whose unfailing encouragement, help and support has been instrumental in bringing this submission to fruition.

ABSTRACT

The empirical research outlined in this submission explores the environmental attitudes and practices of owners of small and medium-sized enterprises (SMEs) in the UK and Japan. The submission spans three studies conducted over a period of seven years from 2000-2007, involving interviews with a total of 70 owner-managers and 22 government and industry 'key informants', as well as survey responses from 220 SMEs. The research provides a dynamic picture of the barriers and drivers of environmental reform within small businesses during this time, embedding the findings within broader debates on sustainability and 'ecological modernisation' (EM) theory. A key conclusion of the research is that an SME policy strategy which relies too heavily on voluntarism and self-regulation is unlikely to be effective due to the many internal and external barriers to environmental management experienced by owner-managers. A more participatory and interventionist approach, which combines education initiatives with stricter regulatory controls, market-based instruments and negotiated decision-making is highlighted as a potentially more successful way to encourage SMEs to reduce their environmental impacts. The responses of business owners also highlight that to achieve environmental goals, it is just as important to encourage a change in culture amongst customers as it is amongst companies. The research thus recommends that EM scholars broaden their focus to include the ecological modernisation of consumption, and to engage with contested concepts such as 'sufficiency' and equity in order to ensure that theory can still have currency and gravitas in debates on sustainable development.

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PART I:

**The Business Case for
Sustainability:
A Small Firm Perspective**

1. Introduction

The 'greening' of small and medium-sized enterprises (SMEs) is an important topic of inquiry given the significant environmental impact of this vast sector of the economy – and the fact that SMEs have often been overlooked by scholars within the business and environment field. Particularly in recent years, the environmental practices of small firm owners have been influenced by a rapidly changing physical environment and corresponding transformations in local, national and global environmental policy, which clearly deserves attention. The research outlined in this submission reflects some of the social transformations occurring among SME owner-managers as a result of these changes. The published works provide an important contribution to knowledge in the form of policy recommendations outlining ways of encouraging environmental management among SMEs, and in arguments that feed into wider debates on the 'ecological modernisation' of industry, policy and society. Barriers and drivers of greening, ecological modernisation theory and policy directions form the three unifying themes of the research. The submission comprises 10 outputs, including 6 journal articles, 3 book chapters and one conference paper.

1.1 Outline of Submission

Journal Articles:

1. Revell, A. (2007a) 'The Ecological Modernisation of Small Firms in the UK's Construction Industry', *Geoforum* 38(1):114-126
2. Revell, A. and 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(6):404-420
3. Revell, A. (2005). 'Ecological Modernisation in the UK: Rhetoric or Reality?' *European Environment*, 15:344-361
4. Revell, A. (2003a) 'Environmental Policy and the Small Firm in Japan: Comparisons with the Netherlands', *Journal of Environmental Policy and Planning* 5(4):397-413
5. Revell, A. (2003b) 'Is Japan an Ecological Frontrunner Nation?' *Environmental Politics* 12(4):24-48
6. Revell, A. and Rutherford, R. (2003) 'UK Environmental Policy and the Small Firm: Broadening the Focus', *Business Strategy and the Environment* 12: 26-35

Book chapters:

7. Revell, A. (forthcoming) 'Environmental Economics and the Limits to Growth Debate', Buckingham, S. (ed) *Understanding Environmental Issues*, Sage
8. Revell, A. (2007b) 'Sustainable Development: The Case of Japan', Singh, J. (ed) *Society, Sustainability and Environment* Shivalik Prakashan, Delhi
9. Barrett, B. and Revell, A., (2005) 'Ecologically Modern Industrialisation', in Barrett, B. (ed) *The Environmental Performance of Japan*, Routledge, London and NY

Conference paper:

10. Revell, A., Stokes, D. and Chen, H. (2007) 'UK SMEs and the Environment: Turning Over a New Leaf?' Presented at the Corporate Responsibility Research Conference, Leeds, July 15-17th, 2007

Total word count of published works: 84,941

2. Research Journey

The studies outlined in this submission are best explained in the context of the research journey that I have undergone since I joined the Small Business Research Centre (SBRC), Kingston University at the end of 1999. At that time Robert Rutherford and Dr. Laura Spence (both senior researchers at the SBRC) had just finished conducting the centre's first environmentally-focused study exploring the environmental attitudes and behaviour of UK and Dutch SMEs in the restaurant and mechanical engineering sectors (see Rutherford and Spence, 1998, Rutherford et. al, 2000; Spence et. al 2000; Spence and Rutherford, 2001). This research provided direction for my own developing environmental research agenda within the centre. In 2000 I wrote an article with Rob Rutherford:

- Revell, A. and Rutherford, R. (2003) 'UK Environmental Policy and the Small Firm: Broadening the focus', *Business Strategy and the Environment* 12: 26-35

The article was essentially a concept paper situating the drivers and barriers of environmental reform amongst UK SMEs within a context of national policy arrangements and networks.

2.1. Study 1: Environmental Attitudes and Practices of Japanese SMEs

In 2001, when my husband's job took us to Tokyo for a period of two years, I was funded by the SBRC to undertake the first of the three studies in this submission. The objectives of the study were to explore the environmental attitudes and practices of Japanese SME owner-managers, (including the barriers and drivers to environmental action they experienced), and to examine the influence of environmental policies and governance structures on the greening of the SME sector in Japan.

To maximize comparability, the study replicated the methodology of Rutherford and Spence's earlier qualitative research in the UK and the Netherlands by conducting in-depth face-to-face interviews with 10 key informants within industry and government, followed by 20 SME owner-managers in the restaurant and mechanical engineering sectors of Tokyo. I undertook almost all aspects of this study, including research design, implementation and project management, fieldwork, data analysis and dissemination. A translator was present at the interviews, which were conducted in Japanese. Please refer to the appendix for further details on the methodology, key findings and collaborative process for this study.

There were four outputs from this study, including journal articles in *Environmental Politics*

(Revell, 2003b) and the *Journal of Environmental Policy and Planning*¹ (Revell, 2003a), along with book chapters in 'Ecological Modernisation and Japan' (Barrott and Revell, 2005) and 'Society, Sustainability and the Environment' (Revell, 2007b). 'Ecological Modernisation in Japan' has been rated by David Sonnenfeld, (a seminal author on EM theory), as one of the top 12 books in the ecological modernisation literature².

2.2. Study 2: Environmental Attitudes and Practices of UK SMEs

Upon returning to the UK at the end of 2002, I was awarded an Economic Social Research Council grant to follow up the Japanese research with a study of environmental management practices within UK SMEs. This second study formed part of the ESRC's 'Environment and Human Behaviour Programme' (www.psi.org/ehb), which funded 12 projects with the aim of exploring why people behave the way they do towards the environment, how they might respond and adapt to rapid environmental change, and whether they will react positively to environmental policies that seek to reduce environmental damage.

This second study for the most part replicated the aims and methodology of the Japanese study, with interviews conducted among 12 key informants and 40 SME owner-managers in the UK. However, SMEs from the construction industry were chosen to compare with the responses of restaurateurs rather than mechanical engineers. The rationale for this change was that the construction industry was a potentially more interesting sector from a policy viewpoint, as it has a high environmental impact and numerous policy initiatives had been implemented to improve its environmental performance. By contrast, the restaurant industry had been targeted with very few environmental initiatives and thus provided a good comparison of the effects of varying sectoral policy arrangements on small firms in the UK.

I was responsible for most aspects of study 2, including proposal writing and project funding, research design and implementation, project management, data analysis and dissemination. Fieldwork was shared with Professor Robert Blackburn, director of the SBRC, who was also responsible for monitoring and quality control. Please refer to the appendix for further details on the collaborative process, methodology and findings for study 2.

The outputs from this research included three journal articles; one in 'Geoforum' (Revell, 2007a), one in 'European Environment' (Revell, 2005) and one in 'Business Sustainability and the Environment' (Revell and Blackburn 2007).

¹ The *Journal of Environmental Policy and Planning* is an international journal edited by Arthur Mol, one of the founding authors of EM theory, which has attracted publications by many of the theory's most prominent authors.

² see <http://www.amazon.com/Ecological-Modernisation/m/RELJGPYEJSR9P>; accessed 25/02/08

In 2005 I took up a full-time lecturing post at Brunel University, while continuing to disseminate the findings of studies 1 and 2. During this time, I also wrote a book chapter (Revell, forthcoming³) discussing the link between environmental economics and ecological modernisation theory, and the influence of these important schools of thought on policy debates in the UK and beyond.

2.3 Study 3: UK SMEs and the Environment: Turning Over a New Leaf?

In 2007 my husband's job took us abroad again, this time to Bangalore, India. In my capacity as Associate Lecturer for Brunel, I collaborated with the 'Westfocus Knowledge Exchange' (which co-ordinates a consortium of universities in South and West London, including Brunel and Kingston University) on a third study exploring the environmental attitudes and practices of UK SMEs. To retain consistency, this study had the same objectives as studies 1 and 2. However, the methodology differed in that it combined a cross-sectoral quantitative survey of 220 SMEs in London and the south-east with 5 case studies and 5 in-depth interviews with survey respondents. The study was part-funded by the 'Workspace Group Plc', a London-based property company that specialises in small business tenants. The report formed a key part of the corporate social responsibility report of the company.

My research responsibilities for this study primarily focused on the literature review, data analysis and dissemination aspects of the study. I also gave advice on research design and methodology in the initial stages of the project. Dr. Stokes (director of the Enterprise Exchange, Kingston University) was responsible for project funding and management, while Dr. Hsin Chen, the research assistant for this project, was responsible for data collection and SPSS manipulation.

The output from this research to date has been the publication and presentation of a conference paper (Revell, et al. 2007), which has now been accepted (subject to minor revisions) by the journal 'Business Strategy and Environment'. Please refer to the appendix for further details on methodology, key findings and the collaborative process for study 3.

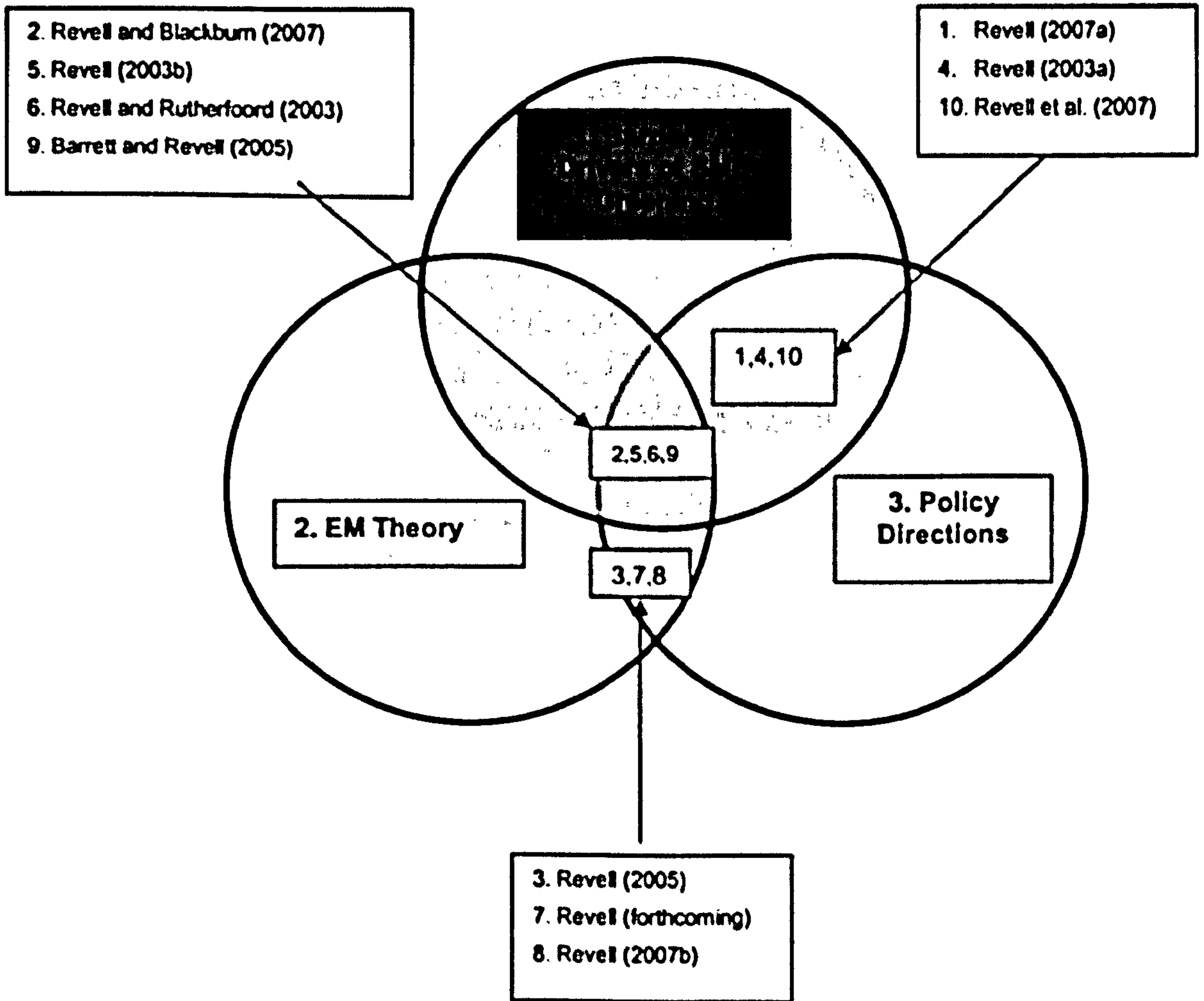
³ Whilst this book chapter is still forthcoming, the publisher has made all the final edits and the chapter is now signed off for publication (please see accompanying letter from the editor).

3. Unifying themes of the research

Barriers and drivers of greening amongst SMEs, ecological modernisation theory and policy directions form the unifying themes of the published works (fig.3.1). Each published work includes at least two of these three themes.

3.1 Diagram of unifying themes

NB: Numbers in diagram refer to outputs referenced in submission outline (P3)



3.2. Theme 1: Barriers and Drivers of Greening

For environmentalists, much of the existing academic literature on the greening of small firms makes for depressing reading. The enormous numbers of SMEs⁴ ensures that cumulatively this important sector of the economy has a very significant environmental impact, reportedly accounting for as much as 70% of all global pollution (Hillary, 2000). Moreover, while SMEs often have a higher environmental impact per unit than large firms, they lag far behind their corporate counterparts when it comes to improving their environmental performance (Gunningham and Sinclair, 2002). Understandably, researchers have thus tended to focus on identifying the barriers to environmental reform experienced by owner-managers, and how they might be constructively removed.

3.2.1 External barriers

Studies of SMEs from around the world have found numerous barriers to environmental management, both internal and external to the firm. Key external barriers found in my research, (and supported by other studies⁵), include i) a lack of green consumer demand, ii) little or no supply chain pressure for greening, iii) limited environmental visibility and exposure of smaller firms, iv) lack of an organizational network supporting the environmental activities of SMEs, v) size disadvantages (as environmental initiatives tend to be targeted at large firms), and vi) limited infrastructure for supporting environmental management, such as poor local recycling facilities. (Revell and Blackburn, 2007; Revell, 2007, 2003a, 2003b, 2002).

The papers in this submission make a number of recommendations to remove these barriers, again supported by other researchers in the field⁶, such as i) correcting market failures with market-based instruments and environmental regulations, ii) focusing policy initiatives on cultivating green consumerism, iii) Infrastructure developments to encourage environmental action, iv) promotion of a more participatory policy context, along with the support of stakeholder partnerships and networks to encourage environmental management amongst SMEs. (Revell and Blackburn, 2007; Revell, et al, 2007; Revell, 2007a; Barrett and Revell, 2005; Revell, 2003a; Revell and Rutherford, 2003).

⁴ SMEs (employing less than 250 people) make up around 95% of private sector firms in most industrialised economies (Schaper, 2002). In the UK they account for 99.8% of businesses in the private sector (SBS, 2006)

⁵ See Drake et al. 2004; Hillary, 2003, 2000 and 1999; Schaper, 2002; Verheul, 1999; Bianchi and Noci, 1999; Berger et al. 2001; Bowen, 2000; Rutherford et al, 2000, Wycherly 1999; Tilley, 1999; Bayliss et al 1998; Masurel, 2007; Struder et al forthcoming, Verheul, 1999; Hunt, 2000; Pederson, 2000; Fanshaw, 2000; Biondi et al, 1998, Vernon et al., 2003; Jones and Greenwood, 2003

⁶ See Struder et al, forthcoming; Drake et al, 2004; Simpson et al, 2004, ten Brink; 2002; Spence et al. 2001; Rutherford et al, 2000; Murphy and Cohen, 2001; Spargaaren 2003; 2001; 2000; Gunningham and Sinclair, 2002; De Bruijn and Hoffman, 2000; Hunt, 2000; Pederson, 2000; Fanshaw, 2000; Biondi et al, 1998; Vernon et al, 2003)

3.2.3 Internal Barriers

The literature also cites numerous internal obstacles which have contributed to a culture of environmental inaction amongst SMEs. Key Internal barriers found in my research, and corroborated by other studies⁷, include i) owner-managers' lack of awareness of the environmental impacts of their firm, ii) their perception that environmental management is costly and likely to result in a loss of competitiveness, iii) poor management skills and a lack of strategic awareness (leading to difficulties in translating environmental improvements into a competitive advantage), iv) limited time and resources, and v) low levels of compliance due to a lack of awareness of regulations combined with a perception that enforcement is weak (Revell and Blackburn, 2007; Revell, 2007, 2003b, 2002).

Other internal barriers cited within the general literature include low awareness of the benefits of environmental management systems, coupled with a perception that EMS adoption is costly (Drake et al, 2004; Schaper, 2002; Hillary, 2000), low levels of 'eco-literacy' and a lack of knowledge or skills to undertake environmental improvements (Tilley, 1999; Vos, 1998; Hillary, 2000; Gerstenfeld and Roberts, 2000; Biondi et al. 2002; Perez-Sanches et al. 2003), and a lack of organisational capacity for change amongst SMEs, such as inflexible work habits and difficulties translating complex environmental regulations into workplace responsibilities (Petts, 2000) All these barriers have led to a so-called 'value-action gap', with SME owners finding it difficult to translate their general concern about the environment into concrete operational changes to reduce their firm's environmental impact (Revell et al., 2007; Tilley, 1999; Schaper, 2002; Mckiever and Gadenne, 2005).

Scholarly recommendations for removing internal barriers have tended to focus on information and education initiatives which help owner-managers become more 'eco-literate', thus raising their awareness of the environmental impacts of their firm, what they can do to reduce these impacts, and how their firm might be able to profit from environmental action. (Tilley et al., 2003; Clark, 2000; Hunt, 2000; Pederson, 2000; Tunnesen, 2000; Fanshawe, 2000; Bichard, 2000; Tilley, 1999). My research has emphasised the need to augment these initiatives with the introduction of more interventionist policy strategies such as regulations and taxes, as the aforementioned barriers have created a context where owner-managers are often resistant to joining environmental support programmes. These policy recommendations have been

⁷ See Environment Agency 2005, 2003, 2002; Fanshawe, 2000; Rutherford et al, 2000; Holland and Gibbon; 1997, Smith and Kemp 1998; Bayliss et al, 1998; Hillary, 2000; 1995; Petts, 1999; Simpson et al. 2004; Drake et al, 2004; Schaper 2002; Observatory of European SMEs, 2002; Gerstenfeld and Roberts, 2000; Hutchinson and Chaston, 1995; Simpson et al, 2004; Tilley et al., 2003; Bianchi and Noci, 1999; Primanova, 2004; Friedman et al 2000, Fischer 2003, Verheul, 1999; Epstein and Roy, 2000

supported by other scholars, such as Simpson et al, (2004), ten Brink; (2002); and Rutherford et al. (2000). However, a key issue for policymakers is the cost of enforcing interventionist policies amongst a huge and heterogeneous sector of the economy – this issue is discussed in section 3.4 (policy directions).

3.2.4 Drivers

Fortunately, there are some significant drivers of greening to counteract the multitude of obstacles to environmental management experienced by owner-managers. My research has consistently found three key factors that are most likely to motivate SME owners to improve their environmental performance; these are i) government regulations and taxes, ii) market opportunities, and iii) environmental concern. These findings are supported by other major empirical studies (see Environment Agency, 2005; 2003; 2002; Observatory of European SMEs, 2002; Hillary 2000; Smith and Kemp, 1998; Hillary, 1995).

SME owners are motivated in varying degrees by these three factors, depending on the different sectoral, regional and national contexts that come to bear on them. For instance, while the emphasis in Japan has traditionally been on the use of voluntary agreements between industry and government to achieve environmental goals, SMEs have recently experienced an upsurge in regulatory drivers with the introduction of a raft of recycling legislation targeting industry. In the past Japanese SMEs had been exempted from many of these laws (see Barrett and Revell, 2005). In the Netherlands, SMEs are targeted both by licensing regulations and covenants between industry and government. All businesses have to obtain an environmental permit in order to trade, and this policy context has been a major driver of environmental reform amongst small firms (Revell, 2003b).

In the UK, policymakers have tended to take a sectoral rather than size approach to regulation, and thus small firms have not been singled out as a specific target group for stricter controls (Revell and Rutherford, 2003). There has also been a lack of political will in the UK to target an SME sector already beleaguered with legislative 'red tape' in areas such as employment and health and safety. As a result, UK policymakers have preferred to emphasize the primacy of market drivers in the greening of SMEs, with political rhetoric focusing on 'the business case for sustainability' such as the growth of green consumerism and the cost savings to be made from efficiency measures (Revell and Blackburn, 2007; Revell, 2007a). However, while the market undoubtedly has a powerful potential to encourage reforms, past studies on UK SMEs have found that in reality it has tended to act as more of a barrier than a driver of environmental action (see Hillary, 2000). My research confirms that pervasive obstacles such as a lack of green consumer demand and supply chain pressure have created substantial resistance to environmental

initiatives amongst SME owner-managers. (Revell and Blackburn, 2007; Revell, 2007a, 2003a, 2003b).

Nevertheless, the findings of study 3 suggest that market drivers are beginning to play a more influential role in the greening of UK SMEs, with owner-managers citing cost savings, new customers, good publicity and higher staff retention as some of the potential benefits of carrying out environmental measures (see Revell, et. al., 2007). One possible reason for this shift is that there has been a sharp rise in public attention on environmental issues recently in the UK (Economist, March 2007), which may have helped owner-managers to see more clearly how environmental action can translate into business opportunities.

The academic literature cites environmental concern as another potentially significant motivator of environmental reform within the SME sector. For instance, in the UK recent studies have found an increasing number of SMEs involved in efforts to reduce their environmental impacts, driven in large part by owner-managers' heightened anxiety about the state of the environment rather than any expectations of a financial return (Environment Agency, 2005; 2007; Simpson et al., 2004). Study 3 confirms this finding, as owner-managers' concern about the environmental impacts of their business was one of the key factors encouraging them to engage in measures such as energy efficiency, recycling and green purchasing. Subsequent interviews with a selection of survey respondents suggested that the exceptional levels of recent media and policy attention on issues such as climate change in the UK had played an important role in shaking business owners out of their state of inertia regarding environmental problems (Revell, et al., 2007).

My research has thus helped to chart the different barriers and drivers experienced by owner-managers as a result of increasing levels of environmental concern and activity in the political economy. Further empirical research is needed to confirm whether a major shift is indeed occurring in the hearts and minds of business owners, as recent studies can only describe their results in terms of an emerging rather than an established trend. As such, study 3 can be considered an exploratory piece of research indicating a promising trend towards greater environmental proactivism in the UK. Further clarification is needed as to whether this is a temporary response to a perceived transient wave of environmentalism within society, or an indication of longer-term strategic changes in business practices.

3.3. Theme 2: Ecological Modernisation (EM) Theory

In this submission I have explored how processes of ecological modernisation apply to the small firm context, and examined the value of EM policy prescriptions in encouraging the greening of

Industry. In doing so I have focused primarily on EM as a political programme of action (see Murphy, 2001) rather than as a theory of reflexive social change (see Mol, 1996). EM theory can be considered an appropriate analytical framework for my research for two key reasons. Firstly, ecological modernisation has particular salience as the dominant discourse in environmental policy debates in the UK, Japan and Europe, (see Revell, 2005; Revell 2003b, Barrett and Revell, 2005), and therefore has implications for policy prescriptions related to SMEs (theme 3). Secondly, EM is particularly useful for exploring barriers and drivers to greening (theme 2), for at its core is the notion that there is a business case for sustainability.

3.3.1 EM and the business case for sustainability

Proponents of EM as a policy strategy describe potential 'win-win' outcomes from environmental protection, as environmental problems act as a spur to technological and organizational innovation within industry, which in turn encourages efficiency, new products and economic growth. The theory argues that as growing societal concern for environmental problems translates into stakeholder pressure for corporate responsibility and green consumerism, early adopters of environmental measures (usually the most innovative and flexible firms) reap the greatest commercial benefits from new markets in environmental goods, as well as increased production efficiencies. As the business case for sustainability becomes more established, other firms follow suit and the market is driven to higher and higher levels of environmental protection. In this way, EM protagonists present environmental and economic goals as a mutually reinforcing, positive-sum game.

EM proponents initially saw market pressures alone as enough to catalyse the greening of industry. In later work however, the focus shifted towards the need for continuing pressure from government due to the presence of pervasive market failures such as the externalization of environmental costs. The debate on 'political modernisation' was thus sparked, particularly regarding the kind of macro-economic policies that would be most effective in achieving environmental goals (see Murphy, 2000). I have contributed to this debate by recommending policy strategies specifically aimed at encouraging environmental reform amongst small and medium-sized firms, a sector largely ignored within the EM literature (see Revell, 2007a; Revell, 2003b; Revell and Rutherford, 2003).

3.3.2 The role of large firms in EM

Large firms have been the primary focus of EM theory because they are seen as potential green champions of ecological modernisation and are thus the main target of government policy. This

reflects the perception that environmental reform requires the kind of financial resources, technical knowledge, organisational capacity and influence that only corporations possess. Large firms also have significant power within the supply chain, and can potentially influence smaller firms to adopt environmental good practice. Big business is thus expected to take a crucial lead on environmental management, and it is for this reason that EM scholars have focused on case studies of industries dominated by corporations (see for instance Mol, 1995), while much less has been written about SMEs. However, my studies (and others) highlight that one of the key barriers experienced by SMEs is a lack of supply chain pressure for environmental management - and where pressure is exerted it is mainly concentrated on first tier firms rather than trickling down to smaller firms in lower tiers. My research has thus recommended that policymakers target SMEs with stricter regulations and economic incentives if they wish to encourage ecological modernisation, rather than passively relying on the greening of the supply chain.

3.3.3 EM policy strategies

Economic incentives such as environmental taxes and tradable permits have been heavily emphasized in the EM literature, as a key trend of political modernisation involves a policy shift away from 'command-and-control' regulation to 'enabling' market-based instruments (MBIs) which harness market forces to achieve environmental goals (see section 3.4.1, p17). Nevertheless, while command-and-control approaches are criticized within prescriptions of EM, regulation is still seen as a necessary element in the policy mix as long as regulators maintain a flexible stance and take into account the needs and constraints of industry when setting standards. The Porter hypothesis (Porter and van der Linde, 1995) is often used to describe how environmental regulations can result in win-win outcomes for business; this states that strict legislation can drive more efficient production processes by encouraging the introduction of cleaner technologies and environmental improvements (the innovation effect). Strong domestic controls can thus stimulate innovation and efficiency within industry, which in turn increases business competitiveness and enables firms to capture new international markets, resulting in 'first mover' advantages. Because the growth that results from environmental legislation outweighs any regulatory costs incurred by industry, it thus represents a win-win scenario consistent with ecological modernisation.

3.3.4 Criticisms of the win-win

Sceptics argue that the win-win outcomes that are so integral to EM as a policy strategy are not sustainable in the long term. For instance, 'first mover' advantages only last as long as it takes for the rest of the market to catch up. Competitive advantages arising from cost leadership or product

differentiation are notoriously difficult to sustain when other firms can simply duplicate the innovation or strategy (Simpson et al, 2004). Moreover, the cost-benefits of environmental improvements may suffer from the law of diminishing returns once a certain threshold of investment has been reached (Walley and Whitehead, 1994). Critics also question the real environmental benefit of win-win cases, given that most do not include a full product life-cycle analysis (Cerin and Carlson, 2002). For instance, the environmental benefits of recycled packaging may be neutralized by the pollution emitted from a fossil fuel powered recycling facility⁸. Moreover, production efficiencies may result in the so-called 'rebound effect', whereby efficiency gains lower costs, which in turn lower prices and encourage a growth in consumer demand that cancels out the environmental benefit of the original efficiency gain (see Revell, 2007a; Revell, 2007b).

3.3.5 The findings of my research

The findings of study 1 and 2 in this submission lend credence to sceptics' arguments regarding win-win outcomes. SMEs in both Japan and the UK saw environmental management as costly and therefore mostly a 'win-lose'; they also remained less than convinced that customers could be won or a competitive advantage gained by investing in environmental improvements. The financial returns on environmental investments were often considered to be too slow or too small to justify the initial outlay, particularly when firms were struggling to survive in a highly competitive marketplace. In some cases, even the paybacks from apparently simple measures such as recycling were not felt to be worth the time and resources required to pursue them. Where environmental reform was being undertaken, measures rarely moved beyond the so called 'low hanging fruit' of efficiency gains to 'darker green' technical, managerial or organisational innovations, as these innovations were felt to be beyond the means of most small firms. This confirms the experiences of environmental support programmes and demonstration projects, which have typically found that SMEs willing to pick the 'low hanging fruit' do not automatically go on to make larger and more long-term environmental changes, thus limiting the scope for win-win outcomes (Tilley et al., 2003).

Nevertheless, in study 3 UK owner-managers seemed to be more optimistic about the business case for sustainability. As mentioned in theme 1 (section 3.3), this emerging positivity may be due to heightened public concern about the environment in the UK, which is motivating firms to perceive increased market benefits from 'going green'. Nevertheless, the majority of respondents did not have the strategic awareness or resources to sell themselves on their environmental credentials and therefore opportunities to establish a green competitive

⁸ See criticisms of the 'circular economy' by ecological economists in Revell (forthcoming)

advantage were being missed. Moreover, there was still concern about the potential costs of environmental measures and some owner-managers were sceptical as to whether being environmentally-friendly could really translate into increased profits. This suggests that SMEs tend to perceive win-win opportunities to be limited; for instance, three-quarters of respondents cited the potential for cost savings as a driver of environmental reform, yet nearly two-thirds also cited increased costs as a barrier to further improvements. SMEs may thus only see certain environmental measures as cost efficient (the 'low hanging fruit'), while environmental action beyond this (the 'high hanging fruit') is viewed as a cost burden and therefore resisted.

Previous research has found that SMEs see reduced risk of prosecution and improved customer relations as the most beneficial outcomes of environmental management (Environment Agency, 2005). Interestingly though, studies have also found that owner-managers are often against any link between environmental action and increased sales (McKiever and Gadenne, 2005; Drake et al., 2004; Observatory of European SMEs, 2002). This suggests that while SMEs may recognise how environmental measures might result in business benefits such as strengthened customer loyalty and goodwill, many are still dubious as to whether rising levels of concern will actually translate into sustained transformations in consumer buying behaviour. The environmental 'value-action' gap clearly does not just apply to SMEs but to society at large.

Win-win opportunities will clearly be much more obvious to business owners if there is a significant growth in customer demand for environmental improvements. Again, tying in with theme 1, my own and other research highlights a lack of green consumerism as one of the key reasons why small firms have been so slow to ecologically modernise (Revell and Blackburn, 2007; Revell, 2007, 2003a, 2003b, 2002; Struder et al, forthcoming; Drake et al. 2004; Hillary, 2003; Schaper, 2002; Verheul, 1999; Bianchi and Noci, 1999). An important recommendation outlined in my work is that both EM scholars and policymakers need to focus on how to encourage the ecological modernisation of consumption as well as production if they are to achieve environmental goals.

3.3.6 The ecological modernisation of consumption

An important criticism of EM as a policy strategy is that it tends to adopt a supply-sided rather than demand-sided approach, preferring to concentrate on transforming production processes rather than consumer attitudes and behaviour (Barry, 2003). EM protagonists thus have a tendency to emphasize 'eco-efficiency' as the panacea for environmental problems, despite the fact that in most countries efficiency gains can – and have been – cancelled out by subsequent

increases in consumption levels (see Revell, 2007b; Barrett, 2005; Mol, 2001; Levett, 2001).

For this reason, critics argue that EM theory should extend its focus from efficiency to 'sufficiency'⁹ in Northern industrialized countries, and to distributional equity in the developing economies of the South (see Revell, 2007b). This links ecological modernisation with the discourse of sustainable development, of which equity is a central principle. Ecological modernisation and sustainable development have often been used interchangeably within the business and environment literature because both have environmental protection and efficiency as core principles. However, an important distinction between the two concepts is that ecological modernisation pays scant attention to issues of social justice and inter/intra-generational equity (Langhelle, 2000).

This issue is discussed in both Revell, (2007a) and Revell (2007b), in which some of the key weaknesses of EM theory are described. One criticism is that EM theorists tend to lack a global perspective, ignoring the considerable ecological footprints of 'ecologically modernised' countries beyond their national boundaries, and skirting challenging issues such as the inequitable distribution of resources between developed and developing countries. Clearly, concerns such as the 'exporting' of pollution from industrialized countries to developing nations with lower environmental controls, and the 'race to the bottom' of international standards resulting from globalisation do not sit easily with EM's central assertion that economic growth and environmental protection are a positive-sum game. EM theorists are thus criticized for circumnavigating important debates regarding the unsustainability of economic growth on a global scale¹⁰.

A second (and related) flaw is that EM theory lacks an adequate analysis of the problem of 'over-consumption' in industrialized countries and how it contributes to global environmental and social problems. Concepts such as 'environmental space'¹¹ are particularly challenging from an EM perspective, which is again linked to its under-theorised notion of power and social justice.

EM's avoidance of 'radical green' discourses on equity, consumption and environmental justice may be precisely why it has become such a prominent theory in mainstream political circles

⁹ Sufficiency refers to the idea of making do with less, living on needs rather than unnecessary wants and thus limiting extravagant lifestyles and consumption patterns

¹⁰ Although see Mol, (2001)

¹¹ Environmental Space' refers to Friends of the Earth's notion of the equal distribution of resource consumption between countries on a per capita basis. Under this framework the current generation would only use a sustainable amount of environmental resources and access to these limited resources would be on a fair basis between countries. This means that economically developed countries must substantially decrease consumption, allowing developing countries to increase theirs.

throughout the industrialized world. Nevertheless, the fact that around the globe efficiency gains are being eclipsed by continuing rises in consumption has encouraged greater policy attention on these issues, and 'sustainable consumption and production' (SCP) is now being integrated into various policy discourses on the environment. For instance, SCP was one of the core goals of the World Summit on Sustainable Development in 2005, and a 10-year framework of programmes on SCP is now being developed by the United Nations. Developed countries are expected to take the lead in establishing national and regional initiatives supporting SCP, and the UK, Japan and Europe have all committed to SCP as a priority policy area.

Reflecting this new policy emphasis, sustainable consumption is an emerging area of research within the ecological modernisation literature, and recent work by Cohen and Murphy (2001), Spargaaren (2003; 2001; 2000), and Spaargaren and van Vliet (2000) has helped to widen the focus of EM scholars. Nevertheless, a great deal more research is needed in this area if EM theory is to continue to be a source of insight for environmental policy debates in the future. The bulk of the EM literature still frames the environment as a challenge for industry, yet as my research has indicated through many of the responses of SME owners, it is just as important to encourage a change in culture amongst consumers as it is amongst companies.

3.4. Theme 3: Policy Directions

One of the key conclusions of my research is that SMEs have been slow to ecologically modernise due to a lack of market signals, which has led to doubt regarding the business case for sustainability among some small firm owner-managers. Because businesses tend to respond to market opportunity rather than social need, it is arguably the government's role to intervene in the market economy to address market failures and ensure that commercial advantage and public interest meet. In this way, government policy can ensure that market opportunity also fulfils the social good.

3.4.1 Market-based instruments

As highlighted in theme 2 on ecological modernisation, one way to do this is via market-based instruments. MBIs such as tradable permits ensure that the costs of environmental protection are distributed more efficiently, thus diminishing the inequalities felt by 'winners' and 'losers' of environmental policies. Government subsidies can help to make clean technologies and environmental management systems more affordable for small firms. Environmental taxes can encourage SMEs to be more efficient, to invest in new technologies and to innovate to reduce their environmental impacts. Taxes also have the advantage of being easily disseminated to

SMEs, thus limiting implementation and enforcement costs. Policymakers in the UK have increasingly used fiscal incentives to achieve environmental goals (see Revell, 2005). However, a key criticism outlined in Revell and Blackburn (2007), Revell et al. (2007) and Revell (2007a) is that prices have not always been set high enough to incentivise a behaviour change, and many SME owner-managers have thus preferred to pay the tax rather than create long-lasting changes in their business practices.

3.4.2 Regulations

Another important theme of all three studies is the powerful role that regulation can play in encouraging the greening of SMEs. The advantage of a strong regulatory approach is that it provides SMEs with clarity regarding their environmental impacts and obligations, and also gives owner-managers the certainty of a level playing field. Regulations are especially needed in the many areas where price signals alone have been too muted to have an effect on behaviour (Stern, 2006). However, legislation can only be truly effective if it is carefully implemented and properly enforced. Tying in with theme 2, the EM literature highlights that regulatory strategies are most successful when they are constructed in such a way as to encourage innovative pollution prevention approaches rather than reactive, 'end of pipe' measures (Murphy, 2001). Where regulators focus on strict compliance with specific environmental standards, the tendency is for firms to aim for compliance and no more. Conversely, where laws contain a measure of flexibility, businesses are encouraged to engage in compliance-plus reforms, and to invest in more innovative, on-going improvements rather than 'one-off' activities (Schaper, 2002).

Attempting to enforce legislation among the huge numbers of SMEs is a major challenge for regulators, and is one of the key reasons why in many countries environmental policies have tended to target large rather than small firms. As SMEs are so numerous, government enforcement agencies have very limited capacity to inspect them all. Nevertheless, the credible threat of inspection (or at least the *perception* of a credible threat) may be all that it takes to motivate recalcitrant owner-managers to comply with regulations. Occasional prosecutions accompanied by broad publicity, on-the-spot fines, field notices and industry blitzes can successfully maintain the impression of enforcement (see Gunningham and Sinclair, 2002).

Arguably, the Dutch model of environmental regulation is the most sophisticated currently available (Gunningham and Sinclair, 2002). In both Revell (2003a) and Revell and Rutherford (2003), the Netherlands is highlighted as an exemplar of the effectiveness of a policy approach that specifically targets the SME sector with a strict legislative and inspection system. Japan is now increasingly extending regulatory controls to SMEs, while the UK still lags behind in this

respect.

3.4.3 Capacity building

Another important area in which policymakers can support the greening of the SME sector is through capacity building. In my research I argue that governments can help SMEs to respond more proactively to environmental issues by developing the local infrastructure (for instance, by improving public transport systems and local recycling facilities). Information and advice programmes can also help to remove some of the internal barriers to environmental management experienced by SMEs. However, empirical studies have found that owner-managers are not very good at reaching out to government support programmes, and as a result a number of countries have experienced poor take-up rates for environmental best practice initiatives - even when clear cost savings and generous government grants have been offered¹² (Verheul, 2003, Merritt, 1998). Policymakers have therefore found it extremely challenging to educate a vast and heterogeneous sector of the economy about the business case for sustainability.

An important conclusion of my research is that a policy approach which relies too heavily on voluntarism and self-regulation is unlikely to succeed because of the many internal and external barriers to environmental management experienced by SME owners. A key recommendation is that voluntary capacity building initiatives work best as part of a policy mix which includes more interventionist strategies such as regulations and MBIs, as these provide the requisite 'push' and 'pull' factors that help to close the SME 'value-action' gap.

3.4.4 The right policy mix

As all policy instruments have both strengths and weaknesses, it is often a combination of policies that has the most success. Gunningham and Sinclair (2002) suggest that in some contexts a sequenced approach, which escalates from cooperative to more interventionist approaches, is the best way to encourage environmental reforms. Education initiatives are clearly needed from the outset to ensure that SMEs have the expertise and capacity to carry out environmental improvements. However, where these fail to encourage wide-scale reforms (as

¹² For instance, in the UK the Small Company Environmental and Energy management Assistance Scheme (SCEEMAS), provided a 50% subsidy for the costs of consultancy fees regarding the implementation of environmental management systems, but attracted only 136 participants (ECOTEC, 2000).

they have in the UK), there is justification for the introduction of policies such as economic incentives and sanctions (accompanied by continued funding for education initiatives to ensure that SMEs can respond to such policies). In other situations, a mix of instruments used concurrently may be the most effective method. Studies suggest that firms in different sectors and contexts are likely to respond differently to the same incentives. The right combination of policies is thus most likely to be found if the varying circumstances of SMEs are recognized, as with the 'target group' approach used in the Netherlands (see Revell, 2003a).

3.4.5 Governance structures

Another focus of my research has been the web of stakeholder relations that SMEs interact with, and the potential influence of these networks on the environmental practices of owner-managers. A central conclusion is that policymakers have an important role to play in changing the structure of social networks surrounding small firms to ensure that they are more conducive to environmental action. In Revell and Rutherford (2003), Revell (2003a) and Revell et. al. (2007), industry bodies and business associations are highlighted for the key role they can play in helping SMEs to become more environmentally proactive. A network approach can also help to build a more participatory institutional framework, as stakeholders are encouraged to collaborate and strengthen relationships with each other to reduce environmental impacts. A key recommendation of my research is that policymakers in the UK and Japan should broaden their focus from internal barriers to external relationships influencing small firms, as these networks can be a major obstacle to environmental reform. Again, the Netherlands provides a good example of what can be achieved from a stakeholder approach, as a wide range of interest groups have formed partnerships to support each other in achieving environmental goals (Revell, 2003a; Revell and Rutherford, 2003).

Moreover, if policymakers are to succeed in engaging owner-managers with environmental initiatives, they also need to encourage a more participatory relationship between government bodies and the SME sector. A key assertion of this submission is that environmental policymakers – particularly in Japan - have not established adequate 'two-way' channels of communication with small firms, and therefore owner-managers have had little incentive to respond to or engage with environmental policy initiatives. A case is thus made for greater enfranchisement of SMEs in environmental policy networks and processes of negotiated decision-making. The success of Dutch environmental policy attests to the efficacy of a participative approach to environmental governance (Revell and Rutherford, 2005; Revell, 2003a).

4. Conclusions

My research has explored the environmental attitudes and behaviour of SMEs and the influence of environmental policy on this important sector of the economy. I have highlighted the considerable barriers to environmental management experienced by owner-managers and what can be done to remove them, as well as the potentially motivating factors and policies that can encourage the greening of small firms. In my work I have used EM theory as a framework for analyzing these barriers and drivers, and to explore current and future policy directions related to SMEs.

The findings of this submission can be condensed into 4 central conclusions:

4.1. Structural factors are creating major obstacles to the greening of SMEs

The pervasive internal and external barriers to environmental management experienced by SMEs have meant that owner-managers are prone to demonstrating reactive rather than proactive environmental behaviour. Policymakers and researchers in the field have tended to focus mainly on internal barriers at the firm level, hence solutions have been focused on the kind of training and support that can be given to owner-managers to encourage environmental improvements. Nevertheless, structural factors are also creating serious obstacles, and policymakers need to give more thought to how these may be addressed. As well as correcting market failures, attention needs to be given to the external relationships influencing SMEs, and the kind of institutional innovations that can help to foster higher levels of environmental protection.

4.2. The business case for sustainability can only take us so far

The business case for sustainability clearly has an important role to play in encouraging owner-managers to pick the 'low hanging fruit' of efficiency gains; however, win-win arguments appear to be less effective in persuading them to pick the 'high hanging fruit'. Even in the UK, where increased attention on environmental issues in the public domain may be creating conditions more conducive to win-win outcomes, owner-managers are still concerned about the cost of reforms beyond a certain threshold. Perhaps for these reasons, research suggests that environmental concern rather than financial returns may be a more significant driver of environmental action amongst small firm owner-managers.

4.3. Government must set the imperative for environmental reform more strongly

Clearly, government intervention is required to ensure that environmental action becomes a business imperative rather than an optional extra when owner-managers find the time. Policymakers thus need to set the imperative for environmental reform very clearly (via a mix of regulatory and market-based approaches), as well as building the capacity of SMEs to respond to those imperatives (via education programmes, infrastructure developments, stakeholder partnerships and more participative governance structures). The Netherlands is a good exemplar of what can be achieved when the right mix of cooperative and interventionist approaches are targeted at the SME sector.

4.4. EM theory needs developing

My research suggests that EM theorists need to focus greater attention on the role of SMEs in processes of ecological modernisation, and to encompass a more nuanced conception of motivating factors for owner-managers beyond simplistic models of supply chain greening. This involves a consideration of how EM prescriptions might be recast to fit the SME context in a more relevant way; for instance by tailoring policies to take into account the heterogeneity of SMEs, using a mix of interventionist and voluntary strategies, and introducing a target group approach to encourage environmental reforms among small firms.

However, at a deeper level EM theory needs developing in a much more fundamental way with regards to the role of SMEs in sustainable development. The emphasis of the theory has predominantly focused on ways of managing and minimizing environmental impacts – yet what is missing is an integration of social, environmental and economic aims under the one sustainability objective. EM's polarised view on the goals of sustainable development (confining itself predominantly to efficiency and environmental protection while ignoring equity and social justice) is a fundamental weakness of the theory - albeit one which EM scholars are beginning to try to grapple with.

4.4.1 EM theory and sustainable development

In Huber's (2000) paper entitled 'Towards Industrial Ecology: Sustainable Development as a concept of Ecological Modernisation', the founder of EM theory attempts to engage with the sustainable development agenda by expanding EM's focus from environmental efficiency to include notions of 'sufficiency' and 'consistency'. Acknowledging the need to integrate efficiency with contested concepts such as sufficiency ensures that EM debates embrace the social

dimension of sustainability, as sufficiency implies a consideration of inter- and intra-generational equity issues (for instance, reducing consumption in developed countries to make way for economic and population growth in developing ones, and limiting consumption so that resources are not depleted for future generations).

As this submission highlights, there is much empirical evidence to suggest that efficiency without sufficiency is counter-productive (see Wackernagel, 2002; Worldwide Fund for Nature, 2002). While EM protagonists emphasize the environmental 'Kuznets' curve¹³ as evidence that environmental degradation can be decoupled from economic growth, in reality the environmental 'N' curve has been found to be much more prevalent, even in ostensibly ecologically modernised countries such as Japan and the Netherlands (see Barrett, 2005; Mol, 2001). The environmental 'N' curve shows that as economic growth continues to increase, any environmental improvements are neutralized by rising consumption rates, leading to a renewed growth in absolute levels of pollution and waste. Efficiency without sufficiency thus creates the illusion of short-term relative improvements when in reality the environment continues to be degraded - albeit at a lesser rate. Marxist authors such as Schnaiberg et. al. (2002) argue that the dangers of such an approach is that it lets capitalism off the hook, ensuring the continued domination and destruction of the environment by ensuring that capitalism is less in need of a green critique.

Despite these limitations, industry continues to focus on efficiency as the answer to environmental problems (although as my research highlights, this focus is much weaker among smaller firms). Due to the vested interest of those with a stake in old development paths, the emphasis in most business agendas is to improve existing production processes, rather than changing to new processes and products which might alter current development trajectories.

Policymakers following a path of ecological modernisation have tended to compound the situation by putting efficiency at the heart of their environmental policies while ignoring the role of consumption in causing environmental problems. As my research highlights, there is a clear need for EM proponents to move beyond this impasse by engaging with debates on sustainable consumption, and to integrate supply and demand-sided policy prescriptions so that industrial efficiency gains are not negated by the 'rebound effect'.

¹³ The environmental kuznets curve is a U-shaped curve which demonstrates that while pollution initially increases with rising income levels, it then declines once a country becomes rich enough to clean up the environmental fall out of economic growth

4.4.2 Encouraging sustainable consumption

Policy approaches supporting sustainable consumption have tended to focus narrowly on pricing (in the form of environmental taxes) and information (in the form of eco-labels) to encourage consumers to make greener choices when purchasing goods and services. However, as highlighted in Revell (2007a), taxation and eco-labelling strategies do not engage with the identity and communicative dimensions of consumption; consumer choice often reflects self-image and the social messages that people want to communicate about themselves to others. Raising the price of a product may thus increase its perceived exclusivity in the eyes of its target market, ensuring that it becomes more - not less - desirable. Similarly, providing information on a product's environmental impact does not automatically ensure that people will switch to more environmentally benign alternatives. Encouraging consumption choices that are more environmentally and socially responsible requires a policy approach that acknowledges the relational and psychological aspects of consumption, (such as its role in establishing identities, reinforcing self-concepts and conveying status or group membership), and which attempts to encourage a change in societal values. Stimulating public debate regarding sustainable lifestyles and notions like 'sufficiency' and 'voluntary simplicity' will clearly play an important role in achieving such a value change; other (more contested) policy proposals include regulating advertising and the media, sponsoring public messages about the environmental and social side-effects of products, and influencing the marketing and branding of goods by making ethical issues more salient (see Cohen and Murphy, 2001).

As SMEs are consumers too, policies need to move beyond a narrow focus on supply-sided product and process innovations by targeting owner-managers with strategies to encourage more sustainable patterns of consumption within business. As such, demand-sided policies can be equally as applicable to industry as they are to consumers. Government can also play an important role in encouraging responsible business behaviour and sustainable entrepreneurship by funding and endorsing new producer-consumer networks, such as organics, fair trade and sweat-shop free labels. These new institutional forms could be encouraged to take on the challenge of linking efficiency with sufficiency, and thus lead the way in replacing conventional business imperatives and relationships with more sustainable ones.

However, as Young and Tilley (2006) highlight, a key question is the degree to which SMEs should accept responsibility for every related impact on the environment or society. For instance, should a company selling fair-traded, organic coffee also be concerned with the health-related impacts of coffee consumption and take responsibility for limiting coffee usage within society? While it is difficult to imagine a coffee company directly advocating a decrease in coffee

consumption, it is conceivable that the same firm might form an alliance with a health-related citizens group or NGO recommending a weekly intake of caffeine that is in line with a healthy, well-balanced diet. The coffee firm thus fulfills a desire for coffee amongst consumers, but is also instrumental in promoting information and debate on sustainable, healthy (and 'sufficient') lifestyles. Along with government, NGOs thus have an important role to play in promoting institutional innovation by helping firms to link profits with public interest, and to grapple with challenging concepts such as sufficiency, where the connection with commercial advantage is typically less than clear.

4.4.3 The role of 'consistency'

According to Huber, encouraging sufficiency as well as efficiency is still not enough to ensure sustainability, as no matter how frugal or efficient, a large population will continue to have a significant impact on the environment. Sufficiency is still conservation, therefore we also need 'consistency' of industrial metabolism with natural metabolism. Huber's notion of 'consistency' is similar to McDonagh and Braungart's (1998) concept of 'eco-effectiveness', which refers to the goal of improving and regenerating the environment, rather than merely reducing impacts. 'Consistency' involves radical innovation of production methods and technology to maintain and improve ecosystems, thus ensuring that business solutions are life sustaining, restorative and regenerative in addition to being efficient. An example of an 'eco-effective' or 'consistent' business solution would be the introduction of new farming processes that sustain and enrich the land and soil.

In order to harmonise natural and industrial metabolisms, 'consistency' requires a systems approach (similar to industrial ecology), where production mimics the cyclical processes of nature by ensuring that all outputs become inputs for something else. An example of this would be using waste heat from one process to run another process that requires a lower temperature. This kind of circularity requires radical technological, organizational and managerial change within industry and society, which has implications for SMEs.

Radical innovations involve discontinuous change and replacement (step changes), which can create space for further incremental improvements that are compatible with existing processes. However, the inherent conservatism of business means that owner-managers tend to be more preoccupied with incremental environmental change. The preference for doing things the way they have always been done before therefore makes radical change difficult to implement. Government clearly has an important role to play in establishing the imperative and building the capacity for radical change in line with concepts of 'consistency'. This can be done by

subsidizing and pump-priming new markets and technologies, funding research and development programmes, introducing emissions caps and levies, providing start-up capital for green businesses and supporting sustainable producer-consumer networks.

It is also important to recognize the role of 'governance' as well as government in promoting radical change amongst SMEs. In recent years the political science literature has increasingly emphasized the need to move beyond the notion of government as an agent capable of developing and implementing policy in a relatively autonomous way (see Mette Kjær, 2004). The concept of 'governance' is more nebulous than 'government', as it refers to the links between policymakers and other actors in society and the need for collaboration among these actors to address the kinds of broad, horizontal challenges associated with sustainability. As such, public participation, stakeholder relationships, and concepts such as the 'network society' (see Messner, 1997) are increasingly relevant when discussing notions of consistency. The radical, systemic change needed to achieve harmonization of industrial and natural metabolisms will clearly depend upon the kind of partnerships, cooperation and consensus that can be achieved between actors and institutions at the local, regional, national and global level. This links back to the importance of focusing on institutional arrangements and the external relationships of SMEs in encouraging sustainable entrepreneurship and the greening of business. Changing the context in which firms operate will thus play an essential role in encouraging radical innovation in line with consistency. This could involve, for instance, new infrastructure developments, legislation for green standards amongst credit institutions, and the reform institutional investors such as pension funds, insurance companies and banks (see Murphy, 2001).

4.4.4 Are consistency and sufficiency compatible with EM as a policy strategy?

Huber (2000:283) concludes that:

"The best overall strategy will be the one that places priority on long-term consistency and utilizes mid-term efficiency as much as possible, while fully acknowledging that certain limitations, thus sufficiency, will always apply"

However, a key question is whether or not EM policy prescriptions can be reconciled with such concepts. Consistency clearly has resonance with EM's emphasis on technological innovation and its links with industrial ecology approaches. However, sufficiency is a much more challenging concept from an EM perspective as it requires acknowledging the idea of 'limits to growth'.

Arguably, in the current global economic and political climate, implementing aggressive demand-sided policy proposals - especially those that might endanger short term economic growth mechanisms - are difficult to envision. A major barrier is that sufficiency requires changing *levels* as well as patterns of consumption. This is highly challenging for policymakers, not only because it negates the notion of consumer sovereignty and civil liberties, but because reducing levels of consumption clearly also entails decreasing Gross Domestic Product (GDP). A central pillar of ecological modernisation (and a key reason for why it is so politically appealing) is the idea that the economy can continue to grow as long as its environmental impact is reduced; changing patterns of consumption away from environmental 'bads' towards environmental 'goods' - rather than reducing consumption per se - has thus been the focus. Consequently, according to Dryzek (1997:144), the *"limits [to growth] are not so much explicitly denied as ignored"* by EM proponents.

However, if one accepts the unsustainability of current rates of economic growth on a global scale, then in order to avoid breaching ecological limits policymakers and EM protagonists must also accept that at some point developed countries are going to have to significantly reduce their consumption in order to allow developing countries to increase theirs.

Hubers' conclusions imply that EM theory can be expanded to embrace such ideas. Extrapolating from his analysis, sufficiency is clearly required in the face of current population growth and inequities between North and South. Nevertheless, 'consistency' suggests that in the long term such policies of self-limitation could conceivably be eased as natural capital is enhanced and regenerated, thus helping to decrease inter- and intra-generational inequities over time. Consistency could thus ensure that the limits to growth were sufficiently removed as to be no real threat to economic development - as long as such development was 'consistent' with nature's metabolism and thus involved qualitative improvements in natural (as well as human) capital, rather than quantitative increases in material throughput (see Daly, 1987). Huber (2000:282) confirms that:

"...there still are limits to growth, and a strategy of consistency should not lead one to expect a boundless land of milk and honey...The point is to avoid setting arbitrary, and hence probably both tyrannical and incorrect ecological limits, but let them instead emerge from a process of innovation and development that takes full advantage of modern society's creative and productive capacities."

4.4.5 Weak versus strong EM

Engaging with issues of scale and equity clearly requires a major shift in the focus of EM theorists away from a weak expression of sustainability to a strong sustainability perspective (see Revell, 2007a). This is suggestive of Christoff's (1996) weak–strong continuum of ecological modernisation, where weak EM is based on the premise of continued economic growth without disruption to the liberal capitalist political economy, while strong EM involves far-reaching, radical social change and a recognition of alternative development paths. According to Christoff, strong EM fundamentally questions the trajectory of industrial modernity, particularly its focus on evolutionary technological adaptation and environmental efficiency (see Revell, 2005).

Authors such as Dryzek et. al (2002), and Hay (2002), add that strong EM takes an international perspective, recognizing the need to address social justice issues at the global level, and factoring in the environmental impacts of countries beyond their national boundaries (and associated issues such as the exporting of pollution to developing nations). Strong EM thus seeks to move beyond narrowly technocratic and economistic policy solutions focused on piecemeal changes to production and consumption by addressing structural impediments to radical change. Strong EM emphasizes the precautionary principle and ecological preservation (as opposed to mere conservation), and involves a deeply embedded and ecologically self-conscious form of cultural transformation which opposes a purely instrumental view of nature as an exploitable resource. This ecological consciousness is predicated on a resurgence of environmental activism which seeks to recapture the environmental movement's critique of industrial society – but without giving up weak EM strategies in the process (such as its focus on technological change and economic instruments). Strong EM thus requires a critical and reflexive public outside the state, engaged in a political struggle against current forms of economic organization.

Both Christoff and Hubers' recasting of EM towards a much more radical interpretation which recognizes the centrality of equity and scale in addressing environmental problems ensures that the theory can still have currency and gravitas in debates on sustainable development. Nevertheless, this recasting arguably involves such a major adaptation of EM's core prescriptions that it starts to resemble a different approach altogether – one that is much closer to the tenets of the radical school of 'ecological economics'.

4.4.6 Ecological Economics vs EM

As highlighted in Revell (forthcoming), ecological economics attempts to integrate economics and the natural sciences around the three goals of sustainable scale, social sustainability (including equitable distribution of wealth and rights) and allocative efficiency in the presence of pervasive market failures (Costanza, 2003). Ecological economics represents a strong sustainability approach and thus has issues of environmental integrity, scale and equity at its heart. Moreover, it is sympathetic to the idea of sufficiency, highlighting that beyond modest levels, increased per-capita consumption (or GDP) does not necessarily lead to improvements in the quality of life, and can in fact have harmful effects on the environment and social wellbeing. Ironically, developing EM theory arguably suggests a reconciliation with these ideas, despite the fact that ecological economics is still very much on the fringes of academic enquiry and thus enjoys far less legitimacy in the eyes of policymakers and academic scholars.

Nevertheless, there is debatably still some practical merit in couching policy recommendations using conventional EM analysis - in fact, one could argue that if policy recommendations are to be taken seriously by today's politicians they are best put forward using their favoured policy discourse. Yet the value of EM as a political programme will remain limited while most interpretations of ecological modernisation tend towards the weak end of Christoff's weak-strong continuum, as these perspectives fail to break free from the shackles of neo-classical economics and the overriding imperative of accumulation and economic growth. Until EM proponents take a more global orientation, explicitly recognizing the limits to growth and the centrality of equity (and related concepts such as sufficiency) in achieving environmental goals, other more radical schools of thought such as ecological economics may ultimately hold more promising answers to the environmental problematique.

4.5. Future SME research

Future research on ways of reducing the environmental impacts of SMEs might therefore be more usefully explored using ideas borrowed from an ecological economics framework. This would involve a much greater emphasis on:

- the limits of eco-efficiency and the 'circular economy' (see Jacobs, 1997), and the need for business to embrace challenging concepts such as sufficiency as well as global (and localised) limitations of scale
- the interdependence of production and consumption as 'coevolutionary' processes, (and the need for an integrated policy approach which reflect both demand and supply-sided solutions)

- operationalising a more precautionary approach to environmental management (including the safeguarding of 'critical natural capital' via 'safe minimum standards')
- social issues (including the link between economic, ecological and social equity, 'strong democracy' and the role of social capital in fostering ethical behaviour amongst SMEs)

5. Contribution to Knowledge

The SME & Responsible Behaviour literature

SMEs & Sustainable Development Policy

- ▶ best-case scenarios (Joseph, 2000; Castka et al 2004)
- ▶ DTI: Sustainable Development Strategy (2000)
- ▶ Environmental best practice programmes (eg Action Energy, Envirowise)
- ▶ Institute of Public Policy research (social inclusion, social responsibility)

SMEs & Business Ethics

- ▶ emerging literature eg Tilley (1999; 2000), Spence & Rutherford, 2003; Spence et al. (2003), Spence & Moore (2006), Carr, (2003), Janjuha-Jivraj (2003), Graafland et.al (2003)
- ▶ shallow vs deep ecology
- ▶ social capital
- ▶ sustainable entrepreneurship
- ▶ moral philosophy, historical + sociological perspectives

SMEs & Social Responsibility

- ▶ e.g Ram (1999); Spence et al. (2003)
- ▶ employment
- ▶ social capital
- ▶ stakeholder relations
- ▶ local community involvement
- ▶ customers
- ▶ supply chain

Corporate Social Responsibility literature

- ▶ 3 pillars of sustainable development (WCED, 1987)
- ▶ triple bottom line (Elkington, 1997)
- ▶ eco-efficiency, business case (Schmidheiny 1992, Porter & Van der Linde, 95)
- ▶ eco-effectiveness (McDonagh + Braungart; '98)
- ▶ 6 pillars of CSR: socio/eco-efficiency, effectiveness, ecological equity, sufficiency (Dyllick & Hockerts, 2002)
- ▶ Social issues (quality of life, social justice) (Thin, 2002)
- ▶ DTI (2002) 'Business and Society: CSR report' (engaging SMEs in CSR a key goal)

SMEs & CSR Literature

- ▶ (Goss 1991; Jenkins, 2004, Spence et al 2000, Young & Tilley, 2004)
- ▶ Inapplicability of CSR concepts to SMEs
- ▶ SME engagement in ethical activity (but not codified as CSR)
- ▶ barriers and drivers of CSR
- ▶ Lack of SME communication of CSR activities

Environmental Management Literature

- ▶ business case, win-win (Porter & van der Linde, 1995)
- ▶ ecological modernisation (Huber, 1995; Mol, 1995; Mol & Sonnenfeld, 2000)
- ▶ clean technology (Jackson, 1993; Kemp, 1993)
- ▶ eco-efficiency (Schmidheiny, 1992, WBCSD),
- ▶ industrial ecology (Frosch + Gallopoulos, '89; Graedel, 1994)
- ▶ Natural capital (Hawken et al, 1999)
- ▶ Life cycle analysis (Remmen, 2001)

SMEs & Environmental Management

Key authors

- ▶ Hillary, Petts, Bayliss; Schaper; Hutchinson + Chaston, Gerstenfeld + Roberts, Tilley, Spence & Rutherford, de Bruijn + Lulofs, Bianchi + Noci, Gouldson & Murphy; Welford & Gouldson)

Key topics

- ▶ EMS (Hillary, 2000; Starkey and Welford, 2001)
- ▶ barriers and drivers (Hillary, 2000)
- ▶ business case (Tilley, et.al 2003; Simpson et al, 2004)
- ▶ environmental training and support (Richard 2000)
- ▶ environmental innovation (Gouldson + Murphy, 1998)
- ▶ supply chain (Drake et al, 2004; Powell, 2000), networks (Hunt 2000), stakeholder cooperation (de Bruijn + Lulofs 2000; Spence et. al; 2000)

Sustainable Entrepreneurship

- ▶ Bennet (1991), Schaper (2002), Walley & Taylor (2002)
- ▶ social entrepreneurship
- ▶ ecopreneurship
- ▶ typology
- ▶ barriers + drivers
- ▶ policies
- ▶ green marketing

My research

- internal/external barriers & drivers
- business case
- environmental policy
- EM theory

Addressing Gaps:

- Macro level
- Theoretical analysis
- Comparative studies
- Business case analysis
- Methodology

Knowledge Gaps in SME & Responsible Behaviour literature (Spence & Moore, 2006)

- ▶ Global/transnational level
- ▶ Macro level
- ▶ Theoretical analysis
- ▶ Comparative studies
- ▶ Business case analysis
- ▶ Methodology
- ▶ SMEs & business ethics
- ▶ SMEs & social responsibility
- ▶ SMEs in developing countries
- ▶ Tools for responsible business practice
- ▶ Impacts of different organizational forms eg family run/sole traders

The EM Literature

My research

- EM theory and SMEs
- EM policy
- Japan + UK

Addressing Gaps:

- EM & SMEs
- EM of consumption

1980s:

- Technocentric EM**
 - (Huber, (1982;1984;1985)
- Macroeconomic restructuring: the gratis effect**
 - (Janicke, 1990, Simonis, 1989)

1990s

- EM + Political Modernisation**
 - Weale: new politics of pollution (1992)
 - Gouldson & Murphy (1996)
 - Boehmer-Christiansen & Weidner (1995)
 - Mol (1995, 1997)
- Cultural politics and discourse**
 - Hajer: politics of environmental discourse (1995)
 - Dryzek: politics of the earth (1997)
- Reflexive modernisation**
 - Mol (1995, 1996)
 - Spaargaren (1997)

2000: Emerging literature:

- Ecological modernisation around the world**
 - Mol and Sonnenfeld (2000)
- Sustainable consumption**
 - Spargaaren (2003; 2001; 2000)
 - Spargaaren and van Vliet (2000)
- EM and Sustainable Development**
 - Huber (2000), Langhelle (2000)
- EM and globalisation: Mol (2001)**

EM Knowledge Gaps

- EM & SMEs
- EM of Consumption
- EM and sustainable development
 - social equity
 - futurity
 - sufficiency
 - scale of global economy
- EM in developing countries

5.1 Explanation of literature maps

The map of the SME and responsible behaviour literature (p31) shows a 'literature circle', within which environmental management (including my chosen area of 'SMEs and environmental management') is one branch of the body of work on corporate social responsibility. Other research on SMEs and responsible behaviour (relating to, for instance, business ethics, sustainable entrepreneurship, social responsibility and sustainable development policy) overlap and link with this literature.

Much of the research on environmental management explores the activities of large corporations, while the environmental practices of small firms is still a fairly nascent area of inquiry. My research has thus contributed to this literature by engaging with key topics within the SME and environmental management field. I have made a particularly timely contribution with respect to the greening of SMEs in Japan, as at the time of researching study 1 there was a distinct lack of internationally accessible studies on Japanese SMEs and their environmental practices.

Outside the literature circle is a box summarizing the key knowledge gaps within the SME and responsible behaviour literature, identified by Moore and Spence (2006). The studies in this submission address four of the ten topics that are highlighted as requiring further research:

5.2 Macro perspective

Firstly, my research takes a macro perspective, exploring the influence of national policy contexts, institutional arrangements and stakeholder networks on the environmental attitudes and behaviour of SMEs. This is in contrast to the many studies which have examined the environmental management practices of SMEs at a micro (or firm) level, focusing on issues such as the influence of company culture and organization on environmental activity, and the perceptual barriers to environmental reform exhibited by owner-managers.

A central argument of my research is that in order to affect radical rather than piecemeal changes, the external (macro) as well as internal (micro) barriers that come to bear on the environmental attitudes and behaviour of owner-managers must be addressed. For instance, the policy recommendations outlined in Revell and Rutherford (2003), Revell (2003a) and Revell (2003b) argue for a more participatory policy context in both Japan and the UK to ensure that SMEs are more actively involved in environmental policy networks and decision-making processes. Few authors have discussed the environmental practices of SMEs from a broader context of national policy networks and discourses, and even fewer have explicitly made the link

between owner-managers' resistance to environmental action at a micro-level and institutional disenfranchisement at the macro-level.

5.3 Theoretical analysis

The literature on SMEs and responsible behaviour has tended to lack a theoretical focus, and authors such as Moore and Spence (2006) and Tilley (2000) are critical of the way in which researchers have relied heavily on anecdotal evidence to substantiate their work. As an example of the lack of theoretical development in the field, few studies have used EM theory as an analytical framework, despite its importance as a basis for environmental policymaking in industrialized countries (Berger et. al, 2001). In Revell (2005) I argue that the discourse of ecological modernisation is deeply entrenched within European and UK environmental policymaking strategies, and in Revell (2003b) and Revell (2007b) I highlight how the Netherlands and Japan have been hailed as exemplars of ecological modernisation. Given the importance of EM theory in current political debates, I have made a significant contribution to the literature by exploring how its core tenets relate to small firm environmental practices and policy approaches.

5.4 Business case analysis

Moore and Spence (2006) highlight that one of the biggest gaps in the literature is the lack of 'business case' analysis, with only a limited number of studies exploring the degree to which responsible business practices are financially advantageous for SMEs. The studies in this submission attempt to address this gap by focusing on the business case for sustainability as a central theme of the research.

5.5 Methodological approaches

Moore and Spence also highlight that there is little comment on appropriate methodological approaches for studying responsible behaviour amongst SMEs. Revell and Rutherford (2003), Revell and Blackburn (2007) and Revell (2007a) highlight that within the small body of work on SMEs and the environment, a high percentage of studies have been quantitative. Despite the need for both quantitative and qualitative work in this area, much less emphasis has been placed on qualitatively understanding the multi-faceted responses of SMEs regarding their environmental impacts, and the nuanced and contextual reasons why SME owner-managers act and react to environmental issues in the way that they do. The studies in this submission have aimed to address this by using qualitative interviews with small business owners to delve into the perceptions, attitudes and motivations influencing their environmental behaviour. Moreover, the

triangulated research design (combining different sources and methodologies) has enabled a more holistic and in-depth understanding of the environmental attitudes and practices of SME owner-managers (see appendix p53).

5.6 Addressing knowledge gaps in the EM literature

The map of the ecological modernisation literature (p31) gives a brief summary of the historical development of the theory, including newly emerging themes and directions. A key focus of my research has been the analysis of EM policy strategies in relation to SMEs, hence the published works fit best with the EM and political modernisation literature. By exploring processes of ecological modernisation in Japan, the studies also contribute to the recent literature on 'ecological modernisation around the world', in which EM scholars have attempted to expand the theory beyond the narrowly 'eurocentric' focus of the 1980s and 1990s.

A major gap within the EM literature has been identified by David Sonnenfeld (2000:254), who argues that EM theory "*must be broadened to include small-and-medium-sized... enterprises*". Small firms have received little attention compared to their large firm counterparts, despite of the fact that SMEs make up the vast majority of businesses within the private sector and therefore have an important role to play in the ecological modernisation of industry. Three of the six journal articles in this submission use the framework of EM to discuss the environmental attitudes and behaviour of SMEs, thus widening and adding depth to debates on ecological modernisation. As far as I am aware there have been no prior studies qualitatively exploring Japanese SME environmental practices from the perspective of ecological modernisation, therefore Revell (2003a) and (2003b) are highly original works. Revell, (2007a; 2007b; 2005) and Barrett and Revell (2005) also highlight the need for a demand-sided approach to EM policy strategies, thus contributing to the emerging literature on sustainable consumption within EM theory.

5.7 Longitudinal perspective

The longitudinal nature of the research outlined in this submission contributes to the environmental management field, in that the submission tracks changes in the environmental attitudes and behaviour of SMEs from 2000 – 2007 (developing Spence and Rutherford's research in 1998). During this period, environmental policy has changed dramatically; charting the gradual shift in business owners' perspectives in response to these changes has thus contributed to our knowledge of SME environmental practices over time. This is arguably an achievement given the lack of funding for studies in a field still in its infancy.

Clearly, the future holds many challenges and further research will be vital in analyzing wider trends and recommending ways of overcoming the considerable hurdles to achieving a more sustainable SME sector and society. I hope my research has made a small contribution toward this end.

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Appendix

1. Summary table of research

	Aims & Methodology	Findings	Outputs
Study 1: Japan 2001-02 Environmental attitudes & practices of Japanese SMEs	Aim of research was to: <ul style="list-style-type: none"> ➤ Explore the environmental attitudes & practices of SME owner-managers ➤ Explore barriers & drivers to environmental action ➤ Analyze influence of government policy and governance structures on greening of SMEs Qualitative interviews with: <ul style="list-style-type: none"> ➤ 20 SME restaurant owners & mechanical engineers ➤ 10 'key informants' from industry and government 	<ul style="list-style-type: none"> ➤ Piecemeal environmental improvements occurring within the sample ➤ Market and policy dynamics acting as barrier to more comprehensive environmental reforms ➤ Cost pressures resulting from Japan's economic recession encouraging environmental management to be sidelined by SMEs ➤ Little consumer and supply chain pressure for greening ➤ SMEs marginalized from environmental policy networks dominated by political, bureaucratic and business elites. ➤ Policy recommendations: <ul style="list-style-type: none"> - shift away from voluntarism and self-regulation towards compulsory measures - more participatory environmental policymaking context with active involvement of SMEs 	<u>Journal articles:</u> Revell (2003a) Revell (2003b) <u>Book chapters:</u> Barrett and Revell (2005) Revell (2007b)
Study 2: UK: 2003-04 Environmental attitudes & practices of UK SMEs ESRC funded	Aims: as for study 1 Qualitative interviews with: <ul style="list-style-type: none"> ➤ 40 SME in construction & restaurant industry ➤ 12 'key informants' from industry and government 	<ul style="list-style-type: none"> ➤ Limited amount of environmental reform occurring within the sample ➤ Key barriers to SME greening <ul style="list-style-type: none"> - lack of market drivers (e.g low consumer demand, lack of supply chain pressure, high cost of environmental management) - lack of enforcement of environmental regulations ➤ Policy recommendations: <ul style="list-style-type: none"> - emphasis on the 'business case for sustainability' not enough to convince SMEs to undertake environmental reform - SMEs resistant to voluntary action due to fear of loss of competitiveness, lack of time/resources - Need policy shift away from voluntarism towards compulsory and market-based measures 	<u>Journal articles:</u> Revell & Blackburn (forthcoming) Revell (2007a) Revell (2005)
Study 3 UK: 2006-07 UK SMEs and the environment: Turning over a new leaf?	Aims: as for study 1 Quantitative with qualitative support <ul style="list-style-type: none"> ➤ Questionnaire Survey 220 SMEs in London & South East ➤ 10 Interviews with survey respondents, including 5 case studies 	<ul style="list-style-type: none"> ➤ SMEs increasingly aware of their firm's environmental impact and proactively trying to reduce them ➤ Corroborates recent research by Environment Agency (2005) and others, reporting an improvement in environmental awareness/practices of UK SMEs ➤ Respondents motivated by mix of potential push-pull factors, including policy drivers (regulation, taxation) and market incentives (e.g cost savings, new customers, good publicity) ➤ Still some ambivalence regarding business case for sustainability; some SMEs sceptical of potential profitability of environmental action ➤ Interviews highlight recent media/policy attention on climate change as an important catalyst of environmental proactiveness amongst owner-managers ➤ SMEs driven as much by heightened environmental concern as by business case for sustainability 	<u>Conference paper</u> Revell, Stokes and Chen (2007)

NB: Revell and Rutherford (2003) and Revell (forthcoming) are not direct outputs of these studies, and are therefore not in the output list

2. The collaborative process

2.1 Roles and responsibilities in each study

Study 1	<p>Andrea Revell: Proposal writing, research design and implementation, project management, sample recruitment, fieldwork, literature review, data analysis and dissemination</p> <p>Robert Rutherford: Advice on research design and implementation, 'sounding board' for hypotheses and conclusions</p> <p>Dr. Hokasan, Komozawa University (Japanese translator) Liaison and coordination with respondents pre and post interviews, simultaneous translation at interviews, transcription of fieldwork and translation into English, translation of documents (eg those given by key informants) into English</p> <p>Professor Mitsuisan, Komozawa University (key academic contact and mentor in Japan) Setting up introductions and meetings with 'key informants' of the study, advice on doing research in Japan</p>
Study 2	<p>Andrea Revell: Proposal writing and project funding, research design and implementation, project management, sample recruitment, fieldwork, transcriptions, data analysis, literature review, report writing and dissemination, presentation of work in progress at quarterly ESRC workshops</p> <p>Professor Robert Blackburn: Monitoring and quality control (including advice on project management), fieldwork, dissemination, presentation of work in progress at quarterly ESRC workshops</p> <p>Dr. Brendan Barrett: dissemination</p>
Study 3	<p>Andrea Revell: Advice on research design and methodology, literature review, data analysis, dissemination (conceptual, literature review, writing, editing, presenting)</p> <p>Dr. David Stokes: Project funding and management, client liaison, dissemination (editing and presentation of conference paper, shared writing of future papers)</p> <p>Dr. Hsin Chen: Data collection, SPSS manipulation, literature review</p>

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A. Revell, The Business Case for Sustainability: A Small Firm Perspective

2. The collaborative process

2.1 Roles and responsibilities in each study

Study 1	<p>Andrea Revell: Proposal writing, research design and implementation, project management, sample recruitment, fieldwork, literature review, data analysis and dissemination</p> <p>Robert Rutherford: Advice on research design and implementation, 'sounding board' for hypotheses and conclusions</p> <p>Dr. Hokasan, Komozawa University (Japanese translator) Liaison and coordination with respondents pre and post interviews, simultaneous translation at interviews, transcription of fieldwork and translation into English, translation of documents (eg those given by key informants) into English</p> <p>Professor Mitsuisan, Komozawa University (key academic contact and mentor in Japan) Setting up introductions and meetings with 'key informants' of the study, advice on doing research in Japan</p>
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2.2 Roles of Joint authors In publications

Reference:	Joint Author split	Joint Author Role
Revell and Rutherford (2003)	Revell: 50 Rutherford: 50	Revell: Literature review, conceptual, writing, editing Rutherford: Conceptual, writing, editing
Barrett and Revell (2005)	Revell: 90 Barrett: 10	Barrett and Revell: shared conceptual, literature review, writing, editing (I wrote the first draft of the paper, Barrett contributed to later drafts)
Revell and Blackburn (2007)	Revell: 90 Blackburn: 10	Revell: conceptual, literature review, writing, editing, presenting Blackburn: Editing
Revell, Stokes and Chen (2007)	Revell: 80 Stokes: 10 Chen: 10	Revell: conceptual, literature review, data analysis, writing, editing, presenting Stokes: Editing and presenting Chen: SPSS data manipulation

3. Methodology

3.1 Philosophical approach

My research reflects a heavy emphasis on qualitative methodologies, which reveals my predilection towards an interpretivist philosophical approach. There are three basic research paradigms; interpretivism, positivism and critical science (Cantrell, 1993¹⁴). The critical science (or critical approach) explores how society functions, critiquing social phenomena in order to help empower people to overcome problems in the social world. The positivistic paradigm, or the scientific approach, reflects 'rational positivist' thought and assumes that there is a 'real, objective world' that can be observed and classified in a factual and unambiguous way. In contrast, an interpretivist philosophy reflects the idea that objective observation is impossible as the act of investigating reality has an effect on that reality and therefore the researcher and researched cannot be extricated from one another. This paradigm assumes that reality is subjective, that it is within us and is therefore socially constructed (Hammersley, 1993¹⁵; Limb et al., 2001¹⁶). While the positivist paradigm is most commonly used in the physical sciences, the interpretivist paradigm is emphasised in the social sciences, where the objects of study are more complex and are therefore influenced by a myriad of factors which are challenging to isolate and control in experimental laboratory settings.

In taking an interpretivist approach, I have stressed subjective experience rather than objective measurement of social phenomena. This perspective negates the reductionist idea that the world can be divided into tidy groups and categories which can be described and examined in a systematic way. According to my ontological position, the world is not fixed and predictable but changing constantly, based on social and power relations, struggles and negotiations. Reality seems empirically different to every individual depending on their personal, cultural, political, economic, and gendered perceptions of themselves and others.

3.2 Methodology of Study 1

As discussed in the main body of the dissertation (p4), the objectives and methodology of the Japanese research were very similar to Spence and Rutherford's (1998) study in the UK and the Netherlands to maximize comparability between studies. The research objectives of both studies sought to examine the environmental practices and attitudes of SMEs, and the barriers and

¹⁴ Cantrell, D. (1993) Alternative paradigms in environmental education: The Interpretive perspective. In Mrazek, R. (ed). *Alternative paradigms in environmental education research*. Ohio: NAAEE.

¹⁵ Hammersley, M (1993) *Social Research*, London, Sage/Open University Press

¹⁶ Limb, M. and Dwyer, C. (2001): *Qualitative methodologies for geographers: issues and debates*, London: Arnold.

drivers of environmental reform. The Japanese study had a more explicit policy orientation, adding a third aim of exploring the influence of environmental policy arrangements on the greening of small firms. This objective was included because a major finding of Spence and Rutherford's study was that the environmental management practices of owner-managers are strongly influenced by national governance structures and the degree of stakeholder participation within these.

As the methodology used by Spence and Rutherford was 'tried and tested' and had worked well to achieve the aims of their research, the sample followed the same split whereby face-to-face interviews were conducted with 10 key informants from industry and government, followed by interviews with 20 SME owner-managers in the mechanical engineering and restaurant sectors. Interviewing different sources in this way added triangulation to the research design, thus limiting research bias by exploring the greening of SMEs from different angles to ensure a more holistic understanding of the issues.

Key informants from relevant trade associations, industrial organisations, chambers of commerce and industry and academia¹⁷ were interviewed first in order to build a picture of the political and economic context of Japan, particularly regarding environmental policy and small firms. A semi-structured interview guide was used and, due to the breadth and depth of the issues, interviews typically lasted around 2 hours. The discussion typically followed the following format:

- Introduction and information about key informant's organisation
- Overview of mechanical engineering and restaurant industry characteristics
- Key environmental issues/policies relevant to SMEs in mechanical engineering/restaurant industries
- Barriers and drivers of environmental reform amongst SMEs
- Overview of governance structures and environmental policy arrangements in Japan
- SME representation and participation in policy networks
- Future changes needed to ensure the greening of SMEs

These discussion points were similar to the ones used in the key informant interviews conducted by Spence and Rutherford (1998), but with a greater emphasis on policy arrangements and their influence on the environmental orientation of small firms. This overview informed the interview guide for SMEs in the second stage of the research, which was adjusted to reflect the main

¹⁷ The key informants for the Japanese study were from the Tokyo Chambers of Commerce, SBRI (Japan Small Business Research Institute), National Federation of Associations of Life and Sanitation related Restaurant Businesses (LSA Ota Ward Environmental Protection Division, PiO (Ota city Industrial Plaza), JSIMM (Japan Society for Industrial Machine Manufacturing, JEMA (Japan Electrical Machine Association), Ota Federation of Engineering, Tokyo Doyukai for SME owners, JSPMI (Japan Society for Promotion of the Machine Industry)

themes emerging from the key informant interviews (for instance views on the perceived lack of SME participation in environmental policy networks in Japan). The main topics covered in the SME interviews were as follows:

- Introduction and information about the firm
- Owner-manager's awareness of the environmental impact of the firm
- Specific environmental practices of the firm
- Barriers and drivers of environmental reform
- Awareness of and attitudes towards environmental policies targeting SMEs
- Views on intermediary bodies and environmental governance structures in Japan
- Future changes needed to ensure the greening of SMEs

A sectoral comparison of SME environmental practices and attitudes was considered important because past studies demonstrate significant differences between SMEs according to sector (Curran and Blackburn, 1994). It was assumed that the environmental practices of smaller firms would be heavily conditioned by the industry sub-culture in which they operate. The restaurant and mechanical engineering industries were chosen because both are made up of large numbers of small firms, and these firms can be considered to be fairly typical of small enterprises in industrialized countries. Moreover, precision engineering and restaurant firms are involved in business-to business and business-to consumer sales respectively, thus enabling an exploration of different kinds of supply chain relationships. However, a limitation of the research design was that mechanical engineers and restaurants have a smaller 'ecological footprint' than other more polluting sub-sectors, such as the automotive or farming sectors, and therefore environmental issues may be less salient to their business.

A spread of SMEs in each sector was ensured to augment the triangulated research design; for instance the restaurant sample included sushi restaurants, noodle bars, izakayas (pub restaurants) and yakitoris (grilled chicken restaurants) among others. The mechanical engineering sample were mostly precision engineers producing metal, automotive, and machine parts, with a spread of first, second, third and fourth tier firms to reflect the experiences of firms at different levels of the supply chain. In both sectors there was a mix of firm sizes, although the majority were small and micro firms as these represented the majority of firms in both industries.

3.2.1 Rationale for using a qualitative methodology

A qualitative approach was considered the most appropriate methodology for achieving the objectives of this study, as the research aims required an exploration of the underlying

motivations and attitudes of SME owner-managers. Qualitative methodologies use a subjective approach which involves an exploration of perceptions and experiences in order to gain an understanding of social and human activities (Hussey and Hussey, 1997¹⁸). They are hence most suited to research questions which are concerned with how the social world is interpreted, understood, experienced or produced (and are thus particularly emphasised within the interpretivist tradition).

The advantage of using a qualitative approach was that I was able to gain a richer, more contextualised and detailed insight into the experiences and perceptions of small firm owners than I might have achieved if I had used a quantitative methodology, which looks for surface patterns, trends or correlations rather than underlying meanings. The qualitative methodology also enhanced the validity of the research because the data collection method was flexible and sensitive to the social context of respondents. Validity refers to the extent to which the research findings accurately represent what is really happening in the situation under study. 'In situ' studies that are rich in context and social meaning are likely to have a higher validity than studies carried out in laboratory settings. Nevertheless, in ensuring a high degree of validity, there was arguably a degree of sacrifice in terms of reliability (the ability to repeat the study and get the same results). Because in the qualitative tradition social phenomena is usually studied in context, there are many uncontrollable variables which limit the reliability of the findings. Those coming from a positivist tradition might also argue that the subjective nature and small (non-random) samples used in the research diminished its generalisability (the degree to which a sample can be considered representative of the population from which it is drawn).

3.2.2 Rationale for using interviews

Interviews were considered a suitable method for addressing the research questions in study 1 as they are a particularly useful way of exploring how respondents experience and make sense of their lives. Because respondents are given a chance to describe their experiences and perceptions in their own words, and are therefore able to construct their own accounts of reality, this makes for a very sensitive and people-oriented approach to collecting data (Valentine, 1997¹⁹). Interviews are especially appropriate for discussing issues that are prone to eliciting a 'politically correct' response such as environmental protection. For instance, owner-managers may be reticent to admit to activities which might harm the environment, or to low levels of environmental compliance within their firm. Because interviews allow a rapport to develop

¹⁸ Hussey, J. and Hussey, R. (1997) *Business Research: A Practical Guide for Undergraduate and Postgraduate Students*. London, Macmillan.

¹⁹ Valentine, G. (1997) Tell me about...Using interviews as a research methodology in Flowerdew, R. and Martin, D. (eds.) *Methods in Human Geography: a Guide for Students Doing a Research Project*, Longman, London, pp. 110--126.

between researcher and respondent, they encourage a sense of trust to emerge in the research process which can ensure a more honest and heart-felt response from interviewees. This is in contrast to questionnaire surveys (the main method used in much of the previous research on the greening of SMEs), where questions may be more susceptible to 'social desirability' biases.

Moreover, it is important to establish a common understanding of environmental issues between the researcher and the researched in order to ensure validity of the findings, and this can often only be unraveled through dialogue with respondents. Interviews are useful for understanding the underlying reasoning behind a respondent's beliefs or opinions (for instance, why SME owners resist or accept the business case for sustainability), and are also helpful in understanding the logic of a situation that is not clear (for instance, the rationale for ignoring 'win-win' opportunities).

However, Yin (1994²⁰) highlights that a potential weakness of using interviews is that the respondent may feel compelled to say what s/he thinks the interviewer wants to hear. The reflexivity of the interviewer is thus clearly important. Reflexivity refers to the degree of self-awareness of the researcher in the research process, particularly how s/he may be impacting on the results. I tried to be as reflexive as possible in the interview process by noting anything that I thought went wrong or could have biased the results in my field notes and transcriptions. I also reflected on ways of improving my interview techniques for the next interview. One aspect of being reflexive is understanding the power dynamic that can occur in an interview situation. The researcher certainly has more power than the respondent in this context because the researcher is the one that has defined the structure, style and content of the interview. This power relation may have an effect on the findings, thus self-conscious introspection on the part of the interviewer can help to limit this effect.

3.2.3 Alternative methods

Other methods that were considered for use in study 1 include focus groups and case study approaches. Focus groups are increasingly being used in qualitative research because they have a number of strengths; they are often more productive than interviews (as they have more people contributing), they have a more creative atmosphere because they are collaborative, and can encourage respondents to brainstorm, generate ideas and spark debates within the group. Focus groups often get people thinking about issues from a fresh perspective and hence are particularly useful when idea generation is a key aim of the research. However, a key limitation of focus groups (and the main reason why they were not used in study 1) is that they are more prone to eliciting socially desirable responses, as respondents want to appear politically correct in front of

²⁰ Yin, R. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publishing.

other members of the group. Because it is quite challenging to elicit views from people who may have a different opinion from other respondents, focus groups can thus encourage more conformist perspectives to be expressed (see Stokes and Bergin, 2006²¹; Blackburn and Stokes, 2000²²).

Case studies could also have been used in study 1 (see Stake, 1995²³; Yin, 2002²⁴). This approach is especially useful when exploring atypical or paradigmatic (exemplar) cases (such as ecopreneurs or social enterprises). The main advantage of a case study approach is that multiple (triangulated) information sources are used to add breadth, depth and validity to the research findings. However, a key weakness of this approach is that conducting an in-depth, longitudinal study of a single case is highly resource intensive, which often limits the number of studies made. Case studies thus tend to have very small sample sizes and are hence particularly vulnerable to criticisms of a lack of generalisability. For these reasons, interviews were deemed to be the most appropriate method for meeting the research objectives of study 1.

3.2.4 Potential research biases

I encountered some interesting cultural differences in conducting research in Japan, which may have affected the outcomes of the research. Firstly, the recruitment procedure was complicated by the fact that in Japan the polite way to set up an interview with a high ranking individual is to be introduced to that person via a respected intermediary. This process was vital to ensuring the participation of key informants, and resulted in an extended recruitment period for the first stage of fieldwork. A 'snowballing' process was used whereby my main academic contact and mentor in Tokyo, Professor Mitsuisan of Komozawa University, helped to set up the first few interviews with key informants using his contacts and academic status. Subsequent interviews were arranged on the recommendations of these key informants. Interviews with small firm owner-managers also required an introduction, in the form of an endorsement by their local trade association. To this end, key informants from the main restaurant and mechanical engineering trade associations allowed me access to the directories of their members, which were used to recruit the sample, and supplied me with a letter to inform potential respondents that the research was bone fide and had the blessing of the trade association. However, a limitation of this method was that it may have caused respondents to be more cautious when responding to questions about these particular industry bodies in the interview.

²¹Stokes D. and Bergin R. (2006) 'Methodology or 'Methodolatry'? An Evaluation of Focus Groups and Depth Interviews' *Qualitative Market Research: An International Journal*, 9(2):26-36

²²Blackburn R.A. and Stokes D. (2000) 'Breaking Down the Barriers: Using Focus Groups to Research Small and Medium Sized Enterprises' *International Small Business Journal*, 19(1): 44-67

²³ Stake, R. (1995) *The Art of Case Study Research*, Sage Publications, Thousand Oaks, CA

²⁴ Yin, R. (2002) *Case Study Research Design and Methods*, 3rd ed. Sage Publications, Newbury Park

Another cultural difference that might have affected the research was that a translator was present at every interview to overcome language barriers. At the start of fieldwork I was concerned that this might lead to a possible research effect if it was found that language differences affected the rapport between the interviewer and respondent. Fortunately these concerns proved to be unfounded; in fact, the opposite occurred as respondents seemed particularly frank in their discussion of the issues raised in the interviews, and in their concerns and criticisms regarding political and institutional arrangements in Japan. This was especially surprising given that Japanese society is predicated on conformity and therefore open criticism of its institutions tends to be frowned upon. One possible reason for the candor of owner-managers is that because the interviewer was a 'gai-jin' (foreigner) and the research was an international project, their responses were perceived to be less likely to be reported to (and therefore have repercussions with) local industry representatives or politicians. Being a foreigner may have thus helped to convince owner-managers of the neutrality of my position and engendered a sense of trust and rapport during the fieldwork.

Another potential issue was the fact that I had to rely on the translator to transcribe the interviews and translate them into English. To ensure quality control I made extensive field notes during the interviews (which was facilitated by the time lag between the interviewee's response in Japanese and its translation in English), and I used these field notes to check against the translated transcriptions. A particular concern was how to ensure that cultural nuances were picked up in the interviews, and I had to rely on the translator to relay and record these, which may have contributed to a research bias.

The research process was a particularly instructive and rewarding one, both from a professional and personal point of view. Professor Mitsuisan provided me with invaluable guidance on social etiquette and the norms of researching in Japan, but to a certain extent I also had to rely on my own resources and ingenuity to negotiate the challenges of conducting research in a foreign context. This inevitably may have had some kind of research effect.

3.2.5 Analytical procedure

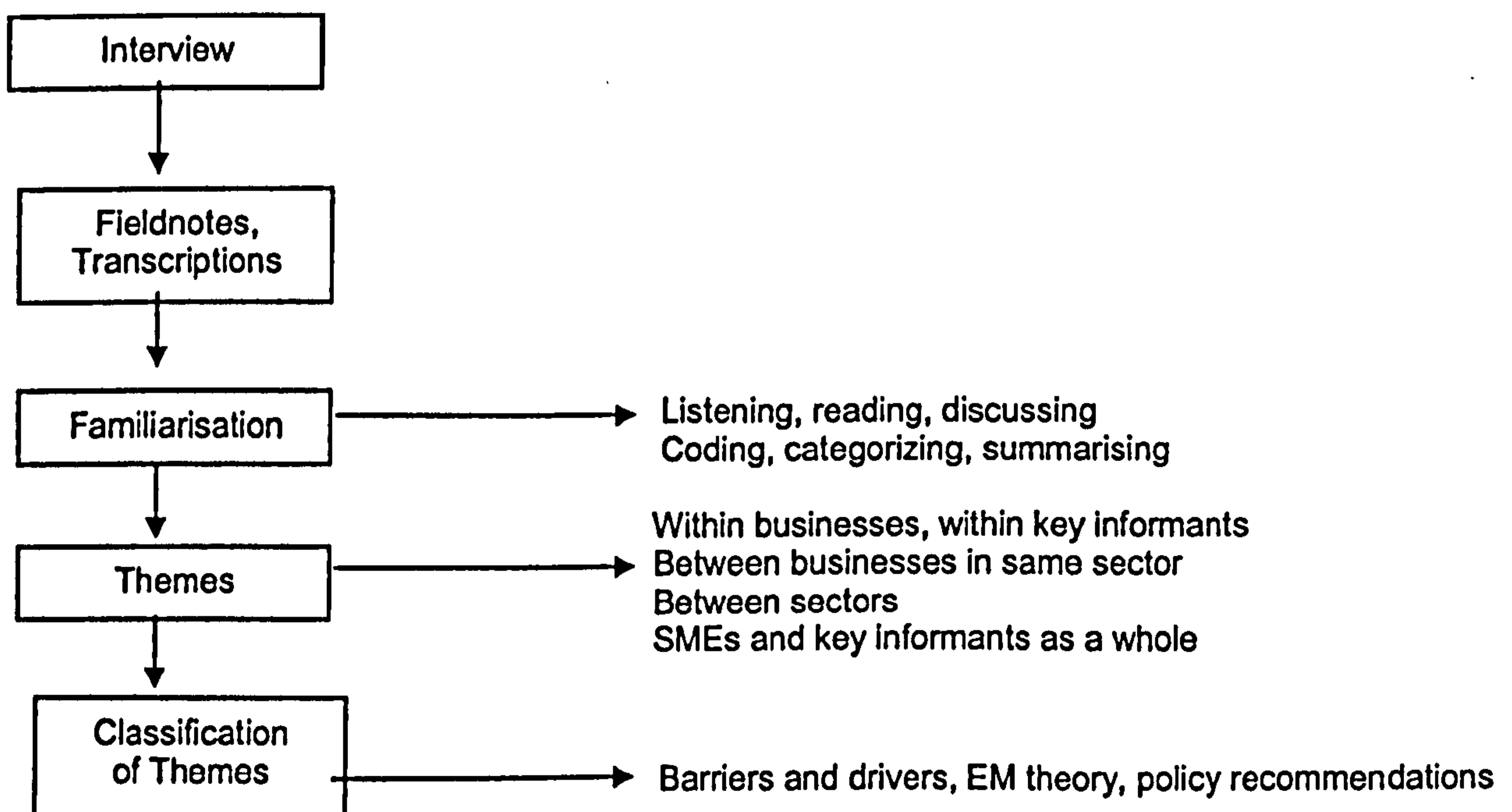
Due to the qualitative nature of the research, I used a non-quantifying method of analysis to organise the data collected from the fieldwork. Five files were maintained for the study, containing the following materials:

- Raw data from interview notes
- Summary of raw data for each of the key themes in the topic agenda

- Reconstruction of the data to build a picture across all key points within each theme (including notes, insights, hunches, developing interpretations)
- Drafts of literature review, findings, discussion and conclusions
- Description of methodology, research timetable, proposal, budget

Using a '*general analytic procedure*' (Hussey and Hussey, 1997), field notes were converted into coded records which were then organised according to the themes that began to emerge. The interview guide provided the conceptual framework for the data collection by identifying key themes and questions which were used to code the results. Themes also emerged from some of the unstructured discussion that arose during the interviews (e.g. restaurateur's views on organic food). Coding was then grouped into smaller categories according to patterns that emerged from the data. As new data was collected it was compared with existing codes and categories, and modifications were made as required. The themes emerging from each business were then classified according to industry sector. This analysis allowed both a cross-sector comparison as well as a general analysis of environmental practices in SMEs. At various stages written summaries were formed to construct generalisations and form hypotheses, and these were used to write the first draft of the findings and discussion. On completion of the first draft of the main report, each transcript was read again to ensure that the findings were consistent with the industry and business settings. Numerous drafts were then rewritten and edited, hypotheses were discussed with academic colleagues and raw data was revisited until conclusions were made and the final report was drafted.

Fig. 1. Outline of analytical procedure:



Initially I had contemplated using a computer software package to analyse the data from study 1, such as NUD*IST or Atlas/ti. These packages allow you to import data files which are then coded and categorized by the software. However, I decided in the end to take a manual approach, as the responses of key informants and small firm owners were not so heterogenous and complex that I needed a computer to do the coding and restructuring of the data for me. Moreover, I was so familiar with the data by the time I came to the analysis (having conducted the interviews, made field notes, read and re-read the translated transcriptions) that I felt more than capable of coding, categorizing and summarizing the data unaided.

3.2.6 Alternative analytical procedure

In retrospect, a grounded theory approach (Glaser, 1992²⁵) might have been a useful way of analyzing the data, as it ensures that the researcher comes into the research process without any presuppositions or perceptions that might prejudice the data. Grounded theory requires that codes emerge from the data (rather than being identified before the data collection). This ensures that themes and hypotheses are 'grounded' in that they can be verified by referring back to the original data. The fact that a) the methodology I used was influenced by Spence and Rutherford's previous research, and b) that the codes and themes in the analysis followed the structure of the interview guide, suggest that my own positionality and presuppositions could have affected the research.

3.3 Methodology of Study 2

This study of the environmental attitudes and practices of UK SMEs mirrored the objectives and methodology of the Japanese research to maximize comparative value, and because the methodology had successfully met the research objectives of the first study. The only difference was that the construction industry was chosen to replace the mechanical engineering sample due to the political salience of the construction industry's environmental impact at the time of the research. This research was triangulated not only by interviewing key informants and SMEs from different sectors, but also by recruiting both architects and builders within the construction industry to highlight supply chain issues, and by splitting the location of respondents between

²⁵ Glaser, B. (1992). *Basics of grounded theory analysis*. Mill Valley, CA: Sociology Press

London and Leeds (to highlight any regional differences that might be occurring, especially in light of local initiatives such as 'Local Agenda 21').

Key informant²⁶ interviews typically lasted for one and a half to two hours, while the SME interviews lasted around an hour. The interview guides followed a similar format to those of the Japan study.

3.3.1 Potential research biases

While recruiting a representative sample (via random sampling) is not the main aim in a qualitative study, it certainly helps to negate criticisms of limited generalisability if one attempts to ensure that the sample at least to some degree reflects the characteristics of the population from which it is drawn. It is thus important to highlight potential sampling biases that could have occurred in study 2.

The sampling frame consisted of 80 restaurants, 40 architectural practices and 40 building firms (i.e. four times the required sample size), selected from business directories in London and Leeds. Letters were sent out to each potential respondent inviting them to take part in the research. After a sufficient lapse of time those who had not replied were telephoned until the sample had been recruited. A strong response rate of roughly 25% was achieved via this method in all three sectors.

As many restaurants are not members of trade associations, restaurateurs were recruited from the local yellow pages, with fast food restaurants excluded from the sampling list. The 10 architectural companies that made up half the sample of construction firms were recruited from the Royal Institute of British Architect's (RIBA) web-based directory (<http://www.riba.org/go/RIBA/Home.html>). As approximately 80% of all architectural practices in the UK are RIBA members (RIBA, 2003)²⁷ it was felt that a sample drawn from their membership list was likely to be fairly representative. Builders were recruited from the Federation of Master Builder's (FMB) web-based directory (<http://www.fmb.org.uk>). According to the key informant at the FMB, its members represent around 13% of all SME builders²⁸; which suggests that a possible sampling bias may have been present. Nevertheless, this was felt to be permissible as the FMB is the UK's leading trade association for small firm builders and has a membership accreditation procedure which involves checking each prospective member thoroughly to ensure they have

²⁶ Key Informants were drawn from the Restaurant Association, Visit Britain, Federation of Master Builders, Building Centre Trust, CIRIA, the Royal Institute of British Architects, DTI's Construction Sector Unit, the Small Business Service, Royal Borough of Kensington and Chelsea, Leeds City Council

²⁷ Royal Institute of British Architects (2003) *Architects, employment and earnings 2003*, RIBA, London.

²⁸ This is an approximate figure only. For more information on construction industry statistics please refer to the DTI's Construction Statistics Annual (<http://www.dti.gov.uk/construction/stats/>).

impeccable credentials. This process weeds the 'cowboy builders' out and provides assurances that FMB members are models of good practice. It was felt that, in theory, the environmental practices of FMB members should therefore be a 'best case scenario', indicating the degree to which environmental good practice is being taken up more generally within the SME building sector.

3.3.2 Analytical procedure

The analytical method employed for study 2 followed the same general analytical procedure used in the Japanese study. All interviews were audio-tape recorded, and I transcribed them soon after each meeting with the respondent to ensure maximum familiarity with the data. I also transcribed the interviews conducted by Professor Blackburn. At the end of the fieldwork I immersed myself in the data by reading and re-reading field notes and transcripts and by coding, categorising and building up themes and hypotheses. This process allowed summaries of themes to be drawn up to provide source material for the first draft of the findings and discussion.

3.4 Methodology of Study 3

To retain consistency, study 3 had the same objectives as studies 1 and 2. However, this time a mixed methodology was used, involving a quantitative survey of 220 SMEs followed by five in-depth interviews and five case studies. The choice of a quantitative method partly reflected the funding priorities of the principle sponsor, who needed numerical data for Workspace's end of year report. The survey was supported by qualitative research which helped to elucidate the underlying reasons and motivations behind the statistical results. This triangulated methodology added depth, breadth and validity to the findings.

The main advantage of using a quantitative method to understand the barriers and drivers of greening among SMEs is that the results are considered to be more generalisable, which is a key reason why statistical surveys often hold more caché with policymakers and other audiences. Another advantage of conducting a questionnaire survey on the environmental attitudes and practices of SMEs is that the findings are more easily comparable with large-scale benchmarking studies such as the Environment Agency's Netregs surveys (2002; 2003; 2005; 2007).

The key weakness of a statistical survey is that it only offers us a 'snapshot' of reality, hence the results have a low validity compared to qualitative methods. In quantitative studies there is a tendency for the richness of the findings and its contextual implications to be lost, thus contributing to a narrower and less 'real' interpretation of the data. Whether surveys have much

explanatory power in any rigorous sense is thus questionable (Hussey and Hussey, 1997²⁹). This underlines the value of combining quantitative and qualitative methodologies, for a mixed approach can offer strengths that compensate for the weaknesses of the other approach (Tashekkori and Teddlie, 1998³⁰). Using a mix of surveys, interviews and case studies for study 3 maximized the validity, reliability and generalisability of the results, as well as enabling a more holistic understanding of the research problem.

3.4.1 Potential research biases

Survey methods can suffer from response biases, as participant who agree to take part in the research are self-selecting. This can diminish the representativeness of the sample (for instance by creating a bias towards respondents who are especially interested in environmental issues), and hence reduce the generalisability of the results (Jamison, 2006³¹). In study 3, this effect was limited by the fact that our sample had an even spread of demographics; however a more rigorous way to limit this bias would have been to use a stratified random sampling technique, whereby the population is divided into categories (or strata), with each category representing a proportion of the total sample.

Other weaknesses of questionnaire surveys are that responses can be affected by the wording and context of the question. We sought to limit these potential biases by meticulously double-checking the wording and order of questions to ensure that they were not loaded or leading, and by using various cross-checking questions throughout the survey to indicate the consistency of responses. As previously mentioned, quantitative surveys are also particularly prone to social desirability biases, which is a major drawback when conducting research on environmental issues. We tried as much as possible to word the questions in such a way as to avoid eliciting a politically correct response. However, such biases are clearly difficult to overcome, and is a key reason why we chose to augment the questionnaire with interviews and case studies, as these methods are better suited to eliciting truthful answers from respondents.

Another possible research bias was that the sampling frame for the survey was limited to Workspace tenants in London. This meant that there were proportionately less micro-firms in the sample (as owner-managers of these firms are more likely to work from home). Moreover, the London SME population has a higher preponderance of firms in service sectors than the rest of the country, and as these firms tend to have a low environmental impact, this might have skewed

²⁹ Hussey, J. and Hussey, R. (1997) *Business Research: A Practical Guide for Undergraduate and Postgraduate Students*. London, Macmillan

³⁰ Tashekkori, A. and Teddlie, C. (1998) *Mixed Methodology: Combining Qualitative and Quantitative Approaches*, Thousand Oaks, CA, Sage publications

³¹ Jamison, J. (2006) *Research Methods in Psychology for High School Students*, Iuniverse

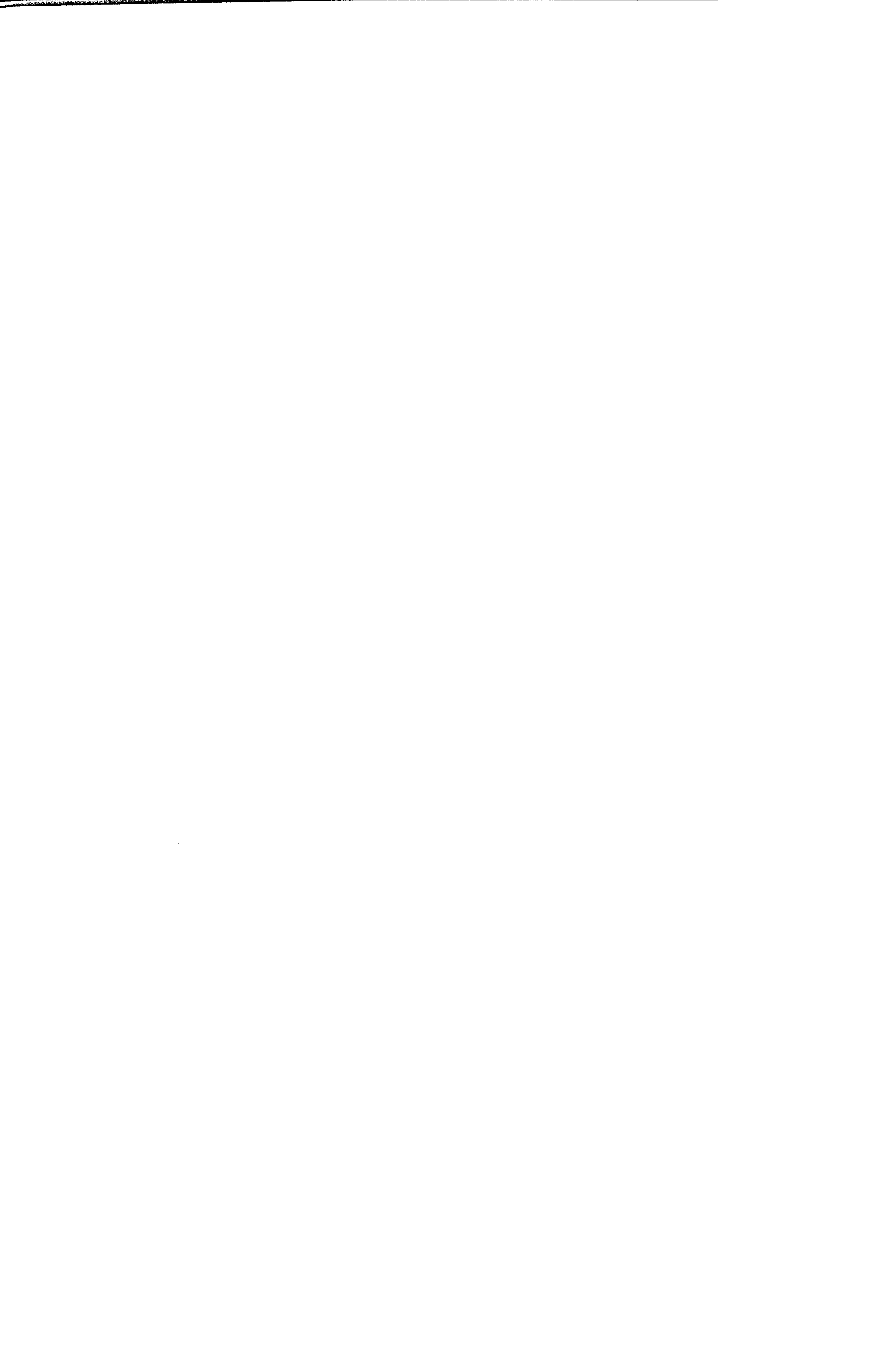
the results. However, ANOVA analysis of the results revealed no significant size or sector variations in responses in study 3, which suggests that the findings can be generalized to the wider population of SMEs in the UK.

3.4.2 Analytical procedure

The interviews and case studies followed the same general analytic procedure as studies 1 and 2. The statistical analysis of the survey results involved the use of t-tests, ANOVA, regression and chi-squared analysis to test the significance of the results. ANOVA analysis is used to test whether the difference between two or more populations is statistically significant. In study 3 ANOVA was used to test the effect of demographics on the attitudes and practices of owner-managers. A t-test is used to determine whether the difference between two means is significantly greater or less than the expected difference (usually 0). A t-test was used in study 3 to examine whether there was a significant difference in the mean responses from the first and second mail out of the questionnaire. Regression analysis tells us how accurately we can predict the value of one variable if we know the value of another, in this case demographics and environmental attitude. Finally, a chi-square analysis is used to determine if something varies from the mean by more than x amount (x being the expected value). In study 3, chi-square was used to test whether owner-managers' attitudes and environmental practices were significantly correlated with membership of trade associations or environmental network groups.

3.5 Conclusion

In conclusion, I feel that the methodological approaches taken in all three studies worked well to achieve the aims of the research. In particular, I feel that the combination of qualitative and quantitative methods has been especially valuable in triangulating and corroborating the research findings, and encouraging interest from audiences with both positivist and interpretivist leanings.



Part II:
Published Works



- Revell, A. and Rutherford, R. (2003) 'UK Environmental Policy and the Small Firm: Broadening the focus', *Business Strategy and the Environment* 12: 26-35



UK ENVIRONMENTAL POLICY AND THE SMALL FIRM: BROADENING THE FOCUS



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The poor environmental performance of small and medium-sized enterprises (SMEs) in the UK has been attributed to a wide range of barriers, both internal and external to the firm. However, the debate has seldom considered the interplay of factors beyond 'the firm'. In order for the debate to progress we emphasize the importance of situating the environmental practices of small firms within a context of national policy arrangements. A lack of institutional enfranchisement for SMEs in the UK is a key factor in understanding why environmental policies have yet to be successful in encouraging more environmentally proactive behaviour within this sector. Copyright © 2003 John Wiley & Sons, Ltd and ERP Environment.

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INTRODUCTION

The importance of small and medium-sized enterprises (SMEs) to the economy and the environment is now well established. The vast numbers of small firms mean that on aggregate they undoubtedly have a significant impact on ecological systems. The *Marshall Report* (1998), which originally endorsed proposals for a climate change levy, estimated that as much as 60% of carbon dioxide emissions from business result from the activities of SMEs. Most research in this area has, however, focused on large firms and their impact on the environment, whilst the impact of small firms continues to be an under-researched area.

Much of the work conducted on SMEs and environmental issues has to date focused on describing the obstacles these firms face in adopting environmental best practice. Empirical studies have found a lack of engagement with environmental issues amongst owner-managers. This disengagement has been attributed to the following factors.

- (i) Business owners' feelings of limited responsibility towards the environment, due to a belief that (a) the environmental 'footprint' of small firms is negligible (Hillary, 1995; Holland and Gibbon, 1997; Smith and Kemp, 1998; Rutherford and Spence, 1998) and (b) the government



should take the leading role in environmental management (Rutherford and Spence, 1998; Lloyds Bank/SBRT, 1999; Tilley, 2000; Ludevid Anglada, 2000).

- (ii) Low levels of 'eco-literacy', a lack of expertise and understanding in tackling environmental issues, resulting in reactive rather than proactive responses to environmental issues (Gerstenfeld and Roberts, 2000; Hutchinson and Hutchinson, 1997).
- (iii) A 'shallow' environmental ethic amongst owner-managers, who tend to favour economic interests over social or environmental considerations (Tilley, 2000).
- (iv) A perception amongst SMEs that legislative compliance is costly (Petts *et al.*, 1999), hence regulation is resisted due to its perceived impact on profits.
- (v) Low levels of compliance amongst small firms due to a lack of awareness of existing environmental regulation, combined with a lack of ability to interpret how legislation might affect them (Hillary, 1995; Gerstenfeld and Roberts, 2000; Hutchinson and Chaston, 1994).
- (vi) Resistance to voluntary initiatives that promote self-regulation due to fears of 'free riders' and a lack of a 'level playing field' (Tilley, 2000; Ludevid Anglada, 2000).
- (vii) Low levels of uptake of environmental management systems due to a lack of time, a lack of technical knowledge, a lack of awareness of benefits, a negative perception of bureaucracy, high cost of implementation, resistance to change within the company culture and little external pressure from stakeholders such as customers and suppliers to adopt EMSs (Hillary, 2000, p. 140).

A persistent theme running through much of the existing literature is that small businesses lack the characteristics that would otherwise enable them to engage effectively with the 'sustainable development' agenda. Clearly, there

are numerous obstacles that owner-managers have towards making environmental improvements – it could even be tempting to assume that these barriers are somehow an *intrinsic* part of small firm culture.

We argue that there are wider issues to consider, however; governance structures and policy arrangements play an equally important part in influencing the environmental practices of small firms. Yet little has been written about the structural factors that influence small firm environmental practices. The environmental performance of small businesses cannot be solely attributed to characteristics inherent within them; it is also related to the way in which societies influence and engage with business – and the way in which business is incorporated into the environmental policy agenda. There is therefore a need to focus not just on the internal world of owner-managers and their reasons for responding in a certain way towards environmental pressures but also on the contextual, structural factors that have shaped their experience of reality.

While the characteristics of small business populations throughout the industrialized world are often similar, different institutional structures linking business, the state and civil society are clearly evident across nations. These varying social and political arrangements can have quite different outcomes in relation to the environmental behaviour of firms. Comparative research can be particularly useful in highlighting the influence of different national policy contexts on the environmental practices of small firms. In the following sections we consider the differing environmental policy contexts of the UK and the Netherlands to illustrate how structural factors can crucially influence the individual responses of small firm owner-managers to environmental pressures.

ENVIRONMENTAL POLICY AND SMES IN THE NETHERLANDS

A comparative study on SMEs and environmental issues found that small firms in the



UK and the Netherlands differed strongly in their environmental performance and most importantly in their attitudes to environmental issues (Rutherford and Spence, 1998; Spence *et al.*, 2000; Rutherford *et al.*, 2000). In contrast to their UK counterparts, Dutch owner-managers were actively engaged in environmental measures and emphasized the roles and responsibilities of individuals, industry and government in addressing environmental issues. Whilst this can be partly contributed to social attitudes, Rutherford and Spence (1998) argue that the consensual way in which environmental policy has been constructed and the way it has been enforced in the Netherlands has played a crucial role.

At a macro level, Dutch SMEs have been actively targeted both by legislation, licensing and voluntary initiatives. Firms have to obtain an environmental permit in order to trade, and this legislative context fosters compliance as environmental action is seen as a legitimate business cost for all. This legal framework is reinforced by a context characterized by shared social responsibility and a consensual style of governance in which co-operation and dialogue is fostered amongst trade associations, local government, support providers and businesses (both large and small). Moreover, membership of trade associations is almost universal (Rutherford *et al.*, 2000).

Recent work by De Bruijn and Lulofs (2000) confirms this analysis, arguing that the 'indirect, consensual, steering model' in which policy networks play a crucial role has been largely successful in implementing change in the Netherlands. They explain that the cornerstone of Dutch environmental policy, the National Environmental Policy Plan (NEPP), in 1989 set in motion plans for radical change to reduce environmental impacts. This policy framework took a thematic, 'target group' approach to tackling environmental problems, whereby policy themes (e.g. climate change) were set ambitious targets (e.g. reduction of carbon dioxide emissions by 20–30%) and then assigned specific target groups who were

charged with the responsibility for achieving those targets (e.g. industry, transport, consumers). The target groups were heavily involved in a consultative process, which created a context of consensual support for the policy strategy and reflected the contribution of the target sector to the solution. Critically, industry representatives such as trade associations were heavily involved in the negotiation and implementation of these decisions (Glasbergen and Driessen, 1994).

Dense policy networks were actively engaged in the policy process. The NEPP and its successors planned to implement policies with the use of intermediary networks, which included trade associations, industrial environmental agencies, local authorities, employee organizations and consulting firms. These networks provided support and information to facilitate the uptake of environmental management strategies. They played a crucial role in influencing industry and small firms to make changes, and they supported proactive responses whilst repressing the behaviour of laggards (De Bruijn and Lulofs, 2000).

The overall strategy for environmental reform included an effective mix of voluntary agreements backed up by a strong regulatory and licensing system. Companies that failed to live up to the voluntary agreements were given 'supplementary conditions' on their permit to trade and were also subject to more stringent inspections, thus forcing 'free riders' to address their 'laggard' status. The threat of direct legislative action provided a strong motivator to achieve the targets agreed in the voluntary agreements.

De Bruijn and Lulofs (2000) argue that this policy context had many positive outcomes. Networks were fortified and stakeholder partnerships nurtured, thus strengthening the Dutch tradition of governance through managed consensus. The policy mix enabled the government to co-operate with proactive companies whilst maintaining strictness with laggards and resulted in an improvement of attitudes and behaviour within industry.



ENVIRONMENTAL POLICY AND SMES IN THE UK

The comparative study by Rutherford and Spence (1998) found that UK small firms, in contrast to Dutch SMEs, did not see environmental protection as a relevant business issue for their firms. Cost was a major barrier to more proactive environmental behaviour, with owner managers perceiving little financial benefit from environmental investments. Responsibility for the environment was ascribed to the government, whilst individual efforts were seen as more or less ineffectual in the face of structural barriers. Rutherford and Spence argue that the institutional context in the UK is a key reason for the low engagement of small firms. They contend that there is not yet a substantial national structure in place which forces the environment on to the business agenda of SMEs, and because of this it is very easy for UK owner-managers to ignore environmental issues.

While the Dutch government has taken a 'target group' approach and developed specific strategies for engaging SMEs, the choice of policy instruments in the UK has tended to ignore the special case of small firms. In the White Paper *A Better Quality of Life* (DETR, 1999), the UK government adopted a sectoral rather than size approach to improving the environmental performance of industry, encouraging the development of voluntary 'sectoral sustainability strategies' via organizations that arguably tend to represent the interests of large firms (such as many trade associations). The climate change levy is also in the process of being implemented, which may have a variable and in some cases discriminatory impact on small firms.

UK policy-makers have thus encouraged voluntary, sectoral initiatives from industry to address environmental problems. This emphasis on voluntary action has meant that the environment has not been forced onto the business agenda of small firms, whilst the sectoral

emphasis has precluded SMEs from being targeted specifically, arguably encouraging further resistance from this sector.

The fact that there has been no attempt to foster the direct involvement of small firms in such environmental initiatives is surprising given the numerous obstacles that owner-managers have towards adopting environmental best practice and their apparent distrust of self-regulation. The typically low engagement of small firms with environmental agendas makes this sector distinct from large firms. Although big business has been widely criticized for appropriating environmental discourses and presenting them in terms that favour its own interests (Eden, 1997), large firms have at least integrated environmental management to some degree within their corporate strategies. The same cannot be said for small firms.

The few government initiatives that have targeted small firms specifically in the UK have tended to focus on the provision of information and advice through the environmental best practice programmes. At a more local level there are a number of fragmented waste minimization and environment-business clubs operating in the UK, which work to encourage efficiency gains.

There is little evidence of a formal strategy to specifically build upon these small beginnings. It appears that dealing with the laggard SME sector is seen by policy-makers as too difficult a task. The onus has thus been put almost entirely on the shoulders of large firms, whom it is hoped will start a process of 'greening the supply chain' by exerting pressure on small firms to improve their environmental performance. Yet studies have shown that, as yet, there exists little supply chain pressure and even less collaboration amongst stakeholders within the supply chain to encourage environmentally sound practices amongst SMEs (Hillary, 2000; Wycherly, 1999; Merrit, 1998).

So why is it that UK policy-makers appear to be so weary of targeting environmental



strategies at small firms? What makes this sector so difficult to reach? We suggest that a key reason for the disengaged and laggardly UK SME lies in the structure of environmental policy networks that have emerged as a result of processes of 'political modernization' within the UK polity.

Before we develop this argument further, it is necessary to give the discussion a more theoretical foundation by summarizing the contribution of ecological modernization theory to an understanding of processes of 'political modernization' and emerging environmental policy arrangements.

ECOLOGICAL MODERNIZATION, POLITICAL MODERNIZATION AND ENVIRONMENTAL POLICY

Ecological modernization (EM) theory has emerged as an influential theory explaining social and environmental change within industrialized nations. Although EM theory has been pieced together from many sources – and therefore different authors have used the concept in different ways – the major contributors to the theory have found broad agreement on some key themes. A central focus of the theory is the decoupling of economic growth from environmental degradation; empirical studies are cited that suggest that from the mid-1990s onwards there has been a delinking of material from economic flows in many industrial economies (Gouldson and Murphy, 1997).

Mol (1997) asserts that five key social and institutional changes are at the core of such physical transformations.

- (i) Markets in industrialized nations are restructuring around ecological principles in response to market signals, encouraged by innovators, entrepreneurs and other economic agents.
- (ii) New ideologies are emerging in business, public and political arenas that view environmental interests as increasingly harmonious with economic interests.

- (iii) Science and technology are judged not only for contributing to environmental problems but for their role in curing and preventing them. They are hence seen as central institutions for overcoming environmental problems.
- (iv) De-radicalized social movements are becoming increasingly involved in policy prescriptions regarding environmental reform, instead of being relegated to the periphery of institutional decision-making.
- (v) A process of 'political modernization' is perceived to be taking place within industrialized nation states as centralized, command and control governance structures are replaced with more decentralized, participatory and 'steering' styles of governance. Blowers (1998) argues that notions of consensus and negotiation are key to processes of political modernization, with environmental policy increasingly seen as a partnership, especially between industry and the state. Stakeholder participation and negotiated decision-making are key characteristics of policy networks that adopt an ecological modernization approach (Leroy, 1999).

Mol and Sonnenfeld (2000) contend that some scholars (such as Weale, 1992; Mol, 1995; Spaargaren, 1997) use these premises as analytical tools to explore current processes of environmental reform and social change in industrialized nations. Others (such as Christoff, 1996; Dryzek 1997) either propound or dispute the idea that EM is not only useful analytically but has normative merit in outlining desirable paths for future political action. The distinction between EM as a theory of social change and as a political programme is an important one, particularly as it is common in the literature for its analytical and prescriptive dimensions to be confused (Murphy, 2000).

As a political programme for change, proponents of EM approaches conceive of environmental degradation as a challenge



for socio-technical reform rather than as an inevitable outcome of capitalism or industrialization, and therefore oppose radical transformations of modern institutions. In this view, capitalism can accommodate environmental problems by increasing the 'environmental efficiency' of the economy. This can be done by substituting polluting and non-renewable materials with environmentally benign and renewable ones, recycling and minimizing waste and encouraging resource and energy efficiency (Gouldson and Murphy, 1997). Ecological modernization is perceived to be a potential source of future growth by stimulating innovation, providing new market opportunities for eco-products and clean technology and lowering clean-up costs. The role of the state is prescribed as 'enabling' rather than controlling, engendering environmental reform within industry via market mechanisms (where possible) and participative, consensual governance structures rather than command and control policies. Processes of political modernization are thus seen as critical in catalysing the ecological modernization of industry.

A third strand to the ecological modernization debate is the role of cultural politics and discourse. This strand has been developed mainly by Hajer (1995, 1996), who examines 'story-lines' and discourse coalitions to understand the process by which notions of ecological modernization are socially constructed. Leroy (1999) develops a critical analysis of political modernization by arguing that negotiated policy environments do not take place in a politically neutral space but are carried out within policy networks of stakeholders that consist of dominant traditions and discourses. He asserts that it is important to look at the policy arrangements underlying political (and ecological) modernization in order to explore the assumptions and priorities implicit within them, and to assess whether these collaborative networks encourage new power relations or merely reinforce old ones (see also Tattenhove *et al.*, 2000).

PARTICIPATIVE GOVERNANCE AND THE PROBLEM WITH UK POLICY NETWORKS

In line with notions of political modernization in EM theory, the role of stakeholder dialogue and partnership in policy formulation has been increasingly emphasized in the UK. The deregulation and privatization emerging from the Thatcherite revolution during the 1980s has engendered a climate of co-operation between government and industry and has allowed business a privileged access to government policy-making (Blowers, 1998). Despite a highly centralized bureaucracy in the UK, decentralized decision-making occurs in large areas of public administration via the dominance of QUANGOs (quasi-autonomous non-governmental organizations), which are made up of business people, local government, academics, voluntary and community groups.

As Leroy (1999) argues, a key issue is whether these policy networks create new collaborative structures, which give a voice to previously marginalized interest groups, or whether they are merely reproducing and reinforcing hegemonic power relations.

We argue the latter: that the environmental policy context in the UK is reinforcing existing power relations and dominant discourses rather than encouraging new ones. In contrast to other European countries such as the Netherlands, the UK has not created an infrastructure that facilitates negotiated dialogue between all interest groups. As Blowers asserts,

[While] power is concentrated amongst political and bureaucratic elites, access to the power structure is restricted and decision-making is hidden. Among the groups enjoying privileged access are business elites. Although other interests such as environmental groups gain admittance from time to time... their access is intermittent and specific rather than privileged and routine (Blowers, 1998, p. 240).



We argue that it is not just environmental groups that remain on the periphery of these elite networks. Instead of being targeted as key stakeholders, SMEs have been marginalized and often omitted from policy dialogue between government and industry. Unlike the case in the Netherlands, there are few formalized networks of intermediary bodies in the UK that represent small firms at the government level. The business lobby, ostensibly propounding 'the view of industry', has little real input from the small firm sector due to low levels of SME membership in trade associations and local chambers of commerce. Such intermediary bodies are dominated by large firms and, arguably, it is their interests that are primarily put forward in stakeholder dialogues at the government level.

We argue that it is this lack of institutional enfranchisement that is the key to understanding the reasons behind the seemingly disengaged and laggardly UK SME. While small firms have so little democratic representation, it is not surprising that the sector has a low engagement with voluntary agreements made by big business and policy-makers, which have little perceived benefit for individual small firms. Proponents of ecological modernization as a political programme might well argue that if the UK government is to successfully encourage the ecological restructuring of industry, 'political modernization' must be furthered by incorporating the small firm sector within processes of negotiated decision-making to a much greater degree.

Recent research evidence supports this idea that stakeholder collaboration is an important factor in engaging SMEs with environmental discourses. A study of Danish SMEs by Pedersen (2000) highlights the importance of effective dialogue between small firms and local authorities as the latter can support the former with a wide range of environmental expertise. Biondi *et al.* (1998) assert that co-operation is the most significant factor in encouraging small firms to consider eco-management and auditing schemes (EMAS), because it enables

firms to learn from each other and it builds relationships with stakeholders. Fanshawe (2000) suggests that greater co-collaboration between small firms and stakeholders such as government, regulators, support agencies and trade associations could help SMEs to understand their environmental responsibilities by creating a framework for more co-ordinated information exchange.

However, is the UK institutional context compatible with negotiated policy environments that involve small firms?

THE ROLE OF TRADE ASSOCIATIONS: THE MISSING LINK?

UK policy-makers have focused on trade associations as the primary agent for developing and implementing voluntary 'sectoral sustainability strategies'. Research evidence has shown that trade associations are a potentially effective way to reach small firms (Boleat, 1996; North *et al.*, 1997). This has certainly been shown to be the case in the Netherlands. In the UK, trade associations appear to have some potential as providers of environmental advice and support. Smith and Kemp (1998) reported that nearly a third of UK SME respondents felt that trade associations could persuade them to change their environmental practices. Hunt (2000) has also argued that trade associations are a particularly effective way of communicating environmental messages to SMEs because they are able to offer sector specific information.

However, little can come of attempts by trade associations to reach SMEs whilst membership levels within this sector are still low. If trade associations are to be the primary tool for government environmental initiatives targeting industry, then it is important that these intermediary bodies are representative of both large and small firms.



CONCLUSIONS

The relative success of Dutch environmental policy in the late 1990s suggests that the problems faced by those seeking to incorporate UK small firms into the environmental agenda may not be as intractable as it first appears. Scope for change may be greater than is often envisaged if we are correct in our central assertion—that the environmental practices of small firm owners are constrained more by a lack of consensual governance in the UK than by anything intrinsic to small business itself.

We suggest that a 'target group' approach like that used in the Netherlands might be an appropriate way of involving a wider range of interest groups in UK environmental policy discourses. Whilst a sectoral approach is important in understanding the ways in which structures and dynamics of different industries affect their response to environmental policy, targeting small firms cross-sectorally to address environmental problems is vital if their common barriers towards environmental management are to be overcome. If UK small firms could be as meaningfully engaged in a consultative process aimed at stimulating environmental management as they have been in the Netherlands, this might create a context of consensual support for environmental policy strategies and reflect the contribution of the SME sector to the solution, thus engendering proactive rather than reactive responses to environmental problems.

It is vital that UK policy-makers place more emphasis on maximizing the engagement of SMEs in initiatives such as the sectoral sustainability strategies, rather than passively hoping for supply chain pressure to catalyse their involvement. It is thus crucial that intermediary networks are strengthened so that they are able to reach and engage SMEs in the policy process. Trade associations could potentially be key tools in reaching the small firm sector in order to implement environmental initiatives. Compulsory membership of trade associations may be a way of kick-starting the creation of

a formal institutional structure that includes SMEs as well as large firms in the stakeholder networks that negotiate environmental policy. This kind of partnership is vital if the UK polity is to stimulate the kind of 'ecological modernization' of industry that has occurred in the Netherlands.

The extent to which it is appropriate for UK policy-makers to rely primarily on voluntary agreements and supply chain pressure to reach SMEs without the backing of a robust legislative system also needs careful analysis. In the Netherlands, covenants with industry organizations have been made, but importantly policy-makers have not relied solely on voluntary agreements. The success of the Dutch environmental policy can also be contributed to a robust legislative, licencing and inspection system, which has encouraged high levels of compliance (see Spence *et al.*, 2000). Instead of relying so heavily on voluntary sectoral strategies, a policy environment in the UK that included a more targeted legislative and inspection system might have greater success in encouraging environmentally proactive behaviour from SMEs.

We highlight the need for further research to explore relations between the state and business, and particularly how the agendas of various interest groups within the business community (including small firms) are constructed within this relationship. Further research is also needed to explore how a more representative institutional structure might be achieved in the UK: one that actively engages with the interests of small firms and other marginalized parties. Issues of political modernization, enfranchisement, participation and corporate hegemony are key to providing a fuller understanding of the macro-context in which policy decisions are ultimately made. It is imperative that we consider these wider power structures because they may explain why UK small firms at the individual level have come to resist environmental discourses. Only by looking at the broader picture might we then come to some understanding of how the barriers that SMEs



have towards embracing environmental goals might be constructively removed.

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Study 1

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Environmental Policy and the Small Firm in Japan: Comparisons with the Netherlands

ANDREA REVELL

ABSTRACT *This article explores how environmental policy arrangements influence the attitudes and behaviour of small firm owners. The findings are presented from a qualitative study exploring the influence of national governance structures on the environmental practices of restaurant and mechanical engineering firms in Japan. A comparison is made with the Dutch environmental policy context to illustrate how structural factors can crucially influence the individual responses of small firm owner-managers to environmental pressures. The political enfranchisement of Dutch small firms and their participation in 'target group' policy consultations appears to have been a key factor contributing to their engagement with environmental initiatives. The paper concludes by suggesting the need for a more participatory institutional structure in Japan in order to encourage the 'greening' of the small firm sector.*

Introduction

The importance of small and medium-sized enterprises (SMEs) to national economies and the environment is clear. SMEs constitute around 95 per cent of all private sector firms in most industrial nations and so, cumulatively, they undoubtedly have a significant "ecological footprint" (Schaper, 2002). The most commonly quoted (although not yet verified) statistic of SMEs' environmental impact is that they collectively contribute to as much as 70 per cent of all global pollution (Hillary, 2000).

Despite this, most research in the business and environment field has focused on the ecological impact of large firms, whilst the impact of small firms continues to be an under-researched area. Much of the work to date on SMEs and environmental issues has described the obstacles these firms face in adopting environmental best practice. Empirical studies have found a lack of engagement with environmental issues amongst owner-managers and, therefore, discussions have tended to focus on how to remove internal barriers within the firm and motivate owner-managers to improve their environmental practices (see Hillary, 2000).

However, little has been written about the structural factors that come to bear on small firm environmental practices, such as the influence of national governance structures and environmental policy arrangements. Whilst the characteristics of small business

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populations throughout the industrialized world are often similar, there are clearly different institutional structures linking business, the state and civil society, and these social and political arrangements influence the environmental behaviour of small firms in a variety of ways. It is important to understand this wider context so that one might come to some conclusion as to how to remove structural barriers and facilitate environmental reform within the small firm sector.

In order to address this gap in the literature a qualitative study was undertaken recently to explore the environmental attitudes and behaviour of Japanese small firm owners, and to examine the influence of environmental policy arrangements on their responses to environmental imperatives. The Japanese context is compared with the literature on Dutch environmental policy arrangements in order to provide some insights into how to facilitate environmental reform within the SME sector. In the Netherlands a consensual, target group approach has been adopted, whilst Japan has favoured voluntary approaches to encouraging environmental best practice within industry.

In the following sections, a brief literature review of Japan's political economy and environmental policy arrangements is presented to build a picture of the institutional context for small firms. Previous studies on small firm environmental practices in Japan are then summarized before the findings of this research are presented. Comparisons are then made with the Dutch case and the implications for Japanese environmental policy and small firms are discussed.

Japan

The Economic Context for SMEs

Japan rates alongside Italy as having the largest number of small firms in OECD nations (OECD, 1994). Small firms are the backbone of the Japanese economy, accounting for over 99 per cent of all firms (JSBRI, 1999). Japan has always had a high proportion of small firms, bucking the trend of U-shaped fluctuations in SME numbers which many other nations have undergone as they industrialized. Yet, fascination with 'Japan Inc.' has meant that the business literature has tended to refer to SMEs mainly in terms of their sub-contracting relationship with large firms.

Much has been written about Japan's 'dual economy' and the mighty *keiretsu* (sub-contracting) structures which emerged after Japan's rapid post-war modernization. Whittaker (1997) explains how wide productivity and wage gaps opened up between small and large firms during the 1950s and 1960s as a period of rapid growth led to the development of a large domestic market for manufactured goods. SMEs lacked equal access to imported technology and were effectively excluded from major sources of finance for investment that favoured big business. Although small firms had lower productivity, they also had lower costs. Large firms on the other hand had higher labour costs which were irreducible, and this led them to subcontract those parts of the manufacturing process which required lower technological and supervisory standards to SMEs. Large firms were, thus, able to make effective cost reductions one step removed. SME sub-contractors were numerous so competition was fierce, enabling large firms to have the major say in fixing prices and terms. In contrast, sub-contractors very livelihoods depended on the custom of their large 'parent' firms. *Keiretsu* structures have, thus, historically enabled parent companies to enjoy a level of control over supply akin to that of vertical integration (Ahmadjian & Lincoln, 2000).

However, Whittaker (1997) argues that supply chain relationships are changing rapidly as large firms have invested heavily overseas whilst rationalizing at home, causing a decline in employment. First-tier sub-contractors are now increasingly supplying other competitors, breaking their reliance on a single parent company. Parent companies, in turn, are increasingly concentrating orders with larger sub-contractors because larger firms are better able to keep up technologically. This has had a profound effect on smaller sub-contractors, who have been forced to reduce their reliance on mass production networks. Costs have risen sharply, resulting in increased closures and depressed start-up rates for small firms.

A key factor affecting the demographics of the SME sector is that the Japanese economy is in a period of crisis and transition. The current malaise has been attributed to a number of factors, including state-industry protectionism and excessive public expenditure on development projects which artificially stimulated demand and encouraged inefficiencies. Growing burdens, including a mountain of corporate debt, has depressed investment and resulted in a prolonged financial and political crisis (*The Economist*, 2001; *Newsweek*, 2001).

Repeated attempts to jump-start the economy with massive public spending have failed dismally, resulting in Japan being the most heavily indebted country in the world (Kerr, 2001). Major, painful reforms within the political economy have been called for. Proposed economic reforms centre on privatization and deregulation, including the scrapping of long-held protectionist policies that have propped up inefficient domestic markets. Political reform has also been on the agenda. However, these reforms have been slow to emerge.

Social change is also working against SMEs. Japan has a rapidly ageing population and falling birth rates that will cause major labour market pressures in years to come. Whittaker suggests that education trends favour large firms who poach young graduates. SME owners, thus, tend to be older and a skills gap has emerged in the manufacturing sector as craftspeople retire without readily available replacements.

Environmental Politics

Environmental policy making in Japan is distinctive for its decentralized, negotiated and voluntary nature. Ren (2000, p. 80) argues that:

The Japanese approach to environmental management features power-sharing among ministries and joint administrative responsibilities at the national level; a relatively high degree of decentralisation of the vertical administrative structure that gives local governments leading roles in implementation; self-governance by business; a triangular model of actors and the determination of operational rules through a negotiation process premised on consensus-building.

The OECD's (1994) review highlights that local authorities have considerable power in environmental policy making, with the municipal and prefectural governments historically being the first to act on policy and prompting action at the national level. The 1947 Local Government Law entitled municipalities to pass their own ordinances and many used this authority to address pollution problems in the 1950s and 1960s. There has been a strong emphasis on self-regulation of industry in Japan and, since the 1960s, over 40 000 voluntary agreements between business and local authorities have been put into effect (Sugiyama & Imura, 1999). Local governments are able to put considerable

pressure on business to conform to voluntary agreements by withholding permits and economic incentives (OECD, 1994).

In Wallace's (1995) major empirical study of environmental policy and industrial innovation in Japan, policy makers and industrialists viewed local authorities as driving environmental policy because they imposed tougher voluntary standards on local industry than existing regulations called for, which in turn pushed future environmental regulations towards stricter standards. Local authorities were perceived to have built up a reputation for listening to industry and had promoted a flexible, participatory approach to achieving environmental policy goals.

Wallace (1995) argues that state-industry relations are characterized by co-operation and consensus:

Commentators on Japan's social and industrial successes in the postwar period frequently refer to deeply held values of consensus and cooperation in Japanese society. In the environmental field, these values are generally thought by outsiders to be the basis on which the national bureaucracy, especially MITI¹ secures the cooperation of industry in meeting environmental objectives.

Wallace highlights how the Ministry of Environment encourages the participation of industry in standard setting via the 'technical hearing system' whereby relevant technical information from industry is heard prior to legislation, thus enabling regulators to set appropriate targets. State-industry relationships are described as highly co-operative, with environmental regulation only enacted after careful consideration of industry's capacity to meet those standards via trial and error voluntary initiatives. Wallace's central assertion is, thus, that environmental goals in Japan are achieved at lowest cost by a flexible process of open dialogue and consensus-building between policy makers and firms.

Whilst environmental policy making in Japan may be characterized by its decentralized and consensual nature, there is a substantial body of literature that describes Japanese politics as highly centralized, closed and elitist. Authors such as Johnson (1995), McCormack (1998) and Woo-Cummings (1999) describe Japan as a 'developmental state' where policies are made by a centralized, strongly bureaucratic system with little role played by pluralist influences. In McCormack's (1998) critique of the Japanese 'economic miracle' he maintains that:

bureaucratic autonomy and privilege, and the exclusion of democratic principles, may have been part of the formula of successful growth in the early post-war decades, but vested bureaucratic interest now constitutes a major blockage to the sorts of fundamental reform of which 21st century Japan stands in need (McCormack, 1998, p. 41).

Supporting this view of 'bureaucratic autonomy', Schreurs (1996) contends that environmental policy networks actively reinforce hegemony by excluding critical commentators from advisory committees. Because the ministries have the right to select who will sit on these committees, there is no place for non-governmental organizations (NGOs) that might criticize government actions. Schreurs argues that such institutional barriers to public participation in environmental policy making have severely hampered the development of the environmental movement in Japan. Whittaker (1997) corroborates that advisory committees which are supposed to solicit broad input end up retaining strong bureaucratic input. Although they are supposedly made up of representatives from

NGOs, industry, academia, media and consumers, half end up being former bureaucrats and others are chosen because they are 'bureaucrat friendly'. Whittaker, hence, sees these policy networks as instruments of bureaucratic manipulation.

Many authors have favoured a corporatist model of the Japanese political economy, whereby power is concentrated within the 'Ruling Triad': a triumvirate of corporate élites, politicians and bureaucrats (Broadbent, 1998, p. 23; Jänicke & Weidner, 1996, p. 85). In Broadbent's (1998) major longitudinal study of Japanese environmental policy networks, he concludes that big business, the state bureaucracy and the ruling Liberal Democratic Party (LDP) dominate national governance structures. Dense social ties among these three spheres make them more like a single interest group, using horizontal networks to maintain a co-operative coalition. Within the Ruling Triad, policy making is based on negotiation and consensus building, but outside the Ruling Triad other stakeholders such as public interest groups have much weaker reciprocal ties to ministerial bureaucrats. Those relations that they do have tend to diminish their autonomy and subordinate them to ministerial priorities. Horizontal ties, thus, dominate within the Ruling Triad and vertical ties dominate outside of it.

In Broadbent's view, the hegemony of the Ruling Triad has resulted in a major emphasis on economic growth and capital accumulation at the expense of the environment. He argues that the LDP has consistently couched its environmental policies in line with the interests of big business, furthering corporate hegemony by allowing producers to dilute the objectives of environmental reform to defend their own narrow economic interests.

Huber (2000) highlights the lack of environmental reporting and stakeholder communication within Japanese corporations, arguing that "industry in Japan may be confronted less with political and civil society counterpowers" (Huber, 2000, p. 276). Miyamoto (1997) highlights how, for 25 years, the business lobby successfully blocked an Environmental Impact Assessment (EIA) Law. It was finally introduced in 1997, by which time Japan had become known as 'the construction state' due to the prolific building of roads, airports, high-speed rail links, tourist resorts and dams. For instance, 60 per cent of the Japanese coastline is now covered in concrete and 110 out of the 113 major rivers are dammed, wreaking havoc on local ecosystems (Kerr, 2001). Imura (1997, p. 85) asserts that:

For several decades, the so called political, administrative and business triangle has dominated Japanese politics. This triangle formed around public works projects and created a strong pro-development power block, opposing EIA legislation and public participation in environmental decision-making.

In summary; environmental policy making in Japan is characterized by its decentralized, consensual and voluntary nature. Local authorities exert a good deal of influence over environmental policy goals and emphasize flexible, voluntary agreements and the self-regulation of industry over command and control approaches. State-industry relations have been described as highly co-operative, with negotiation and consensus occurring to achieve environmental objectives. However, it has also been highlighted that the partnership existing between industry and government is confined mainly to a triumvirate of big business, bureaucratic and political élites. Whilst neo-corporatist structures may well have fostered co-operation and consensus amongst those within the halls of power, other stakeholders have been actively marginalized from policy networks. Scholars describe Japan's governance structures as lacking in participation

and transparency and as fortifying existing structures of entrenched power whilst subordinating other interest groups.

The 'Greening' of the SME Sector

Because studies that focus on this sector are sparse, it is difficult to fathom the degree to which SMEs in Japan are greening. There are a small number of quantitative studies on small firm environmental practices (Asahi Bank, 2000; Japan Finance Corporation, 1997; Sanwa Research Institute and Consulting, 2000; Yamazaki, 2000). Overall, however, there seems to be a distinct paucity of academic research in the area.

The aforementioned quantitative studies suggest that waste minimization is the main environmental measure undertaken by Japanese small firms, which is perhaps not surprising given the waste disposal pressures that Japan faces as a small country with a large population. Yamazaki's (2000) study of over 2000 SMEs in the Tokyo area found that of the 59.4 per cent that claimed to be environmentally active, 54 per cent were attempting to reduce waste. However, 85 per cent of the total sample did not recycle or reuse waste, citing cost, lack of know-how and uncooperative customers as reasons. Only 17 per cent of firms were attempting to save energy. Reasons for not engaging in environmental measures included "costs too much" (particularly in firms with less than 100 employees) and "don't think it is necessary" (particularly for respondents who perceived their firms to have low levels of waste and energy usage). Other reasons cited were "no personnel" and "lack of know-how".

A study of 1590 SMEs in the Tokyo area (Asahi Bank, 2000) found that 70 per cent of the sample claimed to be taking measures to cope with environmental issues, mainly waste disposal (such as cutting paper usage) and reducing energy usage. However, other environmental measures such as recycling or introducing energy saving equipment were rare. The main obstacles to making environmental improvements were found to be a lack of environmental awareness, the cost of investing in environmental equipment and lack of technical know-how. The majority of small firms claimed to be too busy trying to cope with regulations to consider voluntary environmental initiatives or environmental management system accreditation.

Following on from this review, it seems timely to explore the influence of national governance structures and environmental policy arrangements on the environmental orientation of small firms in Japan.

The Japanese Study

The objectives of the research were to:

1. explore the environmental practices of Japanese small firm owner-managers;
2. examine the perceived barriers and drivers to environmental best practice;
3. explore the influence of national governance structures and environmental policy arrangements on owner-manager's orientation towards environmental management.

Fieldwork was conducted between February and May of 2002. The methodology was split into two stages. First, 'key informants' from relevant trade associations, professional bodies, chambers of commerce, local government and academia were interviewed in order to build a picture of the political and economic context of Japan, particularly regarding environmental policy and small firms. This overview informed the interview schedule for the next stage and added triangulation to the research design by allowing

emerging themes and issues to be explored from different perspectives. A semi-structured interview schedule was used and interviews typically lasted two to three hours. To overcome language barriers, a translator was present at every interview; these were audio-taped and subsequently transcribed.

The second stage involved 20 interviews (typically lasting between one and two hours) with owner-managers in the restaurant and mechanical engineering industries of Ota-ku, Tokyo. Ota-ku is the southernmost district of the 23 wards of Tokyo, with a population of 650 000.

A sectoral comparison was considered important because past studies demonstrate significant differences between SMEs according to sector (Curran & Blackburn, 1994). It was assumed that the environmental practices of small firms would be heavily conditioned by the industry sub-culture in which they operated. The restaurant and mechanical engineering industries were chosen because they are made up of large numbers of small enterprises and these firms can be considered fairly typical of small firms in industrialized countries. In Japan, there are 81 640 mechanical engineering firms, (European Commission Directorate General, 2003) and 238 649 restaurants (Asahi Shimbun, 2002). Within these industries, 99.8 per cent are SMEs (METI, 2002). Moreover, mechanical engineering and restaurant firms are involved in business-to-business and business-to-consumer sales, respectively, thus enabling an exploration of the influence of different kinds of supply chain relationships on environmental behaviour. The sample consisted of firms with under 50 employees, and over half of these were micro-firms (1–9 employees), as these represent the majority of businesses in both industries.

Findings

Small Firm Responses

Whilst small firm owners were found to have a positive attitude towards environmental protection and saw it as the responsibility of both individuals and the state, none of the respondents in the sample considered their firms to have much of an environmental impact. Because they felt their impact was insignificant and because they were not the target of legislation to reduce these impacts, the environment was not considered a key business issue. As one independent mechanical engineering firm of 10 employees put it: "I think SMEs in our industry, especially smaller ones, do not have serious environmental problems. I do not know much about regulations, which means [we are] not so regulated".

Pollution control measures appeared to be limited as respondents perceived their emissions to be negligible. There was a limited amount of reform occurring in terms of energy efficiency and waste minimization as some owner-managers had bought energy efficient technology or had attempted to minimize waste in order to reduce collection fees. More progressive environmental reforms such as the implementation of environmental management systems had yet to be embraced across the sample.

An interesting finding of this study was that, due to differing sectoral dynamics, restaurants were less likely to be voluntarily undertaking eco-efficiency measures than mechanical engineering firms. Many mechanical engineers claimed to have reduced their energy usage as a result of upgrading their equipment: "As secondary effects of upgrading of equipment, energy and water use efficiency has been improved" (mechanical engineering firm (mouldings), third tier, four employees); "I installed the [energy

saving] equipment and cut costs" (third- or fourth-tier mechanical engineering firm, sole proprietor).

In contrast, most restaurant owner-managers did not see the cost-benefits to be made from investing in energy saving equipment and were not attempting to minimize energy usage beyond turning off machines when not in use. Typical comments were: "Energy costs are high but I think most restaurants see such costs inevitable and accept them. As a service industry, when it's hot, I have to keep it cool enough for the customers" (restaurant, four employees); "It costs too much to install new [energy efficient] equipment" (restaurant (*yakitori*), five employees).

Sectoral differences in energy efficiency measures may be more understandable when one considers that there may be more of an imperative for mechanical engineers to upgrade their equipment because they work in an industry where state-of-the-art machinery is a key competitive advantage. For restaurant owners on the other hand, the cost of replacing equipment purely to save energy may seem prohibitive.

In terms of waste minimization, mechanical engineers regularly re-used machine cutting dust and oils in their production processes. However, restaurants found recycling problematic because the lack of municipal recycling services meant that the onus was on voluntary initiatives. Organizing communal recycling systems was seen as difficult because of the poor waste separation practices evident within the restaurant industry. As one restaurant owner explained:

It may be correct to say that some restaurants cooperate for recycling but most do not, even though they understand they should separate wastes. Many restaurants are not so cooperative, even if they know what they should do. Even separation is far from enough at present (restaurant (*yakitori*), four employees).

Many respondents believed that lack of care in waste disposal was widespread within the industry. Typical comments were: "All restaurants that use municipal collectors have to separate wastes according to [Tokyo Metropolitan Government's] classification, but they often don't care" (restaurant (*yakitori*), five employees); "Many restaurant owners around here do not live in Ota, and they don't care about waste management. They are concerned more about profits and at night no one watches them disposing wastes in an improper manner" (traditional Japanese restaurant, 11 employees).

A few respondents admitted that they struggled to observe the strict separation procedures required by collectors, claiming to have neither the time nor the personnel to devote to maintaining high waste management standards: "We do not have enough time to meet the collectors requirements regarding waste separation. We are very busy during the business hour" (restaurant (*izakaya*), 11 employees); "We offer very reasonable price to customers, so we have to cut labour costs and this means there's not much time to do other things like waste management" (restaurant (traditional Japanese), 11 employees).

Interestingly, market dynamics such as supply chain pressure and consumer demand did not appear to be encouraging the majority of owner-managers to improve their environmental performance. Customers apparently did not ask about the environmental practices of the restaurants they ate in, nor did they enquire about organic food or the sourcing of food, suggesting that the influence of 'green consumerism' had yet to extend its reach to the restaurant industry. One restaurant owner highlighted the confusion between environmental practices and hygiene, which may be one reason for the lack of pressure on restaurants to address environmental issues: "Customers never ask about

environmental practices. This might be considered quite rude in Japan—as if they doubted the hygiene of the restaurant” (restaurant (*izakaya*), two employees).

Despite Japan’s historically tight *keiretsu* structures, which might have been expected to be a strong driver of ecological reform within the mechanical engineering sector, none of the owner-managers claimed to be experiencing supply chain pressure to green production processes or gain environmental management system accreditation. As one first-tier mechanical engineer explained: “We have to comply with EU standards when importing our products. But so far I haven’t been asked to get ISO 9000 or 14000. It’s too costly for small firms. If we don’t have to pay for it, we won’t” (mechanical engineering firm (metal products), first tier, 22 employees).

It is, perhaps, surprising that large firms, which according to Fukasaku (1995) are becoming increasingly ‘environmentally competitive’ in Japan, are not doing more to encourage environmental reform within their supply base. If anything, supply chain relations were actively discouraging the greening of smaller firms due to the pressure to cut costs as a result of the worsening economic recession. An owner-manager of a third- or fourth-tier firm explained: “The economic climate is very bad, especially for smaller firms further down the supply chain because cuts by large firms affect them first” (mechanical engineering firm (metal products), third or fourth tier, sole proprietor).

Market forces were, thus, creating barriers to voluntary environmental reform as the pressures of Japan’s economic crisis increased owner-managers’ preoccupation with price imperatives. The emphasis on cost reduction as a source of competitiveness clearly resulted in the low prioritization of environmental considerations because the environment was generally viewed as a cost burden. The following quote typified the feeling amongst owner-managers:

If the economy is better, I can charge more to pay for the additional costs. If I can hire one more employee for waste management, I think I can solve the problem. The restaurant industry is now seriously depressed under this bad economy. If I am urged to react to environmental issues now, its impossible in this situation. I want a good economy first (restaurant (traditional Japanese), 11 employees).

Many respondents expressed resistance to taking voluntary action because of a fear that ‘free riders’ would gain competitive advantage. Instead, regulation was considered the best way to ensure sound environmental practices: “I believe most people would be eco-conscious enough to pay for the cost, but some wouldn’t. So you see equal regulation is needed” (mechanical engineering firm (optical instruments), third tier, sole proprietor); “Government should ensure an equal footing in the market” (mechanical engineering firm (air conditioning parts), second tier, five employees).

The Influence of Environmental Policy Arrangements

Japan’s economic recession is one structural factor that is clearly having a major effect on the degree to which owner-managers are voluntarily undertaking environmental measures. However, the policy context in Japan has also had an important bearing on the orientation of owner-managers towards environmental management.

Key informants explained that national environmental policy in Japan tends to take a sectoral rather than size approach and, therefore, does not specifically target small firms. This has made it easier for owner-managers to ignore environmental issues. At the local level, municipal authorities are more likely to ensure that small firms are included in

environmental ordinances, but these are not backed up by regular inspection of small firm premises.³ The emphasis has, therefore, been on self-regulation by the SME sector. A key informant from the environmental division of Ota-ku's local authority admitted that it was difficult to effectively police environmental laggards except by relying on public complaints.

The regulations are basically for permission before a site starts its operation. So there is no systematic follow-up measure to make sure whether SMEs really comply with ordinances or not. Complaints from residents are the only opportunity for inspection.

The fact that the environment is not a core business priority for owner-managers may, thus, be more understandable when one considers that neither the state nor the market are putting significant pressure on SMEs to address environmental problems.

Another factor that may be important in understanding the responses of owner-managers is the degree to which the small firm sector is consulted in environmental policy formulation. A key finding of this study was that small firms did not feel that their views were adequately represented in policy making and this had engendered a reactive rather than proactive response to policy initiatives.

Owner managers felt (and key informants corroborated) that it was big business who had the ear of policy makers, not small firms who lacked the resources and organization to challenge the hegemony of corporate and bureaucratic élites. The co-operative, reciprocal ties between industry and the state was felt to apply mainly to large firms and their ministerial confidants and not to the vast numbers of small firms across the country. As one key informant from Doyukai, an independent lobbying group for small firms explained: "Presidents of major organisations such as those in the Keidanren and government senior officials regularly have meetings over breakfast and exchange information. For SMEs there is no direct channel like this".

One of the key reasons for their sense of political disenfranchisement was that owner-managers felt distanced from the industry organizations that were supposed to represent them in policy networks. A note on the structure and role of industry bodies is necessary here in order to elucidate the significance of this finding.

Trade association membership levels are very high in Japan, with most firms joining one or more associations within their sector (Schaefer, 2000). Membership fees are comparatively high and their big budgets mean that they tend to be well organized. They also rely on public funds and have close ties with government, providing crucial channels for policy implementation.

Trade associations fit into a pyramid structure, with administrative and regulatory roles performed by the lower layers whilst the higher layers carry out political functions. The pyramid bottom consists of core associations (mainly made up of large firms and some middle-sized firms) and co-operatives (made up of small firms). Core associations and co-operatives are mostly categorized by narrowly defined sub-sectors of industries (e.g. noodle restaurants, sushi restaurants, etc.), hence there are multitudes of them. The pyramid middle is made up of umbrella associations or federations (for large firms) and peak co-operatives (for small firms). This middle band of organizations encompass more broadly defined industry segments and are usually national in scope. The major umbrella association for small firm co-operatives is the 'Chuokai' (National Federation of SME Organizations) which represent cross-sectoral SME interests. As there is no independent lobbying industry in Japan, umbrella associations fill this role. However, they rarely mount political campaigns as such, having been 'incorporated' into the policy

processes since the 1970s (Whittaker, 1997). Campaigns that exert pressure for more radical reforms are left to periphery left wing organizations such as the *Doyukai* and the socialist *Minshou* for small firms.

The pyramid top consists of four peak organizations:

1. The Keidanren; the most powerful political forum for big business headed by corporate executives (the chairman is called the 'prime minister of Japan'). Their core role is to mediate disputes and to lobby government.
2. Keizai Doyukai (Economic Friendship Club); members are individuals rather than associations, mainly from blue chip companies in key industries such as banking and retailing. This organization is also important in voicing corporate interests.
3. Nikkeiren, the employers' peak organization which counters labour unions' peak organizations.
4. Japan Chamber of Commerce and Industry (JCCI), the umbrella organization of all regional chambers of commerce (CCI). This quasi-governmental organization provides management advice and guidance for SMEs and also represents small firms in policy networks.

There are also a vast number of informal groups that have not been declared to government, such as informal industry discussion groups and 'shadow associations' to further mutual interests. These informal groups are often hugely influential; for instance the informal Toginkon group in banking is considered to be the most powerful of all banker's associations (Schaede, 2000).

Despite the complex array of intermediary bodies in Japan, this study found that respondents were disappointed with the level of support and representation offered to small firms by peak associations. It was felt that SME interests at the local level were not always fed up to the national trade associations that were influential in environmental policy circles. Moreover, local co-operatives and CCI were considered biased towards the interests of medium-sized firms and out of touch with the needs of their many small and micro firm members. There was a strong perception that trade association and CCI meetings were an opportunity for "socializing or networking" rather than a chance for small firms to receive practical advice and guidance. Participation by smaller members was, hence, low, exacerbated by the time constraints owner-managers felt themselves to be under. Board members were often criticized for being more concerned with their own status than the needs of their small firm members and were considered too removed from practical business realities. Typical comments from owner-managers were: "CCI doesn't understand the reality for firms like us" (restaurant (*izakaya*), 11 employees); "I don't expect much from CCI or trade associations" (mechanical engineering (metal products), third or fourth tier, sole proprietor); "We are too small. It is only larger firms that are involved in policy talks in CCI" (mechanical engineering (automotive parts), third tier, sole proprietor); "Most trade associations are for socializing or networking, so I don't attend" (mechanical engineering (mouldings), four employees).

Augmenting this sense of alienation, government consultations with industry on environmental policy at technical hearings, conferences and government councils were perceived to marginalize the views of small and micro firms. Ministries were thought to make decisions on environmental standards without adequate knowledge of small firm technical/practical issues. The technical hearing system was considered unrepresentative, with the same large and medium-sized firms being invited to take part each time. Conferences for SMEs were also criticized for the same reason; only certain medium-sized, first- and second-tier firms were invited. Key informants from small

firm-dominated trade associations claimed that local authorities rarely asked for their views on policy initiatives. As one representative from Ota Federation of Engineering explained: "TMG [Tokyo Metropolitan Government] often sends written notifications on policy implementation and asks for cooperation, but never consults us".

Owner-managers clearly felt a deep disaffection with the current political climate in Japan. Typical comments were: "I'm against LDP [the Liberal Democratic Party] because they are too self-serving. They are 'political businessmen', rather than politicians. They are so terrible!" (mechanical engineering firm, (metal products), third or fourth tier, sole proprietor); "I don't expect much from politicians. They are just interested in making money out of politics" (mechanical engineering firm, (metal products), first tier, sole proprietor); "Politicians are just canvassing for votes. They often come to [trade association] meetings to advertise themselves, not to listen to or discuss the real problems for small firms" (restaurant (traditional Japanese), 12 employees).

A key informant from Doyukai, the independent lobbying group for SMEs, claimed that policy-making processes in Japan are highly informal and influence peddling is the norm. Informal networks of vested interests, cronyism and corruption were identified as key contributing factors to Japan's prolonged economic crisis: "Trade associations can influence policy making directly via their contacts with politicians—it is a hotbed of bribery"; "Political networks are problematic because they represent the haves only. They tend to be paternalistic and unhealthy".

In conclusion, these findings suggest that the emphasis on voluntary action and the self-regulation of industry within Japanese environmental policy has meant that the environment is not yet a core business concern for small firms as neither the state nor the market have provided significant enough pressure on owner-managers to reduce their environmental impacts. Moreover, a lack of participation in environmental policy networks may have contributed to small firm resistance to environmental action. Whilst they feel they have such little political enfranchisement, it is perhaps not surprising that small firms have such little engagement with voluntary initiatives agreed largely between big business, bureaucratic and political élites.

Having explored the influence of institutional factors on small firm environmental practices in Japan, the last sections compare the Japanese context with environmental policy arrangements in the Netherlands in order to provide some insights as to how structural barriers to environmental reform amongst Japanese SMEs might be constructively removed.

The Netherlands

As in other countries, SMEs represent the vast majority of businesses in the Netherlands, therefore, cumulatively they have a substantial environmental impact. SMEs make up 99 per cent of total businesses and constitute 55 per cent of employment in the private sector. In 1998, they contributed 19 per cent of total carbon dioxide emissions and were responsible for 35 per cent of overall waste generation for that year (Hoevenagel & Wolters, 2000).

The Dutch have made some concerted efforts to reduce their environmental impacts and the Netherlands has been described as something of an "ecological frontrunner nation" (Mol & Sonnenfeld, 2000, p. 6). Some authors have argued that acceptance of the requirements of environmental sustainability in the Netherlands pervades society and Dutch industry (Tuininga & Groenewegen, 1993). In Nelissen & Scheeper's (1992, p. 20) survey of 683 SMEs, they found that "business activities nowadays are settled in a social

climate in which environmental consciousness and behaviour has become a central element in people's lives". Frenz *et al.* (1993) argue that environmental issues seem to be accepted as a legitimate part of the management of Dutch SMEs, citing research that found 70 per cent of SME managers were prepared to adopt progressive environmental policies even when there were financial costs.

In Rutherford & Spence's (1998) qualitative study of the environmental practices of restaurant and mechanical engineering firms in the Netherlands, Dutch attitudes towards the environment were found to be very positive. Respondents were actively engaged in environmental measures, for instance recycling was practised almost ubiquitously. Whilst most owner-managers linked environmental improvements with financial costs, they did not resent the 'burden of environmentalism' which was seen to be a responsibility to be shared by all.

Whilst the proactive attitude of owner-managers can be partly attributed to social attitudes, Rutherford & Spence argue that the consensual way in which environmental policy has been constructed and enforced in the Netherlands has played a crucial factor. At a macro level, Dutch SMEs have been actively targeted both by legislation, licensing and voluntary initiatives. Firms have to obtain an environmental permit in order to trade and municipalities are required to issue licenses and inspect premises at regular intervals. This legislative context has fostered the perception amongst owner-managers that environmental action is a legitimate business cost for all. This shared social responsibility has been reinforced by a consensual style of governance in which co-operation and dialogue is fostered amongst trade associations, local government, support providers and businesses (both large and small).

De Bruijn & Lulofs (2000) explain that the 'National Environmental Policy Plan' (NEPP), which was first published in 1989, has strengthened the Dutch tradition of governance by managed consensus by taking a thematic, 'target group' approach to tackling environmental problems. Policy themes (e.g. climate change) have been set ambitious targets (e.g. reduction of carbon dioxide emissions by 20–30 per cent) and then assigned specific groups to meet those targets (e.g. sectors of industry, consumers). The target groups have been heavily involved in a consultative process that has nurtured stakeholder partnerships and created a context of consensual support for the policy strategy.

Different sectors of industry have been consulted on sector-specific targets with the help of intermediary networks that have included trade associations, industry organizations, environmental agencies, employee organizations and consulting firms. In heterogeneous sectors targets have been translated and specified at the company level, acknowledging the varying capacities and capabilities of firms within that sector. This has enabled the special needs of small firms to be taken into account when setting targets, encouraging a proactive response from individual firms. Trade associations (which typically have high SME membership levels) have been key players in formulating the targets and implementing strategies to meet them. Because there is the threat of direct regulation if the targets are not met, there has been much pressure on trade associations to assist and, if necessary, force individual firms towards negotiated outcomes. Companies who fail to live up to the voluntary agreements have been given 'supplementary conditions' on their permit to trade and have been subject to more stringent inspections, which has effectively discouraged 'free-riders'.

In summary, the environmental policy context in the Netherlands is characterized by a consensual, 'target group' approach to environmental governance whereby a wide range of interest groups are involved in policy dialogue. Institutional arrangements have

facilitated the incorporation of small firms as a target group within the policy process. Voluntary agreements have been made, although, importantly, policy makers have not relied solely on self-regulation of industry. The success of the Dutch environmental policy can also be attributed to a robust legislative and inspection system which has encouraged high levels of compliance.

Comparing Japan with the Netherlands

The Role of Voluntarism vs Regulation

As in Japan, Dutch environmental policy emphasizes voluntary agreements in achieving environmental goals. However, a key difference is that for Dutch SMEs voluntary agreements are backed up by a legislative and inspection system that allows the state to exert significant pressure on the sector to reduce environmental impacts. In contrast, Japanese local authority ordinances are not backed up by regular inspection of small firm premises and there is minimal policing of environmental laggards. This makes it much easier for Japanese owner-managers to ignore environmental issues.

The emphasis on voluntarism in Japan may be an effective policy tool for encouraging environmental management amongst large firms who are experiencing increasing stakeholder pressure for greater levels of corporate social responsibility and who have the resources to invest in environmental management systems and clean technology. However, the findings of this research suggest that voluntary approaches are less likely to be effective amongst resource-poor smaller firms, particularly if market dynamics such as supply chain pressure or customer demand are not driving environmental change. Owner-managers are likely to resist voluntary action whilst they are concerned that making environmental improvements might affect the competitiveness of the business. Clearly, regulatory drivers are needed to ensure that the environment becomes a top business priority for small firms. The Dutch case has demonstrated the effectiveness of a policy mix that combines voluntary agreements with a robust legislative framework and regular inspection system so that the environment is seen as a legitimate business cost for all. When a 'level playing field' is perceived, small firms are more likely to accept additional costs.

The Role of Participatory Environmental Policy Networks

In both Japan and the Netherlands, environmental governance structures are characterized by co-operation and consensus. However, whilst much negotiation and co-operation reportedly occurs within the triumvirate of big business, bureaucratic and political élites that dominate Japanese politics, policy networks appear to have much less interest in gaining the consensual support of subordinated interest groups such as small firms. This political disenfranchisement may well be contributing to small firm resistance to policy initiatives.

A 'target group' approach like that taken in the Netherlands might be an appropriate way to open up Japanese environmental policy networks to pluralist influences. Dutch environmental policy networks have encouraged the participation of a wide range of interest groups and have facilitated the incorporation of small firms within the policy process, creating a context of consensual support for environmental policy strategies amongst the SME sector. Clearly, a policy context that takes account of the special needs of small firms and cultivates their support is more likely to engender proactive

behaviour from owner-managers than one that subordinates their interests to corporate and political priorities.

The Role of Industry Bodies

Industry bodies are key to encouraging a more participatory institutional framework for SMEs, for they give small firms a crucial voice in policy making. Japan and the Netherlands are characterized by strong intermediary networks that play a key role in policy implementation. Trade associations in both countries enjoy particularly high SME membership levels and are a crucial component in the web of relations that bind industry and government together.

The target group approach taken in the Netherlands has reportedly nurtured and fortified the reciprocal ties between small firms, trade associations and other intermediary bodies. In contrast, the perceived hegemony of corporate and bureaucratic élites in the Japanese political economy has distanced owner-managers from industrial networks. Trade associations and chambers of commerce and industry are not considered to have a real understanding of small firm needs or to lobby strongly on behalf of their small firm members.

Despite these issues, at least there are elaborate intermediary networks in place with the potential to be powerful forces for change in Japan. The fact that SME membership in trade associations is so high means that if industry bodies could engage with their small firm members more effectively and mobilize their support, they could greatly increase the likelihood of a small firm sector that is actively involved in the policy process and engaged with the environmental agenda.

For a target group approach to be truly effective in Japan, trade associations and chambers of commerce and industry need to make some serious efforts to regain the trust of their small and micro firm members. Owner-managers clearly desire industry representatives to be in touch with their issues; this could be done by actively seeking out their views, not just in conferences and meetings but in more innovative ways, such as on-site visits and qualitative, in-depth interviews or focus groups rather than the usual postal surveys which typically have low response rates. Moreover, if industry organizations are to involve their small firm members, they will need to create a perception that their key focus is to offer relevant, accessible information and guidance—not, as is currently believed, to provide opportunities for social and political networking.

Conclusions

This comparative analysis has highlighted the effectiveness of a robust regulatory and licensing system, together with a participative institutional context that involves small firms in the setting of targets and voluntary agreements, in engendering environmental reform amongst the SME sector. Arguably, Japanese policy makers could learn much from the success of the target group approach taken in Dutch environmental policy, which may be one reason why small firms in the Netherlands appear to be more proactively involved in improving their environmental performance than in Japan.

Further research is needed to explore the influence of institutional factors on the environmental orientation of SMEs, for clearly national policy arrangements play a key role in determining the degree to which small firm owners are proactively involved in efforts to reduce their environmental impacts.

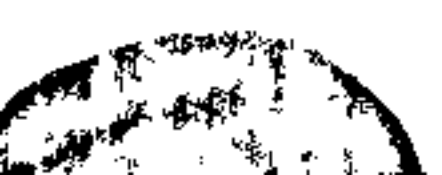
Notes

1. MITI is now METI: Ministry of Economy, Trade and Industry.
2. The government classification for SMEs in manufacturing are firms with 300 employees or fewer, whilst SMEs in service industries have 100 employees or fewer.
3. Restaurants are inspected by Public Health Centre officials for hygiene standards once every five years but this did not extend to environmental standards.

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Study 1

- Revell, A. (2003b) 'Is Japan an Ecological Frontrunner Nation?'
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Is Japan an Ecological Frontrunner Nation?

ANDREA REVELL

Japan has been described by advocates of Ecological Modernisation (EM) theory as an 'ecological frontrunner nation', yet little attempt has been made to analyse the degree to which it conforms to the core tenets of EM theory. This essay aims to address this oversight. First, a literature review is presented to assess the evidence for and against the notion that Japan's social institutions have broadly adopted an ecological modernisation position. The findings from an empirical study on the ecological modernisation of Japanese small firms are then presented.

Introduction

Ecological Modernisation Theory

Ecological Modernisation (EM) theory was first developed in the early 1980s by a small group of environmental social scientists in Western Europe, notably the Netherlands (e.g. Mol, Spaargaren, Hajer), Germany (e.g. Janicke, Simonis) and the UK (e.g. Huber, Cohen, Weale). Since then, EM theory has developed considerably and is now a mainstream theory within disciplines focusing on socio-environmental relations.

A central tenet of EM theory is the idea that industrialised nations are entering a new era, one of radical restructuring of production processes along ecological lines. It is contended that ecological restructuring is being encouraged by a market economy and facilitated by an enabling state which seeks to protect the environment as well as ensure economic growth. Due to certain kinds of reform (entailing a heavy emphasis on technological innovations and market-based incentives), it is argued that both economic and environmental gains have been made in some industrialised nations, providing evidence that economic growth can be de-linked from environmental degradation.

Mol and Sonnenfeld [2000] contend that these premises are useful as analytical tools to explore current processes of environmental reform in industrialised nations. Other scholars, such as Christoff, [1996]; Dryzek [1997] either propound or dispute the idea that EM has normative merit in outlining desirable paths for future political action. As a political

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programme, EM approaches conceive of environmental degradation as a challenge for socio-technical reform rather than as an inevitable outcome of capitalism or industrialisation, and therefore radical transformations of modern institutions are opposed. In this view, environmental problems can be resolved by 'harmonizing ecology and economy' [Simonis, 1989], by stimulating innovation so that environmental management becomes the source of future growth, providing new market opportunities for eco-products and lowering clean-up costs. The distinction between EM as a theory of social change and as a political programme is an important one, particularly as it is common in the literature for its analytical and prescriptive dimensions to be confused [Murphy, 2000].

Mol [1997] stresses the analytical rather than the normative merits of EM by presenting it as a theory of unplanned social change. He emphasises the following core tenets:

- (1) *The delinking of economic growth from environmental degradation:* Empirical studies suggest that from the mid 1990s onwards there has been a de-linking of material from economic flows in 'ecological frontrunner' nations such as Japan, the Netherlands, the United States, Sweden and Denmark [Mol and Sonnenfeld, 2000].
- (2) *Social and institutional transformations:* Recent social and institutional changes are seen to be at the core of such physical transformations. These are grouped into five clusters:
 - (a) *The changing role of science and technology:* Science and technology are judged not only for their role in perpetrating environmental problems, but for their part in curing and preventing them. Science and technology are hence seen as central institutions for overcoming environmental problems [Mol, 1997].
 - (b) *The increasing importance of market dynamics and economic agents in ecological restructuring:* Markets in industrialised nations are restructuring around ecological principles largely in response to market signals (rather than legislation), and encouraged by innovators, entrepreneurs and other economic agents. There is a growing rejection of the opposition of economics and ecology, hence notions of 'eco-efficiency' and 'economising ecology' are becoming increasingly important within industry [Mol, 1997].
 - (c) *Changing discursive practices and emerging ideologies:* New ideologies are emerging in business, public and political arenas. Neglect of environmental considerations is no longer considered acceptable, and environmental interests are increasingly seen as harmonious with economic interests [Mol, 1997].

- (d) *Transformations in the role of the state*: 'Political modernisation' is taking place within industrialised states as command and control, centralised governance structures are replaced with more decentralised, flexible and participatory styles of governance. Blowers [1998] argues that notions of consensus and negotiation are key to processes of political modernisation, with environmental policy increasingly being seen as a partnership, especially between industry and the state. Stakeholder participation and negotiated decision making are key characteristics of policy networks that adopt an ecological modernisation approach [Leroy, 1999].
- (e) *Changing role and ideology of social movements*: Social movements are described as becoming less radical and more reformist. As such, they have been increasingly involved in policy prescriptions regarding environmental reform instead of being relegated to the periphery of institutional decision making [Mol, 1997].

Japan and Ecological Modernisation

EM scholars have recently been concerned with comparative perspectives, particularly how non-European countries may be ecologically modernising in response to globalisation processes [Mol and Sonnenfeld, 2000]. Japan is the world's second largest economy and should therefore provide a good case study of the kinds of environmental reform occurring in industrialised nations outside of Europe.

Mol and Sonnenfeld [2000: 6] have called Japan an '*ecological frontrunner nation*', yet little attempt has been made by EM scholars to analyse the degree to which its social institutions conform to the central themes in EM theory. To address this, an empirical study was recently undertaken to explore the degree to which small firms in Japan can be said to be 'ecologically modernising'. The rationale for choosing a sample from the small and medium-sized enterprise (SME) sector was that if ecological restructuring of the Japanese economy is indeed taking place as EM theory suggests, surely this would be reflected in the practices of SMEs given that they make up 99 per cent of industry [JSBRI, 1999]. Despite the pivotal role of SMEs in most economies, their case has been largely ignored by EM scholars; indeed Sonnenfeld points out that EM theory 'must be broadened to include small- and medium-sized... enterprises' [Sonnenfeld, 2000: 254].

The following discussion is presented in two parts. The first part presents an extensive review of the literature in order to assess the evidence for and against the notion that Japan is an '*ecological frontrunner nation*'. This is in the absence of previous empirical studies of ecological

modernisation theory and Japan. In the second part, the objectives, methodology and findings from the empirical study are described. Mol's [1997] core tenets are used as an analytical framework for both parts. Finally, the conclusions embrace both the findings from this study and the evidence within the existing literature in an attempt to provisionally assess the degree to which Japan's social institutions can be said to be following a path consistent with EM theory.

Literature Review

Is Japan an Ecological Frontrunner Nation?

Japan's ratio of energy supply to GDP fell by 25 per cent from 1979 to 1987, providing evidence of the falling environmental intensity of production [OECD, 1994]. Mol and Sonnenfeld [2000] contend that by the mid 1990's onwards a delinking of material from economic flows had occurred in Japan. According to EM theory, such physical transformations are the result of the 'ecological modernisation' of social institutions, clustered into Mol's five core tenets as discussed below.

1. The Changing Role of Science and Technology

Supporting EM theory is the increasing emphasis placed on science and technology as the solution to, rather than the cause of, environmental problems in Japan. Technology has played a central role in the development of modern Japanese society. The nation's technical mastery was a key catalyst for its rapid modernisation since World War II, swiftly transforming it into a global economic power.

Japan's manufacturing sector is the traditional mainstay of its industrial might, so it is perhaps unsurprising that it is now a world leader in environmental technology markets, behind the US and Germany [Reinhard and Klein-Vielhauer, 1997]. Technical advances have yielded some great successes in environmental reform, particularly in the areas of pollution abatement and energy efficiency. Grave pollution problems in the 1950s and 1960s led to a raft of anti-pollution regulations which forced industry to clean up its act. In recent decades, Japanese companies have spent as much as 9.7 trillion yen (US\$73.5 billion) on pollution control [Taylor, 1999]. This has resulted in such innovations as flue-gas desulphurisation and denitrification, computerised monitoring techniques and automobile exhaust gas control technologies. The automobile industry has dramatically decreased pollutant levels in passenger cars with such inventions as unleaded petrol and the catalytic converter.

Great gains have also been made in energy efficient technology, including the development of photovoltaic cells for solar power, carbon

recycling and combined heat and power generators. Japan has one of the lowest ratios of energy consumed per unit of gross domestic product (GDP), as well as one of the lowest energy intensity rates per capita [OECD, 1994]. It also has high rates of environmental technology transfer to developing countries via its 'Green Aid Plan' and has formed some high profile global scientific research institutes such as the 'Research Institute of Innovative Technology for the Earth' (RITE).

Critics of EM as a political programme might argue that Japan's technological zeal has also led to environmental degradation on an unprecedented scale. Samuels [1995] argues that Japan's dash to modernise has encouraged a technocratic approach within industry and government described as 'techno-nationalism'; the aim of dominating the world technologically. Japan's promotion of high technology is at the core of its development model, which according to Taylor [1999:554] is imbued with an ideology of 'rampant industrialisation without fear of consequences'. This has resulted in:

Radical transformations of nature: huge land reclamation projects, the construction of artificial islands, the flattening of mountains, the concretising of river banks and the construction of dams, underground tunnels, bridges and roadways. [Taylor, 1999: 541.]

For instance, 60 per cent of the Japanese coastline is now covered in concrete and 110 out of 113 major rivers are dammed [Kerr, 2001]. Not surprisingly, such development has destroyed much of the nation's natural habitat and threatened wildlife species [OECD, 1994]. Moreover, the promotion of Japan's technocratic development model abroad has been linked to Asia's growing environmental problems [Taylor, 1999].

In summary, Japan conforms to a central feature of EM theory with its emphasis on technological solutions to environmental problems. However, as a political programme this technocratic approach has come under criticism from those who see 'technological fixes' as part of the problem rather than the solution to environmental crises.

2. Transformations in the Role of the State

The ecological modernisation theory has identified two options for strategies to overcome the deficiencies of the traditional bureaucratic state in environmental policymaking ... First, a transformation of state environmental policy is necessary: from curative and reactive to preventative, from exclusive to participatory, from centralised to decentralised wherever possible ... The second, related, option includes a transfer of responsibilities, incentives and tasks from the state to the market. [Mol, 1995: 46-7.]

Policies of ecological modernisation seek to steer society towards a more sustainable future by adopting market incentives and voluntary agreements that push target groups toward eco-efficient practices. This does not rule out legislative sanctions but the rhetoric strongly emphasises voluntary action.

Murphy [2000] describes Japan's policy makers as having 'broadly adopted an ecological modernisation position' [Murphy, 2000: 3]. This might arguably be due to (a) the widespread use of voluntary agreements to encourage industry to adopt environmental best practice [Sugiyama and Imura, 1999], (b) the power of local authorities and the decentralised nature of environmental policymaking [OECD, 1994], and (c) the co-operative partnership between industry and government in policy formation [Wallace, 1995].

The OECD's [1994] environmental performance review of Japan highlights that local authorities have considerable power in environmental policy making. Historically, the municipal and prefectural governments have been the first to act on policy and have prompted action at the national level. The 1947 Local Government Law entitled municipalities to pass their own ordinances, and many used this authority to address pollution problems in the 1950s and 1960s. Since the 1960s, over 40,000 voluntary agreements between industry and local governments have been put into effect [Sugiyama and Imura, 1999]. Local governments are able to put considerable pressure on business to conform to voluntary agreements by withholding permits or economic incentives [OECD, 1994].

In Wallace's [1995] major empirical study of environmental policy and industrial innovation in Japan, he found that policy makers and industrialists viewed local government as driving environmental policy because it imposed tougher voluntary standards on local industry than existing regulations called for, which in turn pushed future environmental regulations towards stricter standards. Local authorities were perceived to have built up a reputation for listening to industry and taking technical considerations into account, which had promoted a flexible, participatory approach to standard setting. Because voluntary measures were sought first and recommendations were made by policy makers years before they became mandatory, industry had the time and flexibility to respond innovatively (rather than reactively) before the standards became law.

Wallace found that government and industry maintained a good relationship via processes of open dialogue in environmental policy making. The Ministry of Environment encouraged participation via the 'technical hearing system' whereby relevant technical information from industry was heard prior to legislation, thus enabling regulators to set appropriate targets. State-industry relationships were described as highly co-operative, with environmental regulation only enacted after careful consideration of

industry's capacity to meet those standards via trial and error voluntary initiatives. According to Wallace, environmental objectives in Japan were therefore achieved at lowest cost via flexible processes of recommendation and voluntary action, which in turn encouraged innovation.

Yet, in apparent contradiction to this decentralised and participatory view of environmental governance structures, another body of literature argues that Japanese policymaking is elitist and lacks public participation. Japan has famously been called a 'developmental state' where policies are made by a centralised, strongly bureaucratic system with little role played by pluralist influences [Johnson, 1995; McCormack, 1998; Woo-Cummings, 1999]. In McCormack's [1998] critique of the Japanese 'economic miracle' he maintains that:

bureaucratic autonomy and privilege, and the exclusion of democratic principles, may have been part of the formula of successful growth in the early post-war decades, but vested bureaucratic interest now constitutes a major blockage to the sorts of fundamental reform of which 21st century Japan stands in need. [McCormack, 1998: 41.]

Whittaker [1997] claims that advisory committees (such as the Central Environmental Council) are supposed to solicit broad input but end up retaining strong bureaucratic input. Although they are supposedly made up of representatives from industry, academia, media, labour and consumers, half end up being former bureaucrats and others are chosen because they are 'bureaucrat friendly'. These councils are hence seen by Whittaker as instruments of bureaucratic manipulation.

Schreurs [1996] contends that environmental policy networks actively reinforce hegemony by excluding critical commentators from advisory committees. Because the ministries have the right to select who will sit on these committees, there is no place for NGO's that might criticise government actions.

The OECD's [1994] environmental performance review highlights that public access to environmental information is limited in Japan, and because of this NGO's have had little power to influence environmental policy.

Rather than a 'developmental state', other authors have favoured a 'corporatist' model of Japan whereby policymaking occurs within a triumvirate of corporate elites, politicians and bureaucrats [Brown 1998; Broadbent, 1998]. In Broadbent's [1998] major longitudinal study of Japanese environmental policy networks, he concludes that governance structures are dominated by the 'Ruling Triad'; big business, the state bureaucracy and the ruling Liberal Democratic Party (LDP). Dense social ties among these three spheres make them more like a single interest group, using horizontal networks to maintain a co-operative coalition. Outside the

Ruling Triad other stakeholders, such as local government and public interest groups have much weaker reciprocal ties to ministerial bureaucrats. Those relations that they do have tend to diminish their autonomy and subordinate them to ministerial priorities. Horizontal ties thus dominate within the Ruling Triad and vertical ties dominate outside of it.

In Broadbent's view, the hegemony of the Ruling Triad has resulted in a major emphasis on economic growth and capital accumulation at the expense of the environment. He argues that the LDP has consistently couched its environmental policies in line with the interests of big business, furthering corporate hegemony by allowing producers to dilute the objectives of environmental reform to defend their narrow economic interests.

In summary, supporting EM theory is Wallace's account which highlights the voluntary, negotiated nature of environmental policymaking in Japan and the partnership between industry and government. However, other authors describe an environmental policy context which lacks transparency and does little to foster the consensual support of stakeholders outside the elite core of big business representatives, politicians and bureaucrats. Far from being open and participatory as EM theory would suggest, Japanese environmental policy networks fortify existing structures of entrenched power and actively marginalise other interest groups.

3. The Changing Role of Social Movements

There appears to be little evidence for EM theory's contention that social movements are playing an increasing role in environmental policy prescriptions. *Schreurs [1996]* maintains that:

Whereas environmental NGOs and even Green Parties have been central players in environmental policy formation in the West, in Japan large environmental NGOs failed to become institutionalised... Japanese environmental policy formation has been dominated by the state. [*Schreurs, 1996: 1.*]

The current impotence of Japanese environmental NGOs is curious given the fact that Japanese grassroots movements played a crucial role in pushing environmental reform in the past. Local anti-pollution groups were strong at the time of the nation's pollution crisis in the 1950s and 1960s, galvanising public support and pushing the central government to enact a raft of environmental legislation including the Basic Law for Environmental Pollution Control in 1967 which provided the foundation for national environmental law in Japan.

Yet, despite these early successes, social movements have not continued to play a central role in the environmental policy arena. Explanations for

this have focused on both political and cultural factors. Broadbent's [1998] longitudinal study of environmental protest in rapidly industrialising rural Japan draws on hundreds of interviews with policy makers and representatives from citizens' movements who were fighting to scale down industrial development plans for Beppu Bay. Despite years of protest activities, the citizens' groups had limited success against the pro-development alliance between government and big business.

Broadbent contends that historically the 'Ruling Triad' weakened protest movements after their success in the 1960s by staging a quiet campaign to undermine local support. Ministries released minimal information and would not grant environment movements tax-free status. Those that managed to gain non-profit status often had to accept a ministerial retiree onto the board of directors. Environmental organisations called 'third sector groups' were also set up which were sponsored by corporations and led by retired ministers. Broadbent argues that these organisations gave the illusion of strong grassroots influence when in reality it did not exist.

Schreurs's [1996] analysis corroborates this, suggesting that the state created sufficient barriers to prohibit institutionalisation of the environmental movement in Japan. She maintains that because of these institutional barriers, there is currently a lack of public participation in environmental policy making, and this has undermined Japan's desired position as a global environmental leader.

Others highlight how cultural factors have limited the power of environmental groups. A study of environmental attitudes by Gallup affiliates in 24 countries found that Japanese respondents had low levels of desire to participate in environmental movements, with less than 5 per cent of the population belonging to environmental groups (compared with 11 per cent in the US and 10 per cent in the UK) [Dunlap *et al.*, 1992]. Mitsuda (1997) argues that the Japanese are reluctant to join environmental organisations like Greenpeace because they are perceived to be too radical. Kerr [2001] maintains that a culture which emphasises conformity and obedience to authority makes it difficult for individuals to actively challenge the status quo.

Funabashi [1992] claims that citizens' groups are characterised by 'lococentrism', a feature he describes as fundamental to Japanese culture. Local environmental problems evoke high levels of concern but once the problem has been solved there is a tendency for residents' movements to dissipate. This explains why citizens' groups, whose members numbered as many as six million in the early 1970s, experienced a dramatic slump in membership a few years later as environmental problems were perceived to have been resolved – or at least politically responded to. The few groups that have

endured have tended to remain local rather than forming broader networks or creating national environmental movements [Schreurs, 1994].

In summary, the role of social movements in Japan runs counter to EM theory, for they have not become key stakeholders in environmental decision making. Instead, under-funded, under-supported and disenfranchised, they remain very much on the periphery of institutional power.

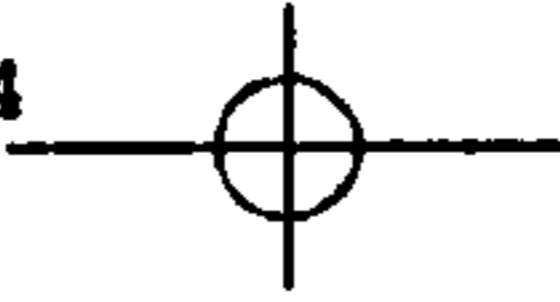
4. Changing Discursive Practices and Ideologies

EM theory holds that ideologies within public and political arenas are placing increasing emphasis on environmental concerns. In support of this, some studies have revealed a growing environmental ethic amongst the Japanese public. Imura [1994] cites the results of an opinion poll by the Economic Planning Agency in 1990 where 60 per cent of people said they would prefer environmental quality over economic growth.

However, the aforementioned accounts of the limited support for environmental groups provide a rather confusing picture of the environmental ethic exhibited by Japan's citizens. Mitsuda [1997] describes the Japanese public as having high levels of concern but with few feelings of responsibility towards the environment. Citing Dunlap *et al.*'s [1992] Gallup poll, he concludes that 'the Japanese environmental attitude is very different from that of citizens in other advanced societies' [Mitsuda, 1997: 450]. The poll found that while 64 per cent of the Japanese public were highly concerned with local environmental problems, concern for global environmental issues was the lowest amongst developed nations with only 44 per cent seeing global environmental problems as serious (compared with 57 per cent in the US and 64 per cent in the UK).

Broadbent [1997] attributes this to cultural factors which encourage the Japanese to have more concern for their own community than other groups. He maintains that Japan's 'spectator political culture' creates high levels of NIMBYism ('Not In My Back Yard'), but less concern for global environmental issues.

Imura [1997] claims that changing discursive practices have clearly occurred within industry, particularly in the last decade, as ideas of 'corporate citizenship' and environmental responsibility have taken hold. However, he cites one study which suggests that economic growth and environmental protection are not always viewed as potentially harmonious. A survey of 2,754 companies conducted by the Japan Development Bank in 1992 reported that 64 per cent had found the costs of environmental protection as having a large (negative) effect on corporate earnings, while only 20 per cent had perceived no cost burdens due to the opportunities for growth in environmental markets. This suggests that there may still be a



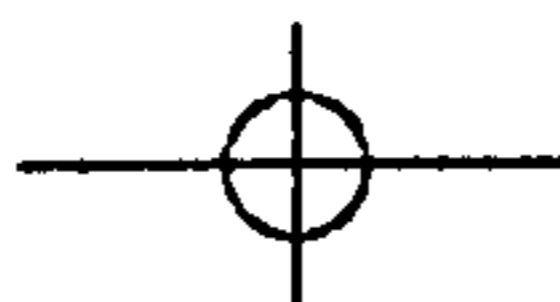
counter-positioning of economic and environmental interests within the business community, even if environmental protection is recognised as a necessary expense.

There is evidence to suggest that a transformation in discursive practices has certainly occurred within political arenas in Japan in the past 15 years. Schreurs's [1996] review of Japanese environmental policy highlights how changing discursive practices were evident within the Japanese polity during the late 1980s and early 1990s as a result of the 'greening' of former Prime Minister Takeshita who was concerned that Japan's international image was being tainted by its environmental impact overseas. Although Japan claimed to have improved many of its domestic environmental problems, it was heavily criticised abroad for its global environmental impact, specifically its contribution to tropical deforestation (as the world's largest importer of tropical hardwoods) and its contribution to over-fishing in the Pacific. Japan was also strongly denounced for its trade in endangered wildlife products and for exporting polluting industries to Southeast Asia.

As a result, Prime Minister Takeshita began a programme of policy reform to restore its tarnished international image. In the ensuing years, Japan became a major donor to overseas environmental programmes and an active player in international efforts to address global climate change. This is in stark contrast to the position Japan took before 1988, when there was minimal involvement with international environmental action. Schreurs highlights that in contrast to Europe and the US, changing discursive practices within Japan have occurred largely as a result of top down, reactive policy initiatives rather than grassroots pressure from social movements.

Taylor [1999] concurs that Japan has in recent years made a concerted effort to recast itself as an environmental leader. However, he argues that Japan's environmental image is mainly rhetorical – it continues to have serious domestic environmental problems (including waste disposal, water and marine pollution, coastal degradation, habitat destruction and biodiversity loss) and plays a dominant role in causing international ones (including deforestation, overfishing, and pollution).

In summary, Japanese citizens have been found to have different attitudes towards environmental issues compared to citizens in other industrialised nations. This makes it less than clear as to whether the Japanese public can be said to have embraced ideologies that fit with EM theory. However, political and to a certain extent business rhetoric has increasingly emphasised environmental concerns, providing some evidence for EM theory.



5. Role of Market Dynamics and Economic Agents

According to EM theory, industry is playing an increasingly pivotal role in environmental reform, largely in response to the 'carrot' of market incentives rather than the 'stick' of legislation. Japanese industry has been described by EM scholars as leading the way in environmental practices by shifting from 'end-of-pipe' solutions towards preventative technologies and life-cycle analysis models [*Mol and Sonnenfeld, 2000*].

In his review of energy conservation policies in Japan, Fukasaku [*1995*] notes that Japanese production technologies have become increasingly environmentally competitive, with certain sectors of Japanese industry (such as the iron, chemical, steel and automobile industries) being particularly responsive in reducing energy intensity and in controlling pollution. Fukasaku claims that legislation has been a key catalyst for environmental reform within Japanese industry. For instance, large firms are required to hire energy saving managers under the 'Law of Energy Conservation' and these managers have legal responsibilities to increase energy efficiency.

As well as regulatory drivers, it can be argued that market dynamics have played a role in encouraging environmental reform within industry. Environmental problems have created new market opportunities for business and have spurred innovation in Japan's environmental technology markets. The private sector finances some 60 per cent of all research and development into environmental markets and contributes heavily to a number of government research agencies [*UNEP, 2000*].

Confirming the influence of economic agents in environmental reform is the widespread adoption of voluntary goals and standards within Japanese corporations. Japan boasts the highest number of ISO14001 accreditations globally, with 9,467 firms having obtained certification by 2002 [*ISO 14001 Information Centre, 2002*]. In the 1990s, over 30,000 voluntary agreements between industry and local governments were in place [*Imura, 1998*]. The 'Keidanren', the most powerful political forum for big business in Japan, has prepared a 'Voluntary Action Plan' to meet with emerging environmental policy goals (such as the reduction of greenhouse gases). The 'Voluntary Action Plan' involves 36 industries and 137 industrial organisations, and includes some quantitative targets for reducing environmental impacts [*Keidanren 2001*].

Despite a concerted attempt to portray itself as environmentally responsible, there is also evidence to suggest that the environmental performance of Japanese industry is far from exemplary. In their review of recent empirical studies on pollution control, Rosenbluth and Theis [*1999*] argue that Japanese corporations have been able to avoid costly abatement measures because political institutions are biased in favour of business



interests and are against any serious, sustained effort to regulate environmental pollution. As a result, pollution control in Japan has been much less effective than previously thought. Highly visible and relatively easily regulated air pollution has been curtailed, but less visible and trickier water and soil pollutants remain unchecked. For instance, allowable concentrations of dioxin exceed typical western standards by 80-800 times.

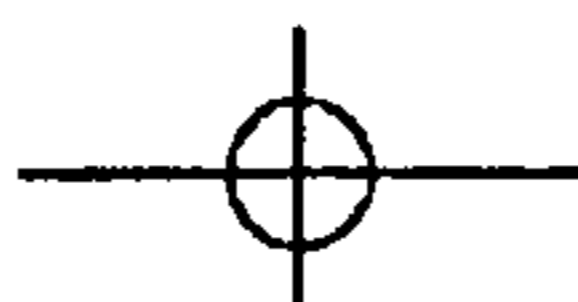
Japanese industry has also been accused of 'exporting pollution' to neighbouring Asian countries as manufacturing plants have moved to nations with less stringent environmental standards [Imura, 1997]. Japan may have thus given the impression of de-linking economic growth from environmental degradation, when in fact it has merely externalised its impact by importing rather than producing certain goods.

Huber [2000] draws attention to the lack of environmental reporting and stakeholder communication within Japanese corporations, arguing that 'industry in Japan may be confronted less with political and civil society counterpowers' [Huber, 2000: 276].

Miyamoto [1997] highlights how for 25 years the business lobby successfully blocked an Environmental Impact Assessment (EIA) Law. It was finally introduced in 1997, by which time Japan had become known as the 'construction state' due to the prolific building of roads, airports, high-speed rail links, tourist resorts, dams and nuclear power stations. Imura [1997] asserts that:

For several decades, the so called political, administrative and business triangle has dominated Japanese politics. This triangle formed around public works projects and created a strong pro-development power block, opposing EIA legislation and public participation in environmental decision making. [Imura, 1997: 85.]

Kerr [2001] claims that Japanese industry acquired its global competitiveness partly because it was able to externalise the environmental costs of its rapid growth due to the extreme pro-development ideology of the state. Kerr highlights the power of the construction industry, which absorbs nearly half of government expenditure, as an example of the collusion between government and powerful business actors to promote development at all costs. He maintains that government subsidy rather than real growth or infrastructure needs has caused excessive development at major expense to the environment. McCormack [1998: 36] asserts that the construction industry's 'primary significance in the political economy lies...in the several circuits of private interest and advantage that it feeds; with vast sums flowing to those who form part of the privileged national grid of politicians, bureaucrats and business people with a private stake in "public works"'.



In summary, supporting EM theory is the evidence that some Japanese corporations are considering ways to reduce their environmental impact beyond regulatory requirements and are proactively involved in voluntary measures to achieve this goal. Market dynamics as well as legislative drivers have certainly played a part in stimulating environmental innovations in some sectors. However, blighting this ostensible image of corporate responsibility is the lack of environmental disclosure within industry and the fact that big business interests lobbied heavily to block the introduction of an EIA law. Moreover, industry has been accused of avoiding pollution control measures at home, exporting pollution abroad, and externalising the environmental costs of its rapid development.

The 'Greening' of Japanese SMEs

The degree to which small and medium-sized enterprises have been involved in ecological restructuring is difficult to ascertain from the limited research in this area. From the small number of quantitative surveys conducted [e.g. *Yamazaki, 2000; Japan Finance Corporation, 1997, Asahi Bank 2000, Sanwa Research Institute and Consulting, 2000*] it appears that the environmental measures most likely to be carried out by owner-managers are waste reduction (driven by regulatory factors) and energy efficiency (driven by market dynamics as firms endeavour to reduce costs). More progressive voluntary measures such as environmental management systems and life cycle analysis have yet to be embraced.

Yamazaki's [2000] quantitative study of over 2000 SMEs in Tokyo found that 59.4 per cent claimed to be engaged in environmental measures. Of this environmentally active group, 54 per cent claimed to be involved in industrial waste reduction, 35.6 per cent claimed to be recycling or reusing products, 33.5 per cent claimed to be involved in measures to cut noise, vibrations, offensive odours and 30 per cent in energy saving measures. Only 3.8 per cent claimed to have acquired or be in the process of acquiring environmental management systems. In terms of size, larger SMEs were more likely to be engaged in environmental measures than their smaller counterparts. Environmental measures were often viewed as either 'not necessary' (as owner managers perceived their firm's environmental impact to be negligible), or as a cost burden which they were unwilling to bear.

Another study of 1,590 SMEs in the Tokyo area [*Asahi Bank, 2000*] found that 70 per cent of the sample claimed to be taking measures to cope with environmental issues, mainly minimising waste disposal (such as cutting paper usage) and energy usage. However, more proactive environmental measures such as recycling or installing energy saving equipment were rare. The main obstacles to making environmental improvements were found to be a lack of environmental awareness, the cost

of investing in environmental equipment and lack of technical know-how. The vast majority of small firms claimed to be too busy trying to comply with environmental regulation to consider voluntary initiatives.

Regrettably, there has been no attempt to place these findings within a broader theory of socio-environmental relations such that we might understand the wider significance of environmental reforms (or lack of) within the SME sector. It thus seems timely to explore the environmental practices of small firm owners within the analytical framework provided by EM theory.

The Study

Research Objectives

The broad aims of the research were to explore empirically the degree to which aspects of EM theory apply to the Japanese small firm context.

The following core tenets of EM theory were of particular interest:

- (1) *The increasing importance of market dynamics and economic agents in ecological restructuring.*

Are Japanese small firms showing signs of ecological restructuring (such as reducing resource/energy consumption and minimising waste/pollution)? Is environmental reform being driven by market forces (such as supply chain pressure, competition, consumer demand), or legislation?

- (2) *Changing discursive practices and emerging ideologies.*

Are ideologies amongst owner-managers increasingly exhibiting an environmental ethic? Do they see economic and environmental interests as harmonious? Do they feel personally responsible for protecting the environment? Are environmental considerations being incorporated into business agendas?

- (3) *Transformations in the role of the state.*

Are environmental policy networks becoming increasingly consensual and participatory with regards to the small firm sector?

Sample and Methodology

Fieldwork was conducted between February and May of 2002. The following methodology was used:

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- Stage 1:** Ten in-depth interviews with 'key informants' within industry, government and academia.
- Stage 2:** Ten in-depth interviews with small firm owner-managers in the mechanical engineering sector.
Ten in-depth interviews with small firm owner-managers in the restaurant sector.

First, key informants from relevant trade associations, professional bodies, chambers of commerce, and academia were interviewed in order to build a picture of the political and economic context of Japan, particularly regarding environmental policy and small firms. This overview informed the interview schedule for the next stage and added triangulation to the research design by allowing emerging themes and issues to be explored from different perspectives. A semi-structured interview schedule was used and interviews typically lasted two to three hours. To overcome language barriers, a translator was present at every interview; these were audio-taped and subsequently transcribed.

The second stage involved 20 interviews (lasting one to two hours) with owner-managers in the restaurant and mechanical engineering industries of Ota-ku, one of the 23 wards of Tokyo. A sectoral comparison was considered important because past studies demonstrate significant differences between SMEs according to sector [*Curran and Blackburn, 1994; Bayliss, 1998*]. The restaurant and mechanical engineering industries were chosen because they are both made up of large numbers of small enterprises which can be considered fairly typical of small firms in industrialised countries. The sample consisted of firms with under 50 employees, and over half of these were micro-firms (1-9 employees), as these represent the majority of businesses in both industries.

Findings

1. The Role of Market Dynamics and Economic Agents

The ecological restructuring of Japanese small firms appears to be heavily influenced by sectoral differences. Many mechanical engineering owner-managers claimed to be implementing energy efficiency measures:

I installed the equipment to cut electricity use by half and cut costs.

However, firms in the restaurant sector did not see any cost benefits to be made from investing in energy saving equipment and most were not attempting to minimise energy usage beyond turning off machines when not in use:

As a service industry, we have to use energy and water when necessary.

Efforts to minimise waste and recycle were reportedly occurring in both sectors. However, in the restaurant sector, waste management was still considered to be a significant problem as poor separation and lack of care in disposal was widespread:

Waste management is a big issue for us.

More progressive reforms such as the implementation of environmental management systems had yet to be embraced in either industry. Pollution control measures were limited as the sample perceived their emissions to be negligible.

Refuting the central role of market-led environmental reform within EM theory is the finding that neither supply chain pressure nor consumer demand was encouraging respondents to consider their environmental impact more carefully:

There's no pressure from the supply chain.

[Customers] are not demanding EMS or changing specs.

Japan is famous for its historically tight 'keiretsu' (subcontracting) structures which has enabled 'parent' companies to enjoy a level of control over supply akin to that of vertical integration [Ahmadjian and Lincoln, 2000]. The fact that mechanical engineers were not experiencing pressure from their customers to 'green' suggests either that the environment was not such a high priority for their parent companies, or that this particular sample was not incorporated into the kind of strong keiretsu relationships which might have been expected to be a key driver of ecological reform within the supply chain. Similarly, customers were apparently unconcerned about the environmental practices of the restaurants they ate in, suggesting that the influence of 'green consumerism' had yet to extend its reach to the restaurant industry:

[Customers] don't pressure us on environmental issues like organic food.

Whilst market forces were encouraging mechanical engineers to minimise energy usage, they were also creating significant barriers to environmental reform as the pressures of competition increased owner-manager's preoccupation with price imperatives. The emphasis on cost reduction as a source of competitiveness clearly resulted in the low prioritisation of environmental considerations because the environment was generally viewed as a cost burden by small firms:

If I don't *have* to pay for [environmental improvements] I won't.

Due to the prolonged economic recession in Japan and the acute economic pressures that owner-managers were facing, environmental considerations

were not currently high on their business agendas. Instead, owner-managers tended to be wary of making voluntary environmental improvements because of the fear that 'free riders' would gain competitive advantage by avoiding costs. Many preferred the 'level playing field' that environmental legislation offered:

Government should ensure an equal footing in the market.

Paradoxically though, owner-managers also resisted regulation because of its perceived effect on profits. Nevertheless, the government's new waste disposal charges had encouraged 'self-regulation' of industry, highlighting the potential of market-based mechanisms in state intervention.

2. Changing Discursive Practices and Emerging Ideologies

EM theory claims that ideologies and discursive practices are increasingly stressing the harmony between economic and environmental interests. However, the responses of Japanese owner-managers suggested that 'win-win' outcomes were not being perceived in many cases. Whilst energy savings were being sought by precision engineers to lower costs, such 'eco-efficiencies' were not occurring within the restaurant sector as owner-managers did not perceive that significant cost savings could be made:

I can't see [that] the equipment cuts costs much. The cost of the lease is much the same as the cost saved.

It is not clear how such discrepancies have come about, but what is clear is that there may be considerable sectoral differences in the degree to which economic and environmental interests are seen as non-conflicting, and therefore in the degree to which environmental measures are voluntarily undertaken.

Owner-managers clearly wanted to live in a clean environment and so to a certain extent they may be said to have embraced an environmental ethic. Individual as well as state responsibility for environmental protection was acknowledged by many:

We're all responsible for the environment; it's no use blaming others.

But whilst there was a positive attitude towards environmental protection, Japanese small firm owners arguably tended to operate within a 'shallow environmental ethic' [Tilley, 2000] whereby economic imperatives took precedent over environmental ones. This 'shallow environmental ethic' was exacerbated by the economic uncertainty felt by owner-managers as a result of the recession, and was compounded by owner-managers' perception that their firms' environmental impact was negligible:

Small firms in our industry do not have serious environmental problems.

The environment was thus not considered a key business issue. Some owner-managers even resisted environmental measures such as proper waste separation on the grounds that they were time consuming, highlighting the low priority that environmental issues were given within some business agendas:

We are too busy – we do not have enough time to meet the collector's requirements regarding waste separation.

The rhetoric of 'competitiveness' was still clearly the central discourse for owner-managers. This is not surprising given that the dominant social paradigm of industrial societies may be said to emphasise economic considerations over environmental ones [Catton and Dunlap, 1978]. It is important to note however, that owner-managers clearly felt constrained by these competitive pressures, making it difficult for them to translate their good intentions into concrete environmental reforms.

3. Transformations in the Role of the State

Responses of owner-managers and key informants suggest that small firms feel subordinated and disenfranchised within the complex machinery that makes up the Japanese polity. It was claimed that Japan's policy making processes are highly informal and influence peddling is the norm. Many intermediary bodies have their own informal pressure groups which enable them to keep close ties with politicians:

Trade associations can influence policy making directly via their contacts with politicians – it is a hotbed of bribery.

It was highlighted that small firms have nowhere near the resources or cohesion that large firms do and so naturally their influence was smaller. Opportunities to meet with government officials were therefore much less frequent:

Presidents of major organisations and government senior officials regularly have meetings over breakfast and exchange information. For SMEs there is no direct channel like this.

Informal networks of vested interests which seek to win political influence was seen as a source of many of Japan's problems, with cronyism and corruption identified as a major contributing factor to its prolonged economic crisis:

Political networks are problematic because they represent the haves only. They tend to be paternalistic and unhealthy.

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Key informants and small firm owners emphasised that greater participation and transparency in Japan's political economy was long overdue. Corroborating Broadbent's [1998] account of the hegemony of the Ruling Triad, policy networks were perceived to do little to foster the consensual support of interest groups outside the elite core of big business representatives, politicians and bureaucrats:

Usually government talks to large trade associations to get their approval before introducing new policies ... SMEs are excluded from those policy dialogues or they have little, if any influence.

Small businesses have little sense of political clout.

Wallace's [1995] assertion that co-operative ties exist between industry and government was felt to apply to large corporations and their ministerial confidants, but it was not perceived to extend to the smaller firms which comprise 99 per cent of industry [JSBRI, 1999].

Government reportedly lacked a real understanding of small firm issues and was felt to 'command rather than to listen' to SMEs. Even at the local level, where municipal authorities were allegedly more likely to consult with SMEs on standard setting, consultations on environmental policy at technical hearings, conferences and government councils tended to exclude small and micro firms.

Representatives from 'Chambers of Commerce and Industry' (CCI, the main avenue of political representation for SMEs), and trade associations were also perceived to have a bias towards larger firms and were therefore out of touch with small and micro firm issues. Owner-managers thus felt distanced from the very industry bodies that were supposed to represent them:

CCI doesn't understand the reality for firms like us.

I don't expect much from CCI or trade associations

Respondents perceived that SME interests at the local level were not always fed up to the national trade associations which were influential in environmental policy circles:

National associations discuss policy with their assigned ministry, and small firms usually get information only after policy decisions have been made.

The government was felt to have adopted a 'top-down' interpretation of the requirements for participation; in other words, that the participation of small firms was required principally in the implementation of environmental policy, but not in decision making about its objectives.

Conclusions

Are Japanese Small Firms Ecologically Modernising?

Two conclusions can be drawn from these findings. The first is that EM theory is of only limited use in explaining current processes of social change in the Japanese small firm sector. This study suggests that whilst some environmental restructuring is occurring, market dynamics and changing discursive practices are not pushing reform in the way that we might have expected under EM theory. Small firms are experiencing little pressure from customers, competitors or consumers to make environmental improvements. Economic and environmental interests are often perceived as conflicting, and there is little evidence that business agendas are being refashioned to reflect sustainability objectives.

It is also clear that Japanese environmental governance structures are not as consultative and participatory as might be expected from a nation which has 'broadly adopted an ecological modernisation position' [Murphy, 2000: 3]. Small firms have been marginalised and even omitted from environmental policy networks that are dominated by big business, political and bureaucratic elites. Given the pivotal role that small firms play in the nation's economy, this suggests that at the very least the European EM model may need to be amended to fit the Japanese context in a more relevant way.

The second conclusion focuses on the prescriptive merits of EM theory. Buttel [2000] asserts that a key aspect of the more sophisticated versions of the theory is the idea that political practices are critical in encouraging processes of ecological modernisation:

Ecological modernisation processes are a reflection of policy environments that are made possible through the restructuring (or 'modernisation') of the state [Buttel, 2000: 61]

Political modernisation is thus seen as vital in stimulating the ecological modernisation of industry because of the key role that participative and 'enabling' policy approaches can play in encouraging industrial reform. Extrapolating from this claim, it may be hypothesised that processes of ecological modernisation within the small firm sector are being hampered by the lack of 'politically modernized', participatory approaches towards environmental policy in Japan. Whilst small firms have such limited participation in policy networks, it is hardly surprising that they have little engagement with environmental agendas agreed largely between big business, bureaucratic and political elites.

This has obvious normative implications. If policy makers are to encourage small firms to embrace environmental reform there must be a



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concerted attempt to involve them in policy dialogue, to give them a voice in negotiated decision-making processes and to empower them within environmental governance structures. For if small firms could be meaningfully engaged in a consultative process aimed at stimulating environmental management within the sector, this might create a context of consensual support for environmental policy strategies, thus engendering proactive rather than reactive responses to environmental problems.

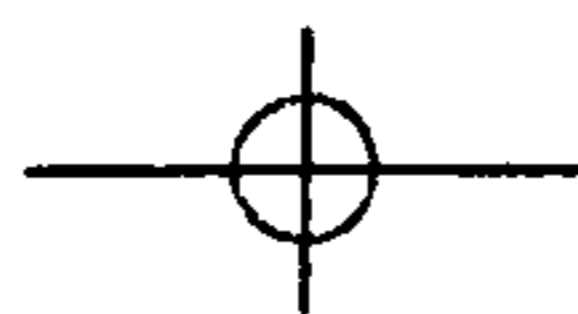
Is Japan Ecologically Modernising?

It is important to embed this empirical study within a wider (if provisional) analysis of the degree to which Japan's social institutions can be said to be ecologically modernising, if we are to make some conclusions as to whether Japan is indeed an 'ecological frontrunner nation'.

Evidence from the existing literature suggests that Japan is conforming to some of the core tenets of EM theory. The nation has placed a major emphasis on science and technology as the central institutions for solving environmental problems. Japanese industry has enthusiastically embraced the challenge of finding technical solutions to environmental problems and has excelled in environmental technology markets. Market dynamics (such as the drive for greater energy efficiency) appear to be playing a role in the ecological restructuring of some sectors of industry. Local authorities play an important role in environmental policy and clearly emphasise flexible, voluntary agreements over command and control approaches.

However, it appears that key features of Japanese environmental governance structures do not fit with EM theory. The Japanese polity is centralised, hierarchical and highly bureaucratic, lacking in both public participation and transparency. Environmental policy networks marginalise key interest groups (such as NGO's and small firms), fortifying the entrenched power of political and corporate elites, and allowing big business to dilute the objectives of environmental reform to defend their own narrow economic interests. In contrast to Western NGO communities, social movements have not become key stakeholders in environmental decision making and remain very much on the periphery of institutional power. Membership rates within environmental groups are low.

Moreover, public environmental attitudes have been described as 'very different' from those of citizens in other industrial nations, which suggests that ideologies and discursive practices may not be transforming in the manner that EM theory describes. It is apparent that an ideological shift has at least occurred in the discourse employed by Japan's business leaders and politicians in order to position the nation as a global environmental leader, but arguably this rhetoric disguises the reality of the nation's considerable 'ecological footprint' both at home and abroad.



Japan's elevated position within the EM literature may have been largely based on: (a) its enthusiasm for 'technological fixes' to environmental problems; (b) the close relationship between big business and policy makers; (c) the voluntary nature of environmental policy; and (d) the convincing rhetoric that politicians and business elites have used to create an image of international environmental leadership. Critics of EM as a political programme might well question the degree to which such approaches can truly further environmental goals.

With such dense webs of vested interest and advantage confronted with such limited civil society counter-powers, the lack of 'political modernisation' in Japan appears to be a major obstacle to environmental reform. Without a more participatory and transparent government, an empowered NGO and small firm sector, and a public prepared and able to take action to protect the environment and curtail industry's excesses, Japan still has a long way to go before EM scholars can legitimately call it an 'ecological frontrunner nation'.

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Study 1

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8 Ecologically modern industrialization

Brendan F.D. Barrett and Andrea Revell

A recycling oriented economic system is an economic system in which measures for the environment and conservation of resources are built into every aspect of industrial and economic activity, and in which the social and behavioural standards that were accepted in conventional economic society, which generally gave little thought to measures for conservation of environment and resources, are converted into a society in which the environment and the economy are integrated.

(METI, February 2002)

Recent statements like the one above imply that the most powerful industry oriented governmental body, the Ministry of Economy, Trade and Industry (METI), views the integration of environmental and economic concerns as central to the future development of Japan. As we mentioned in Chapter 1, some commentators consider that environmental performance of Japanese industries has broadly followed a path consistent with ecological modernization (see e.g. Jänicke *et al.* 1996; Dryzek 1997; Gouldson and Murphy 1997; Christoff 2000; Gille 2000; Gouldson 2000; Mol and Sonnenfeld 2000; Fisher and Freudenburg 2001; Mol 2001b). In this chapter we will explore some of the empirical evidence on eco-efficiencies¹ in Japan's industrial and energy sectors. Policy measures to increase eco-efficiencies in the economy by reducing material, water, land and energy intensities (as well as the demand for transportation) are a central component of ecological modernization (Jänicke *et al.* 1996; Cohen 1997). In this chapter, we will begin with a discussion of trends in the environmental performance of Japanese industry and then focus on the question of eco-efficiencies mainly in relation to resource consumption patterns. This will be followed by a discussion of the emergence of a recycling society and then we will look at patterns of energy consumption as well as the growth of new energy sources. We conclude with a discussion of the role of small and medium-sized enterprises in the attainment of ecological modernization related goals for Japanese industry.

The following sections aim to develop the debate on Japan's status as environmental laggard or front-runner (see Chapter 1) by looking at the complex relationships between environmental reforms, industrial environmental conservation measures, eco-efficiencies, waste management, energy policy and the

environmental practices of Japanese small and medium-sized enterprises (SMEs), a sector which comprises 99 per cent of Japanese industry (JSBRI 1999) yet which previous studies on ecological modernization have curiously ignored.

Environmental trends in Japanese industry

The environmental performance of Japanese industry has been the subject of considerable and contested debate (Li 1992; Moore and Miller 1994; Fukasaka 1995; Wallace 1995; Janicke *et al.* 1996; Imura 1997; Richards 1997; Rosenbluth and Theis 1999; Cruz *et al.* 2002; Yoshida 2002). For instance, it is argued that between 1970 and 1980 the Japanese steel industry cut air pollutant emissions by 30 to 80 per cent, producing steel with 40 per cent less energy expenditure than the United States (Moore and Miller 1994) and that:

By 1989, Japan had installed three times as many flue-gas cleaning systems as the rest of the countries in the industrialized world combined. The number of systems for removing sulphur dioxide rose from 323 in 1972 to 1,810 in 1988. Selective catalytic reduction systems for NO_x control jumped from 5 in 1972 to 379 in 1988.

(Moore and Miller 1994: 42)

As a result, Japanese industries were emitting less SO₂ and NO_x pollutants per capita by 1989 than any other industrial nation. Building on this work, it has been argued that due to the efforts of Japanese industry between 1971 and 1996 ambient SO₂ levels and carbon monoxide (CO) dropped by 85 per cent and 75 per cent respectively (Cruz *et al.* 2002).² Looking at other aspects of industrial performance, Janicke *et al.* (1996) compare the manufacturing sectors of Japan, Germany and Sweden, and examine the trends in energy consumption and water consumption, as well as environmental performance in different manufacturing sectors between 1971 and 1987 and find that some of the most significant industrial energy savings have taken place in Japan. They conclude that 'ecological modernization [in Japan] has thus far mainly taken the form of increases in the efficiency of energy and water use and in the extent of recycling' (1996: 17).

Contrary to common belief at the time such measures actually reduced production costs and created new markets (Moore and Miller 1994; see also Schreurs 2002: 3).³ The overall impression is that Japanese production practices became increasingly resource efficient as a result of the government's energy conservation and pollution control policies, with certain industrial sectors (such as iron, chemicals, steel and automobiles) being particularly effective in reducing energy intensities and pollution emissions. Fukasaka (1995) supports this view, noting that strong GDP growth (around 57 per cent) between 1980 and 1991 was accompanied by significant reductions in SO_x, NO_x and CO₂ as a result of the government's energy diversification policies and emission control standards. According to the OECD, urban air quality in Japan continued to improve in the 1990s and the strong decoupling of air emissions from GDP was reinforced (-5 per cent for SO₂,

NMVOCs and CO between 1990 and 1999, while GDP rose by 13 per cent). Among OECD countries Japan has the third lowest emission intensity (kilogram/unit GDP) for SO_x and the lowest for NO_x. Reductions have also been witnessed in relation to other pollutants (-60 per cent for total dioxin emissions, -45 per cent for benzene, -43 per cent for trichloroethylene and -50 per cent for tetrachloroethylene from 1995 to 1999) for major emitting industries (OECD 2002).

Effectively Japanese industry led the way internationally in the shift from end-of-pipe solutions towards preventative technologies and life-cycle analysis models (Mol and Sonnenfeld 2000). The Japanese approach to pollution prevention involves a creative mix of command-and-control instruments (emission standards, environmental quality standards and technology designations), market-based mechanisms (compensation levies - polluter pays principle, emission taxes and emission permit trading) and voluntary measures (Matsuno 2003). Perhaps most striking has been the use of pollution control agreements between business and local governments/communities which complement the local regulation and guidance with measures designed to reflect industry-specific pollution prevention goals, the condition of the local economy and the local social context. By the 1990s, over 30,000 voluntary agreements between industry and local governments were in place (Imura 1998). Most of the early agreements in the 1960s dealt with major industrial facilities (over 1,000 employees), peaking at about 450 agreements per year in 1974, after which there was a drop-off to nearly 200 a year in the 1980s, before a second peak in the late 1980s/early 1990s in response to newly recognized threats such as high-technology pollution.

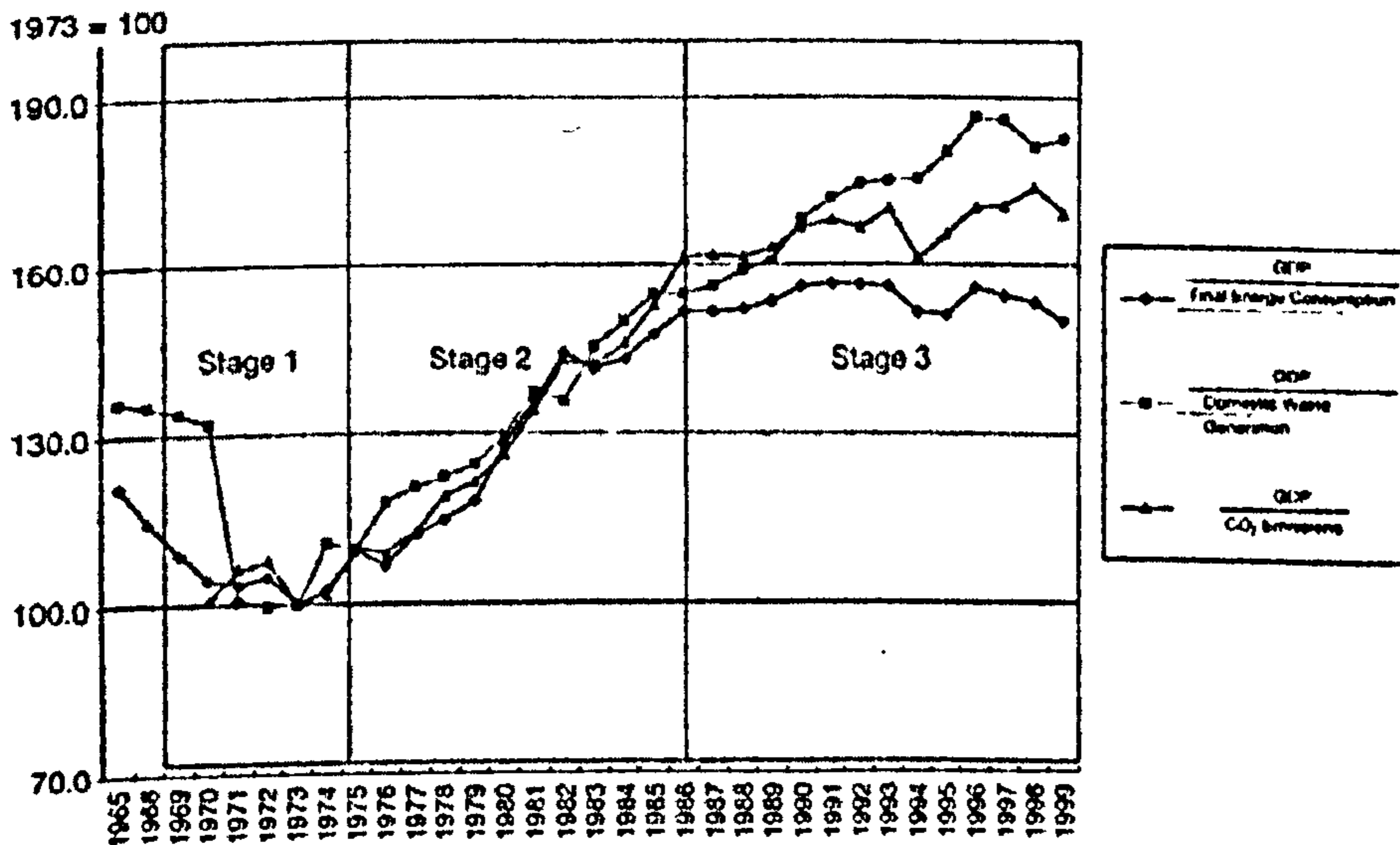
Other studies, however, present contrasting evidence on the form and relative impact of environmental innovation within Japanese industry. For instance, it is argued that energy savings from the 1970s to early 1990s were less the outcome of national policies and more an environmental gratis effect resulting from the fast growing and highly flexible industrial structure (e.g. restructuring and the decline in energy intensive industries) attempting to cope with rising energy prices and a heavy dependency on imports (Janicke *et al.* 1996). As mentioned in Chapter 1, there are also those who claim that Japanese industry has 'exported pollution' to neighbouring Asian countries as manufacturing plants have moved to nations with less stringent environmental standards (Ui 1989c; Imura 1997; Taylor 1999). Moreover, others argue that Japanese corporations have been able to avoid costly abatement measures because political institutions are biased in favour of business interests and oppose any serious, sustained effort to regulate environmental pollution (Rosenbluth and Theis 1999). As a result, highly visible and relatively easily regulated air pollution has been curtailed but less visible and trickier water, toxic,⁴ soil and groundwater pollution have been more difficult to tackle (Yoshida 2002). Regulations in these areas have been slow in coming with the prevention of groundwater pollution delayed until revisions to the Water Pollution Control Law were made in April 1997. Prevention of soil contamination was not addressed until the May 2002 enactment of the Law Concerning Countermeasures against Soil Pollution. Finally, the OECD states that, whilst Japan has achieved a strong decoupling of economic growth from pesticide, fertilizer, NO_x and SO_x emissions,

environmental gains have been more than off-set by additional impacts arising from an expansion of output. In the 1990s growth in energy demand cancelled out energy efficiency gains, resulting in a 5 per cent increase in the energy intensity of the economy and an increase in absolute CO₂ emissions. Similarly, the growth in private consumption and waste generation has cancelled out many material efficiency gains (OECD 2002). Let us discuss these contrasting perspectives further within the context of the eco-efficiency debate.

Eco-efficiency in Japan

Perhaps the best discussion of the links between eco-efficiency and ecological modernization can be found in Cohen's work where the former is described as 'the implementation of industrial practices that can improve corporate profitability by redesigning manufacturing processes to reduce the production of wastes at the source so as to avoid remedial treatment' (Cohen 1997: 1). One of the main promoters of the eco-efficiency concept is the World Business Council for Sustainable Development (as explained in DeSimone and Popoff 1997). Eco-efficiency has become a consensus strategy amongst multinational corporations and has been embraced by a number of governments including Japan,³ as exemplified by the 2002 White Paper on the Environment published by the Ministry of the Environment (MoE 2002a). Presenting data for the period from 1965 to 1999, the White Paper looks at, amongst others, final energy consumption, CO₂ emissions, domestic waste generation, NO_x and SO_x concentrations as well as energy eco-efficiencies. The entire period is sub-divided into three stages. Stage one covers the period to 1973, the occurrence of the first oil crisis. In this stage, as Japan experienced rapid economic growth, eco-efficiencies generally declined for energy and waste but increased for NO_x and SO_x as regulations were implemented to control air pollution (see Figures 8.1 and 8.2). The second stage covers the period to 1985 when the price for oil fell and here we find that, as economic growth slowed, eco-efficiencies improved for all indicators mainly due to the impact of energy and resource conservation measures. The final stage covers the period from 1985 to 1999, where we see continued improvements in eco-efficiencies for NO_x, SO_x and waste contrasting with only minor improvements for CO₂ and energy. Overall, this data is supportive of the findings from the OECD environmental performance review of Japan which argued that in the 1990s there was a 'very strong decoupling between conventional air pollutants from GDP' at -82 per cent for SO_x and -22 per cent for NO_x (OECD 2002: 23).

With respect to implementation of policy measures to promote eco-efficiency in Japan most of the expertise lies with METI. In April 2002, the Ministry established a new committee under the chairmanship of Professor Ryoichi Yamamoto dealing with 'Factor Eight' as a means of improving resource productivity (Bleischwitz 2002). Professor Yamamoto of the University of Tokyo, in close collaboration with METI, has undertaken much of the research on eco-efficiency in Japan. His work analyses the improvements in eco-efficiency for LNG-fuelled combined cycle power generation systems and for thermal storage type air conditioning systems. He



Source: 2002 White Paper on the Environment, Government of Japan

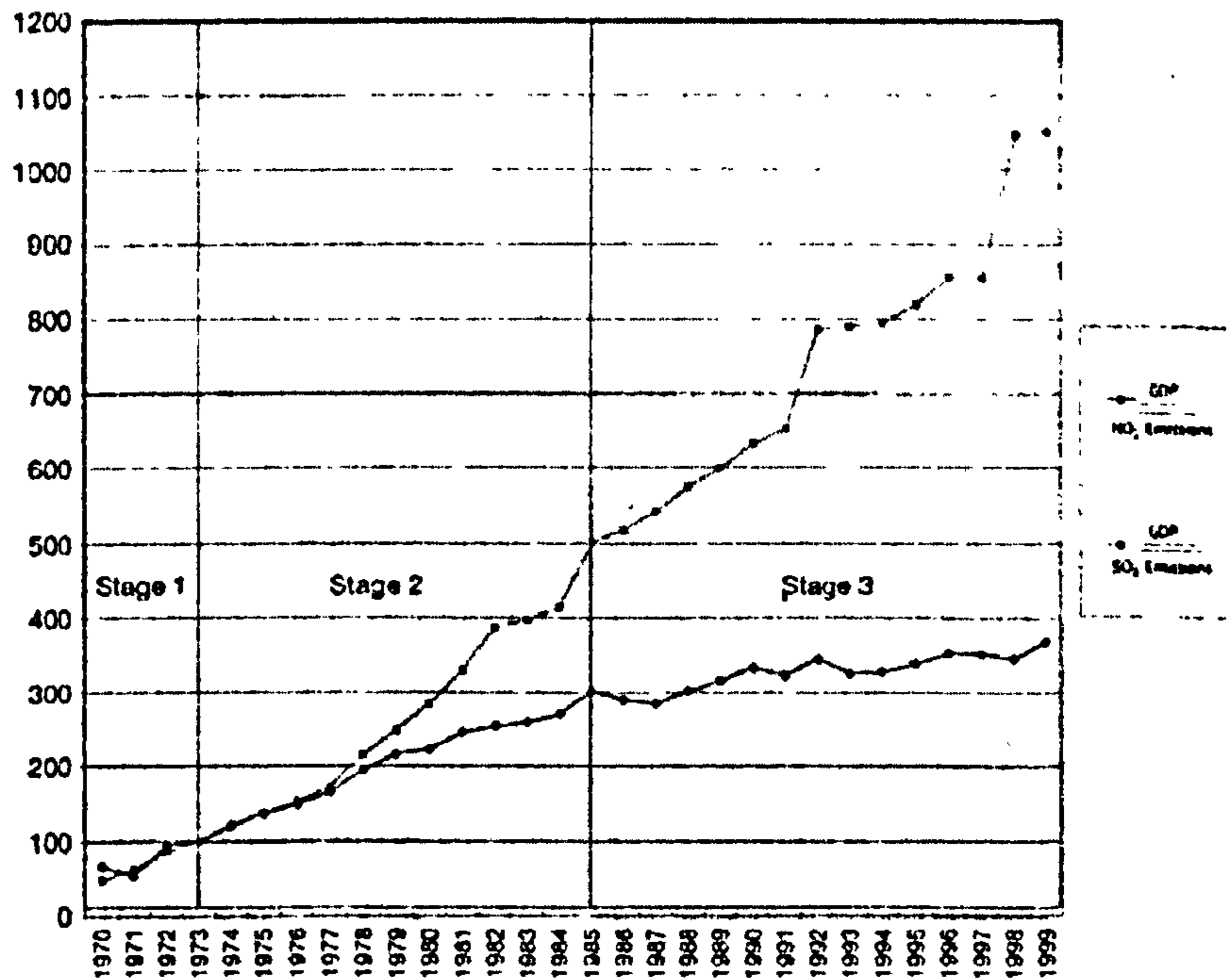
Figure 8.1 Changes in eco-efficiencies for final energy consumption, CO₂ emissions and domestic waste.

Note: Prepared by the Ministry of the Environment based on the 'Annual Report on National Accounts' published by the Cabinet Office, 'Comprehensive Energy Statistics' published by the Agency of National Resources and Energy and 'Emission of Domestic Waste and Processing Status (Performance of 1999)' published by the Ministry of the Environment.

also looked at the performance of a number of eco-designed products and found improvements ranging from factor 2 for the Toyota hybrid car to factor 10 for the Sharp liquid crystal display (LCD) TV and factor 20 for Honda's Intelligent Community Vehicle System (ICVS) (Yamamoto 2000). Yamamoto concludes that Japan is now in a new phase of promoting environmental protection through the development of eco-efficient products and services, as well as green purchasing (Yamamoto 2001). Another influential figure with respect to eco-efficiency and green productivity is Professor Hiroshi Komiyama, also from Tokyo University and chair of METU's materials flow committee (Bleichwitz 2002). Professor Komiyama has developed 'Vision 2050' designed to promote green productivity by increasing energy efficiency threefold compared to today's levels, creating recycling systems and doubling the use of renewable energy sources (Bleichwitz 2002; Itochu 2002).

As a result of the work of these and other influential thinkers, the concept of eco-efficiency has gained much ground in Japan in the past decade and has been associated with the emergence of such concepts as zero emissions, green productivity and factor four (Mitsuhashi 1998; Watanabe 1999; Yoshida 2002; Hotta 2004). A large number of projects have been implemented across the country

1973 = 100



Source: 2002 White Paper on the Environment, Government of Japan

Figure 8.2 Eco-efficiency rates for other air pollutants.

Note: Prepared by the Ministry of the Environment based on 'Annual Report on National Accounts' published by the Cabinet Office and 'Air Pollutions Status Report' by the Ministry of the Environment.

with direct involvement from local government and business. Interesting examples include the Fujisawa Eco-Industrial Park developed by Ebara Corporation (a manufacturer of precision electronic devices and environmental equipment), the Kokubo Eco-Industrial Park in Yamanashi Prefecture promoting collaboration between a number of firms including Panasonic, Fujitsu and Pioneer (Morikawa 2000) and the Kitakyushu Eco-Industrial Park (Bleischwitz 2002). The latter is also referred to as an Eco-Town project, initiated by METI in 1997 in order to encourage development of environmentally sound community systems involving industrial and public sectors. Initially, ten Eco-Towns were launched with METI financial support in the prefectures of Hokkaido, Chiba, Gifu and Akita and in the cities of Sapporo, Iida, Omuta, Uguisuzawa, Kitakyushu and Kawasaki (Morikawa 2000). Other influential initiatives relate to the formation of zero-emissions clusters with the best examples being that of Yakushima Island (a model area for material recycling and the development of renewable energy based on the zero-emissions concept) and production of eco-cement by Taiheiyō Cement

Corporation utilizing ashes from municipal waste incineration and sewage sludge (Morikawa 2000; Kai *et al.* 2002). These eco-industrial initiatives have been matched by the widespread adoption of environmental management systems (EMS) within Japanese corporations. For instance, Japan now boasts the highest number of ISO 14001 accreditations globally, with over 13,800 entities obtaining certification by December 2003.⁶ Concerns have been expressed however about the need to increase participation from the small and medium-sized enterprises in EMS processes in order to promote vertical and horizontal coordination amongst firms (Bleischwitz 2002). We will explore this matter further later in this chapter.

All of the above illustrate how eco-efficiencies are improving in some areas matched by performance enhancements with respect to eco-designed products up to factor 20 in some cases. Many major eco-industrial community projects are under way and represent the search for a new development model bringing together various stakeholders including government, businesses and local communities. However, these projects are still in their early days and analysis of their environmental impacts is limited. Moreover, they tend to focus on solid waste management/technology issues rather than on environmental management from a more holistic, industrial ecology perspective (see Morikawa 2000). In this context, our main concern relates to the potential for recent efficiency gains to be undermined by the return of economic growth. In particular, it has been shown that, even during economic recession, energy efficiencies have been weakened by the expansion of consumption in different sectors, e.g. personal computers in the commercial sector, air conditioners in the residential sector and large sports utility vehicles in the transportation sector (MoE 2002a). As with most industrialized countries, household size in Japan is declining, from 3.22 persons per household in 1980 to 2.67 in 2000⁷ and this is accompanied by associated impacts on the environment.⁸ Further, of the 46 million households in Japan in 2002, 86.4 per cent owned a car, 63.3 per cent owned personal computers and 81.4 per cent owned video players. Moreover, whilst in 1970 around 10 out of 100 homes had an air conditioner and 25 out of every 100 homes had a colour TV, by 1999 this had increased to 208 and 226 respectively (Masuzoe 2001). These trends imply that further greening of Japanese industry may be unlikely to bring about significant environmental gains unless some kind of policy framework is in place to respond to the environmental impacts associated with major consumption pressures. Ecological modernization is less effective in providing explanatory sub-theories on environment related consumption patterns and on how innovations might result in environmental improvements (despite the efforts made by Spaargaren 2000a; Spaargaren and van Vliet 2000). It appears, however, that the Japanese are responding to this dilemma in their own unique way through the promotion of something called the *junkangatta shakai* – recirculatory society.

Emergence of the recycling (recirculatory) society

The notion of the recycling society first began to take shape in Japan in 1991 with the publication of a report by the Japan Environment Agency entitled

'Towards a Recycling Society in the 21st Century' calling for the recovery, recycling and reuse of materials and energy as well as the reduction of the nation's environmental load through measures to encourage the frugal use of resources and the selection of environmentally benign resource options (Japan Environment Agency 1991b). At this time, it was estimated that only 10 per cent of the 2 billion metric tons of materials used each year by Japan were actually recycled (Gotoh 1997). By 2000, Japan was responsible for the extraction of 1.84 billion tons of natural resources (0.7 billion tons or 38 per cent from overseas) with 0.23 billion tons of recycled materials, or roughly 11 per cent of the total resource inputs (MoE 2002a). Japan generates around 450 million tons of waste each year (50 million tons of municipal and 400 million tons of industrial waste) (Yoshida 2002). For municipal waste this translates into per capita waste generation at around 410 kilograms per year (daily rate of 1 kilogram of waste per capita), lower than Norway, Germany and the Netherlands. Nevertheless, Japan faces a serious shortage of landfill capacity with only 12.3 years of municipal landfill space remaining in 1999 and 3.7 years remaining for industrial wastes (OECD 2002). As a result, unlike in other industrialized nations, the primary method of disposing of general waste is incineration (77 per cent of waste was incinerated in 2000) and this has led to considerable public concerns over the associated dioxin emissions (Kerr 2001; OECD 2002: 107; Yoshida 2002). Container and packaging wastes such as cans, PET bottles and plastic/paper boxes account for about 60 per cent of the total municipal refuse. The rate of waste recovery by municipalities and community groups stood at around 13 per cent in 1999. Recovery rates for individual wastes vary greatly. For instance, in 2000, 84 per cent of steel cans, 80 per cent of aluminium cans, 78 per cent of glass bottles, 57 per cent of used paper and 34 per cent of PET bottles were recovered (MoE 2002a).

Effective waste management in Japan is complicated by three key factors. First, Japan is dependent on the import of both natural resources and finished goods, particularly consumer electronics. In 2000 alone, Japan imported 9.8 million televisions, 2.5 million personal computers and 2.3 million video cameras. These represented roughly 96 per cent, 14 per cent and 19 per cent respectively of domestic sales (ME 11 2002). Second, in the 1990s there was a steady increase in the export of used goods from Japan (including automobiles, air conditioners, televisions and microwaves) and recyclable materials (e.g. plastics, paper, iron, aluminium and copper scraps) to countries such as China, Taiwan, Vietnam, Thailand, South Korea and Hong Kong. Third, domestic illegal dumping of industrial wastes is a major problem, with some 1,027 cases in 2000, representing around 400,000 tonnes (MoE 2002a) and tens of thousands of unreported waste sites all over the country. Central and local governments have been heavily criticized for supporting illegal dumping by means of limited policing and cover-ups.⁹ Well-known examples include Teshima (Seto Inland Sea),¹⁰ Mitake town (Gifu Prefecture) and Hinode town (Tokyo) (Yoshida 2002). The outcome at Teshima was instrumental in bringing about revisions to the 2002 Waste Management Law that now holds firms liable for dumping violations if they are

irresponsible enough to leave their waste in the hands of illicit contractors. All of the above represent significant obstacles to the attainment of a 'recirculatory society' in Japan.

In recognition of and response to the above problems, it is significant that nine laws were recently enacted or revised at the national level. These include: 1) the Basic Law for Promoting the Creation of a Recycling Oriented Society (enacted and enforced in 2000); 2) the Law for Promotion of Effective Utilization of Resources (revised in 2000 and enforced in 2001); 3) the Containers and Packaging Recycling Law (enacted in 1995 and enforced in 2000); 4) the Home Appliances Recycling Law (enacted in 1998 and enforced in 2001); 5) the Food Recycling Law (enacted in 2000 and enforced in 2000); 6) the Construction Materials Recycling Law (enacted in 2000 and enforced in 2002); 7) the Green Purchasing Law (enacted in 2000 and enforced in 2001); 8) the Revised Waste Management Law (revised in 2000 and enforced in 2001); and 9) the Automobile Recycling Law (enacted in 2002 and enforced from 2004). The new law on automobile recycling is noteworthy since it introduces for the first time in Japan the concept of extended producer responsibility (EPR), and specifically defines the roles and responsibilities of car manufacturers. A total of 72 million four-wheeled vehicles are registered in Japan, and 5 million are scrapped every year. At present, more than 70 per cent of used cars are recycled, but the Japanese government aims to raise the car-recycling ratio to 95 per cent by 2015.¹¹ The enactment and revision of so many laws has led the national government to hint at similarities between the 1970 Pollution Diet and the 2000 Recycling Diet as indicative of a new age of environmentalism in Japan (METI 2002). The general policy direction is the so-called 3-R approach; reduce (decrease wastes generated during production), re-use (re-utilize parts of products) and recycle (convert wastes into raw materials). A whole set of rules have been put in place to require businesses, local governments and citizens to adopt this approach. The recycling guidelines have been developed covering some 35 items of production and 13 types of business, estimated at around 60 per cent of municipal wastes and 50 per cent of industrial wastes. This is an impressive suite of new laws and according to Yasuo Tanabe, Director, Recycling Promotion Division at METI:

industry is making progress in reduction, using less resources, extending product life, and constraining the emergence of waste. In the product area, the volume of resources used per unit for containers and computers has been pared back by 10 to 20 percent in recent years. Companies are competing fiercely to produce smaller, lighter and slimmer products. Once scarcer than in US and Europe, the number of repair businesses is also picking up. In plants and factories too, efforts to reduce industrial waste toward the goal of zero emissions are making rapid progress. In response to guidelines issued by the Industrial Structure Council in June 2001, manufacturing majors and other players in 12 industries have committed themselves to reducing the final volume of industrial waste by 20 to 60 percent by 2010.

(see: http://www.meti.go.jp/english/policy/index_environment.html)

The MoE also plays a key role in waste management and in March 2003 published the Basic Plan for Establishing a Recycling-based Society. The plan includes measures to limit natural resource consumption and to increase recycling. Numerical targets are included in the plan to boost resource productivity (GDP divided by natural resource inputs) by 40 per cent, to reduce per capita daily waste generation by 20 per cent and to halve the amount of waste going to landfills from 50 million tons in 2000 to 28 million tons by 2010 (MoE 2003c). It is still early days but clearly Japan has embarked on a major process of institutional innovation related to waste management that could be described as a prime example of ecological modernization. Nevertheless, according to METI, a number of limitations need to be addressed including the relative difficulty of treating different business wastes, associated costs, the state of development of recycling facilities, and perhaps most importantly the implications for performance of the Japanese economy globally and the potential ramifications of the recycling society for imports and exports within the framework of WTO rule-making (METI 2002: 3). Interestingly, the promotion of a recirculatory society also includes emphasis on 'thermal recycling' in Japan, or waste to heat schemes, which brings us to the next topic of discussion.

Energy industry/energy consumption

As in many other countries, the Japanese economy made the shift from coal to petroleum in the late 1950s only to be faced with the problems of the high sulphur content in heavy oil and the need to stabilize supplies (Fukasaka 1995). The need to respond to the associated environmental problems culminated in the formulation of a whole new legislative and institutional framework in the 1970s (Gresser *et al.* 1981; Hoshino 1992; Tsuru 1999). Various fiscal measures were introduced at this time including low interest government loans, preferential tax treatment and special depreciating schemes for the industrial sector. The result was massive investment by the industrial sector in technological innovation to ensure compliance with environmental standards. Reductions in the levels of SO_x were possible through the introduction of desulphurization technologies (Ren 2000). However, it was the impact of the 1973 oil shock that had the greatest impact on Japan's reliance on petroleum products and its consumption (Barrett and Therivel 1991). A number of initiatives were launched in the late 1970s to try to reduce Japan's dependency on petroleum including the search for alternative energy sources, diversification of energy sources, promotion of energy conservation, and the implementation of research and development on new energy sources. For instance, in 1979, the Energy Conservation Law established standards for all energy-consuming sectors and called for an increase in energy efficiency in consumer products. As a result the Japanese economy was better placed than others to weather the second oil crisis of 1979 and it is argued that the introduction of these energy policies in no way hindered the performance of the Japanese economy (Fukasaka 1995).

An often-quoted statistic concerns Japan's ability to reduce by 25 per cent the ratio of energy consumption to GDP from 1979 to 1987 (OECD 1994). As a result,

Japan has one of the lowest ratios of energy consumed per unit of gross domestic product (GDP), as well as one of the lowest energy intensity rates per capita (OECD 1991; IEA 2003). However, we can note that more recently, between 1990 and 1999, Japan's total final energy consumption increased by 16 per cent, during a time of economic recession, exceeding GDP growth by 2 per cent (OECD 2002: 222-223). Moreover, while Japan's overall electricity consumption increased by 24.6 per cent in the 1990s, that of the residential/commercial sector increased by 42 per cent.¹² Interestingly, the growth rate per capita of energy consumption was 13 per cent, close to that of GDP growth for the same period. The explanation for these trends given by the OECD is that Japan is witnessing a continuing shift towards a mass consumption based economy, as mentioned above, with smaller households living in larger homes with more electrical appliances and increased use of information and communication technologies (OECD 2002). For instance, total energy consumption for all households in Japan in 2001 was 193 billion kWh, of which 16 per cent was from refrigerators, 10 per cent from air conditioners and 15.8 per cent from lighting (ANRE 2003).

A number of initiatives were implemented in the 1990s in order to support the attainment of Japan's energy policy objectives. From May 1997 onwards, an Action Programme for Economic Structure Reform began the process of deregulation designed to restructure the supply side of the energy industry. Also in 1997, this time in June, a new law was passed to promote the development and use of new energy (not clean energy, since it also includes energy from waste). These two initiatives have had the impact of allowing smaller entities (Independent Power Producers) to construct energy facilities and sell their electricity to the ten main electricity utilities. Associated with this has been a steady growth in different forms of electricity production. According to the New Energy Foundation, the long-term impact of these measures would be to increase new energy related employment to around 1.3 million persons with a market size of Yen 7 trillion (US\$ 8.3 billion) by 2010.¹³

In 2001, METI published the Long-Term Supply and Demand Outlook to 2010, which forms the basis for government policy (Toichi 2002; ANRE 2003; IEA 2003). Considering that approximately 90 per cent of CO₂ produced in Japan is energy related, the measures that Japan adopts to deal with growth in energy consumption are particularly important (IEA 1999: 7, 2003). Just like the 3Rs of the waste policy, the energy policy of Japan is based on 3Es - economic growth (deregulation to cut high energy costs), energy security (more nuclear and alternative energy sources) and environmental protection (Toichi 2002). There are four central policies currently being pursued under this framework. First, energy conservation activities are being strengthened so as to restrict growth in primary energy demand to 0.1 per cent per annum in the period 1999-2010 (compared with an anticipated GDP growth of 1.5 per cent per year). Second, new energy sources are being developed to try to reach a target of 18 million TOE by 2010, about 3 per cent of the total primary energy supply. This policy thrust is supported by various fiscal measures including low interest loans for the establishment of new businesses, subsidies and loan guarantees as well as by the

supply of information/know-how. Third, plans for the construction of nuclear power stations have been revised downward from 16–20 new plants to 10–13 (Toichi 2002). This may in part explain the difficulties encountered when siting these facilities (Hayden Lesbirel 1993) and public concerns over safety related incidents in recent years (IEA 2003). At present there are 53 commercial nuclear power plants in Japan, which when in operation provide roughly 35 per cent of the national electricity supply (see <http://www.enecho.meti.go.jp/english/energy/index.html>). This represented 12 per cent of the total primary energy supply in 1995, estimated to increase to 17.4 per cent by 2010. Fourth, emphasis is placed on increasing the use of natural gas from the current level where it represents around 13 per cent of total primary energy supply (ANRE 2003). With respect to the growth of new energy sources, cumulative output of photovoltaic power generation systems in 2000 was about 321 MW and the numerical target for 2010 is an increase to 4,820 MW (1,180 million oil equivalent litres – moel).

Turning now to renewable energy resources, with respect to wind power generation there has been significant progress in recent years with about 284 units built by September 2001, representing a total installed capacity of about 300 MW. The national target for the installation of wind power generators by 2010 is 3,000 MW (1,340 moel) (ANRE 2003). Data is also available for power generation from biomass showing this represented around 80 MW in 1999 and estimated to increase to around 330 MW in 2010. As of the end of 2000, there were 5,603 cogeneration plants in Japan with a combined power output of 5,480 MW (2.4 per cent of overall power generation output and significantly lower than US and European countries). The numerical target for the introduction of cogeneration (excluding steam turbine system) by 2010 has been set to 10,020 MW (6,620 moel). Other renewable energy resources with a longer, more established history in Japan include hydropower and geothermal. The former, in 1997, accounted for 46,320 MW at around 1,800 sites in Japan. With regard to the latter, there are 16 geothermal plants operating in 14 stations with a total potential output of 530 MW, or 0.2 per cent of Japanese power capacity. However, there are no plans to increase the number of geothermal stations. In contrast, waste to energy is viewed as an important source of electricity and there were more than 1,900 municipal solid waste incineration facilities in Japan in 1999, and only 189 had power generation equipment. The combined power output was 843 MW. The number of industrial waste incineration plants featuring power generation equipment, on the other hand, stood at 53 with a combined power output of 136 MW. Altogether, there were 242 waste incineration plants with power generation equipment, and their combined installed capacity was 979 MW. The numerical target for the introduction of waste incineration power generation by fiscal year 2010 has been set to 4,170 MW (5.52 billion LOE₄). Taking all of the above into consideration, with the addition of hydropower and geothermal, it is estimated that Japan's renewable and new energy supply will reach 7.5 per cent (i.e. 3 per cent for clean energy) of the total in 2010, compared with 29 per cent for Denmark, 10.3 per cent for Germany and 9.3 per cent for the United Kingdom for the same period (Iida 2003). One reason for this marked difference may relate to funding priorities. For instance, research and development

is a central component to the future of Japan's energy economy. The IEA has, however, pointed out several internal inconsistencies with the current energy related R&D expenditure patterns (IEA 1999: 145). For instance, in the mid-1990s, government expenditure in Japan on energy R&D was significantly higher than in other IEA member countries (e.g. US\$4.7 billion compared with US\$2.9 billion for the United States). Within this context, less than 5 per cent of this R&D spending was committed to non-nuclear priorities – photovoltaics, geothermal, storage technologies and so on.

Other problems have been identified in relation to institutional structures and the policy formulation process. In particular, reference is made to the fact that the existing monolithic energy supply structure is based on powerful central control through METI and the ten electricity utilities (Iida 2000). Recent deregulation efforts have had a positive impact and there are calls for the establishment of a regulatory system that would be completely independent from METI (IEA 2003). Furthermore, considerable progress in the promotion of renewable energy has been made on the ground by new coalitions of business, local government and NGOs working to develop renewable energy resources. These groups see renewable energy as a launch pad for Japan's sustainable energy future that would increase public participation in energy policy formulation and overcome the deep divisions that currently surround Japan's nuclear power policy. At the same time, the previously closed policy process has begun to open up (although METI remains the convenor). These changes appear to indicate that with respect to green energy policy Japan has placed 'one foot on the threshold of ecological modernization' (Iida 2000). It is a hesitant step forward dependent on balancing the three Es. It lacks clarity on how best to make trade-offs between liberalizing the utility sector, ensuring secure energy supplies and reducing carbon dioxide emissions (IEA 2003). The contradictions between these policy goals may in part explain why the Japanese government struggles to communicate its position and timetable for utility restructuring and deregulation. The challenge that Japan again faces is how to reduce energy consumption growth while at the same time enabling the economy to grow. Efforts are being made to try to remedy this situation and a set of detailed and specific measures designed to bring about greater energy efficiencies in all sectors has been introduced through various programmes (including the April 1997 Ministerial Council for Comprehensive Energy Measures and the 2001 Long-Term Energy Supply and Demand Outlook). These include the introduction of 'quantitative targets' to reduce energy consumption at all Japanese factories. The target calls for an average annual reduction in energy intensity of more than 1 per cent. At present, these targets are to be met through voluntary actions, for example, through the Keidanren's Voluntary Action Plan on the Environment (IEA 2003). The government is also promoting the adoption of energy codes and standards for buildings and appliances to increase energy efficiency requirements and a Top Runner methodology is being used specifically for appliance energy efficiency standards (ANRE 2003).¹¹ In April 2003, the Special Measures Law Concerning the Use of New Energy by Electricity Utilities was enacted, functioning as a renewable portfolio standard (RPS). This legislation sets the minimum percentage

of electricity generated from renewable sources in relation to the amount of electricity sold (Nakakuji and Kudo 2003). Concerns have been expressed however, about the need to ensure consistency with existing policy measures (Nakakuji and Kudo 2003) and perhaps more importantly on the potential to use the RPS to shift renewable energy from a marginal concern to a central factor in Japan's energy policy that could have positive impacts with respect to the promotion of technological innovation and possible rethinking of national nuclear energy policy (Iida 2000). So far we have examined recent innovations related to waste and energy management. The success of these measures is dependent on participation from all sectors including small and medium-sized enterprises.

Japanese SMEs and ecological modernization

The degree to which small and medium-sized enterprises (SMEs) are involved in ecological restructuring is an important issue to explore if one is to gain any sense of the extent to which ecological modernization is occurring within industry, given that they are such a vast sector of the Japanese economy. In 1996, SMEs accounted for 99 per cent of all firms, 77 per cent of employment and 51.0 per cent of total shipment value of the manufacturing sector. Data for 1994 show that they represent 61.4 per cent of the total amount of wholesale and 76.8 per cent of retail sales.¹³ However, fascination with 'Japan Inc.' has meant that to date there has been little research on the environmental behaviour and attitudes of smaller firms, and therefore their part in METI's vision of a 'new age of environmentalism' remains unclear. From the small number of quantitative surveys conducted on the environmental practices of SMEs in Japan (e.g. Japan Finance Corporation 1997; Sanwa Research Institute and Consulting 1999; Asahi Bank 2000; Yoshida 2002) it appears that most of the ecological restructuring occurring within the SME sector is focused on reducing waste and energy usage, which certainly bodes well for the government's plans for a 'recirculatory' and 'clean energy' society. The primary motivation for these practices is to reduce the cost of waste fees and energy bills. However, the perception that other environmental improvements will impose a cost burden on business is a barrier for many owner-managers. Lack of environmental awareness and appropriate skills is also an obstacle to more proactive behaviour. The number of small firms with environmental management systems is low due to the resources required to embark on the accreditation process.

Yoshida's (2002) quantitative study of over two thousand SMEs in Tokyo found that 32 per cent claimed to be involved in industrial waste reduction, 21 per cent claimed to be recycling or re-using products, 20 per cent claimed to be involved in measures to cut noise, vibrations and offensive odours and 18 per cent claimed to be involved in energy-saving measures. Only 2.3 per cent indicated they had acquired or were in the process of acquiring environmental management systems. In terms of size, larger SMEs were more likely to be engaged in environmental measures than their smaller counterparts. Environmental measures were often viewed as either 'not necessary' as owner-managers perceived their firm's environmental impact to be negligible, or as a cost burden which they were

unwilling to bear. Another study of 1,590 SMEs in the Tokyo area (Asahi Bank 2000) found that 70 per cent of the sample claimed to be taking measures to cope with environmental issues, mainly minimizing waste disposal (such as cutting paper usage) and energy usage. However, more proactive environmental measures such as recycling or installing energy-saving equipment were rare. The main obstacles to making environmental improvements were found to be a lack of environmental awareness, the cost of investing in environmental equipment and a lack of technical know-how. The vast majority of small firms claimed to be too busy trying to comply with environmental regulation to consider voluntary initiatives.

Revell's qualitative study of mechanical engineering and restaurant firms in Tokyo used the analytical framework provided by ecological modernization theory to explore the environmental practices of small firm owners (Revell 2002). Twenty in-depth interviews were conducted with owner-managers of businesses with under 50 employees, augmented by interviews with ten 'key informants' from relevant trade associations, industrial organizations, chambers of commerce and industry and academia. The findings challenged three assumptions in ecological modernization theory, namely the role of market dynamics in the 'greening' of industry, the emergence of new ideologies such that business actors increasingly view environmental and economic goals as compatible, and the increasingly participative nature of environmental governance structures. The study found that, whilst some environmental reform was occurring within the sample, market dynamics and changing ideologies were not pushing this reform in the way that might have been expected under ecological modernization. Firstly, there was little supply chain pressure to ecologically restructure (for instance, mechanical engineers had not been encouraged by suppliers to improve their environmental performance or invest in environmental management systems, and restaurants similarly felt no pressure from customers to take an interest in environmental concerns). Secondly, economic and environmental goals were often perceived as conflicting, with many owner-managers unwilling to invest the resources required for environmental management because of the perception that it would be too costly. Thirdly, small firm owners felt marginalized from policy networks that they perceived to be dominated by political, bureaucratic and business elites. The study concluded by arguing that the environment was not yet a core business concern for small firms as neither the state nor the market had provided significant enough pressure on owner-managers to reduce their environmental impacts. Moreover, a lack of participation in policy networks was highlighted as a possible reason for small firm resistance to environmental action, as firms had not been engaged in a consultative process aimed at stimulating environmental management and therefore a context of consensual support for policy strategies had not been created (Revell 2002).

Whilst it appears that large firms in Japan have widely adopted voluntary goals and standards, these studies indicate that small and medium-sized enterprises are more laggardly with regards to voluntarily embracing environmental best practice than their corporate counterparts. The environmental performance gap between large and small firms may in part be due to the sheer numbers of small firms which

make them more difficult to regulate than large firms, but it is also due to the traditional emphasis on voluntarism within Japanese environmental policy. Voluntary agreements, a favoured policy tool in Japan, have been very effective in encouraging environmental management amongst large firms who are responsive to stakeholder pressure to reduce environmental risk and who have the resources to invest in environmental management systems and clean technology. However, voluntary approaches are arguably less likely to be effective amongst resource-poor smaller firms, particularly if market dynamics such as supply chain pressure and consumer demand are doing little to drive environmental change. Owner-managers are likely to resist voluntary action when they are concerned that making environmental improvements might affect the competitiveness of their business.

Clearly, regulatory drivers are needed to ensure that the environment becomes a top business priority for small firms. The introduction of the raft of new legislation on waste and energy augurs well for reducing the environmental 'footprint' of the SME sector, for when a 'level playing field' is perceived small firms are more likely to accept additional costs. Small firms have unique characteristics that distinguish them from large firms and therefore attempts to include them in the 'recirculatory' and 'clean energy' society will necessarily entail the adoption of a size as well as sectoral approach to policy-making in Japan. Moreover, it appears that policies such as the Green Purchasing Law will be essential in encouraging the vertical and horizontal coordination amongst firms that a Wuppertal Institute's study identifies as currently inadequate in Japan, yet which is so vital to the formation of a recirculatory economy (Bleichwitz 2002).

Conclusions

Japan has gone through various phases of eco-efficiency since the 1960s. In the past, Japan was able to reduce environmental impacts in some areas by applying its technical prowess to find innovative solutions that allowed greater productivity to occur without the need for more material and energy usage. However, it is apparent that due to a continued expansion in output Japan has achieved only a relative decoupling of economic growth from environmental degradation. This has led to a debate over whether Japan is an environmental laggard or leader, as absolute levels of waste, energy usage and pollution continue to increase. In this chapter we have discussed policymakers' aspirations for a new age of environmentalism in Japan, involving the creation of a 'recirculatory' and 'clean energy' society. This renewed vigour in environmental policy indicates that Japan is hoping to reassert itself as an 'ecological front-runner nation'. However, this new phase of ecological modernization will not be without its challenges, for it requires a radical reordering of many segments of industry and society.

In this chapter, we have shown that management of the environmental side effects of industrialization goes beyond single industrial facilities (end-of-pipe) or entire production processes (cleaner production) or even entire groups of industries (zero emissions). It is apparent with respect to both waste management and energy in Japan that we are now talking about the embedded nature of industrialism within

society such that, in order to green industry, we must also green the wider society. This will inevitably involve challenging some of the existing values surrounding consumption. In Japan, within the waste management sector, we note the use of the term recirculatory or recycling society to describe a gradual process whereby waste generation and depletion of capital stock is curtailed. This may be possible without undue disincentives for economic growth but the challenge lies in the fact that it intrinsically involves the creation of greater linkages and shared responsibilities between producers and consumers, between large and small firms, as well as between different sectors of the economy and society. The same is also true of the early efforts we are witnessing as Japan attempts yet again to decouple primary energy growth from GDP growth. The government has recognized that measures targeted at industry have reached saturation in terms of their relative effectiveness and that additional investments in this sector will have limited impact. The test is how to curtail growth in the residential, commercial and transportation sectors where decisions are made based on lifestyle choices rather than rational neoclassical economics. The success depends to a large extent on whether society is willing to buy into ecological modernization's notions of 'economizing ecology' (Mol 1997), whether the place for dialogue and consensus building around these notions actually exists in Japanese society (outside of academic forums and government committees) and whether a socially shared value structure is possible in order to facilitate this process of change. One thing is clear. The current environmental dilemma in Japan does not lend itself easily to command-and-control mechanisms that worked so successfully in the past and may in part explain why the government has favoured steering policies consistent with ecological modernization. The 'recirculatory' and 'clean energy' society is an ambitious policy platform based on radical social change; if achieved Japan will have certainly earned its position as a global environmental leader.

Notes

- 1 Defined as the implementation of industrial practices that improve corporate profitability by redesigning manufacturing processes to reduce the production of wastes at source (Cohen 1997: 8).
- 2 Citing experience at the Nippon Steel Corporation, the Cruz *et al.* report argues that this company was able to reduce SO₂ emissions from its factories by 83 per cent between 1973 and 1997. Similar trends are found for NO_x with the case of the Tokyo Electric Power Company indicating that it reduced emissions by 85 per cent per kilowatt-hour (kWh) between 1973 and 1997 (Cruz *et al.* 2002). Unfortunately, these industry related reductions were offset by increases in NO₂ emissions from vehicles and the associated gradual increase in road traffic.
- 3 Technical advances have yielded great successes in Japan, particularly in the areas of pollution abatement and energy efficiency. In recent decades, Japanese companies have spent as much as Yen 9.7 trillion (US\$73.5 billion) on pollution abatement (Taylor 1999). Research and development in clean technology has resulted in such innovations as flue-gas desulphurization and denitrification, computerized monitoring techniques and automobile exhaust gas control technologies. The automobile industry has dramatically decreased pollutant levels in passenger cars with such inventions as unleaded petrol, the catalytic converter and the hybrid car.

- 4 Toxic waste regulations in Japan are described as 'primitive' by Kerr (2001), who highlights that only a few dozen substances are regulated compared with over a thousand chemicals in the US.
- 5 Some of the leading thinking on this topic in Europe has been undertaken in Germany at the Wuppertal Institute and in Finland at the University of Tampere. For instance, a paper from Jukka Hoffren at the University of Tampere includes a comparison of material efficiencies for Finland, the Netherlands, the USA, Japan and Germany (based on a calculation of GDP divided by the primary consumption of natural resources) between 1975 and 1994 (Hoffren 2003). The results indicate that, through the 1970s and 1980s, Japan and the Netherlands followed very similar paths in terms of eco-efficiency only to diverge around 1990 as the Japanese economy managed to make greater improvements up to 1993. Consequently, efficiencies dropped off as a result of the sudden economic decline at the end of the bubble economy (i.e. direct material inputs to the Japanese economy fell from over 2 billion tons per annum in 1990 to around 1.7 in 1993) (Adriaanse *et al.* 1997).
- 6 For more recent data see <http://www.ecology.or.jp/isoworld/english/analv14k.htm>.
- 7 See following web sites for access to these statistics - <http://www.jin-japan.org/stat/> and <http://www.stat.go.jp/english/index.htm>.
- 8 It is very interesting to reflect upon the Japanese government's efforts to look more closely at the current environmental load created by the residential, commercial and transportation sectors, particularly in the area of climate change. Similar activities are under way in most industrialized countries with a recent study from the UK being most interesting. The report by Dr Jan Koojiman published in June 2001 looked at the environmental impacts of households and came up with some fascinating observations (INCPEN 2001). Firstly, he argues that declining household size has implications for the associated environmental impacts (i.e. a single person has double the impact of a person in a large household) and in the UK the average household size dropped from 3.1 in 1961 to 2.3 in 2001, with associated negative environmental impacts. Second, each household consumes around 4,300 items of all kinds in a year (equivalent to 2.8 tonnes) and all 25 million households consume 100 billion goods per year. The choice for consumers is ever increasing, with the average supermarket now offering around 20,000 products. Furthermore, most households now have all the necessary basic commodities - car, fridge, washing machine, microwave, television and so on. Dr Koojiman then applies life-cycle analysis to identify where the big environmental impacts occur for individual households. His results show that the production of food and goods accounts for 109 gigajoules of energy for each household per year, home heating and water were next with 63 gigajoules followed by transportation 39 gigajoules and the use of household appliances at 16 gigajoules. He then presented a comparative analysis of various possible environmental conservation measures and showed that choosing a car that can travel 40 miles to the gallon over one capable of only 20 saves in one year the energy equivalent to the recycling by a household of all its glass bottles for 100 years.
- 9 According to Kerr (2001), of the industrial waste sites that are reported, more than half are unprotected with no devices to prevent leaching.
- 10 The case of Teshima is possibly the best-known case. The story begins in 1975 when the Kagawa Prefectural Government received an application from a firm to use a seven-hectare site on the island for a hazardous waste management business. Within two years, the company modified the application to an intermediate disposal and earthworm cultivation in the sludge (Yoshida 2002). The application was granted in 1978 but, according to the *Daily Yomiuri Newspaper* (23 August 2003: 9), from 1983 onwards, the company called Teshima Sogo Kanko Kaihatsu began illegally dumping industrial waste and open burning. This continued until 1990 when the prefectural government began investigations. Two years later, the national Environmental

Disputes Coordination Committee was brought in to mediate between the company and the local residents. The latter demanded the removal of the waste and compensation. In 1996, the local court ruled in favour of the local residents. An intermediate agreement was then reached in 1997 between the local residents and the prefectural government whereby the latter admitted that it had made a mistake. The local citizens then successfully took legal action against the prefectural government. Subsequently, in June 2000, after something like 36 rounds of negotiation between community groups and the prefectural government, the local authority formally admitted responsibility and promised to remove the waste. The local area was subsequently designated as an Eco-Town and at a cost of Yen 50 billion a new waste processing facility was constructed on the adjacent Noashima and will operate for ten years until all of the waste is dealt with.

- 11 As reported on the Japan for Sustainability web site - <http://www.japanfs.org>.
- 12 Interestingly Masuzoe (2001) indicates that there are 2 million beverage vending machines in Japan each using around 3,500 kWh of electricity annually.
- 13 See <http://www.nef.or.jp/english/new/implement.html> for more details.
- 14 Moreover, a similar approach is being implemented to compute fuel efficiency standards for automobiles. If effectively implemented, the current Top Runner standard will mandate significant improvements in automobile efficiency (on average a 22.8 per cent improvement by 2010 over 1995 levels).
- 15 See the following web site for details: <http://www.actetsme.org/japa/jap98.htm>.

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Study 1

- Revell, A. (2007) 'Sustainable Development; The Case of Japan', Singh, J. (ed) *Society, Sustainability and Environment* Shivalik Prakashan, Delhi

Sustainable Development: The case of Japan

Andrea Revell

"Having escaped the bonds of the traditional, undeveloped economy, and unlocked the secrets of growth, the question remains of how to channel that growth so that human needs are met...The problem is profoundly political but at the same time it is a moral and philosophical issue. While it confronts Japan in its most acute form, it is a problem of modern industrial civilisation as a whole, and the Japanese failure, or success, in coping with it has huge significance. It is at the root of the problem of establishing social control over the forces of production"

(McCormack, 2001:25)

Introduction

Japan is an interesting case study of the sustainability of modern industrial societies. Japan industrialised much later than other OECD nations, with the foundations for the country's development into a world economic superpower being laid during the post-war reconstruction period of the 1950s. After the US occupation forces withdrew in 1952, Japan undertook a program of aggressive industrial development which transformed the nation into the second largest economy in the world. What is interesting about Japan is that whilst its rapid modernisation has devastated much of the nation's natural habitat and initially caused grave pollution problems, Japan is now hailed as one of the world's 'ecological frontrunner nations' (Mol and Sonnenfeld, 2000:6). Japan has been described as a pioneer and world leader in environmental policy, and has been identified as one of the top five 'ecologically modernized' societies in the world (Dryzek, 1997). Does this imply that Japan has not only 'unlocked the secrets of growth' but the secrets of environmentally sustainable growth? Can Japan be considered a model of 'sustainable development' for the rapidly industrialising Asia-Pacific region?

This chapter seeks an answer to such questions. In the next sections various discourses on sustainable development are explored, including Sachs' (1997) 'contest perspective' which incorporates the discourse of 'ecological modernisation'. An account of why Japan has been called an ecologically modernised nation is then given, followed by a discussion of how critics have challenged Japan's environmental record both at home and abroad, highlighting some key flaws with the contest perspective.

Competing Discourses on Sustainable Development

The language of sustainable development has come to dominate the environmental arena, and the term is now the common currency of those working in the field of environmental

politics and policy. Jacobs (1995) highlights that until recently, this arena was a battlefield for sharply opposing worldviews, from radical greens advocating a complete overhaul of the political economy, through to reformist environmentalists advocating technological solutions to environmental problems, and governments and business leaders defending economic growth and the status quo. Yet these groups are now using the same language and supporting the same objective – that of 'sustainable development'.

How can such disparate groups come to agree on the same objective? Because 'sustainable development' is sufficiently vague to encompass a wide variety of views on environment and development issues, and therefore it can be incorporated into the discourse of most interest groups. Clearly, the ability to get different groups to agree on common aims is a strength of sustainable development, but it is also a key weakness. Detractors argue that if the term is so generalised that opposing groups can advocate it whilst at the same time holding radically different visions of development, then the term cannot mean much in practice. Sustainable development leaves important questions unanswered; for instance, exactly what is development, and what is it that must be sustained? Does it allow economic growth or not? Does it mean a global redistribution of resources? What and whose needs are to be met?

Jacobs (1995) argues that sustainable development is best seen as a concept like 'democracy' or 'liberty' or 'social justice'. These terms have a first level meaning that is readily understood and has general political acceptance, but also a second level meaning that belies a deeper contestation about how to put these concepts into practice.

"Almost everyone is in favour of democracy and liberty; the debate is over alternative conceptions of what they mean, at the second level" Jacobs, 1995; 5)

The first level meaning of sustainable development is now well defined. Most people who use the term acknowledge the 'Brundtland definition' provided by the World Commission on Environment and Development in its report 'Our Common Future' (1987):

'Development which meets the needs of the present without compromising the ability of future generations to meet their needs'.

Others prefer the 'Caring for the Earth' definition provided by the World Conservation Union (IUCN), United Nations Environment Programme and the World Wide Fund For Nature (WWF) (1991):

"improving the quality of human life while living within the carrying capacity of supporting ecosystems "

Once hotly contested, the core aims of sustainable development¹ are now also well defined and immutable:

1. **Efficiency:** a commitment to ensuring the efficient use of all resources and the integration of environmental, social and economic goals in decision-making
2. **Environmental Protection:** ensuring environmental resources and services are protected, and that we live within the 'carrying capacity' of the earth
3. **Equity:** a commitment to both intra-generational equity (ensuring the basic needs of this generation are met), and inter-generational equity (ensuring the needs of future generations are met)
4. **Quality of Life:** a recognition that human well-being means more than just income growth
5. **Participation:** a recognition that sustainable development requires the political involvement of all stakeholders in society

It is at this second level meaning that the underlying divisions between different groups become evident, for when they come to express their ideas on what practical policies are needed to achieve these core aims, it becomes clear that the term 'sustainable development' means different things to different people. Operationalising sustainable development is thus where the old battlefield of environmental politics has reoriented itself, with all its previous vigour and intensity.

Wolfgang Sachs (1997) provides a useful framework for understanding this battleground, for he groups the various competing perspectives on sustainable development into three major camps; the 'contest perspective', the 'astronaut perspective' and the 'home perspective'. Sachs argues that social actors within these camps emphasise certain issues and underplay others, so that the way problems and solutions are defined depends on how the sustainability debate is framed. It is to these discourses we now turn, for they provide us with a helpful structure from which to understand the tensions at work in exploring sustainability in Japan.

The contest perspective

¹ (Source: Adapted from Imperial College at Wye External Programme (1997) 'Efficiency and Sustainability Rules in Environmental Economics' Economics for Environmental Management, Wye College)

In Sach's description of the contest perspective, primacy is placed on environmental protection in the core aims of sustainable development. This camp incorporates the ideas of 'ecological modernisation'², a discourse that has become increasingly prevalent within debates about environmental politics and policy in western industrialised nations (Barry, 2003; Strandbakken and Stø, 2003; Berger et al, 2001; Pepper, 1999; Revell, forthcoming). The contest perspective is therefore the view adopted by most governments, businesses and reformist environmentalists on sustainable development.

The contest perspective and the discourse of ecological modernisation revolve around the imperatives of competitiveness, eco-efficiency, technological innovation, and the decoupling of material from economic flows. A core belief is that growth rates in industrialised countries are becoming more sustainable as economic development is de-linked from environmental degradation. This idea is related to Panayotou's (1993) 'Environmental Kuznets Curve' (EKC), an inverted U shaped curve, where pollution initially increases with economic growth, then begins to decrease once a certain threshold of income has been crossed. The central idea is that once society becomes rich enough, it cleans up the environmental fall-out of economic growth, and therefore more economic growth results in a cleaner environment. The core tenant of the contest perspective is hence that economic growth is part of the solution rather than the problem. The fact that environmental protection is rendered compatible with wealth creation is a key reason why this is the discourse most commonly adopted by governments and industry in environmental debates.

Eco-efficiency is key to ecological modernisation and the contest perspective, because a decoupling of economic growth from environmental degradation can only be achieved by reducing the material and energy throughput of the economy. In other words, by limiting the inputs and outputs of production, the environmental impact of economic development can be minimised so that further growth becomes environmentally sustainable. The imperative of eco-efficiency demands technological innovations of the highest order as researchers call for an increase in efficiency by a factor of 4, and even a factor of 10. As such, science and technology are seen as crucial institutions for achieving efficiency gains. The 'business case for sustainability' is a key rhetorical device used by policymakers to encourage technological innovation and a shift towards greener production within industry. New market opportunities for environmentally friendly products and services are highlighted as potential sources of future growth, and resource efficiency is emphasised as a way of lowering production costs and increasing the competitiveness and profitability of business.

Under the contest perspective, the market is seen as the best medium for solving environmental problems, for if market failures are corrected, the most efficient (or eco-

² (For a detailed discussion of Ecological Modernisation theory, see Mol and Sonnenfeld, 2000, Hajer, 1995, Barry, 2003)

efficient) allocation of resources will result. Policy prescriptions thus focus on encouraging eco-efficiency and internalising environmental externalities in the North, using market-based mechanisms such as environmental taxes and tradable permits. In the South the emphasis is on economic reform and the abandonment of protectionist policies that distort markets.

Overall, the contest perspective sees the North as the stronghold of excellence, whilst the South is seen as the home of incompetence. The South is thus seen as the major arena for environmental adjustment as environmental problems are framed in terms of rapid population growth, low economic growth, outdated technology, lack of expertise and insufficient capital. The inclination from this viewpoint is to define environmental problems in the Third World in such a way that their solution can only come from the North.

The astronaut perspective

The astronaut perspective is a planetary perspective, whereby sustainable development is seen as a challenge for global environmental management. This discourse sees 'Planet Earth' as a scientific and political object in its own right and is particularly prevalent within the community of scientists and ecologists around the globe. Sachs argues that this planetary perspective developed out of the 1960s and 1970s, when the world was increasingly perceived as a biosphere rather than as a collection of countries and cultures.

Because of the global nature of environmental problems, the world is considered the proper arena for environmental adjustment under the astronaut perspective. There is an emphasis on galvanising the North and South to protect the planet's environmental systems. The goal is thus for global management of the earth, with ecology the centrepiece of world politics. Strategies include global information systems, international regulations, conventions and multilateral agreements such as the Kyoto Protocol. Protagonists call for global governance and some even advocate a world government.

The Home perspective

Sustainable Development in this perspective is not about sustaining economic growth or biospheric stability, but sustaining local livelihoods. The home perspective views the primary cause of environmental degradation as over-development, a force which is seen to be disempowering communities in the South and diminishing quality of life in the North. Under this perspective, sustainable development is suspected of being an oxymoron. The goal is thus to develop alternative development paths.

This is the only perspective that puts primacy on equity rather than environmental protection in the core aims of sustainable development. What is important is the question of 'whose

needs' and 'what needs' are to be met. Sustainable development in the home perspective means resisting current development - the 'Modernisation Project' and its focus on industrialisation, commercialisation and the globalisation of trade, which is blamed for the appropriation and degradation of natural resources and the destruction of local livelihoods. Sustainable development in the South is thus about social, economic and political empowerment of local communities, equitable distribution of resources, alleviation of poverty and debt. It also means local control over resources, decentralisation, and local participation.

Sustainable development in the North is about transforming consumer societies into 'conservator societies'. The North is seen as the primary culprit of the environmental crisis and is therefore the primary arena for environmental adjustment. The vast ecological footprints of the North are considered deeply unjust and thus a key focus is the objective of inter- and intra-generational equity.

Sustainable Development in Japan

The case of Japan fits neatly with the contest perspectives' imperatives of competitiveness, eco-efficiency, technological innovation, and decoupling economic growth from environmental degradation. Japan has been described as a 'paradigmatic' example of ecological modernisation (Hajer 1996:249), and an 'ecological frontrunner nation' (Mol and Sonnenfeld, 2000; 6). Dryzek (1997) identifies five ecologically modernized societies; Japan, Germany, the Netherlands, Norway and Sweden.

Barrat and Revell (2005) argue that Japan's reputation as an environmental leader is largely a result of the following key factors:

1. The role of science and technology; Japan is a leader in environmental technology markets and has been highly successful in finding technological solutions to environmental problems
2. The 'greening' of Japanese industry; Japanese corporations are considered to be some of the most eco-efficient in the world
3. The 'ecological modernisation' of policy; Japan's leadership in environmental policy is seen as one of the key reason why a decoupling of material from economic flows has occurred in recent decades

Viewed from the contest perspective then, Japan might be considered a 'model' of sustainability. But is this justified? To explore this in more detail, lets take a closer look at the factors that have contributed to Japan's status as an 'ecological frontrunner nation'.

1. The role of science and technology

Technology has played a central role in the development of modern Japanese society, so it is little wonder that finding technological fixes to environmental problems has been a key focus in Japan. The nation is now a world leader in environmental technology markets, second only to the US (Eurotechnology-Japan, 2001). Technical advances have yielded some enormous successes in environmental reform since the 1970s and there is an extensive literature on Japan's progress in the areas of pollution abatement and energy efficiency. Due to such innovations as flue-gas desulphurisation and denitrification, Japan was able to drastically reduce its sulphur and nitrous oxide emission intensity in during the 1980s and '90s. Driven by its reliance on imported energy sources, Japan has channelled significant resources into technologies to promote energy efficiency and the nation has made great energy savings in the past few decades. Amongst Japan's most high profile inventions are catalytic converters, unleaded petrol, the hybrid car and Sharp Liquid Crystal Display (LCD) TV. Moreover, Japan has been at the forefront of innovations in renewable energy such as the hydrogen fuel cell and photovoltaic cells for solar power.

Due to the country's experience in energy efficiency and renewable energy applications, Japan is a leader in green energy development to tackle climate change and is a member of the 'Renewable Energy and Energy Efficiency Partnership' (REEEP), which was established in 2002 at the Johannesburg World Summit on Sustainable Development. 'REEEP' is a coalition of governments, businesses and organisations aiming to accelerate the development of renewable energy and energy efficient systems. Japan also has high rates of environmental technology transfer to developing countries via its 'Green Aid Plan', and has established the International Centre for Environmental Technology Transfer (ICETT) and the Global Environment Centre Foundation (GEC), along with some high profile global research institutes such as the Research Institute of Innovative Technology for the Earth (RITE).

2. The Greening of Japanese Industry

Another reason why Japan has been described as an 'ecological frontrunner nation' is because of its progress in terms of the so-called 'greening of industry'. The role of market dynamics in environmental reform is strongly emphasized in the contest perspective, which sees growing stakeholder pressure for environmental management and the rise of the 'green consumer' as key reasons why firms are increasingly viewing the environment not as a threat but as a business opportunity. In Japan's case, voluntary goals and standards have been widely adopted within the corporate world, suggesting that environmental reform has been a growing priority for business. For instance, Japan now boasts the highest number of environmental management systems (EMS) accreditations globally, with around 14,000 firms

obtaining ISO14001 certification by the end of 2003 (Barrat and Revell, 2005). There have also been over 40,000 voluntary agreements on pollution control in place between business and local government since the 1960s (Sugiyama and Imura, 1999), and this has resulted in significant investments in pollution prevention by industry.

Fukasaku (1995) asserts that certain industrial sectors (such as iron, chemicals, steel and automobiles) have been particularly effective in reducing energy intensities and pollution emissions. For instance, Moore and Miller (1994) highlight that between 1970 and 1980, the Japanese steel industry cut air pollutant emissions by 30 - 80%, producing steel with 40% less energy expenditure than the United States. Japan has led the way in other aspects of industrial performance; Janicke et al.'s (1996) comparative study of Japan, Germany and Sweden found that some of the most significant industrial energy savings since the 1970s have occurred within Japan's manufacturing industries.

Within the corporate sector, the concept of eco-efficiency has certainly gained much ground in the past decade. The language of business has been transformed to include a new green vocabulary, with increasing reference made to concepts such 'eco-efficiency', 'factor 4', 'factor 10', 'zero emissions', 'green productivity' and 'natural capitalism' (Mitsubishi 1998; Watanabe 1999; Yoshida 2002; Hotta 2004). A large number of 'eco-industrial' projects have been implemented across the country. Eco-industrial projects are environmentally sound community systems involving industry and public sectors. High profile projects include the 'zero emissions clusters' like that of Yakushima Island, a model area for material recycling and renewable energy based on the zero emissions concept. 'Eco-Industrial' Parks have also been developed in Fujisawa, Kokubo and Kitakyushu, along with 'Eco-Towns' in the prefectures of Hokkaido, Chiba, Gifu and Akita and in the cities of Sapporo, Iida, Omuta, Uguiszawa, Kitakyushu and Kawasaki. (Barrett and Revell, 2005).

Professor Ryoichi Yamamoto at the University of Tokyo has undertaken much of the research on eco-efficiency in Japan. Yamamoto (2000) concluded that Japan is now in a new phase of environmentalism due to the development of eco-efficient goods and services, as well as green purchasing. In April 2002, the Ministry of Economic Trade and Industry (METI) established a new committee under the Chairmanship of Professor Yamamoto focusing on 'Factor Eight' as a way of improving resource productivity (Bleischwitz 2002).

"...industry is making progress in reduction, using less resources, extending product life, and constraining the emergence of waste.... Companies are competing fiercely to produce smaller, lighter and slimmer products...in plants and factories too, efforts to reduce industrial waste toward the goal of zero emissions are making rapid progress..., manufacturing firms in

12 industries have committed themselves to reducing the final volume of industrial waste by 20 to 60 percent by 2010' (METI, 2002³)

3. Ecologically modernised policies

Another key reason why Japan has been hailed as an ecologically modernised nation is due to its position as a world leader on environmental policy, particularly in the areas of pollution control, recycling and energy efficiency.

i. Pollution Control

Japan's rapid modernisation since World War II resulted in a drastic pollution crisis in the 1950s and 1960s. Many Japanese died from mercury poisoning and other horrific industrial pollutants, which sparked a huge public outcry and a raft of anti-pollution legislation that transformed environmental policy in Japan. By the 1970s the nation was seen as a world leader in pollution control. The Japanese approach to pollution control today involves a creative mix of regulatory instruments (emission standards, environmental quality standards, technology designations), market based mechanisms (compensation levies, emission taxes, emission permit trading) and voluntary measures (ISO14000 and green purchasing).

Fukasaku (1995) notes that as a result of the government's energy diversification policies and pollution control standards, strong GDP growth (around 57%) was matched by significant reductions in SO_x, NO_x and CO₂, between 1980 and 1991. Strong decoupling of air emissions from GDP was reinforced in the 1990s (-5% for SO₂, NMVOCs and CO between 1990 and 1999, while GDP rose by 13%). Urban air quality in Japan has continued to improve; among OECD countries Japan has the third lowest emission intensity (kg/unit GDP) for SO_x and the lowest for NO_x. Reductions have also been witnessed in relation to other pollutants for major emitting industries (-60% for total dioxin emissions, -45% for benzene, -43% for trichloroethylene and -50% for tetrachloroethylene from 1995 to 1999) (OECD 2002).

ii. Recycling

³ See: [http:// www.meti.go.jp/english/policy/index_environment.html](http://www.meti.go.jp/english/policy/index_environment.html) (accessed 16/11/05)

Another key policy strategy that fits with the contest perspective's focus on eco-efficiency is Japan's recent efforts to become the 'junkangatta shakai' – literally translated as the 'recirculatory society'. This concept was catalysed by the publication of a report by the Japan Environment Agency (1991) entitled 'Towards a Recycling Society in the 21st Century'. At that time only 10% of the 2 billion metric tons of materials used each year by Japan were estimated to be recycled (Gotoh 1997).

At the heart of the emphasis on the 'junkangatta shakai' is the fact that Japan faces a serious shortage of landfill capacity. The OECD (2002) reported that in 1999 only 12.3 years of municipal landfill space remained and 3.7 years remained for industrial wastes. As a result, the primary waste disposal method in Japan is incineration; in 2000, 77% of the nation's waste was incinerated. This has led to significant public concerns regarding the resulting dioxin emissions, as allowable concentrations in Japan exceed typical western standards by 80-800 times (OECD 2002: 107). One study on dioxin contamination in a city just outside of Tokyo found that the milk of mothers with infants were twenty to twenty five times higher than the recommended safety level (Kerr, 2001).

In response to these problems, the Ministry of the Environment published the 'Basic Plan for Establishing a Recycling-based Society' in 2003. The plan included targets to boost resource efficiency by 40%, reduce per capita daily waste generation by 20%, increase recycling and halve the amount of waste going to landfills by 2010 (MoE 2003). The general policy direction is the so-called '3-R approach'; reduce, re-use and recycle.

A raft of laws have been enacted since 2000 including:

- The Basic Law for Promoting the Creation of a Recycling-Oriented Society
- The Law for Promoting Effective Utilization of Resources
- The Containers and Packaging Recycling Law
- The Home Appliances Recycling Law
- The Food Recycling Law
- The Construction Materials Recycling Law
- The Green Purchasing Law
- The Revised Waste Management Law
- The Automobile Recycling Law

The enactment of so many laws has led the government to suggest that Japan is entering a new age of environmentalism (METI, 2002).

iii. Energy Policies

Japan's response to the energy crisis of the 1970s is another exemplar of eco-efficiency. Japan has few fossil fuel sources of its own and is highly dependent on oil imports. The 1973 oil crisis was a considerable blow for the economy, after which Japan attempted to reduce its dependency on petroleum by searching for alternative energy sources, and by promoting energy efficiency with policies such as the 'Law for Energy Conservation'. This law established standards for all energy-consuming sectors and called for an increase in energy efficiency in consumer products. Japan was therefore better placed than others to weather the second oil crisis of 1979.

During the 1980s, Japan made remarkable savings in energy and raw materials as a result of the policies of the state. For instance, between 1979-1987 Japan successfully managed to decrease its ratio of energy supply to GDP by 25% [OECD, 1994]. The nation was admired the world over for having one of the lowest ratios of energy consumed per unit of GDP as well as one of the lowest energy intensity rates per capita (OECD 1994; IEA 2003). This gave scholars a key reason to hail Japan as a shining example of how industrialised nations can decouple economic growth from environmental degradation, and was a significant justification for Japan's position as one of the five ecologically modernised states. In the words of Dryzek (1997: 139):

'Japan stands out in the environmental stakes in large part due to the energy-efficiency of its economy'

However, there is a key problem with this 'shining' example of ecological modernisation. More recently, resource efficiency in Japan has started to slide and it has become increasingly clear that Japan has only achieved a relative decoupling of economic output from environmental impacts [Gouldson and Murphy, 1997, OECD 2002]. In the 1990s, Japan's energy consumption actually increased by 16%, exceeding GDP growth by 2% (OECD 2002). This was despite the fact that Japan was going through a period of economic recession, when energy usage should have been expected to go down. Moreover, actual CO₂ emission levels have been increasing almost year on year from 800 million tons in 1970 to 1.3 billion tons in 2000. This has obvious implications for climate change and Japan's commitment to the Kyoto Protocol, which obligates the nation to reduce greenhouse gas emissions by 6% by 2012. When the Japanese government ratified the Kyoto Protocol in June 2002, greenhouse gases were 7.6% higher than the 1990 level. (Japan Times, 2004)

Japan's consumer society and the rebound effect

The OECD (2002) highlights that energy efficiencies have been weakened by a continuing shift towards a mass consumption based economy in Japan. Japan has become one of the

world's most profligate consumer societies, with 46 million households consuming a total of 100 billion goods a year, or 4,300 goods each. In 2002 86.4% of households owned a car, 63.3% owned personal computers, and 81.4% owned video players (Masuzoe 2001). To make things worse, like most industrialized countries, household size in Japan is declining, from 3.22 persons per household in 1980 to 2.67 in 2000⁴. The key problem with this is that a single person has double the environmental impact of a person in a large household. These trends indicate that energy and resource efficiency gains will continue to be cancelled out by increases in consumption.

This tendency for consumption to wipe out efficiency gains is exacerbated by the 'rebound effect'. This refers to the idea that when efficiency gains are made (through, for instance, dematerialisation, energy efficiency and recycling), a firm's production costs are decreased, which in turn encourages the company to lower prices. Lower prices stimulate demand, and the resulting increase in consumption wipes out the environmental gains from the efficiency measure. There are many examples of the rebound effect. For instance, houses and heating systems have become more energy efficient, and therefore energy bills have become cheaper. Consumers have responded by heating more rooms to higher temperatures for longer. Consequently, consumers now use just as much energy in their homes than they did 30 years ago. Car engines have also become much more efficient in terms of the amount of fuel consumed for a given level of performance. However, consumers have reacted by driving their cars further and more often, resulting in an increase in fuel consumption for road passenger transport by as much as 80% (Levett, 2003). Critics argue that because of the rebound effect, eco-efficiency is still not a sustained solution to environmental problems as it tends to be eclipsed by the subsequent growth process.

This reflects the dilemma of the environmental 'N curve'⁵ (Barret, 2005), which contrasts sharply with the 'Environmental Kuznetz Curve'. Whilst the EKC implies a positive relationship between economic growth and environmental protection, the environmental 'N Curve' shows that as economic growth continues to increase, any environmental improvements are cancelled out due to increased consumption. According to Barrat (2005), the environmental N Curve remains very much in evidence within industrialised countries. This certainly appears to be the case with Japan, for despite its efficiency gains, continued economic growth and consumption has meant that absolute levels of energy usage, pollution and waste continue to increase.

Japan's 'ecological footprint'

⁴ Source: <http://www.stat.go.jp/english/index.htm>.

⁵ The Environmental N Curve was first described by Janicke in 1978 (as cited in Mol, 2001:162)

Whilst efficiency gains are clearly integral to the core aims of sustainable development, localised improvements in resource use and emissions do not on their own indicate the sustainability of a nation's economy. This is because industrial countries like Japan have vast 'ecological footprints' that far exceed their national territories. Several comparative studies of national ecological footprints, including studies conducted by Wackernagel and Rees (1996) and the Worldwide Fund for Nature (2002), show that Japan is in ecological deficit. Barrat (2005) cites the work of Wackernagel in 1999 called 'Redefining Progress', which found that on average there are only 1.9 global hectares per person of biologically productive space available on the Earth, yet the world average ecological footprint is 2.3 global hectares per person, exceeding the biosphere's ecological capacity by 20%. Japan currently has an ecological footprint of 4.8 hectares per person, 2.5 times the carrying capacity of the earth. This is in contrast to 1880, when it had an ecological footprint of 0.4 hectares.

Barry and Paterson (2004) cite a study by the Global Commons Institute, which shows that the national pollution accounts of industrialised countries like Japan make it look like CO₂ emissions were decoupled from GDP growth in the 1970s as a result of efficiency gains. However, if global ecological footprints are taken into account, there is a more linear relationship between CO₂ and economic growth. The report concludes that what the energy crises of the 1970s stimulated was less a revolution in energy efficiency than a shifting of energy-intensive production towards newly industrialising countries like South Korea. Barry and Paterson argue that the 'Environmental Kuznets Curve' conveniently ignores the possibility that such a curve may well be achieved through the exporting of pollution and resource extraction.

This kind of analysis suggests that Japan may have given the impression of decoupling economic growth from environmental degradation, when in fact it has merely externalised its environmental impact by shifting 'dirty industries' to developing countries with lower environmental standards. Taylor (1999) links the internationalisation of the Japanese economy to Asia's growing environmental problems, and argues that major investments in manufacturing and resource extraction in the region has led to considerable environmental degradation in South East and East Asia. This has been compounded by Japan's excessive consumption of imported forest and fishery resources, which has led to over-fishing and deforestation in the region. Japan has the largest fish-catch in the world, and is also the world's largest softwood and tropical hardwood importer (OECD, 1994). Taylor cites a study of the global forestry industry by Marchak, which claimed that Japan is not only partly responsible for the deforestation that the industry has caused due to its high demand for timber products, but that it also initiated current trends in the globalisation of the timber trade. Japan's ecological footprint is clearly not limited to its national territory; it has a huge impact on the global environment.

Conclusion

Japan has made some laudable attempts to become a 'recirculatory', ecologically modernised society. Yet because recent environmental gains have been more than offset by additional impacts arising from an expansion of consumption, Japan can be said to have achieved only a relative de-linking of economic output from environmental impact. At home absolute levels of pollution, waste and energy usage continue to increase and abroad Japan's vast ecological footprint continues to put pressure on the global environment.

These issues call into question some important aspects of the contest perspective and the discourse of ecological modernisation. Firstly, in focusing narrowly on environmental improvements at a national level, this perspective ignores the considerable ecological footprints of OECD countries like Japan beyond their national boundaries. Advocates of both the home and the astronaut perspective might argue that the contest perspective thus conveniently circumnavigates the unsustainability of current levels of economic growth on a global scale. The astronaut perspective would assert that a more planetary perspective is required, with an emphasis on political unification and global governance of Planet Earth. The home perspective draws attention to the goals of inter and intra-generational equity, and the need for the North to reduce its ecological footprint and repay its 'ecological debt' to the South.

Related to this point is the criticism that the contest perspective does not adequately address the issue of over-consumption. Advocates of the home perspective might argue that it is clearly not enough to be a 'recirculatory society', we must tackle the root cause of the problem – 'consumer society'. The home perspective emphasises that lifestyle changes are needed in the North, and that countries like Japan must reduce the environmental burden it places on other countries by transforming its materialistic consumer culture into a 'conserver culture'. Such a radical transformation clearly involves changing not only patterns of consumption (as advocated by the contest perspective), but *levels* of consumption.

"What really matters is the overall physical scale of the economy with respect to nature, not only the physical allocation of resources. Efficiency without sufficiency is counterproductive; the latter has to define the boundaries of the former" (Sachs, 1997:80)

This highlights one of the central conundrums of sustainable development; can the core aims of 'efficiency' and 'quality of life' be made compatible with ideas like 'sufficiency' and

'conservator culture'? Is it possible for Japan, and all modern industrialised societies like her, to break free from the bonds of material attachment and truly embrace lifestyles of 'voluntary simplicity'? Is relinquishing consumer sovereignty, a concept that has become so embedded within liberal democracies, the bare-faced reality of what it means to be a model of sustainable development? If so, then Japan could not be more further away from such a model. In the words of Sachs (1997: 80):

"No doubt a politics of self-limitation always implies a loss of power, even if it is sought in the name of a new prosperity"

It is just such a loss of power that goes to the heart of the deep contestation that lies so turbulently beneath the concept of sustainable development, and which exemplifies the struggles over the future direction of the social, political and economic development of the world.

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Study 2

- Revell, A (2005). 'Ecological Modernisation in the UK: Rhetoric or Reality?' *European Environment*, 15:344-361

Ecological Modernization in the UK: Rhetoric or Reality?

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ABSTRACT

This paper discusses the degree to which recent trends in UK policy-making amount to a paradigm shift towards the prescriptions of ecological modernization (EM) theory. First, in keeping with EM's 'win-win' philosophy, recent political speeches and policy documents on the environment have expressed the idea that there is no conflict between environmental protection and economic growth. Second, policies have attempted to encourage the invention and diffusion of clean technologies. Third, policy-makers have explored innovative market-based policy approaches to tackle environmental problems. These three trends suggest UK policy-makers' predilection towards EM as a policy strategy. However, there has arguably been less success in terms of a fourth key characteristic of 'ecologically modernized' states, that of environmental policy integration. The paper concludes that New Labour's failure at 'greening government', combined with its economistic and technocratic policy focus, places the UK at the weak end of Christoff's (1996) weak-strong continuum of ecological modernization. As such, environmental imperatives continue to remain ideologically and politically peripheral to conventional economic goals. Copyright © 2005 John Wiley & Sons, Ltd and ERP Environment.

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Introduction

BERGER ET AL. (2001) ARGUE THAT ECOLOGICAL MODERNIZATION THEORY IS OF PARTICULAR significance because it provides the basis for the mainstream environmental policies and practices of Western industrialized nations. Strandbakken and Stø (2003) maintain that EM is the perspective guiding the World Commission for Environment and Development. Pepper (1999) argues that ecological modernization is the new name for environmental politics in the European Union and is enshrined in its Fifth Environmental Action programme. The 'Europeanization' of UK environmental policy suggests that the UK may also be increasingly driven by an EM agenda.

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This paper sets out to provide a starting point from which to explore the relationship between EM theory and environmental policy directions in the UK. In the following sections the central tenets of ecological modernization theory and EM's historical influence in the UK are summarized before an analysis is made of the degree to which current policy strategies are being influenced by an EM agenda. New Labour's environmental policies are discussed in terms of four themes that Murphy (2000a) identifies as core to 'ecologically modernized' nation states.

Ecological Modernization Theory

EM theory arose in the 1980s as a challenge to the 'limits to growth' and demodernization perspectives that were dominant in the 1970s. The architects of the theory (Joseph Huber, Martin Janicke and Udo Simonis) challenged the traditional ideas of the environmental movement and counter-productivity theorists, who saw environmental deterioration as an inevitable consequence of economic growth and the capitalist order. EM theorists argued instead that economic growth and environmental protection could in fact be mutually supportive. Key to this position was the separation of economic growth from rising energy and material throughputs via technological innovation. Joseph Huber (1985) postulated that production processes within industrialized nations were transforming in a manner that he called 'super-industrialization', involving the invention and diffusion of technical innovations that increased energy and material efficiencies, effectively de-linking economic growth from environmental degradation. He is famously quoted as saying

... The dirty and ugly industrial caterpillar will transform into a[n] ecological butterfly (Huber, 1985, p. 20, as quoted by Mol, 1995, p. 37).

Since then, EM has developed considerably and is now a mainstream theory within the environmental social sciences. EM theory is challenging to summarize due to the many strands and subdivisions that have developed within it. For instance, the term ecological modernization has been used to describe processes of technological reform, a form of policy analysis and a political ideology. EM's subdivisions include the work of Mol (1995, 1996), who extends Beck's notion of the 'risk society', highlighting EM in terms of 'reflexive modernization' or the reflective redesign of modern institutions as they attempt to overcome environmental risk. This work highlights EM as a process of institutional learning in order to come to terms with environmental problems. A key assumption is that the institutions of modernity can learn, and that their reflexivity can result in radical transformations to address environmental problems, without changing these institutions beyond recognition. In another interpretation, Hajer (1995) takes a social constructionist perspective, viewing EM as a new form of cultural politics and discourse adopted by policy elites to advance their interests. In yet another strand, authors such as Weale (1992), Boehmer-Christiansen and Weidner (1995) and Gouldson and Murphy (1998) focus on the role of government within processes of EM, examining the ways in which the design and implementation of environmental policies have transformed in order to respond to environmental imperatives.

Despite these varying interpretations, the major contributors to ecological modernization have attempted to agree on some common ground. Mol (1997, 1999) highlights that EM has both descriptive and prescriptive dimensions; it denotes both a theory of unplanned social change and a political programme of action. Mol describes the following core tenets of EM as a theory of social change.

- Economic growth is being de-linked from environmental degradation in ecologically modernizing nations.

- Science and technology are seen as the principal institutions in finding solutions to environmental problems and as such are key to processes of ecological modernization.
- The prescriptions of de-radicalized environmental movements are gaining increasing legitimacy in the core domains of decision-making.
- There is a growing perception within business, public and political spheres that there is no necessary opposition between economic growth and environmental protection, that in fact environmental and economic goals are a positive-sum game.
- The state in ecologically modernizing nations plays a key role in encouraging the 'greening of industry' and the integration of environmental and economic goals. Arising out of the deregulation and privatization trends of the 1980s, the ecological modernization of policy-making (labelled 'political modernization' by Janicke (1990) or 'the new politics of pollution' by Weale (1992)), involves a transfer of responsibilities for environmental reform from the state to the market. There is an increasing emphasis on stakeholder participation and partnership in policy formulation, especially between the state and industry. The popularity of command-and-control regulatory approaches recedes in favour of policies that attempt to 'steer' industry towards environmental reform. These include market-based instruments such as environmental taxes and voluntary agreements.
- Changing state-market relations result in an increasing role for economic actors in environmental reform, with these actors using mainly economic arguments (such as cost-savings or new market opportunities) to justify the pursuit of environmental goals. The 'greening' of industry involves a process of 'economising ecology' (Mol, 1997, p. 141). Technological innovation and increasing material and energy efficiency are an essential aspect of industrial restructuring.

The prescriptions of EM as a political programme are founded on the idea that capitalism is capable of accommodating environmental priorities. In contrast to demodernization perspectives, the environmental crisis is seen as an opportunity to improve modern institutions rather than as a reason to reject current development trajectories. As such, EM theorists reject the notion that 'environmental deterioration [can] be held as proof of the modernisation project being a dead end' (Mol and Spaargaren, 1998, p. 4).

A central EM prescription is that restructuring of production processes around ecological principles is a precondition for long-term economic growth (Weale, 1992). Advocates argue that environmental protection is a potential source of future growth for the economy as it can stimulate innovation, provide new market opportunities for environmental products and services and lower clean-up costs. Because the market is seen as the best medium for solving environmental problems, the state is prescribed a 'steering' rather than 'commanding' role in encouraging industry to voluntarily adopt practices that reduce pollution and increase resource efficiencies. Regulatory controls are not ruled out, but the political rhetoric strongly favours voluntary agreements and economic incentives to encourage environmental reform.

Critics of EM tend to focus on this prescriptive aspect; for many EM represents the 'greening' of capitalism, an unacceptable attempt to legitimize the status quo and stave off radical transformations of modern institutions (Blowers, 1997; Cohen, 1997; Barry, 1999; Schnaiberg *et al.*, 2002). In Christoff's (1996) critique, he delineates between weak and strong EM. Weak EM is described as part of mainstream development theory, which sees environmental management as the next stage in a unitary evolutionary process of modernization. Weak EM is criticized as narrowly technocratic and economic; environmental problems are framed in monetary terms and technical fix is prescribed as the solution to environmental problems. Under weak EM the broader goals of sustainable development (such as inter- and intra-generational equity) are ignored. In contrast, strong EM is described as a strategy that considers radical changes to societal institutional structures and economic systems with a view to making them more responsive to environmental concerns. Strong EM is ecological rather than economic,

institutional rather than technical, integrated and systemic rather than piecemeal, diversifying rather than hegemonic. Christoff concludes that weak EM serves merely to legitimize the continued domination and destruction of the environment, whilst the adoption of a strong EM approach would be more likely to lead to a sustainable resolution of environmental problems.

In the next sections an analysis is made of how influential ecological modernization has been in shaping historical and current policy directions in the UK, and whether the approach adopted amounts to a path of weak or strong EM.

EM in the UK: Historical Context

Whilst it has one of the oldest and most complex systems of environmental protection in the industrialized world, when EM theory first emerged Britain was considered the 'dirty man' of Europe (Carter and Lowe, 1998). In Osborne's (1997) review of UK environmental policy he highlights how, due to problems with the economy in the 1980s, environmental concerns were marginalized and the quality of the environment declined. Agricultural development degraded the rural environment, investments in sewage treatment and water quality lagged behind, air pollution caused acid rain in Europe and national as well as international commitments failed to be implemented.

Hajer's (1995) analysis of the acid rain issue in Britain indicates that EM discourse started to emerge in UK policy debates during this time, but failed to take root as a dominant ideology despite its ascendancy in other European countries. Weale's (1992) analysis of the 'new politics of pollution' corroborates that, in contrast to the emerging EM discourses of Germany and the Netherlands, the UK at the turn of the 1990s reflected the traditional environmental discourse of the 1970s and 1980s. This position saw economic profit and environmental protection as a zero-sum trade-off, and advocated end-of-pipe pollution control solutions (versus preventative technologies) in the name of 'safeguarding' industrial competitiveness.

During the 1990s the UK broke away from its laggard status as policy developments in air and water pollution, waste management and conservation greatly improved environmental quality in Britain. The UK also became much more engaged with its European partners in pushing forward the European environmental agenda. Due to the increasing prominence of EM discourse within EU environmental politics, EM ideas became more evident within UK policy-making during the Conservative governments of the 1990s. For instance, Roberts (2003) highlights that regional development programmes increasingly emphasized the integration of economic and environmental goals, reflecting the objectives and budget priorities of the EU's Structural Funds programmes, which were heavily influenced by EM thinking. However, critics argued that the UK at this time was still failing to address the central issue of establishing a genuinely strategic and cohesive approach to environmental policy (Osborne, 1997).

With its election manifesto firmly committed to improving the environmental performance of the UK, New Labour's electoral win in 1997 had the potential to be a significant event in the development of British environmental policy. Many of the proposals in the manifesto were based on a document entitled *In Trust for Tomorrow* (Labour Party, 1994), which was published as a response to the foot-dragging of successive Conservative governments on the environment. A central commitment was the reduction of carbon dioxide emissions by 20% of their 1990 level by 2010, requiring changes in transport usage, energy consumption and a shift towards renewable energy. The manifesto also emphasized that a considerably more integrated approach to environmental protection would be needed across all areas of policy. New Labour has attempted to demonstrate its 'green' credentials through various policy initiatives, but does this amount to a paradigm shift towards a programme of 'ecological modernization' within UK policy-making?

EM in the UK: Current Context

In his review of EM theory, Murphy (2000) highlights four themes that scholars (such as Weale, 1992; Gouldson and Murphy, 1996, 1998; Boehmer-Christiansen and Weidner, 1995) identify as indicative of government-led programmes of EM. Whilst these criteria are by no means exhaustive,¹ they have been used to classify nation states such as the Netherlands and Germany as broadly adopting an ecological modernization position. As such they provide a useful starting point with which to review the environmental policies of New Labour and their fit with EM.

1. *'Win-win' ideas.* Murphy highlights that scholars have focused on the 'win-win' policies of ecologically modernized states. Such states base their environmental policies on the core EM notion that there is no necessary conflict between environmental protection and economic growth, and that in fact they can be mutually supportive.
2. *Promotion of clean technology.* The development and diffusion of clean technologies as a means to spurring industrial innovation is central to EM theory, and as such government action to promote this technology is seen as a key criterion of nations following a path of EM.
3. *Innovative policy approaches.* Alternative and innovative policy approaches that introduce economic concepts and mechanisms into environmental policy are another central focus of EM theory. Scholars note that there has been an increasing popularity of market-based policy tools such as ecological taxes, tradable permits and voluntary agreements within EM states.
4. *Integration.* The literature highlights that the integration of environmental policy goals into all areas of government has been a central aspect of programmes of EM. Murphy states that

Ecological modernisation recognises that effective environmental protection can only be achieved through a realignment of broader policy goals relating to areas such as economics, energy, transport and trade. Ecological modernisation requires strong integration with the strategic and operational characteristics of government departments, modified to the extent that their original character may be lost altogether (Murphy, 2000a, p. 3).

So how do the policies of New Labour fit with these four criteria?

Win-Win Ideas

Since its ascendance to power in 1997, New Labour has increasingly emphasized the complementarity of economic and environmental goals in key political speeches and policy documents. For instance, in a speech on sustainable development Tony Blair stated that

Tackling climate change or other environmental challenges need not limit greater economic opportunity . . . economic development, social justice and environmental modernisation must go hand in hand (Blair, 2003).

In a speech at the Fabian Society conference, the deputy Prime Minister John Prescott stated that

Treating the environment with respect will not impede economic progress, it will help identify areas of inefficiency and waste and so unleash whole new forces of innovation (Prescott, 2003).

¹For instance, Blowers (1998) and Leroy (1999) emphasize other EM criteria, such as negotiated decision-making and stakeholder participation in processes of ecological modernization.

Similar arguments are made by the Performance Innovation Unit of the Cabinet Office responsible for 'blue skies' thinking on policy:

Greater resource productivity potentially offers a route to achieving faster growth sustainably – at the same time as reducing demands on the environment – by using fewer inputs of materials and energy for any given level of output (Performance Innovation Unit, 2001).

The 'win-win' philosophy of EM chimes neatly with the discourse of sustainable development. In the UK's revised sustainable development strategy, the Department of Environment, Transport and the Regions (DETR, 1998) emphasizes four objectives: (i) 'social progress which meets the needs of everyone', (ii) 'effective protection of the environment', (iii) 'prudent use of natural resources' and (iv) 'high and stable levels of growth and employment'. Tying in with these goals, the DTI's (2000) *Sustainable Development Strategy* states that

We need higher levels of growth and increased prosperity, but this needs to be both environmentally sustainable and socially acceptable. This will require increasingly de-coupling economic growth from unsustainable impacts on the environment and people. It is innovative businesses and responsible entrepreneurs in a knowledge and technologically rich economy that will lead the delivery of such a step change (DTI, 2000, p. 6).

In the new 'knowledge economy', the strategy proposes that industry raises 'resource productivity' via technical innovation, dematerialization and the promotion of recycling, waste minimization and energy efficiency. The strategy exhorts business to embrace environmental management because it will lead to improved business performance:

The environment is a business opportunity . . . there are economic benefits in reducing waste, avoiding pollution and using resources more efficiently . . . Reducing pollution through better technology will almost always lower costs or raise product value/differentiation (DTI, 2000, p. 7).

The emphasis is thus on voluntary environmental action from industry on the premise that it will be good for business. The notion that economic and environmental goals might be in serious tension is excluded from the government's rhetoric on the environment; it is certainly not presented as a possibly problematic issue for industrial production processes or for global capitalism. Instead, environmental protection and economic growth is portrayed as a positive-sum game.

Such a position resonates well with Labour's 'social inclusion' agenda, offering a 'win-win-win' in terms of the integration of economic, environmental and social goals. The assumption is that unlinking environmental degradation from economic growth (via resource productivity) will enhance quality of life, thereby fulfilling the social good and helping society to develop more sustainably. In the modern 'stakeholder society', reconciling economic and environmental priorities is seen as predominantly a task for partnership between government and industry, and also increasingly with previously marginalized social groups including local communities and voluntary organizations.

The 'win-win-win' model has proved to be particularly influential at the regional policy level. Reflecting the objectives of the EU's Structural Funds programmes, regional development policies have increasingly emphasized the need to integrate economic, environmental and social concerns. Specific examples of best practice include the establishment of 'eco-industrial initiatives' such as the 'Sustainable Growth Park' in England and the 'Eco Park' initiative in Wales (Gibbs, 2003). These 'eco-industrial parks' comprise a network of manufacturing and service businesses exchanging material inputs and outputs so as

to minimize pollution and waste, and thus increase resource efficiency and business productivity. Such initiatives also involve the participation of local community groups and voluntary organizations to achieve social as well as environmental and economic cohesion.

Arguably, ecological modernization has become a useful discursive strategy for UK policy-makers precisely because of its underlying win-win premise and its fit with the discourse of sustainable development. Barry (2003) argues that the increasing use of EM in political speeches and policy documents is because environmental goals are rendered compatible with Labour's central goal of wealth creation, thus giving it strength as a political ideology. Because EM promises both economic growth and environmental protection, it is a particularly attractive discourse for electorally sensitive politicians attempting to respond to the competing demands of industry, consumers and environmental groups.

Barry also highlights that EM is compatible with New Labour's aims and identity in a number of other important ways. For instance, the 'modernization' aspect of EM has particular appeal to a government and Prime Minister for whom modernization is a central principle. Furthermore, EM takes a supply side rather than a demand side approach to environmental policy. EM thus concerns itself with finding more sustainable means (i.e. cleaner production methods) to achieve the same ends (continuing growth in consumer demand and GDP). As such, EM policies do not attempt to regulate consumption² or to address issues of distributional justice (thus circumnavigating the more politically contentious aspects of sustainable development). Finally, EM policies require no radical structural change in the political economy and are therefore more politically acceptable than the alternatives proposed by radical groups within the green movement.

Promotion of Clean Technology

Government action to promote the innovation and diffusion of clean technologies is a critical element of ecological modernization strategies. In New Labour's first term, clean technologies were promoted with far less vigour than biotechnologies or information technologies, which were seen as key industries contributing to Britain's 'knowledge economy'. This was particularly the case with renewable energy, which was largely absent from the government's energy policy. However, the year 2000 saw a shift in thinking as New Labour began to see the political and economic benefits of developing the UK's environmental technology markets, and in particular the low carbon and renewable energy technologies that could help the UK meet its Kyoto protocol commitments. To encourage take-up, the 'sustainable technologies initiative' was increased from £7.8m to over £20m in 2000. In 2001 the climate change levy (an industry tax levied on fossil fuel) was launched, giving business an incentive to cut energy use and switch to low carbon technologies. The Carbon Trust was created in the same year to promote low carbon, energy efficient and renewable technologies such as combined heat and power plants and wave and solar power. Nuclear power was given the cold shoulder, with the industry left to run down as the old stations reached the end of their lives. The Energy Efficiency Commitment was also published in 2001, requiring electricity and gas suppliers to promote energy efficient technologies amongst their domestic consumers.

In 2002 'enhanced capital allowances' for firms investing in energy saving technology were introduced along with 'action energy' loans for smaller firms. In the same year the government, somewhat belatedly seeing the economic potential of renewable energy, launched the 'renewables obligation', under which suppliers must source 10% of their electricity from renewable sources by 2010. This was

² Whilst consumption has received relatively little attention in the EM debate to date, Cohen and Murphy (2001) have explored its role in identity formation and group communication, and how this can inform ecological modernization theory. However it can be argued that, due to the deep entrenchment of the idea of consumer sovereignty in liberal democracies, policy-makers find it difficult to incorporate consumption as a target for environmental policy.

later increased to 15% by 2015. This target was underpinned by capacity building initiatives such as the DTI's 'capital grants scheme' (which funds demonstration projects to help reduce the costs and risks involved in developing emerging technologies), the 'new opportunities fund' (which contributes £50 million to renewable energy projects) and the 'new and renewable energy R&D programme' (which funds innovative industrial R&D projects on renewable energy). In July 2002 the 'powering future vehicle strategy' was launched, setting targets for the promotion of low carbon vehicles and fuels in the UK.

With the climate change levy creating the imperative for environmental improvement within UK industry, these initiatives aimed to build the capacity of businesses to innovate using clean technologies and to increase the UK's market share in global environmental technology markets. The government also attempted to enhance its environmental leadership status on climate change at the Johannesburg World Summit in August 2002 by taking the lead on 'REEEP', the 'renewable energy and energy efficiency partnership'. 'REEEP' is a coalition of governments, businesses and organizations aiming to accelerate the development of renewable energy and energy efficient systems.

In 2003 the government launched its Energy White Paper entitled 'Our energy future – creating a low carbon economy'. In it, unprecedented and ambitious new targets for reducing carbon dioxide emissions were set, surpassing the UK's Kyoto protocol commitment¹ by promising a 60% reduction in carbon dioxide by 2050. According to the document, the government's preferred strategy for reducing emissions is to encourage energy efficient and renewable energy technologies. Later, the government announced plans for major offshore wind farms to be built, in the hope that by 2010 three-quarters of the UK's renewable energy would be supplied by wind-power.

New Labour's recent interest in promoting low carbon and renewable technologies has in part been due to its climate change targets, but it is also because the government increasingly recognizes that there are potential economic benefits for UK industry in promoting clean technology. In a foreword to a report assessing the future potential of the renewable energy industry for employment, the energy minister Stephen Timms stated that

The development of renewable energy is an important part of our efforts to tackle climate change. But it also offers a huge opportunity to enhance our manufacturing capacity and provide new employment, particularly in the remoter areas (DTI, 2004).

Innovative Policy Approaches

Central to EM policy strategies are the use of innovative policy instruments that aim to 'economise ecology' (Mol, 1997, p. 141). Despite its long legacy of legislative controls, the potential of new environmental policy instruments (NEPIs), such as eco-taxes and other market-based instruments (MBIs), voluntary agreements (VAs) and informational devices such as eco-labels are now being explored in the UK. Jordan (2003) highlights that whilst the use of voluntary agreements and eco-labels is much less common than in other European countries such as Sweden and Germany, the recent introduction of tradable permits and eco-taxes marks a decisive break from traditional policy approaches. Jordan describes the UK as

... now a world leader in designing emissions trading schemes and other complex instrument packages that fit together different types of NEPIs [New Environmental Policy Instruments] (Jordan, 2003, pp. 180–181).

¹The UK's Kyoto Protocol commitment is to reduce CO₂ emissions to 12.5% below 1990 levels by 2010.

The UK is somewhat of a latecomer to the use of NEPIs, having started to introduce them in the early 1990s whilst European 'leader' states such as the Netherlands and Denmark adopted them as far back as the 1970s and 1980s. In its environmental performance review of the UK in 1994, the OECD described the UK as a circumspect follower rather than innovator in the use of NEPIs. However, its latest report (OECD, 2002) highlighted that there has been an increasing emphasis on market-based instruments in the UK, and as such the government's policy mix has become much more balanced in recent years.

Environmental taxation was originally introduced by the Conservative government, which launched the unleaded petrol differential in 1987, the fuel price escalator and VAT on domestic fuel in 1993 and the landfill tax in 1996. Only the landfill tax was revenue neutral (with revenue recycled by lowering other taxes on waste disposal companies). Consequently, eco-taxes were heavily criticized by those who saw them as 'stealth taxes' to augment government coffers rather than as genuine innovations in environmental policy-making.

New Labour's first term saw the introduction of the 1998 packaging recycling notes (PRNs, which are tradable permits designed to promote recycling) and the 1999 vehicle excise duty (VED, with reduced tax rates for fuel efficient cars and lorries). The government's second term saw a dramatic increase in the number of NEPIs adopted. The chancellor Gordon Brown demonstrated a particular affinity to using eco-taxes to achieve environmental goals, announcing in his 2002 budget that

We are using combinations of taxes and other economic instruments to deliver environmental results more efficiently than extra regulation would achieve – and we are today committing ourselves to investigate where these approaches can be applied to further environmental issues (HM Treasury, 2002).

Eco-taxes have been particularly concentrated in the areas of transport and energy. Transport policy has seen the adoption of the VED and fuel duty differentials for sulphur-free petrol and bio-diesel. April 2002 saw the introduction of reforms to company car taxation, which linked the tax to exhaust emissions. The government also announced the introduction of distance-based road-user charges for lorries by 2005–06. In 2003 congestion charging in city centres was introduced, whereby drivers have to pay a daily charge to enter the congestion zone. This has successfully decreased traffic congestion and increased traffic flow in areas such as inner London (BBC, 2004). In 2004 plans to introduce more congestion charging zones were announced, along with a nation-wide road user charging scheme to replace the existing motoring tax system within the next 10–15 years.

In the area of energy policy, instruments such as the controversial climate change levy have also been introduced (in 2001), despite heavy lobbying from industry. In the April 2002 budget, Gordon Brown announced the first UK greenhouse gas emissions trading scheme, enabling companies who have signed up to the initiative to buy and sell emissions credits. The emissions trading scheme had in fact been mooted earlier by industry as their preferred alternative to the climate change levy.

Jordan (2003) argues that the recent trend in the UK towards adoption of NEPIs has been the result of a number of factors. There has been increasing pressure to find innovative ways of achieving environmental goals as a result of strict EU and UN commitments on issues such as climate change. There has also been growing appreciation of the limitations of command and control regulatory approaches. This, combined with the economic recession of the 1990s and the strong trends in Britain towards deregulation, has helped to fuel the search for more flexible and cost effective policy tools. Economic instruments also fit with New Labour's 'third way' philosophy rather better than regulation.

However, Helm (1998, cited by Jordan, 2003) argues that many eco-taxes in the UK are 'implicit', i.e. designed primarily to raise revenues rather than protect the environment. For instance, the response of the government to a major road blockage campaign in 2000 by drivers protesting at high fuel taxes

highlighted that hypothecation was not the central purpose of the fuel duty. Instead policy-makers made the argument that health service cuts would have to be made if the fuel duty were cut. Nevertheless, there has been a renewed emphasis on hypothecation in recent years. For instance, whilst just a third of the landfill tax funds were spent on sustainable waste management before 2003, in the April budget of that year the government announced that the money would be allocated directly to local authorities to help them develop recycling facilities. The climate change levy is designed to be revenue neutral, with £150 m hypothecated to the Carbon Trust and enhanced capital allowance funds, and the rest recycled back to business via reductions in employers' national insurance contributions.

Arguments for the use of environmental taxes tend to focus on the notion that they are the most efficient and effective means for achieving desired environmental goals, and that they have worked in a wide variety of contexts in many different countries. However, the barriers to their further implementation in the UK include concerns about social equity and the distributional effect of additional taxes on the poor, which is one reason why environmental taxes in the UK have mostly targeted industry and not consumers. They also include concerns about the erosion of international competitiveness, a key argument of business groups who have lobbied against the introduction of environmental taxes such as the climate change levy.

Voluntary agreements are another favoured policy tool of countries that have adopted EM strategies. Jordan (2003) asserts that despite the UK's highly voluntaristic policy style, the UK is far behind the Netherlands and Germany in its use of VAs. Those that have been agreed are generally unilaterally volunteered by industry rather than negotiated as part of a legally binding commitment. Jordan estimates that there are around 20 VAs in the UK, of which around half are unofficial, non-binding and self-assessed. The other half are negotiated agreements, which mean they are more formal contracts between industry and public authorities, and may be legally binding. The most prominent negotiated agreement is the climate change levy agreement (CCLA), which allows certain sectors to obtain an 80% reduction on the climate change levy. Jordan claims that some VAs in the UK have been fairly successful, but others have failed miserably, such as the VA governing newsprint. Reasons for such failures include the fact that certain sectors have a limited number of trade associations or suffer from low trade association membership, which makes it difficult for industry-wide agreements to be made. There is also the 'free-rider problem', where some firms defect from the VA. VAs have also been criticized for placing an unfair burden on large firms, as small and medium-sized enterprises are less likely to sign up to them.

In summary, whilst the UK is far behind other countries in its adoption of voluntary agreements, the government has increasingly favoured market-based approaches such as environmental taxes, indicating genuine innovation in policy-making. The government's previous suspicion of NEPIs has been replaced with a keen enthusiasm for them, so much so that the outgoing environment minister Michael Meacher expressed concern over a

... risk of a policy glut in the energy efficiency field, because of the combined impact of the climate change levy, IPPC, negotiated agreements and possible permit-trading regimes (Meacher, 1999).

Integrated Policy

According to Murphy, the integration of environmental goals into all areas of policy is another key emphasis of EM programmes. In 1997, Tony Blair stated to a UN General Assembly on sustainable development that

We must make the process of Government 'Green'. Environmental considerations must be integrated into all our decisions, regardless of the sector. They must be in at the start, not bolted on later (Blair, 1997).

Once in power, New Labour proclaimed the importance of 'joined up government' and created the 'super-ministry' Department of the Environment, Transport and the Regions (DETR). New Labour also carried on the Conservatives' appointment of 'green ministers' in each government department, responsible for ensuring that policy initiatives take account of environmental issues. The Environmental Audit Committee (EAC) was created to scrutinize how well government departments remain in line with the objectives of sustainable development, and the Sustainable Development Unit (SDU) was formed to support cross-governmental operations on sustainability. The government also outlined its commitment to using environmental appraisals:

Government will from now publish all free-standing environmental appraisals of policies unless there are overriding reasons for not doing so (SDIG, 2000).

Although this process of 'greening government' has ensured that 'non-environmental' departments have increasingly had to consider environmental issues, attempts at integration have arguably been less than successful. The SDU, which was to be established in the Cabinet Office, ended up in the DETR (and then the Department for Environment, Food and Rural Affairs, DEFRA), which meant that it had much less co-ordinating authority. Underlining the deep divisions existing between competing departments of state, the DETR 'super-ministry' was fragmented in 2001 into three separate departments; DEFRA, the Office of the Deputy Prime Minister (ODPM) and the Department of Transport (DoT). Jordan (2000) asserts that 'green' ministers have been largely ineffective and the environmental appraisals of government departments have been done half-heartedly, with most only paying lip service to sustainable development objectives. Despite the fact that the Labour Manifesto in 2001 pronounced 'every department a green department' (CPRE, 2002), the annual report of the 'green ministers network' published later that year revealed that only 55 environmental appraisals had been published between April 2000 and the end of March 2001, and that the DETR had been responsible for 45 of those appraisals. A total of 11 departments had not published a single environmental appraisal, including the Cabinet Office.

The Environmental Audit Committee has consistently highlighted the lack of political will to integrate environmental priorities into departmental policy strategies:

The Government has put in place much of the machinery necessary to generate policies with sustainable development at their heart. However, these are far from delivering their full potential because few departments consider sustainable development to be central to their activities (Environmental Audit Committee, 2002).

The EAC's (2003b) report on *Greening Government* concluded that

Most departments devote little in the way of staff resources to the Sustainable Development agenda, while the grade of the most senior staff working on these issues is relatively low. This reflects a lack of commitment by senior management and a failure to exploit the potential within many departments to mainstream sustainable development more radically. Objectives and targets agreed within Public Service Agreements act as key drivers for departments. Yet, with the exception of DEFRA, these agreements contain hardly any environmentally related targets – fuelling the impression that sustainable development is a relatively low priority.

Environmental policy integration has also been attempted at a spatial level, with devolved and local governments adopting EM-style strategies in the UK. Reflecting the goals of the EU's European Spatial Development Perspective (ESDP), spatial management strategies have been devised to strengthen

economic, environmental and social cohesion at the local, regional, national and transnational scale (Roberts, 2003). Gibbs (2000) argues that regional development agencies (RDAs) have partially incorporated ecological modernization into their policies as a result of the devolution of environmental responsibility downwards through the Local Agenda 21 process. However, he argues that integration of economic and environmental goals has been progressively watered down from policy formulation to implementation, making it increasingly unclear as to what EM means in operational terms:

The dominant discourse at the UK regional levels is that of creating competitive regional economies located within a global world economy, and where technology, knowledge and conventional economic measures can be harnessed to create wealth, as measured in conventional GDP terms . . . the watering down of the ecological message within UK regional policy serves to illustrate the continual failure of the government to seize the initiative and to remain subservient to more conventional economic analysis (Gibbs, 2000, pp. 16–17).

Michael Jacobs (1999), in a widely read Fabian Society pamphlet entitled *Environmental Modernization*, argues that this failure to 'green government' is due to the fact that New Labour is not comfortable with the environment as a political issue, associating environmental discourses with the radical anti-industry and anti-consumer agenda of the Green movement. He argues that New Labour is 'fundamentally suspicious of environmentalism', because it sees the prescriptions of the green movement as 'anti-aspirational', challenging the consumerist lifestyles of 'Middle England', its core middle-class constituency. New Labour also regards environmentalism as 'anti-poor', as it advocates raising costs for its core working class voters (Jacobs, 1999, pp. 9–10).

Jacobs asserts that New Labour views integration as requiring too radical a departure from its overarching 'third way' approach. He then goes on to argue that this view is mistaken: that in fact by extending the government's key goal of raising labour productivity to 'environmental productivity' (the efficiency with which material and energy is utilized in production), 'environmental modernization' goals could have a remarkable fit with the government's existing economic policies. Environmental goals could therefore be essentially compatible with New Labour's central goal of wealth creation. Paterson and Barry (2004) counter that Jacobs is essentially advocating the 'bolting on' of environmental policies to New Labour's existing modernization agenda and that this 'bolting on' strategy is in fact a fairly accurate description of the government's approach to solving environmental problems.

Transport policy is a popular target for those who are critical of the government's attempts at joined up government, for it is an area where policy contradictions are particularly evident. When Labour came to power, it suspended the Conservatives' biggest ever road-building scheme, which at the time was half way through completion. Scorning the outgoing government's policy of 'predict and provide', John Prescott famously declared in 1997 that

I will have failed if in five years there are not many more people using public transport and far fewer journeys by car (*New Statesman*, 2003).

In 1998 a White Paper on an integrated transport strategy was published entitled *A New Deal For Transport: Better For Everyone* (DETR, 1998). This represented a sea change in thinking. With the aim of increasing the use of public transport and reducing car use and carbon dioxide emissions, various innovative policy tools were proposed, including road pricing, parking taxes and fuel and vehicle excise duty charges. The document also proposed to hypothecate taxes to develop local authorities' provision of public transport. Unfortunately, many of these policy goals were watered down or abandoned as Prime Minister Blair became increasingly concerned that the proposals were 'anti-car' and would jeopardize

the votes of key sectors of his electorate. Reversing its earlier pledge to call a halt on road-building and get people out of cars, the government earmarked £29 billion for new road-building programmes in its subsequent strategy document *Transport 2010 – The 10 Year Plan* (DETR, 2000). Scared by fuel protests and the powerful road lobby, the government abolished the fuel duty escalator and set no targets for reducing car usage.

One of the most striking characteristics of the government's transport policy is the way in which it has been undermined by key features of New Labour's economic strategy. For instance, on the one hand the government has attempted to reduce car emissions by introducing a framework for congestion charging in city centres and differential tax levels for fuel-efficient cars. On the other hand, New Labour has lowered the cost of driving by abandoning the fuel duty escalator and, in 2000, ordering carmakers to slash prices to bring the UK into line with European prices. The government itself admits that motorists have continued to receive disproportionately high tax advantages over those who use public transport. According to the Commission for Integrated Transport (2004), motoring costs in real terms have stayed constant over the last 20 years, whilst bus and rail fares have risen by 80%. Since 2000, motoring costs have actually fallen by 2.8% per annum, whilst the cost of using buses and trains has risen by 1.4%. These are key reasons why road traffic has increased by 7% per annum since 1997, and is set to increase by another 17% over the next decade (FOE-UK, 2002, 2003).

Paterson and Barry (2004) argue that transport policy under the Labour government has had little overall direction and a scant willingness to offend 'Mondeo man', who voted them into power in 1997. They argue that

The failure to pursue a clear strategy regarding transport is more easily understood if one understands that the political imperative to appease 'Mondeo Man' reflects an accumulation strategy predicated on car-led mobility. Flexible labour markets require flexible labourers, and the flexibility of the car in terms of mobility is key here. Those voters dependent on the car thus become key elements in Labour's electoral strategy and simultaneously key elements in their economic strategy, which requires continued (if not accelerated) throughput and consumption of strategic economic goods, notably cars (Paterson and Barry, 2004).

One can add to this aviation-led mobility, for the government has recently endorsed a massive expansion of air travel in its Aviation White Paper (DTI, 2003). Instead of introducing a demand management approach, the government has chosen to accept and meet growth forecasts of air passenger numbers doubling by 2020. In the face of the powerful aviation industry, the government's solution is to propose the greatest airport expansion ever contemplated, hugely increasing the capacity for air travel in the knowledge that this will stimulate demand. Given that aviation emissions are three times as damaging as those from other sources, any growth in air traffic will seriously compromise the targets set out in the government's climate change policy. The government itself acknowledges that carbon dioxide emissions from aviation could be 25% of Britain's total contribution to global warming by 2030. Yet in the White Paper, the government warns that anything that undermines the competitiveness of the industry will be effectively ruled out. The Environmental Audit Committee's (2003a) report on aviation criticized the Minister of Transport, Alistair Darling, for his opposition to 'pricing people off planes'. The report emphasized the need for urgent steps to be taken to reduce air travel demand, particularly in light of government forecasts of a 40% decrease in airfares over the next 30 years.

Considerable opportunities exist for cross-country learning on environmental policy integration in areas such as transport. For instance, the European Environment Agency (2005) highlights that Norway and Sweden have developed particularly comprehensive sectoral environmental integration strategies. However, the EEA also highlights that despite great strides in political commitment to environmental

policy integration across Europe, capacity and resources dedicated to integration remain inadequate, and most national sustainable development strategies (NSDs)

lack vision and pathways for delivering on the objectives. There is little evidence of NDS's being implemented and considerable opportunities exist for greater cross-cultural learning (EEA, 2005, p. 7).

Like the UK, many member states have developed cross-governmental structures to facilitate integration of sustainable development into all areas of policy, but according to Coffey and Dom (2004) environmental or sustainable development objectives are not necessarily being taken on board. It appears that the UK is not alone in finding integration a political challenge of the highest order.

Conclusion

This analysis has highlighted three key policy trends in the UK. First, recent political rhetoric has promoted economic and environmental goals as a win-win game, emphasizing the 'business case' for sustainability by linking environmental management with greater efficiency and competitiveness. Second, recent emphasis has been given to stimulating the invention and diffusion of environmental technologies, particularly low carbon and renewable energy technologies. Third, market-based instruments have become a favoured tool of policy-makers, who have attempted to harness market forces by creating the price signals needed to establish the business case for sustainability. It can be argued that these trends indicate New Labour's increasing predilection for the prescriptions of ecological modernization.

However, the UK has been less successful in the fourth area that Murphy (2000a) identifies as a key characteristic of EM states: that of integration. Arguably, the government's current policies do not represent a 'joined up' approach to dealing with environmental problems, for at its core New Labour views the idea of fully integrating environmental protection into its Third Way approach as unworkable. Whilst espousing the virtues of 'green government', in practice New Labour finds it easier to bolt environmental goals onto its existing economic strategies so as to ensure that environmental protection does not jeopardize its central goal of wealth creation. Jordan (2003) states it simply:

Environmental imperatives are subservient to the perceived need to address the country's long term economic and industrial decline as a world power (Jordan, 2003, p. 182).

Arguably, the policy contradictions evident in areas such as transport indicate that the government's ecological modernization strategy is concerned more with the sustainable development of the economy than the sustainability of the environment. As such, environmental interests continue to remain ideologically and politically peripheral to economic imperatives.

New Labour's overriding concern with wealth creation may explain why it has persisted in protecting the sovereignty of the consumer at all costs. Barry (2003, p. 202) argues

That consumer demand is sovereign, and not to be challenged on environmental grounds (or any other), is one of the many links between New Labour's 'Third Way' and ecological modernisation. Equally, not only is consumer demand beyond political regulation or questioning, but the market commodities and services which constitute this demand are equally beyond negotiation.

As Barry highlights, New Labour's idea of ecological modernization is a narrow, supply-sided approach to finding more sustainable means of achieving the same ends – continuing growth in consumer demand and GDP. Prime Minister Blair has explicitly argued that

... we should harness consumer demand, not stifle it. We should not be trying to reduce people's aspirations, but rather find innovative ways of satisfying those aspirations. As our societies become more prosperous, so people's demand for a better environment is growing. More and more people want to buy green. We should encourage that, and harness that green consumer power in our environmental policies (Blair, 2000).

Yet, whilst ostensibly aiming to enhance quality of life and 'harness consumer demand', the government has continued to encourage the kind of consumption that is harmful to the environment – hence the increase in car usage due to decreasing motoring costs and the growth in demand for air travel.

Murphy and Cohen (2001) highlights that the notion of consumer sovereignty is deeply embedded in liberal democracies and therefore policy-makers find it difficult to conceive of consumption as a target for environmental policy. Yet clearly, integration of environmental protection into all areas of policy requires a demand as well as supply-sided approach to dealing with environmental problems. Solutions to over-consumption tend to sit rather uncomfortably with the DTI's (2000) objective of 'high and stable levels of economic growth', which is clearly why the government has so studiously avoided tackling the issue. Yet, if the efficiency gains and emissions reductions that the government is attempting to encourage are not to be neutralized, it must accept that – whatever its effect on GDP – serious changes in consumption patterns are necessary in the UK to achieve the quality of life that New Labour is ostensibly aiming for. Policies that encourage Daly's (1987) notion of economic 'development' (qualitative improvements in the non-physical characteristics of capital) rather than economic 'growth' (quantitative increases in material throughput) might enable economic and environmental goals to become significantly more integrated than they are currently.

Arguably, the degree to which the UK can be said to be following an EM path depends on the degree to which strong integration is considered an imperative of ecological modernization. Indeed, strong integration of environmental, economic and social goals may require a much broader definition of ecological modernization, and it is here that Christoff's (1996) distinction between weak and strong EM is helpful. Christoff suggests that

... different interpretations of what constitutes EM lie along a continuum from weak [one is tempted to write, false] to strong, according to their likely efficacy in promoting enduring ecologically sustainable transformations and outcomes across a range of issues and institutions (Christoff, 1996, p. 490).

Whilst strong EM is ecological, systemic and democratic, involving far-reaching and radical social change, weak EM is hegemonic, technocratic and economistic. Weak EM has a narrow focus on resource and waste management, energy efficiency and pollution control, and uses the language of business to conceptualize environmental management in terms of its potential to increase efficiency and thus produce cost savings for industry. Christoff (1996, p. 486) argues that weak EM puts a:

green gloss on industrial development... such EM remains superficially or weakly ecological. Consideration of the integrity of ecosystems, and the cumulative impacts of industrialisation upon these is limited and peripheral.

Similarly Hajer (1995) makes a distinction between techno-administrative EM and truly reflexive EM, the former characterized by the economization of nature and elitist decision-making structures, and the latter emphasizing democratic decision-making (including deliberate social choice between alternative paths of development), social justice and economic redistribution.

New Labour's technocratic and economistic policy approach has a remarkable fit with Christoff's depiction of weak EM and Hajer's techno-administrative EM. Yet if New Labour is to show true commitment to sustainability, a strategy that bears a greater resemblance to a stronger, more reflexive ecological modernization is surely required. This means an integrated policy approach that considers radical changes to the institutions of modernity in order to address the impacts of industrialization on the environment. Unfortunately, whilst the goal of 'high and stable levels of economic growth' takes precedence over 'effective protection of the environment', UK policy-makers are unlikely to endorse and encourage the kinds of embedded social transformations (such as changes in both patterns and levels of consumption) that are required to truly progress towards sustainability. As Jacobs (1999) argues, this is the territory of the 'anti-aspirational' Greens, and as such is an anathema to New Labour.

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Biography

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Study 2

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The ecological modernisation of SMEs in the UK's construction industry

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Abstract

Ecological Modernisation (EM) theorists argue that businesses in industrialised nations are ecologically restructuring in response to market signals, and that economic actors increasingly perceive a business case for sustainability. Whilst UK policymakers urge companies to undertake environmental measures voluntarily on the basis that it will be good for business, a qualitative study exploring the environmental practices of small and medium-sized construction firms found that the opinions of owner-managers had little resonance with this 'win-win' rhetoric. Respondents did not perceive the financial returns to be gained from eco-efficiency measures to be significant enough to warrant the short-term investment in time and resources required to pursue them. Moreover, the market was not signalling that product value could be raised or that customers could be won by embracing environmental best practice. The paper concludes by questioning the UK government's faith in EMs 'win-win' ideology to encourage the greening of industry.
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Keywords: Ecological modernisation; SMEs; UK; Policy

1. Introduction

Small and medium-sized enterprises (SMEs) are arguably the most important sector of a nation's economy; they are innovative and entrepreneurial, a source of job creation and competition in the market. In the UK they constitute 99.1% of all businesses, provide 43.7% of private sector employment and 37% of turnover (SBS, 2003, Table 1). Their impact on the environment is therefore an important consideration. Despite the difficulties in collecting hard data on the environmental impact of this vast sector, it is estimated that UK SMEs are responsible for as much as 60% of carbon dioxide emissions (Marshall Report, 1998), 60% of commercial waste, and 8 out of 10 pollution accidents (Environment Agency, 2003).

As the collective 'ecological footprint' of small firms is indeed significant, the environmental practices of this sector have become an emerging field of enquiry in the UK. Stud-

ies have found that SMEs tend to have low levels of engagement with environmental agendas (see Hillary, 2000a). However, there has been little attempt at placing these empirical findings within a broader theoretical framework of socio-environmental relations.

This paper presents the findings of an Economic and Social Research Council¹ funded study exploring the ecological modernisation of small and medium-sized architectural and building companies in the UK. The research explores whether key tenets of Ecological Modernisation (EM) theory apply to firms in this context, namely whether market dynamics and EM policy strategies are driving the greening of SMEs, and whether owner-managers agree with the idea that there is a 'business case for sustainability'.

The study is timely for two key reasons. Firstly, SME researchers in the UK have given little attention to EM theory, despite the fact that its prescriptions inform government strategies for improving the environmental practices

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main challenges ecological problems pose for social democratic thought' and therefore that the theory is 'too good to be true'.

One such challenge for EM theory is the potential for efficiency measures to reconcile environmental and economic concerns. EM theorists highlight empirical studies that demonstrate how ecologically modernised nations are decoupling material from economic flows, thus increasing the sustainability of their economies. For instance, Japan is highlighted as 'paradigmatic of ecological modernisation' (Hajer, 1996, p. 249) because it successfully managed to decrease its ratio of energy supply to GDP by 25% between 1979 and 1987 (OECD, 1994). Other industrialised countries have followed suit; for instance the OECD (2002a) highlights that the UK has achieved a 'strong decoupling' of carbon dioxide and air pollutants from GDP growth since the 1990s.

However, a major challenge for EM theory is the fact that such trends tend to be relative, and that in most countries absolute levels of pollution, material and energy use continue to increase. The key reason for this is that efficiency gains are constantly being neutralised by rapid rises in consumption. For instance, since the 1990s Japan's energy consumption has increased by 16%; this has wiped out the progress made in energy efficiency so that energy use now outstrips GDP growth by 2% (OECD, 2002b). The OECD's explanation for this is that Japan is undergoing a continuing shift towards a mass consumption-based economy. Similarly in the UK, despite a relative decoupling from GDP, absolute levels of CO₂ have continued to increase largely as a result of householders and drivers increasing their consumption of fossil fuels (BBC, 2006).

This tendency for consumption to wipe out efficiency gains is exacerbated by the 'rebound effect'. This refers to the idea that when efficiency gains are made, a firm's production costs are decreased, which in turn encourages the company to lower prices. Lower prices stimulate demand, and the resulting increase in consumption wipes out the environmental gains from the efficiency measure. Critics argue that because of the rebound effect, eco-efficiency is not a sustained solution to environmental problems as it tends to be neutralised by the subsequent growth process (Levett, 2001).

Barrett (2005) argues that even if absolute improvements in resource use and emissions were being achieved at the local level, this does not necessarily indicate the sustainability of a nation's economy at the global level. The vast 'ecological footprints' of supposedly ecologically modernised countries exemplify this point. Barrett cites the work of Wackernagel in 1999 called 'Redefining Progress', which found that on average there are only 1.9 global hectares of biologically productive space available per person on the Earth. Yet Japan's footprint is 4.8 hectares per capita, Germany's is 4.7, the Netherlands' is 4.8, Sweden's is 6.7 and Norway's is a staggering 7.9 hectares per capita.

A major criticism of EM theory is hence that it ignores the considerable ecological footprints of OECD countries

beyond their national boundaries. At the national level, EM theory reassures us that no tough choices need to be made between economic growth and environmental protection. Yet its lack of institutional analysis at the global level conveniently circumnavigates the probability of ecological collapse if Northern consumption rates were replicated by developing countries in the South. Due to its unwavering faith in eco-efficiency as a means for ensuring sustainable growth, EM theory pays scant attention to the possibility of sustainability boundaries (Jacobs, 1997), despite the ramifications of the rebound effect. EM theory thus takes a supply-sided approach to environmental problems, resulting in policy prescriptions that focus on finding more sustainable means for achieving the same ends – continuing growth in consumer demand and GDP (Barry, 2003).

This criticism relates to EM's failure to address a core aim of sustainable development, namely 'equity'. Langhelle (2000) argues that whilst ecological modernisation and sustainable development are often conflated within the literature because both have environmental protection and efficiency as core principles, there is a fundamental difference between the two concepts. The Bruntland Report 'Our Common Future' (1987), states that sustainable development is possible only if there is:

"A change in the content of growth, to make it more equitable in its impact, i.e. to improve the distribution of income" (WCED, 1987, p. 52)

A major criticism levied at EM theory is that it is silent on issues concerning the equitable distribution of resources, and makes no link between environmental problems and social injustices between North and South. Sustainable development, on the other hand, deals not only with the inter-relationship between economy and ecology, but with environmental and social justice issues on a global scale. Langhelle argues that because of this, EM is at best a 'weak' expression of sustainable development. Strong sustainability, on the other hand, acknowledges that the objective of efficiency may be constrained by other key aims such as ecological integrity and social equity.

Despite such important distinctions, Langhelle (2000, p. 306) highlights that:

"Environmental politics is...now dominated by the discourse of ecological modernisation, and seems in addition to encapsulate sustainable development."

3. The ecological modernisation of UK policy

EM scholars highlight that EM theory underlies the environmental policies and practices of Northern industrialised nations (Hajer, 1996; Berger et al., 2001; Strandbakken and Stø, 2003; Pepper, 1999). For instance, Pepper (1999) asserts that ecological modernisation is the new name for environmental politics in the European Union, and is enshrined in its Fifth Environmental Action Programme.

Revell (2005), Barry (2003) and Gibbs (2000) argue that due to the 'Europeanisation' of policy, EM discourse has also become increasingly prevalent in UK environmental policy circles since New Labour came to power in 1997. Barry (2003) asserts that EM's promise of both environmental protection and economic growth makes it a highly appealing discursive strategy for policymakers attempting to respond to the competing demands of industry, consumers and environmental groups. Gibbs (2000, p. 12) corroborates that:

"Ecological modernisation chimes neatly with the government's vision of a modernised, forward looking society, appearing to allow a better environment and a modernised economy."

EM ideas are evident in the government's key policy documents on the environment. For instance, the Department of Trade and Industry's (DTI) (2000) 'Sustainable Development Strategy' states that:

"We need higher levels of growth and increased prosperity, but this needs to be both environmentally sustainable and socially acceptable. This will require increasingly decoupling economic growth from unsustainable impacts on the environment and people. It is innovative businesses and responsible entrepreneurs in a knowledge and technologically rich economy that will lead the delivery of such a step change" (DTI, 2000, p. 6)

Like EM discourse, policy rhetoric in the UK links environmental management with greater economic competitiveness. Firms are thus exhorted to improve their environmental performance on the basis that it is good for business:

"The environment is a business opportunity...there are economic benefits in reducing waste, avoiding pollution and using resources more efficiently... Reducing pollution through better technology will almost always lower costs or raise product value/differentiation" (DTI, 2000, p. 7)

Environmental problems are portrayed as an opportunity for industry, as rising consumer demand for 'eco-products', growing environmental technology markets, and increasing stakeholder pressure for environmental management provide a growing business case for sustainability. In line with EM prescriptions, these market transformations are seen to be facilitated by partnerships between government and business through voluntary agreements (Gibbs, 2000).

Ecological modernisation has particular resonance with government strategies for improving the environmental practices of the SME sector. As existing regulatory standards mostly apply to large firms, policymakers have focused on voluntary initiatives to encourage environmental reform amongst smaller firms. Reports by the UK Roundtable on Sustainable Development (1999) and the Advisory Committee of Business and the Environment (1999) advocate information and advice as the central mechanism for encouraging the greening of SMEs. Policy-

makers have thus attempted to build the capacity for small firms to become more environmentally proactive by setting up numerous environmental best practice programmes (such as the 'Environment and Energy Helpline', 'Envirowise' and the Carbon Trust's 'Action Energy' programme). The business case for sustainability is a key discursive strategy used to encourage SMEs to join these voluntary schemes. For instance, the 'Action Energy' website states:

"Saving energy makes an immediate difference to your organisation's bottom line. In the private sector this means extra profit" (www.actionenergy.org.uk, accessed 10/05/06)

'Envirowise' asserts that:

"UK companies [can] increase their profits by as much as £1000 for each employee by eliminating waste at source" (www.envirowise.gov.uk, accessed 10/05/06)

Despite these claims, studies of business attitudes on the ground overwhelmingly demonstrate that SME owner-managers tend to view environmental management as a cost burden (Hillary, 2000a; European Observatory, 2002; Smith and Kemp, 1998; Revell and Rutherford, 2003; Baylis et al., 1998; Tilley, 2000). A review of 33 studies by Hillary (2000b) highlights that SMEs are under little pressure from suppliers or consumers to reduce their environmental impacts, and owner-managers are thus highly resistant to undertaking environmental reforms voluntarily for fear of losing competitiveness. Even in the few cases where the business benefits of environmental reform are perceived, low levels of 'eco-literacy' mean that owner-managers often feel ill-equipped to undertake environmental improvements (Gerstenfeld and Roberts, 2000). Because of the perceived 'burden of environmentalism', owner-managers are inclined to view legislation as the only way to ensure the greening of SMEs, as regulations provide the level playing field needed to prevent 'free riders' from gaining a competitive advantage (Rutherford et al., 2000).

Such findings indicate that owner-managers may not share the UK government's faith in EM's win-win philosophy, and calls into question policymakers' reliance on voluntary initiatives to encourage environmental reform within the SME sector. These issues will be examined in more depth in this paper in relation to the construction industry.

4. Methodology

The aims of the broader research project were to explore the role (if any) of market forces and government policies in driving the greening of SMEs in construction, and whether owner-managers see a business case for sustainability. These objectives relate to three of Mol's (1997) five core social transformations under EM (see above).

The construction industry was considered a potentially interesting sector with which to explore the influence of market dynamics and government policies on the environ-

mental practices of SMEs, as it has a significant environmental impact and a high public profile, and as such is the subject of numerous government and industry-led initiatives to promote best practice. Moreover, the business case for sustainability is a key theme in the DTI's (2003) strategy document, 'Sustainable Construction':

"The UK's strategy for more sustainable construction, Building a Better Quality of Life, suggests key themes for action by the construction industry...Most of these [themes] simply make good business sense – eg minimising waste increases efficiency" (DTI, 2003, p. 1)

As the research objectives required an understanding of the subjective attitudes and perceptions of owner-managers regarding their environmental practices, a qualitative methodology was chosen for this study. Much of the research to date on SMEs and environmental issues has been quantitative; whilst useful in setting out broad comparative parameters such methods have arguably not facilitated a deeper examination of the underlying reasons for the actions and attitudes of small firm owners regarding the environment. For this reason, the research team felt that 'thick descriptions' from detailed cross-sectional data would inform the objectives of the research more appropriately than 'thin descriptions' using quantitative data from a larger sample.

In-depth face-to-face interviews were deemed to be the most appropriate method for collecting data because they allow a more detailed exploration of individual motivations and views. Interviews were conducted with 20 small and medium-sized firms (10 architectural practices and 10 building firms), and 10 'key informants' from government and industry (including the Royal Institute of British Architects (RIBA), the Federation of Master Builders (FMB), the Small Business Service (SBS), the DTI's Construction Sector Unit, CIRIA,⁴ the Building Centre Trust,⁵ and several industry specialists in sustainable construction).

Although the sample size precluded a statistical representation of the results, businesses selected for interview were chosen from the RIBA and FMB databases, with no bias towards the selection of firms that were more or less environmentally proactive.⁶

Respondents were drawn from both the architectural and building sectors to allow an exploration of the influ-

ence of supply chain dynamics on SME environmental practices. Reflecting the predominance of small firms in construction, the builders interviewed were all owner-managers of small and micro firms, with the exception of two medium-sized firms.⁷ The sample's expertise ranged from house-building and domestic refurbishments to commercial developments. Most firms were main contractors, and some also did sub-contracting work. Within the architectural sample there were two medium-sized practices whilst the remaining firms were small, reflecting the fact that small firms constitute 86% of all architectural practices in the UK (RIBA, 2003). The sample had a range of design foci, from commercial and domestic new builds to refurbishment and extensions of existing buildings.

Fieldwork was conducted between April and July of 2003. Firstly, key informants were interviewed in order to build a picture of the political and economic context of the construction industry, particularly regarding small firms. This overview added triangulation to the research design by allowing emergent themes and issues to be explored from different perspectives. A semi-structured interview schedule was used and interviews typically lasted one and a half to two hours. Areas covered included key environmental issues/policies relevant to SMEs, barriers/drivers to environmental reform amongst SMEs, opinions of the business case for sustainability within construction and perceptions of market/policy changes required to promote sustainable construction.

In the second stage, owner-managers were interviewed using interview guides similar to those used in stage one, but designed to fit with the nuances gleaned from the key informant interviews. Each interview typically lasted an hour, and all interviews were audio-tape recorded and transcribed. The analytical procedure employed followed an interpretivist approach to the data collected (Miles and Huberman, 1994).⁸

5. Findings

5.1. Market forces

The responses of owner-managers indicated that little ecological restructuring was taking place within the sample,

⁴ CIRIA is an independent broker of construction research and innovation.

⁵ The Building Centre Trust is an independent charitable organisation providing support for educational, research and cultural activities connected with the built environment.

⁶ As approximately 80% of all architectural practices in the UK are RIBA members (RIBA, 2003) it was felt that a sample from RIBA's membership list was justified. According to a key informant at the FMB, its members represent around 13% of all SME builders, which indicates a built-in sampling bias. This was felt to be permissible as the FMB is the UK's leading trade association for small firm builders and has a thorough membership accreditation procedure. It was felt that, in theory, the environmental practices of FMB members should therefore be a 'best case scenario', indicating the degree to which environmental good practice is being taken up more generally within the SME building sector.

⁷ The UK government defines a micro firm as having between 1 and 10 staff, a small firm as having 1–50 staff, and a medium-sized firm as having 51–250 staff (SBS, 2003).

⁸ This involved interviewers familiarising themselves with the material collected, including making notes after the interviews, listening to the audio-tapes, reading the transcripts and building up themes within and between businesses. In some instances these themes followed the structure of the interview guide, whilst in others they emerged from the unstructured discussion within interviews. The themes emerging from each business were then classified according to industry sub-sector. This process allowed summaries of themes to be drawn up to provide source material for the first draft of the findings and discussion. This analysis enabled both a sub-sector comparison, as well as a general analysis of the environmental practices in SMEs.

as the market was not signalling to firms that product value could be raised or that customers could be won by embracing environmental best practice. Key informants highlighted that market forces were actively discouraging more environmentally sound behaviour amongst SMEs due to intense competition within the construction industry. Barriers to entry were reportedly few, and the vast numbers of small firms in construction meant that to compete, profit margins were often very low.

“It’s an incredibly competitive industry. It’s probably the most competitive sector of the economy. Because there are so many firms, barriers to entry are almost non-existent, margins are at subsistence levels...By and large the industry doesn’t have any money to invest in people, technology, training, anything” (Construction industry specialist)

Respondents consistently highlighted that the enormous competitive pressures on small firms made cost and speed of build the number one priorities whilst environmental management remained a peripheral concern. A key informant from the FMB corroborated that environmental protection was not a high priority for many firms in the industry:

“There has not really been a tremendous constraint on the ability of firms to do whatever they want without regard for environmental or sustainability issues... The environment with regard to construction is a lower order issue.”

At the top of the supply chain, architects claimed that whilst lip service was paid to sustainability issues within the industry, there was currently little in the way of environmental design occurring in the UK, and sustainability tended to be a peripheral issue in their own work. Although it was acknowledged that architects should be at the forefront of sustainability, most respondents felt that it was difficult to push an environmental agenda forward because clients tended to be driven by commercial rather than environmental or social concerns. Most architects thus did not promote environmental issues for fear of alienating clients, and environmental designs were only explored if it was expressly asked of them.

“[Clients] are not interested in renewable resources. They’re not aware of carbon emissions and the amount that’s given off...Clients are interested in speed and economy and the way that the market is at the moment” (Architect 6, sole proprietor)

These market dynamics were clearly having a knock-on effect down the supply chain as builders perceived a low demand for sustainable buildings and construction methods, and therefore were not incentivised to improve their environmental performance or to differentiate themselves on environmental credentials. The key informant from the FMB concurred that the supply chain was doing little to encourage environmental reform amongst small firm builders currently:

“The architectural profession is not promoting environmentally-friendly design, apart from the odd high level case. Neither are clients or major contractors pushing small sub-contractors on sustainability. There are clearly one or two high profile people pushing it, but by and large, not at all.”

Builders claimed that architects rarely specified sustainable options; instead specifications were often ‘generic’ where the architect names a product ‘or equivalent’. This allowed the contractors to use substitute products and thus have a degree of influence over the materials used within the production process. Respondents claimed that the usual criteria for choosing products was price, as buying the cheapest equivalent product was one way for builders to squeeze a profit out of tight budgets. Builders confessed that they rarely considered the environmental impacts of materials, and beyond the use of timber from sustainable sources, most were not even aware of which materials might be greener than others. Information about environmental impacts was thought to be difficult and time-consuming to obtain, and many respondents highlighted that building suppliers could do much more to encourage the use of green materials in construction, such as eco-labelling schemes to differentiate products with lower environmental impacts.

These supply chain dynamics contradict a central theme in EM theory, namely that businesses are ecologically restructuring in response to market signals. Corroborating Hillary’s (2000b) review of 33 cross-sector studies on the barriers to environmental reform amongst SMEs, these findings suggest that neither customers nor suppliers in construction are pushing an environmental agenda or pressurising small firms to improve their environmental performance. At the very least, these findings suggest that there may be considerable size and sectoral differences in the degree to which businesses are ecologically modernising as a result of market drivers. In contrast to this study, Mol’s (1995) research on the Dutch chemical industry found that growing public pressure for environmental reform meant that the environment was increasingly a factor in competition between chemical corporations. However, much of the EM literature has been manufacturing and large firm ‘centric’, and it is not clear that processes of ecological modernisation have equal application for smaller firms – particularly in ‘cleaner’ sectors such as architecture – that are experiencing considerably less stakeholder pressure to reduce their environmental impacts.

The key issue for firms in this study was that customers invariably focused on ‘value for money’ at the expense of environmental concerns. Many architects were of the opinion that there was not much of a business case for sustainable design to present to clients, who were unwilling to pay the premium for a more sustainable building. Developers reportedly wanted capital outlay to be as low as possible in order to get a high return on their investment. This meant that they would often prefer to go for the cheapest option

and compromise on other factors such as quality, durability and energy efficiency as this would mainly benefit the end-user. End-users were also considered to be cost-conscious, and even though they had a greater incentive to invest in energy-efficient designs to reduce running costs, lowering capital expenditure was reportedly more of a priority than raising environmental standards beyond regulatory requirements.

Whilst the majority of architects did not believe that there were significant opportunities to develop environmental activities, this does not mean that there were none. Rather it indicates that owner-managers may have been ignorant of such opportunities, or that they perceived greater returns to be gained from exploring other activities. This is confirmed by the experience of one 'eco-architect' in the sample, who had attempted to attract a niche market of clients interested in investing in sustainable buildings. This owner-manager, whose firm had won awards for sustainable design, viewed the business case for sustainable construction far more positively than other respondents. He highlighted to clients that many aspects of sustainable design were cost efficient, for instance because they reduced the need for expensive air conditioning and heating systems. To developers he emphasised the possible financial returns to be gained from adding 'green credentials' to buildings which could appeal to top-end commercial tenants looking to demonstrate their corporate social responsibility.

However, one of the key problems he encountered in convincing clients to invest in a more sustainable building was that detailed arguments outlining the business case were often based on guesswork, and that beyond a certain level of investment the financial benefits were reportedly more difficult to establish.

"Up to a certain point things cost the same, then they become cost-efficient by utilising things like orientation and natural ventilation. Then it'll be a little bit of extra spend but you're going to reduce running costs and it adds credentials to the building. And then it gets to another stage where it becomes almost a glass ceiling where there is a question over the return"
(Architect 10, 100 staff)

This indicates a key challenge for EM theory. Once the so-called 'low hanging fruit' of efficiency gains have gone, further gains may come at considerable cost to industry. Economic growth may thus be periodically stifled by the significant investment required to achieve the next level of efficiency. The notion that economic growth and environmental protection are a win-win game may thus be less than obvious to businesses on the ground, particularly those that are resistant to taking a long-term view on investments.

The business case for eco-efficiency measures such as minimising energy usage was certainly not obvious to the majority of builders in the sample. Respondents highlighted that there was little financial incentive to save energy on site

as the mains electricity used was paid for by the client. Some felt that energy efficiency was more of an issue for designers than builders as it was in the end-use of a building that most energy savings could be made.

Interestingly, the business benefits of waste minimisation were also not apparent to builders. Many respondents highlighted that the vast volumes of waste produced in construction was a result of the public obsession with refurbishment in the UK, and was therefore out of builders' hands. One site-manager argued:

"In general, people move house a lot more now than they ever did... People now [think], "We'll put this cheap kitchen in because we might not be here in three years," and then they go to another house. The first thing they do, Well, let's have a kitchen fitted. We don't like this kitchen. Rip it out." People have got the expendable money to do it. It's a throwaway society – cheap, cheap, cheap" (Builder 10, sole proprietor)

Respondents acknowledged that many of the materials put in skips were perfectly reusable. However, most claimed that little was reused (apart from the odd expensive item such as certain slates and metals), because the cost of keeping material was often more than buying it new, once storage and labour costs had been factored in. Also, the used material was usually not quite to the specification required for the next job, so many builders felt that it was just easier and cheaper to throw it away. Recycling was similarly dismissed because of the management and labour time involved in ensuring proper waste separation procedures:

"It takes too long. It affects the labour. I mean if I've got 10 labourers on site, I'm not going to bring another labourer in just to make sure that copper is over there and plasterboard's there and metal's over there" (Builder 4, 85 staff)

The FMB key informant confirmed that it was not just the cost but also the time and effort involved in environmental management that was a barrier for owner-managers:

"Unless you can mainstream environmental management so it is a natural bi-product of things that the builder would have to do anyway, there simply is no time in their day."

These responses have important implications for EM theory. Clearly, even where the financial returns from eco-efficiency measures are supposedly most obvious, such as in the case of waste minimisation and recycling, under-resourced and busy owner-managers may not feel that such returns are significant enough to warrant the initial investment in time and resources required to pursue them. Because small firms are typically more concerned with short-term survival than the long-term environmental impacts of their business, eco-efficiency measures may thus be rejected if the pay-back is not perceived to be immediate. The short-termism of owner-managers clearly presents a serious barrier to the ecological modernisation of SMEs.

5.2. Government policies

Murphy (2001) asserts that if market forces are not providing enough of an impetus to encourage ecological modernisation then there is a clear justification for increased state intervention to set the imperative for environmental reform and build the capacity of firms to respond to that imperative.

Largely driven by European directives, the UK's legislative context for construction was considered to be a key driver of environmental reform within the industry. For instance, amendments to 'Part L' of the building regulations had come into effect in 2002, stipulating an increase in the energy efficiency of all new buildings and large-scale renovations. Key informants claimed that Part L had encouraged architects to look at innovative, cost-effective ways of saving energy such as utilising orientation and natural ventilation, and this had prompted a significant improvement in the sustainability of buildings.

"The agenda is being driven now by the European Union ... I think [developers] are probably constructing buildings which are kind of 'light green' without realising it now because Part L has brought that in" (Sustainable design specialist)

Key environmental regulations of concern to site-managers were reportedly 'special waste' (governing the disposal of hazardous waste) and 'duty of care' (requiring the completion of a waste transfer note to ensure safe waste disposal). Across the sample, builders saw health and safety as a much higher priority than environmental protection, and the raft of health and safety regulations recently introduced in the UK reinforced this. Whilst unpopular due to the bureaucracy it entailed, the majority of respondents felt that more stringent environmental legislation – as seen with health and safety – was the best way to ensure that the building industry took environmental concerns more seriously:

"At the end of the day, unless it's in black and white and law, I think the building industry are going to get away with as much as we can to save time and it doesn't matter how much impact it's going to have on the environment. We're going to do it" (Builder 1, self-employed)

However, across the sample it was felt that a major factor hampering the potential of regulatory measures to engender reform was the apparent culture of non-compliance amongst 'cowboy builders', who were reportedly proliferating at an alarming rate due to the lack of enforcement targeting small firms.

"Enforcement is the [problem]... Off the top of my head I would guess between 30% and 50% of small firms don't comply with building regulations and then if you remember the other 50% are probably not inspected as they should be...the council inspectors are just massively under-funded" (Builder 5, 28 employees)

Key informants highlighted that this lack of enforcement was one of the biggest challenges facing the industry,

and was an issue that policymakers urgently needed to address.

Due to the inherent problems in adequately policing the vast numbers of small firms in construction, some key informants highlighted eco-taxes as another policy tool for encouraging the greening of this sector. However, there was little evidence that fiscal measures had made much of an impact on the environmental practices of firms within the sample. The landfill tax had done little to reform the waste practices of builders due to the perceived cost and labour involved in recycling and reusing material. Most respondents felt that any increases in the tax would just encourage fly tipping, which was claimed to have become increasingly prevalent as less scrupulous builders attempted to keep down costs. Of those respondents that had heard of it, the aggregates tax (a levy on quarry material) had apparently done little to encourage a switch to environmentally benign material due to a perceived lack of viable substitutes.

Along with regulatory and fiscal measures, key informants highlighted that there were numerous government and industry-led voluntary initiatives to encourage best practice, for instance 'Rethinking Construction', 'Partners in Innovation' and the 'Construction Best Practice Programme', all with sustainability as part of their remit. However, most respondents felt that these voluntary schemes were unlikely to result in a step-change in the environmental practices of SMEs due to the considerable barriers to environmental reform existing amongst owner-managers.

6. Policy implications

UK policymakers have to date relied on voluntary initiatives to encourage the ecological modernisation of SMEs. Whilst EM prescriptions clearly advocate the transferral of environmental responsibilities from the state to the market, it may be argued that the government has rather over-estimated the propensity of small firms to undertake reforms voluntarily. The findings of this study suggest that policymakers' focus on the business case for sustainability is unlikely to have the desired effect on owner-managers for the following reasons:

6.1. SMEs are not convinced of the 'win-win'

As corroborated in studies by Hillary (2000b), European Observatory (2002), Revell and Rutherford (2003) and Baylis et al. (1998) to name but a few, many small business owners are not confident that embracing environmental management is a good way of reducing costs or winning customers. Voluntary environmental action will obviously be resisted if SMEs think that reducing their environmental impact may also reduce their bottom line.

6.2. SMEs lack resources and support systems

Even if owner-managers accept the business case for sustainability in some cases, this does not necessarily mean

that they will feel they have the capacity to carry out environmental reforms. For instance, whilst it may be acknowledged that energy efficiency and waste minimisation are ways to reduce costs, the take up for SMEs is dependent not just on the theoretical savings to be made but on the short-term investment in time and resources required to make the change. Many small firm owners may feel that there is no time in their day to pursue environmental measures that are not a bi-product of core management activities.

6.3. A policy emphasis on voluntarism encourages the environment to be seen as a peripheral issue

Because small firms are not subjected to the same stakeholder pressure for corporate social responsibility that large firms are, policy strategies which emphasise voluntary environmental action without the threat of future legal action tend to reinforce the idea that the environment is a secondary issue. In fact, if it is not regulated, some owner-managers may assume that there is no environmental problem, or at least that their firm's environmental impact is so inconsequential as to render voluntary action unnecessary. SMEs are coming to terms with the raft of new legislation in other areas, such as health and safety, so why should they perceive environmental issues to be of prime concern if they are not compelled to do so?

Whilst it seems that neither the state nor the market are pushing the environment onto the business agenda of owner-managers, it is perhaps unsurprising that two decades of information provision on environmental management by government has resulted in so few opportunities being taken up by SMEs (Levett, 2001). Policymakers' discursive emphasis on the business case for sustainability has arguably encouraged firms to pursue environmental improvements only if they happen to coincide with economic priorities, with the result that the environment remains a negligible concern amongst owner-managers who are always finding more pressing and profitable things to be working on.

Despite the government's narrow win-win focus, it is important to highlight that EM theory is actually about much more than this. The state's role in setting the imperative for ecological modernisation is not merely about highlighting the potential profitability of environmental protection, it is about encouraging radical innovation amongst producers using a demanding mix of policies which includes market-based instruments (MBIs) and regulations as well as voluntary agreements. Hard-hitting fiscal and regulatory measures combined with rigorous enforcement arguably has the capacity to move SMEs beyond 'business as usual', if only policymakers would muster the political will to support the kind of strong intervention required.

Whilst it is currently unfashionable to advocate legislation due to the onerous bureaucracy it entails, the inescapable conclusion from this study is that it may be the only

way to truly effect change within the SME sector. Legislative sanctions are clearly one way to be certain that the environment becomes a top business priority for small business owners. Regulation makes the environmental obligations of firms clear from the start, and offers SMEs the security of a 'level playing field' so that environmental good practice is not perceived as a threat to competitiveness. However, it is also true that SMEs despise filling in endless forms and therefore administrative simplicity is key to ensuring high rates of compliance amongst busy owner-managers.

A robust system of enforcement is essential to ensuring that there really is a level playing field for firms. A major problem that this study has highlighted is the lack of adequate enforcement within the construction industry. Until this is addressed, more stringent regulation is likely to increase levels of non-compliance and push more small firms into the shadow economy. Regular inspections and 'spot-checks' would go a long way towards encouraging SMEs to view their environmental responsibilities as a legitimate business concern, rather than an optional extra if they find the time.

As part of an integrated policy mix, economic incentives also have the potential to be an effective mechanism for stimulating change. EM protagonists emphasise that MBIs such as eco-taxes can be effective because they make voluntary action profitable; taxing environmental bads and incentivising environmental goods provides the price signals needed to establish the business case for sustainability. WWF-UK's (2002) report entitled 'Fiscal Incentives for Sustainable Homes' identifies a list of potential MBIs that could promote more sustainable construction. The list includes 'carrots' (such as reduced VAT on eco-products and stamp duty relief on sustainable homes), as well as 'sticks' (such as product charges on non-sustainable building materials and equipment).

However, economic incentives cannot always be relied upon to effect change amongst SMEs. This is because, as this study has highlighted, owner-managers are inclined to perceive more urgent and lucrative things to be working on than environmental housekeeping measures. For instance, builders may not feel that a tax credit on recycled materials is enough to compensate for the extra management and labour time required to set up on-site recycling systems. Taxes would therefore have to be set sufficiently high to incentivise firms to make eco-efficiency measures a top business priority. Raising taxes, however, is clearly a politically contentious issue. Moreover, increasing levies such as the landfill tax could cause illegal behaviour such as fly tipping to rise, which further underlines the critical role played by enforcement agencies.

One way to increase the effectiveness of eco-taxes is to combine them with the kinds of infrastructure developments that make it simple for firms to be more environmentally proactive. For instance, the landfill tax may be more effective in incentivising builders to minimise waste if there is perceived to be a convenient and cost-effective recycling

infrastructure. Similarly, the aggregates tax might be more successful if environmentally friendly substitutes are perceived to be readily available. Developing markets for green materials (such as for recycled timber, the usage of which is against building regulations) will be crucial to encouraging more sustainable forms of construction. Clearly, the government has a major role to play not just in encouraging firms to reduce their environmental impact, but in making it easy for them to do so.

7. Implications for EM theory

Ecological Modernisation theory has become increasingly prominent in UK and European environmental policy circles. The theory operates at various levels of complexity, yet there is a tendency amongst policymakers to simplify EM into a discourse that is primarily about the achievement of win–win outcomes. Ecological modernisation thus becomes a discursive strategy whereby policymakers can appear to be delivering on environmental goals without seriously challenging existing economic practices or development trajectories. It is this seeming compatibility with conventional aspirations of wealth creation that explains why EM has become so influential in policy debates in the UK and beyond.

However, one of the fundamental criticisms of EM theory is that it can help to legitimate an environmental policymaking culture that absolves businesses of their environmental responsibilities. As Harvey (1996, p. 382) suggests, EM can be:

“...corrupted into yet another discursive representation of dominant forms of economic power.”

The findings of this study suggest that the win–win rhetoric of UK policymakers may have done little to encourage a shift in attitudes away from ‘business as usual’ amongst SMEs in the construction sector. The government’s narrow focus on the financial benefits of environmental protection underlines its technocratic and economistic interpretation of ecological modernisation, and illustrates the overall subservience of New Labour to conventional economic priorities.

Policymakers have unquestioningly extolled the virtues of eco-efficiency as the solution to industry’s burgeoning environmental impacts, despite the implications of the rebound effect and the relentless rise in consumer demand. Yet even small building firms in this study were able to see that any efforts to minimise waste on their part might be offset by the desire of homeowners to constantly replace the old (or nearly new) with the very latest design fad. Similarly, major advances in the energy efficiency of buildings has been more than offset by the trend for householders in the UK to heat more rooms to higher temperatures for longer, with the result that domestic energy usage is the same as it was in the 1970s (Levett, 2001).

Such consumption trends imply that eco-efficiency can only ever be a partial solution to the environmental crisis.

One of the key problems with EM theory is that it ignores the problems associated with increased demand by taking a narrow supply-sided approach to solving environmental problems, when clearly the ecological modernisation of production is intimately bound up with the ecological modernisation of consumption.⁹

Consumer demand is obviously a critical factor in helping or hindering the development of more sustainable forms of construction. Policies such as environmental taxation and eco-labelling can provide important information to consumers to encourage the purchase of more environmentally sound building materials and services. However, as Murphy (2001) points out, consumption and lifestyle choices are closely associated with identity formation and communication; ideas of consumer ‘taste’ are often used to establish status, and to make and maintain social relationships. This has important policy implications, as eco-taxes do not directly engage with the identity and communicative dimensions of consumption. For instance, a granite worktop may be considered the signature of a ‘classy’ kitchen by some consumers, and therefore a tax on granite may not incentivise them to switch to cheaper environmentally friendly alternatives. Making granite more expensive may even make it more of a status symbol and therefore more desirable and popular.

A policy approach that involves information and education is therefore key. Social and environmental messages that encourage a fundamental shift in the lifestyles, attitudes, values, habits and aspirations of both consumers and producers is ultimately what is required. However, this is unwelcome news to most politicians who fear accusations of a ‘nanny state’ from voters who are ill-prepared for the message.

EM theory arguably under-theorises the role of government regarding the kind of institutional adaption required to encourage more sustainable levels of consumption. Protagonists prescribe the delivery of ecological modernisation via corporatist relationships between industry and an ‘enabling’ state seeking to ensure the efficient functioning of the market economy (Blowers, 1997). However, EM’s continued emphasis on the positive-sum relationship between economic growth and environmental protection does not address the potential unsustainability of universal economic growth on a global scale, nor does it adequately conceptualise the social processes by which embedded cultural transformations supporting environmental goals (such as reduced consumption, or shifts in consumer tastes) will come about. As consumer sovereignty is so embedded within liberal democracies – and so it appears in EM thinking – there is an urgent need to engage more fully with consumption debates, and to expand on the role of government in encouraging more ecologically modernised consumption.

Finally, there is a need to develop EM theory by focusing on the special case of small firms with regards to both

⁹ Although see Cohen and Murphy (2001).

the ecological modernisation of production and consumption, for without the engagement of this vast sector of the economy, it is difficult to see how society might move beyond 'business as usual'.

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Study 2

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The Business Case for Sustainability? An Examination of Small Firms in the UK's Construction and Restaurant Sectors

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ABSTRACT

Studies show that despite a concerted attempt by UK policy-makers to portray 'eco-efficiency' measures as cost reducing, most owner-managers of small firms view environmental measures as expensive to undertake. As a result, owner-managers tend to be highly resistant to voluntarily improving their environmental performance. Given that SMEs are such a vast sector of the economy, this perceived discord between profits and environmental protection is clearly a major barrier to the 'greening' of industry. This ESRC-funded study has sought to unearth the underlying motivations for why SME owner-managers in the UK resist or accept the idea that there are business benefits for improving their environmental performance. The findings from 40 in-depth interviews with SME owners in the UK's construction and restaurant sectors and 12 'key informants' from industry and government are presented, followed by a discussion of SME perspectives on the 'business case' for sustainability and its implications for policy-makers. Copyright © 2005 John Wiley & Sons, Ltd and ERP Environment.

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Introduction

CONSTITUTING 99% OF ALL BUSINESSES, PROVIDING 43% OF PRIVATE SECTOR EMPLOYMENT AND 36% of turnover, SMEs are crucial to the UK economy (SBS, 2004). The vast numbers of small firms mean that on aggregate they undoubtedly have a significant impact on the environment. It is estimated that SMEs in the UK are responsible for as much as 60% of industry's carbon

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dioxide emissions (Marshall Report, 1998), 60% of commercial waste and 8 out of 10 pollution accidents (Environment Agency, 2003).

Despite such estimates, the influence of scale on the environmental performance of industry has remained an under-researched area within the business and environment literature, with most scholars preferring to focus on the environmental impacts of large corporations. In Europe, however, there has been a recent upsurge in interest in the environmental practices of SMEs and there is now a growing body of work that suggests that SMEs are much less engaged with the environmental agenda than their large firm counterparts (e.g. European Observatory, 2002). Studies show that despite a concerted attempt by policy-makers to present the 'business case for sustainability' by portraying 'eco-efficiency' measures as cost reducing, most owner-managers view environmental measures as expensive to undertake and therefore tend to be highly resistant to voluntarily improving their environmental performance (see Hillary, 2000; European Observatory, 2002; Smith and Kemp, 1998; Rutherford *et al.* 2000, Revell and Rutherford, 2003; Baylis *et al.*, 1998; Tilley, 2000).

Perhaps because the environmental practices of SMEs are still an emerging field of enquiry, most studies have focused on the collation of quantitative data to describe the environmental practices of SMEs (see ENDS, 1995; Smith and Kemp, 1998; Petts *et al.*, 1999; European Observatory, 2002; Environment Agency, 2003). However, few studies have sought to explain the reasons for why SME owner-managers approach environmental issues in the way that they do. Funded by the Economic Social Research Council under its 'Environment and human behaviour' programme, this study attempts to address this gap in the literature by exploring the underlying values and motivations for why owner-managers resist or accept the idea that there is a 'business case' for improving their environmental performance.

In the following sections a review of the existing literature on the environmental practices of SMEs is presented, along with a brief synopsis of the government's approach to encouraging the 'greening' of the SME sector. The findings of the study are then presented and its implications for policy-makers are discussed.

The Environmental Practices of SMEs: What Do we Know?

In Hillary's (2000) recent compilation of current research in the field, she concludes that the SME sector is

Largely ignorant of its environmental impacts and the legislation that governs it; oblivious of the importance of sustainability; cynical of the benefits of self-regulation and the management tools that could assist it in tackling its environmental performance; difficult to reach, mobilise or engage in any improvements to do with the environment (Hillary, 2000, p. 18).

Many studies have found that low awareness of the overall environmental impact of small firms has been a major hindrance to change (Hillary, 1995; Holland and Gibbon, 1997; Rutherford *et al.*, 2000). A survey of over 1000 UK SMEs by the Environment Agency (2002) found that 86% of respondents in these firms did not believe they had an impact on the environment. This is a significant finding, given that when prompted with specific examples of hazardous activities, the reality turned out to be quite different: 58% acknowledged conduct that was potentially harmful to the environment, 69% stored chemicals, fuels or oils, 35% stored waste and 29% had high energy consumption. The fact that small firms perceive their environmental impacts to be negligible is perhaps one of the reasons why they appear to take such little interest in environmental management. When asked what firms were doing to improve

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things, the survey found that only 12% were reducing their energy and water consumption, 6% were minimizing waste and 5% were reducing harmful substances. The study found sectoral differences in the number of SMEs introducing practical measures to safeguard the environment. For instance, only 29% of small firms in the hotel and restaurant sector had measures in place, compared with 70% of firms in the chemical sector.

Studies such as these have confirmed the commonly held view that SMEs in the UK have a poor environmental performance. Much of the evidence suggests that this is a result of a combination of factors ranging from ignorance to deliberate strategies to avoid rises in production or service costs.

Low Levels of Eco-Literacy

One of the emerging themes within the literature is that many owner-managers exhibit low levels of 'eco-literacy' and a lack of expertise in environmental management. (Hillary, 2000; Gerstenfeld and Roberts, 2000; Tilley, 2000). Reactive rather than proactive behaviour tends to be the norm, as owner-managers do not feel that they have the requisite capabilities to undertake environmental improvements and therefore resist voluntary action. This attitude and approach is not confined to their treatment of environment issues. Other research has shown the reluctance to change amongst business owners and the multiple pressures on their pivotal role in their enterprise (Scase and Goffee, 1980, see Ch 5 and 6). An area for investigation therefore, is the extent to which the apparent low levels of eco-literacy are a result of other competing pressures and, if needed, how this can be addressed.

Negative Perception of the 'Business Case' for Sustainability

One of the major potential barriers to the adoption of environmental best practice amongst SMEs is that environmental measures are perceived to be a drain on profits. A survey by ENDS (1995) found that only one in five SMEs believed that environmental action would generate cost savings. Similarly, the survey by Baylis *et al.* (1998) of 914 firms found that only 18% of SME owner-managers believed that cost savings could result from environmental reform (versus 39% of large firms).

In one of the few qualitative studies on SME environmental practices, Rutherford *et al.* (2000) found that owner-managers in the UK's restaurant and mechanical engineering sectors resisted making environmental improvements because of the perception that they rarely resulted in economic benefits. Because of the perceived 'burden of environmentalism', owner-managers felt that only regulation could provide the level playing field necessary to take action on environmental issues and prevent 'free riders' from gaining a competitive advantage. Responsibility for the environment was thus ascribed to the government and individual efforts were seen as more or less meaningless in the face of structural barriers.

Evidence shows that size of enterprise appears to be a major factor influencing perceptions of the 'business case' for sustainability. A survey of 300 SMEs by Smith and Kemp (1998) found that just under 60% of micro-firms, 40% of small firms and 20% of medium-sized firms cited that there were no business benefits of improved environmental performance.¹ The Environment Agency's (2002) survey found that 78% of medium sized firms cited reduced costs as a benefit, compared with 49% for small firms. Sectoral as well as size differences were also evident: for instance hotels and restaurants were least likely to see the business case for taking environmental action.

¹ Micro-firms are defined as having 1-10 employees, small firms have 1-50 employees, medium-sized firms have 50-249 employees (SBS, 2004).

Lack of Customer and Supply Chain Pressure

Adding to the negative perceptions of cost, studies also suggest that neither supply chain pressure nor consumer demand are driving environmental reform to any great degree amongst SMEs. Hillary (2000) reviewed 33 studies and found that SMEs experienced little external pressure from stakeholders such as customers or suppliers to adopt environmental management systems. Other studies confirm that little supply chain pressure is exerted on SMEs to improve their environmental performance and there is even less collaboration on environmental management amongst stakeholders within the supply chain (Wycherly, 1999; Merritt, 1998). The study by Berger *et al.* of the environmental partnering actions of SMEs in supply chains in South Wales (Berger *et al.*, 2001), found that cost, quality and delivery rather than reducing environmental impacts were the main concerns of suppliers.

Baylis *et al.* (1998) reported on the commonly held view of 'top down' pressures from large firms onto SMEs through their supply chain relationships. Rather than verify the conventional wisdom of top down pressure, Baylis *et al.* suggest that large companies tend to focus on first tier suppliers, which are often large firms, rather than the smaller firms further down the chain. They also suggest that the influence of supply chain pressure varies according to sector. For instance, they describe the food sector as an environmental 'laggard', citing an ENDS (1995) report highlighting the sector's bad record for pollution accidents. However, they found that firms showed marginally higher levels of motivation to make environmental improvements due to supply chain pressure than those in the chemical, metal and mechanical industries, and they attributed this to the food industry's closeness to consumer markets.

'Vulnerable Compliance'

Another key theme in the literature is SMEs' low level of awareness of and compliance with environmental regulations. Smith and Kemp (1998) found that there was a perception amongst SMEs that compliance with environmental regulations was costly. The survey by Petts *et al.* (1999) of over 1000 SMEs in England and Wales confirmed this finding. They argued that this perception of cost, coupled with a lack of awareness of regulation and a perception that enforcement of regulation is weak, has encouraged a state of 'vulnerable compliance' amongst SMEs:

While the majority of SMEs are not deliberately non-compliant they are vulnerable to this state, particularly where there is a lack of awareness of, and empathy with, regulation. Combined with the apparent failure to see the environment as a cost advantage, the capacity and feasibility to act in the majority of SMEs does not match the generally positive culture (Petts *et al.*, 1999, p. 28).

Other studies have also attributed low levels of compliance amongst small firms to a lack of awareness of existing environmental regulation, combined with a lack of ability to interpret how legislation might affect them (Hillary, 1995; Gerstenfeld and Roberts, 2000; Hutchinson and Chaston, 1994). A survey of 8064 UK SMEs by the Environment Agency (2003) found that only 24% of firms had heard of 'Duty of care' regulations, which apply to all UK businesses. This may not necessarily be a UK phenomenon: a European Observatory (2002) survey on the levels of social and environmental responsibility amongst 7600 SMEs found that most did not know enough about environmental legislation to make sure they were compliant.

Despite this, SMEs paradoxically tend to view direct legislative action as the only way to ensure that businesses change their orientation towards environmental issues (Rutherford and Spence, 1998; Lloyds Bank-SBRT, 1999; Tilley, 2000). Regulation is often reported as the most widespread stimulus

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for making environmental improvements amongst SMEs (Baylis *et al.*, 1998; Hillary, 1995). Owner-managers typically feel that it is up to the government to take the lead on environmental issues by creating a 'level playing field' via regulation. This perception of parity helps business owners to feel they are safeguarded against 'free riders', who might avoid costly environmental measures and thus gain competitive advantage. Hunt (2000) found that small firms see regulation as providing a clear signal of what are their environmental responsibilities. In fact, if it is not regulated, then owner-managers often assume that there is no environmental problem.

The Government's Approach to the 'Greening' of SMEs

Despite the survey evidence that small firms tend to be resistant to voluntary change in relation to their environmental practices, the UK government has tended to favour a voluntary, rather than a compulsory, approach to stimulating the 'greening' of the SME sector. The primary vehicles chosen by policy-makers to encourage environmental reform within industry as a whole have been either (i) regulatory (e.g. 'Duty of care'), (ii) fiscal (e.g. the landfill tax) or (iii) voluntary (e.g. the ISO14000 series). Initiatives most likely to capture small firms have tended to fall into the fiscal or voluntary category and have been generic rather than targeted. For instance, SMEs are affected by both the landfill tax (in the form of fees levied by waste collectors) and the climate change levy (an industry tax levied on fossil fuel). SMEs are also targeted by numerous voluntary environmental best practice programmes, such as 'Groundwork Environmental Business Services' and the Carbon Trust's 'Action Energy' programme.³ Attempts to encourage SMEs to join these voluntary schemes usually focus on the financial gains to be made from making environmental improvements. For instance, the Groundwork Environmental Business Services website states

What will [an environmental management system] really mean for your bottom line? Implementation of such a system via a structured programme with clearly defined goals can significantly improve your company's performance and save you money (<http://www.groundwork.org.uk/business/management-systems/index.html>).

The Action Energy website states

Lower energy costs bring immediate savings to the bottom line, increasing profitability. A 20% saving in energy consumption – realistically achievable by most businesses – can have the same positive effect as a 5% increase in sales (http://www.thecarbontrust.co.uk/energy/pages/page_28.asp).

In relying on economic arguments for why businesses should voluntarily reduce their environmental impact, it seems that a great deal of faith has been placed in the 'business case for sustainability'. Yet, judging by the aforementioned studies, SMEs are not so persuaded by such arguments. Our study aimed to explore whether this general SME response is the case for small firms in the construction and restaurant sectors, and if so the reasons why owner-managers remain unconvinced that environmental management is good for their business.

³Other voluntary initiatives include the Waste and Resources Action Programme (WRAP) Business Development Service, Remade Network UK, NETREGS, Groundwork Environmental Business Services, Enworks, Environment and Energy Helpline, Future Energy Solutions and Envirolink.

Methodology

The objectives of this paper are to explore

- (i) whether environmental reform is occurring amongst SMEs in the UK's construction and restaurant sectors
- (ii) whether environmental reform is being driven by market dynamics and the belief in the 'business case' for sustainability
- (iii) the efficacy of government policies seeking to encourage the 'greening' of SMEs.

Given the clear need to understand the values, belief systems and motivations of SME owner-managers regarding the environment, a qualitative methodology was chosen for this study.³ In depth face-to-face interviews were conducted with

- stage 1 12 'key informants' within industry and government
- stage 2 20 small and medium-sized restaurants in London and Leeds, UK
 - 10 small and medium-sized architectural practices in London and Leeds, UK
 - 10 small and medium sized building firms in London and Leeds, UK.

This methodology allowed respondents' motivations to be explored in detail, enabling a richer understanding of the reasons behind particular environmental practices and attitudes displayed in previous empirical studies.

Fieldwork was conducted between April and July of 2003. The first stage involved interviewing key informants from relevant trade associations, industry bodies and local government to draw out the main issues regarding small firm environmental practices and the efficacy of environmental policies targeting each sector. A semi-structured interview schedule was used and interviews typically lasted one and a half to two hours. The second stage involved 40 interviews with owner-managers in the construction and restaurant industries of London and Leeds. The interview guides were designed to 'fit' with sector nuances gleaned from the key informant interviews. The sample was split north (Leeds) and south (London) to highlight any regional differences that might be occurring in the environmental practices of small firms, especially in the light of local initiatives and actions (such as 'Local Agenda 21' processes).

A sectoral comparison was chosen as SMEs demonstrate significant differences according to sector (Curran and Blackburn, 2001; Baylis, 1998). The construction industry was chosen because it has a significant environmental impact; 10% of the carbon dioxide emissions in the UK arise from the production and use of building materials, and materials production and construction accounts for an estimated 30% of total waste in the UK (Building Research Establishment, 2005). As such, the construction industry has been targeted by numerous government and industry led initiatives to promote environmental best practice (DTI, 2003). The 'business case' for sustainability is a key theme in the DTI's strategy on sustainable construction:

The UK's strategy for more sustainable construction, *Building a Better Quality of Life*, suggests key themes for action by the construction industry . . . Most of these [themes] simply make good business sense – eg minimising waste increases efficiency. Sustainability is of increasing importance to the efficient, effective and responsible operation of business (DTI, 2003, p. 1).

³ Further details of the methodology can be found in the work of Revell and Blackburn (2004).

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To investigate the influence of supply chain dynamics on the 'greening' of SMEs within construction, respondents were drawn from the architectural and building sub-sectors as the two are heavily integrated in operational terms.

The restaurant industry was chosen as the second sector for this study, as it has attracted a great deal of interest from researchers seeking to investigate the changes in management practices as a result of the impact of regulations (Ram *et al.*, 2001). However, very little research has explored the environmental practices of the industry, or the impact of environmental policy within this sector. The industry is subject to a raft of environmental health regulations and it is interesting to see how this has influenced both the understanding and attitudes of restaurateurs towards the growing environmental agenda.

In the case of construction, businesses selected for interview were chosen randomly from the databases of the Royal Institute of British Architects (RIBA) and the Federation of Master Builders (FMB).⁴ In the case of restaurants, business were chosen randomly from local business directories. There was no bias towards the selection of firms that were more or less environmentally proactive.

Results

The following findings are presented in terms of the aforementioned objectives of the research.

Is Environmental Reform Occurring Within the Sample?

Construction

Within the construction industry, it was evident that market dynamics were actively discouraging environmental reform amongst SME architects and builders. Key informants highlighted that there are very few barriers to entry within the construction industry, and because 'just about any "man-in-a-van" can set up shop', competition is fierce and profit margins tend to be low. Both architects and builders claimed that such extreme competitive pressures had inevitably meant that cost and speed of build were the primary factors that firms differentiated themselves on, and environmental impacts were given very little thought within most business agendas.

The way tenders are won at the moment is on cost and time. I mean there's companies going in that are making 1% profit on jobs and making money with their sub-contractors just to get the work. They're buying the work. Now not for one instance is separating materials for waste going to enter their minds because they know they've got the job on a time scale because X firm said they could do it in six weeks and you say you can do it in three – so that's how it goes (Builder 4, London, 85 staff).

At the top of the supply chain, architects claimed that there was surprisingly little in the way of environmental design occurring in the UK, despite the general consensus that the architectural industry should be at the forefront of pushing the sustainability agenda within construction. Most respondents

⁴ As approximately 80% of all architectural practices in the UK are RIBA members (RIBA, 2003) it was felt that a sample from RIBA's membership list was likely to be representative. According to a key informant at the FMB, its members represent around 13% of all SME builders, which indicates a built-in sampling bias. This was felt to be permissible as the FMB is the UK's leading trade association for small firm builders and has a thorough membership accreditation procedure. It was felt that, in theory, the environmental practices of FMB members should therefore be a 'best case scenario', indicating the degree to which environmental good practice is being taken up more generally within the SME building sector.

admitted that sustainability tended to be very much a peripheral issue in terms of their own work as clients were reportedly driven by commercial rather than environmental or social concerns.

I don't think any clients have [environmental specifications] written into any brief we've got. It's very much design led. I'd like to think that we have the chance and the opportunity to spend the time to look at [environmental impacts] a little bit more and to actually make informed suggestions. I think there are very few practices who'll have the time and the client base to do that to be honest. I think you'll probably find that people tend to be either commercially driven or driven by the clients to get the best value for money (Architect 7, Leeds, 5 staff).

Correspondingly, builders highlighted that a major barrier to environmentally sound construction was the perception that environmental issues were a low priority for clients and their architects. Builders therefore felt little incentive to differentiate themselves on environmental credentials. Typical comments were

What we're asked to build has no recognition to anything environmental at all (Builder 5, London, 28 staff)

Occasionally clients may pay lip service to the environment and put in a question like, 'What is your policy on the environment?' or, 'What efforts are you intending to make to use of environmentally friendly materials?' So you'll say, 'Yeah, well we're thinking of doing this, that and the other'. 'Oh, that's great,' they'll say. But another company might do nothing, and guaranteed their price will be cheaper than yours because of it and they'll always get the job (Builder 2, London, 25 staff).

These responses highlight the lack of environmental reform occurring within the sample, which is blamed on a lack of market signals encouraging the greening of their industry.

Restaurants

Similarly, the environment appeared to be a low priority for most restaurateurs, who tended to see their firm's environmental impact as negligible. On probing, waste disposal, energy and water consumption were areas where owner-managers saw their firms as having an environmental impact, yet most owners felt that there was little scope to reduce these impacts. Almost all restaurateurs spoke of the considerable time pressures they were under and claimed to be too busy coping with daily business pressures to contemplate environmental issues.

I think that sometimes a manager or whoever might think they've got so much on their plate already that the last thing they'll think about is how can I save on energy as well. It's the sort of thing that should happen. I must admit I wouldn't have time to do that (Restaurant 10, London, 10 staff).

In terms of the sourcing of food, the primary concerns of most respondents were quality of product whilst controlling costs. It was the exception rather than the rule that environmentally sound practices coalesced with these concerns. For instance, in cases where respondents bought goods from local suppliers, this was mostly because they wanted to support local industry and because these suppliers were thought to offer fresh, high quality ingredients. Reducing transport-related environmental impacts was not a prime consideration in their purchasing decisions.

These responses indicate that, like owner-managers in construction, many restaurateur owner-managers do not see the environment as a key business concern and therefore little resources are devoted to reducing the environmental impacts of their firm.

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Is Environmental Reform Being Driven by the 'Business Case' for Sustainability?

One of the cornerstones of the government's strategy for the greening of industry is a drive towards 'eco-efficiency'. Indeed, this is an area where business benefits and the environmental agenda may chime: reductions in energy and resource use lead to reductions in the cost of production. Despite this *a priori* reasoning, the business benefits of efficiency measures remained elusive to many of the owner-managers within this sample.

Construction

Most architects and builders perceived the cost of sustainable design and construction to be high, as was the potential to lose a client if an environmental agenda was pushed too enthusiastically. It was felt that neither developers nor end-users were interested in reducing the environmental impact of their buildings, even if running costs were also reduced as a result, because short-term capital costs were likely to increase. Many architects were of the opinion that there was not much of a business case for sustainability to present to clients, and clients were unwilling to pay the premium for a more sustainable building. Typical comments were

You can't rely on altruism, its got to be economic. In our business cost is the main barrier [to sustainability] (Architect 3, London, 40 staff)

Environmental solutions cost much more . . . and clients aren't interested in that (Architect 7, Leeds, 5 staff).

Nevertheless, there was one architect within the sample who, because of his strong personal belief in the importance of sustainability, attempted to promote environmental options with his clients. An interesting finding of this study was that this 'eco-architect' had a much more positive view of the business case for sustainable design than the other architects in the sample, claiming that many aspects of environmental design in new builds were in fact cost efficient because they reduced the need for expensive air conditioning and heating systems. However, he concurred with the view of a key informant (who had previously worked at the Building Research Establishment), who argued that the business case became less clear beyond a certain level of investment:

We talk about it in terms of 'light green', 'middle green', 'deep green' and there are elements that you can do that have no additional cost, which will have a positive impact on the environment and reduce running costs. Things like orientation, things like natural ventilation, things like daylight penetration, things like the reflectance of surfaces . . . external shading devices which diffuse light in . . . And then there's a big leap to middle green because that involves new technology, more capital costs, and the business case is less clear.

Resistance to the business case for sustainable construction was particularly evident amongst the builders interviewed. The financial benefits of eco-efficiency measures such as energy and waste minimization were not clear to the majority of respondents. There was reportedly little financial incentive to pursue energy efficiency measures on site as mains electricity was used that was paid for by the client. Materials were rarely recycled due the perception that waste separation was prohibitively time consuming and would therefore add unnecessary labour costs to the job. Even reusing old material was considered more expensive than buying it new, once the labour and storage costs were factored in.

Huge amounts are thrown away because recycling is difficult to organize and slower if you're trying to re-use stuff . . . it's quite difficult to get down to the guy on the site to [reuse or recycle material] because they're not worried about that sort of stuff (Builder 3, London, 30 staff).

The key informant from the FMB confirmed that it was not just financial costs but also the time and effort involved in environmental management that was a barrier for owner-managers:

Energy efficiency and waste minimization are ways to reduce costs, but the take-up of those for small firms is dependent not just on the theoretical savings that can be made but the short-term investment in time and effort to make the change. On top of everything else they have to deal with. Bearing in mind that 60% of our firms are 1–5 staff. The employer will not be in an office but will be on-site doing the work. He'll be getting up at 6am, doing a full day's work then going out and do estimating, then coming home and doing his invoicing, VAT return, PAYE. . . . So when does he get the chance to do the other stuff? Unless you can mainstream environmental management so they are a natural by-product of things that the builder would have to do anyway, there simply is no time in their day.

Restaurants

Likewise, most restaurateurs did not recognize the business benefits of improving their firm's environmental performance. The majority felt that being environmentally friendly was not a particular draw for customers, and therefore any costs that were incurred would be difficult to pass on. Instead it was felt to be the quality of the food and wine, the service and the ambience of the restaurants that won a regular clientele.

[The environment] is not a high priority because as yet there's revenue involved in implementing the systems and usually in a business you need a return on something and there's no natural return. It's a stumbling block because people aren't going to come to your restaurant because you dispose of your bottles and waste in a [more] environmentally friendlier manner than anybody else. You can't advertise or get any increase in custom from it (Restaurant 18, Leeds, 12 staff).

Many restaurateurs felt that the public had become more health conscious, more concerned about where their food came from and more aware of the benefits of organic produce. However, most respondents claimed that these trends had yet to be converted into actions that affected their business. Customers apparently rarely asked whether ingredients were organic, locally produced or GM¹ free. Although many owner-managers claimed to be advocates of organic food, most felt that there was limited demand for expensive organic menu options, especially when there were high quality non-organic ingredients available at much lower prices. Some were also concerned that they might not be able to rely on a consistent supply of ingredients as there were so few organic farms in the UK, or that produce might not be as fresh if farms were further away or if goods had to be imported.

It's not a consideration yet to promote organic produce. It's not always available to us. I mean for a restaurant to offer totally organic, that is very hard . . . Its costly . . . Somewhere along the line if it all backfires . . . if something's not available, there is no substitute (Restaurant 5, London, 26 staff).

¹GM stands for 'genetically modified'.

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Whilst it was acknowledged that energy efficiency and waste minimization measures were potentially cost reducing, most restaurateurs could not see how they could reduce their energy and waste consumption. Food waste was reportedly negligible due to the fact that careful attention was paid to stock take and portion control – waste represented inefficiency and so this was heavily cost driven. However, when asked about where waste goes the answers were less equivocal. Owner-managers felt that waste separation procedures would create problems for busy staff and the effort required by managers to police such practices was prohibitive:

[Separating waste would be] very hard to enforce. On a Saturday night when you've got a restaurant the size we have . . . we've got 20, 25 staff in the building . . . to stand by the bins and sort of say, 'No, not that one. That one there,' and at the end of the day you want to grab a plate and shovel the leftovers into a bin (Restaurant 15, Leeds, 60 staff).

Many owner-managers had not looked into recycling opportunities because there was ostensibly not enough room in their restaurants to store the extra bins required for waste separation. The majority of respondents thus saw waste collection fees as an inevitable overhead cost. Many felt that increasing waste disposal fees would do little to incentivize change unless there was an adequate infrastructure that made it easy for restaurants to recycle their waste. Suggestions tended to focus on daily doorstep collection of recyclable materials.

Most restaurateurs also found it difficult to see how they could reduce their energy bills. Kitchen equipment, such as ovens, tended to be left on during opening hours as they took too long to warm up again once turned off. Lights also tended to be turned on during the day as well as at night to create the right atmosphere in the restaurant. Heating in the winter and air-conditioning in the summer was considered essential for restaurants. Moreover, the paybacks from energy saving technology were not considered worth the initial investment required to buy new equipment. As with other issues relating to the environmental agenda, respondents explained that energy efficiency was not a core business concern:

We're busy on other things. We haven't got the resources to suddenly say, 'I know what, I wonder if a new boiler would serve the community'. It's difficult to say [this], but I don't really care (Restaurant 12, Leeds, 36 staff).

These results may present depressing reading for those seeking to champion the cause of improving the environmental practices of small firms. Yet, they represent the realities of running an enterprise in sectors where price, service and quality of product are of paramount importance. Moreover, they also reveal the ambivalence of business owners towards the assumption of government that voluntarism is a way forward to change the behaviour of businesses.

Are Government Policies Encouraging the 'Greening' of SMEs?

Construction

Respondents in the construction industry felt that the government had become more consultative in recent years, with lots of committees and confederations set up to hear the views of industry. Because of its high public profile, key informants highlighted that there had been numerous government and industry-led voluntary initiatives to encourage best practice, for instance 'Rethinking construction', 'Partners in innovation' and the 'Construction best practice programme', all with sustainability as part of their remit. Nevertheless, it was legislation that respondents saw as the key driver of environmental reform within the sector.

Amendments to the building regulations had encouraged much greater levels of energy efficiency in building design, and waste disposal regulations had encouraged builders to dispose of waste in an appropriate manner. Reinforced by the raft of health and safety legislation that had recently been introduced, site managers were particularly vigilant about waste disposal protocols that overlapped with environmental health issues.

Whilst unpopular because of the bureaucracy it entailed, many respondents felt that more stringent environmental legislation was the only way to ensure that the industry reduced its environmental impact. As one builder from Leeds put it,

I think the building trade in particular wants regulating. I know people say, 'We don't need regulating'. You do. If people aren't working in a way that's going to be friendly to the environment, then we need to make sure that they do. We need to have licensed builders with identification somewhere that people can go back and lift up that image of the building trade. Nothing happens voluntarily now (Builder 6, Leeds, 12 staff).

However, of key concern to both owner-managers and key informants was the low level of compliance and inadequate enforcement that were felt to be undermining the effectiveness of regulatory drivers. 'Cowboy builders' were considered to be a serious problem in the UK, the numbers of which were reportedly burgeoning at a disturbing rate due to the paucity of enforcement aimed at smaller firms.

There's no policing whatsoever. I do know you're always going to compete with a builder that's just got a van, bungs stuff up, goes in, gets his money and gets out again (Builder 5, London, 28 staff).

Economic incentives such as the landfill tax had done little to encourage eco-efficiency amongst builders due to the perceived higher cost and effort involved in recycling and reusing material. Fly-tipping was considered a growing problem within the industry, as 'cowboy' builders attempted to keep down costs.

Restaurants

Whilst the restaurant industry has to contend with a raft of legislation in areas such as employment and health and safety, there are currently few regulations aimed at reducing environmental impacts. The landfill tax requires that all restaurants pay a waste fee to collectors, whilst the 'UK Licencing Bill' requires owner-managers to reduce noise pollution and noxious smells. The 2000 'Genetically modified and novel foods labelling regulations' require catering outlets to identify any genetically modified foods in meals.

When respondents were asked whether they were aware of the environmental regulations that applied to their restaurants, most tended to discuss food hygiene rather than environmental legislation. This result may be due to the fact that health and safety inspectors were called 'environmental health officers'. Owner-managers' environmental obligations were thus viewed as relating mainly to their food safety and environmental health practices, as this position resonated more with the day-to-day imperatives of running a business and their direct experience with the state and its agencies. The regular health and safety inspections that restaurants received were generally seen in a positive light because owners could see the value of having stringent hygiene standards.

Like builders and architects, most restaurateurs felt that although burdensome regulations were the best way to ensure environmental best practice within industry:

I suppose in a way [regulation] is a form of education. It scares a lot of people, but it should be seen as a positive thing and it's obviously not. The more it happens the healthier the environment (Restaurant 18, Leeds, 12 staff).

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In contrast to the construction industry, many restaurateurs expressed frustration at the government's lack of partnership and consultation on policy with their industry. Some claimed that local authorities did not disseminate enough information, for instance about changes to legislation, thus undermining the guarantee of a 'level playing field' as some restaurants were not up to date with their legal obligations. Many argued that there should be much more dialogue and support from government so that restaurants were better able to respond proactively rather than reactively to policy measures.

We need to try to establish a relationship . . . now in this very moment I don't think there is. I mean it's like two different roads. We are on one, [policy makers] are on another. We don't really talk to each other. We don't really have any sort of relationship as such (Restaurant 8, London, 20 staff).

Discussion

This paper has presented evidence on the environmental practices of SME architects, builders and restaurants in the UK. The complexities of encouraging environmental reform within these sectors has been illustrated, not least because of the conflation of environmental issues with the more dominant discourse of environmental health. The findings from this study suggest that as yet there is little environmental reform occurring amongst SMEs within the construction and restaurant industries, as the majority of respondents claim to be too busy coping with daily business pressures to contemplate environmental measures. Added to these day-to-day demands are those arising out of government regulatory requirements, including health and safety legislation (Vickers *et al.*, 2003) and employment rights (Blackburn and Hart, 2003). Many owner-managers remain unconvinced that there is a legitimate business case for reducing their environmental impacts, as they do not believe that customers can be won or that costs can be significantly reduced by making environmental improvements. The business benefits of eco-efficiency measures thus remain elusive to many owner-managers, who cite barriers to waste minimization and energy efficiency as reasons why such 'win-win' opportunities remain untaken.

UK policy-makers appear to be relying on voluntary initiatives to spur environmental reform within the SME sector. However, these findings suggest that a policy emphasis on voluntarism is unlikely to be effective, or at the very least, that sectoral factors are likely to heavily influence the success of voluntary initiatives based on the business case for sustainability. In this instance, it appears that many restaurateurs, builders and architects perceive green consumerism to be occupying a niche position in the marketplace and do not feel that there are adequate business benefits in differentiating themselves on environmental credentials. It is also clear that owner-managers fear the incurrence of costs that will affect their competitiveness if they undertake environmental improvements voluntarily, and these two perceptions are working in tandem to obstruct the development of more environmentally sound business practices.

Voluntary initiatives may be more effective in 'dirtier' sectors such as the chemical industry, which experience significant stakeholder pressure for corporate responsibility. For instance Mol's (1995) study of the Dutch chemical industry found that voluntary agreements such as the 'Responsible Care' initiative had been highly effective in stimulating firms to implement environmental management systems as a result of growing public pressure for environmental reform. However, if 'cleaner' sectors like the architectural and restaurant industries are not experiencing significant stakeholder pressure to improve their environmental performance, there is arguably a case for greater state intervention to set the imperative for environmental improvement and build the capacity of firms to respond to that imperative.

Market-based instruments are being increasingly utilized by policy-makers to stimulate innovation amongst producers. By internalizing many of the environmental externalities in the price of goods and

services, environmental taxes such as the landfill tax and climate change levy are a way of making the business case for sustainability clearer to firms. However, it is evident from this study that even where the business benefits of environmental management are acknowledged by SMEs many owner-managers do not perceive the potential savings to be sufficient to warrant the time, effort and resources needed to pursue them. For instance, many restaurateurs may not see the savings to be made from recycling bottles to be worth the time and effort involved in waste separation. Correspondingly builders may not see the savings made from reusing or recycling material as worth the storage and labour costs involved. Taxes would therefore have to be set sufficiently high to incentivize firms to make eco-efficiency measures a top management priority. However, raising taxes is clearly a contentious political issue and may be unpalatable to many vote-sensitive politicians.

The views of business owners themselves may help in resolving this issue. Many studies have shown that regulation is the primary driver of environmental reform amongst SMEs. This study confirms that owner-managers perceive regulation as the best way to encourage environmentally sound business practices, not least because it creates a level playing field and thus circumvents the 'free rider' problem. Implicit in this perception is the view that becoming more environmentally responsible does cost the firm.

Despite the fact that restaurateurs see legislation as the most appropriate way to improve the environmental practices of their industry, little in the way of environmental regulations is impacting the sector currently. Whilst these firms clearly must fit within a legislative framework, health and safety legislation does not include environmental criteria despite the obvious overlaps of waste management with food safety standards. This may be reinforcing owner-managers' perception that the environmental impacts of their firm are too small to warrant much attention.

Whilst regulation is undoubtedly one way of making the imperative for environmental reform explicit to business owners, it is equally clear that regular inspections are key to ensuring that SMEs not only understand their environmental obligations, but take them seriously. The stringent health and safety inspections that are currently carried out within the restaurant industry attest to this. Could it make sense to augment the existing infrastructure for health and safety enforcement with environmental regulation and inspections, thus capitalizing on the conflation of environmental issues with environmental health discourses?

The construction industry provides a useful comparison to the regulatory context of the restaurant industry, as environmental legislation targeting this sector is much more developed and environmental standards have been continually raised as a result of amendments to the building regulations. Nevertheless, the responses of builders and architects highlight that a strong legislative structure has little impact if it is not combined with a robust system of enforcement. Whilst the poor enforcement evident within the construction industry remains unaddressed, more rigorous regulation will (at best) increase 'vulnerable compliance' amongst smaller firms and (at worst) increase the numbers of 'cowboy' builders operating with impunity. Regular inspections and 'spot checks' – as currently occurs for health and safety – might encourage owner-managers to see their environmental responsibilities as a core business concern, rather than a secondary (even negligible) issue as currently seems to be the case.

There is another element in the policy mix that is crucial to decreasing rates of 'vulnerable compliance'. Studies have shown that SMEs often exhibit a low level of 'eco-literacy' and lack the ability to interpret how legislation might affect them. Owner-managers clearly need accessible information and support regarding their environmental responsibilities, which is why consultation and dialogue with government agencies on environmental policies is so important. As this study has highlighted, there is some degree of frustration at the government's lack of partnership and consultation with the restaurant industry, and as a result some owner-managers feel ill equipped to respond proactively to policy measures. This is in

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contrast to respondents in the construction industry, who feel far more able to deal with changes in policy as a result of the numerous consultations and voluntary initiatives targeting the industry. Regular dialogue and collaboration between SMEs and government, regulators, support agencies and trade associations is crucial, for without this owner-managers may feel marginalized and resistant to new policy measures.

Conclusions

The findings of this study and others point to a major problem with the 'win-win' philosophy of UK policy-makers and their fundamental faith in the market for solving environmental problems; SMEs have little incentive to voluntarily improve their environmental performance whilst they remain unconvinced of the business case for sustainability. So why is it that politicians still seem to be buying into the ideological myth that a policy emphasis on voluntarism can work? Perhaps it is because of their unerring belief that business owners are 'rational maximizers of utility' and that by providing them with more information or tinkering with prices a change in behaviour will automatically result. Unfortunately, this assumption is not always correct; as this study has shown SMEs do not always behave 'rationally' and continue to neglect 'win-win' opportunities for improving their environmental performance that would also save them money.

Perhaps more crucially, it is questionable whether the government's emphasis on the 'business case' for sustainability (and the implied assumption that firms can 'have their cake and eat it') is appropriate in light of the considerable economic hardships that may result if the true environmental and social costs of production are internalized. A more practically operational approach would be for policy-makers to acknowledge that becoming environmentally sustainable may well add to the costs of production. At the very least there are likely to be definitive sectoral 'winners' and 'losers' as a result of environmental change. In the case of restaurants and construction firms, shifting environmental performance may cost the enterprises involved.

The research has also demonstrated that there is a fundamental difference between the state and enterprise on how to affect change in small businesses. With the formidable transformations that sustainable development requires in the years ahead, surely the energies of policy-makers would be better spent encouraging firms to view their environmental obligations as a legitimate business expense, rather than proselytizing a 'win-win' game. A normalizing of the attitudes of government and owner-managers on the raising of environmental performance, with the state accepting that this may cost industry, would represent a significant building block in encouraging businesses to shift their behaviour. This process clearly needs to involve dialogue with businesses and an understanding by policy-makers of the experience and expertise of business owners, who are clearly stating that a rise in their environmental performance will incur costs. Further, a demonstration by the state that it is serious about shifting the environmental practices of industry through compulsory measures may help break down the view held by SME business owners that their environmental impacts are small and therefore relatively unimportant.

Fortunately, recent policy directions in Europe may help to break down these perceptual barriers. As the EU shifts towards a more adversarial regulatory regime in the style of the US (Löfstedt and Vogel, 2001), legislative pressures are likely to increase throughout the supply chain, pushing environmental concerns further up the business agenda of small firms. For instance, a European directive (in force in 2006) requiring the eco-labelling of commercial buildings and further gains in energy efficiency will undoubtedly serve to underline environmental imperatives within the construction industry.

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Biography

Andrea Revell is a lecturer in human geography at Brunel University. She was previously a researcher at the Small Business Research Centre, Kingston University. Her main research interests are in the field of business and sustainability, with a particular focus on ecological modernization theory. She has conducted research in both Japan and the UK on these themes, funded by UK research councils. She has completed an MSc in environmental management at Imperial College and is currently working towards a PhD.

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Environmental Economics and the Limits to Growth Debate

By Andrea Revell

1. Introduction

Natural resources are used to produce things that benefit people, but unfortunately these benefits often come at a great cost to the environment. It is important to understand the trade offs between these benefits and costs, for if continued economic growth means riches for some but dirtier air or fewer forests for all, is it really worth it? Is more economic growth really raising standards of living? Or is there a point where it degrades the quality of life? The fundamental question we thus have to consider is what is the optimal scale of the economy? How big can our economy get before we start to approach the limits to which the earth can support us?

This chapter aims to explore these questions by comparing the views of different schools of economic thought on the relationship between the economy and the environment. The following sections explore how new branches of economics, including the influential school of 'environmental economics', and the more radical approach of 'ecological economics', challenge traditional economic ideas that ignore the environmental impacts of the economy. The chapter concludes by exploring how these new models have influenced environmental policy debates across the globe.

2. Challenging neo-classical economics

Neo-classical economics has been the dominant paradigm in the economics profession since the late 19th century. This model sees the economy solely in terms of a circular flow of goods and services between producers and consumers in a closed loop. No reference is made to resource depletion or waste as the earth is assumed to have an unlimited capacity to support its population. Kenneth Boulding (1966) famously referred to this as the 'cowboy economy'; so called because the cowboys of the North American plains lived on a linear flow of inputs to outputs, from sources to sinks, taking what they wanted from the earth and throwing away the rest. In the cowboy economy there was no need to recycle anything because resources were assumed to be so abundant.

These assumptions were seriously challenged in the 1960s and 1970s with the advent of the environmental revolution. Seminal books such as Rachel Carson's 'Silent Spring' (1962), Paul Ehrlich's 'The Population Bomb' (1968) and the 'Club of Rome's 'Limits to Growth' (1972) foresaw

gloomy prospects for the world due to massive population growth, resource depletion and pollution. The Club of Rome painted a particularly apocalyptic future for the earth if the environmental impacts of the economy were not addressed. The Club of Rome was made up of an informal, international group of scientists, humanists, economists and industrialists who shared a deep concern for the rapid rise in global population, global consumption and industrial output. The stage was being reached, they argued, when this explosion of economic and population growth would exceed the carrying capacity of the earth. Using complex computer modeling programmes they predicted that if growth continued at the same rate, the earth would strike its limits by the end of the 20th century.

The book was highly contentious. At that time, there was a general belief in the West that society had been largely released from the constraints of nature as a result of the massive technological and economic progress that had occurred since the Industrial Revolution, and particularly during the post-war reconstruction period of the 1950s and 1960s. There was a sense that human ingenuity could fix any problem, and that there was a standard western formula for economic growth and prosperity that could be applied throughout the world. Those proposing the idea of 'limits to growth' were dismissed as alarmist pessimists, enemies of progress and modernity.

However, as environmental problems gradually worsened, the notion of 'limits to growth' began to be taken more seriously. Increased media coverage of environmental issues resulted in growing public awareness of the problems unleashed by industrialization, and membership of environmental pressure groups soared. Responding to public concern, many governments set up environmental departments and introduced environmental laws to regulate the excesses of industry. The first great world environmental conference, the 'United Nations Conference on the Human Environment' occurred in 1972 in Stockholm, followed by the establishment of the United Nations Environment Programme (UNEP). The 1970s thus heralded what can be considered the 'dawning of environmentalism', when people for the first time began to realize that the environment was not a free good that could be exploited endlessly.

The Dawning of Environmentalism In Japan

For Japan, the post-war reconstruction period of the 1950s and 1960s heralded a period of massive industrialization and economic growth on a scale never before seen in its history. Rapid modernisation brought prosperity and higher standards of living for many of its people, but as industrial expansion continued unabated, a major pollution crisis ensued. Thousands of Japanese citizens suffered from mercury poisoning and other industrial pollutants, sparking a major public outcry and a heightened sense of environmental concern within society. Numerous grassroot environmental groups emerged all over the country, and the government responded by introducing a raft of anti-pollution legislation. This regulatory approach was so successful that by the 1970s Japan was hailed as a world leader in pollution control.

During the 1970s, environmental non-governmental organisations (ENGOS) were generally sympathetic to the idea that there were limits to growth. They hence allied themselves with radical new branches of economics such as the 'zero growth' and steady-state' schools (see Boulding 1966; Daly, 1973). These schools supported the idea that the economy was fast approaching the carrying capacity of the earth, and that production and consumption should therefore be contracted. This meant zero economic growth to avoid breaching ecological limits. While these ideologies were highly influential within the Green movement, they essentially went against the grain of capitalism and free market economics, and so were wholly untenable to political and business leaders around the world. Developing countries stressed the need to grow their economies to cope with massive population growth and high rates of poverty, while developed countries viewed the idea of contracting production and consumption as political and economic suicide. In supporting the idea of limits to growth, the Green movement hence found itself in direct opposition to a global political economy underpinned by the ideas of traditional neo-classical economics, which unquestioningly viewed growth as 'good'.

In the neo-classical view, growth is the ultimate goal because it assumes that the faster the economy grows, the more material wealth is created, which increases social welfare and results in the utilitarian notion of the 'greatest happiness for the greatest number'. This reflects Adam Smith's invisible hand theorem, which states that the economy is characterised by profit-maximising producers and welfare-maximising consumers acting in their own self-interest. If all agents act in a self-interested, rational manner, the market's invisible hand will deliver a socially desirable outcome. This outcome is the efficient allocation of resources, which results in the greatest happiness for the greatest number.

Neoclassical economics thus emphasizes the central role of the market in maximizing the social good by allocating all resources - including environmental ones - efficiently. The market is viewed as self-correcting; if resources are exploited too rapidly, they become scarce, prices go up and so usage goes down. Once resources become scarce, producers are encouraged to find substitutes; this encourages technological innovations that can reduce environmental impacts. The assumption is that the market harnesses individual self-interest for the advantage of society and the environment.

The tension between neo-classical economics and those advocating limits to growth is illustrated by the debate discussed in Chapter 2, between 'cornucopian' economist Julian Simon (1981), and Paul Ehrlich, the celebrated author of 'The Population Bomb' (1968). You will remember that Simon (1981) challenged Ehrlich's notion of a pending 'Malthusian' catastrophe – that population growth would eventually result in demand outstripping the supply of natural resources, thus leading inevitably to a global environmental catastrophe and a return to subsistence-level conditions worldwide. Instead, Simon argued that population was the solution to resource scarcities and environmental problems, since people and markets find ways to innovate. He was thus described as a cornucopian for his belief that human ingenuity and technological progress would ensure continued economic growth and prosperity for humankind.

Simon will go down in history as the man who bet Ehrlich on a mutually agreed upon measure of resource scarcity - and won. Simon bet that the price of a basket of metals (chosen by Ehrlich) would go down (indicating plenty) rather than up (indicating scarcity) despite major increases in population growth. True to his prediction, by 1990 the global population had grown by over 800 million, yet the price of all Ehrlich's selected metals (chrome, tin, copper, nickel, tin, and tungsten) had fallen - in some cases spectacularly so. Simon thus lent credence to his argument that short term scarcity could be overcome as higher prices motivated inventors and entrepreneurs to search for alternatives.

Mainstream economists continue to follow traditional ideas regarding economy-environment relationships. However, challenges have come from more progressive thinkers in economics who have been concerned about the growing environmental impact of the economy, and have branched off to form their own schools of thought.

3. Environmental economics

One school that has had a great impact on the environmental policy agenda worldwide is that of 'environmental economics', which emerged in the late 1970s as a challenge to the zero growth and steady-state ideologies dominant at the time. Instead of zero growth, environmental economics introduced the more complex objective of 'sustainable growth'; a concept that was considerably more palatable to those within the halls of power. This perspective argued that the economy could continue to grow as long as Boulding's (1966) 'cowboy economy' was transformed into what Jacobs (1997) terms a 'circular economy'.

3.1 Sustainable growth and the circular economy

The idea of a circular economy is founded on the first law of thermodynamics, which states that '*matter cannot be created or destroyed, it can only be transformed*'. Under this law it becomes clear that if matter and energy cannot be destroyed, all inputs must inevitably end up as waste. Material goods do not just disappear once we are finished with them, they are transformed into refuse and pollution. The goal of environmental economics is to minimize this waste by increasing the circularity of the economy, for if wastes can be returned to the economy (ie recycled) both resource depletion and pollution can be minimised. The key emphasis in environmental economics is thus to increase the 'eco-efficiency' of the economy by limiting the throughput of production. Advocates of this approach argue that sustainable growth is then possible because the economy has a much smaller impact on the environment.

A major focus of environmental economics is the design of policies which increase resource efficiencies at least cost to the economy. This involves three aspects:

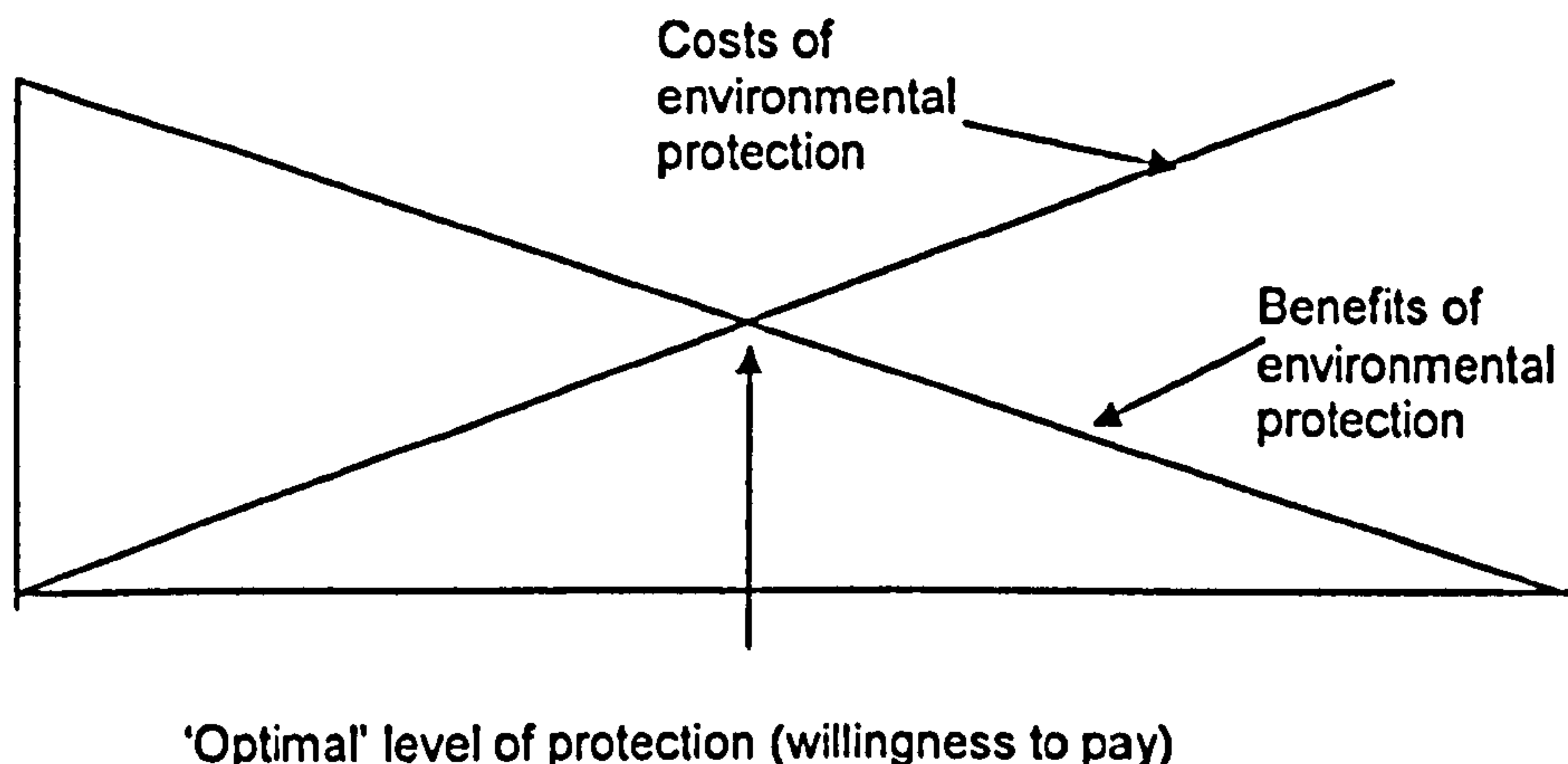
- i. Commodifying the environment
- ii. Defining the 'optimal' level of environmental protection via cost-benefit analysis
- iii. Creating policies to enable the market to achieve the optimal level of protection.

i. Commodifying the environment

Jacobs (1994) highlights that at the heart of environmental economics lies the aim of turning the environment into a commodity. This is because commodification enables environmental goods and services to be incorporated into economic models and analysed like any other market commodity. The process of commodification involves breaking the environment down into its constituent goods and services. For instance the tropical rainforest provides a range of goods (timber, medicines, food etc), and services (climate stabilisation, watershed protection etc). Each one of these 'commodities' are then priced according to supply and demand, like any other product or service. In this way, the environment is brought into the market economy.

ii. Finding the optimal level of environmental protection

Environmental economists argue that because environmental protection can be beneficial to society but costly to the economy, benefits and costs should be weighed up to decide the 'optimal' level of protection. This is done in a process called 'cost-benefit analysis' (CBA), which is widely used by policymakers to help them decide which policies to adopt. CBA was developed over the last 30 years by economists as a mechanical way of making decisions about resource allocation. The level of environmental protection that is considered optimal in CBA is the intersection of the costs and benefits curves, as this is where the benefits of environmental protection are maximised at least cost to the economy.



The costs and benefits curves reflect supply and demand curves. As the costs associated with supplying environmental protection go up, demand goes down as people are less and less willing to pay for higher levels of protection.

Environmental valuation methods are essential to cost-benefit analysis, as economists have no other way of comparing benefits with costs except by using financial estimations. In the market, the price of a product or service represents its value or benefit. However, there are no markets - and hence no prices - for many environmental goods and services, so in these instances economists must estimate their value by calculating what people would be willing to pay for that environmental good, or what they would be willing to accept as compensation for environmental losses.

Economists use two methods to assess the value that people ascribe to the environment. The first is to make an assessment of what is termed 'revealed preferences'. In the case of valuing a national park for instance, economists might include the amount that people pay to travel to a national park, how much they pay to use the park, or how much house prices have gone up around the park. The other method is by 'expressed preferences' using 'contingent valuation'. Contingent valuation involves surveying people on what they are willing to pay for an environmental good or service, or what they are willing to accept as compensation for the loss of that environmental good or service. A monetary value on nature is thus found by researching the expressed preferences of consumers (which of course is constrained by ability to pay - ie incomes).

Once a monetary value for environmental commodities has been calculated, the benefits of environmental protection (based on revealed or expressed preferences) may be compared with the costs of that environmental protection, including the opportunity costs of not being able to allocate resources elsewhere. The optimal level of protection is the point where benefits are maximised at least cost.

iii. Creating policies

Once the optimal level of environmental protection has been established using CBA, the next stage is to actually create policies that will achieve that level of protection. Regulations (such as water, land and air quality standards) have traditionally been the central mechanism for protecting the environment. However, since the 1980s deregulation trends have helped to fuel the search for more flexible and cost-effective policy tools. Regulation is often criticised for involving excessive 'red tape' (which can restrict business and discourage innovation), and for requiring a significant amount of funding for enforcement. A central aim of environmental economics has thus been to design more efficient market-based policy instruments, which give producers greater flexibility in deciding how to respond to environmental problems, at the same time as lowering the cost of enforcement. The key

market-based instrument (MBI) used by policymakers today are environmental taxes and tradeable permits.

Environmental taxes

Environmental taxes change the prices of existing goods and services in the market in order to internalise 'environmental externalities'. The idea of an 'environmental externality' relates back to traditional economic ideas. Because the economy is defined solely in terms of production and consumption, with no reference to the ecological systems that underpin it, the environment is considered 'external' to the economy. In setting the price of goods and services, producers thus internalise costs such as capital and labour, but ignore environmental costs such as pollution and waste. In effect, this means that prices in the free market economy are set artificially low, because they do not reflect the so called 'true social cost of production'. Low prices increase demand, and producers thus increase supply - with a devastating effect on the environment.

Environmental economists highlight that it is because most environmental costs are not internalised within prices that we are facing such acute environmental problems today. Environmental externalities represent a market failure, for they encourage producers and consumers to be wasteful and polluting. For instance, factories in China pump pollution into the air and waterways because they have not had to pay for the impacts of their activity on the environment. Shoppers in Tokyo or New York eat their lunch out of throw-away plastic containers because they can put the packaging in the rubbish bins to be picked up for free by the municipal authorities. However, although the factory or the shopper does not pay, there is a cost to society. We all ultimately pay if the air is polluted, our waters are toxic and our landfill sites full. Sometimes taxpayers are forced to pick up the tab by funding government spending on pollution control, or they may pay indirectly, for instance by funding treatment for asthmatic patients through their health insurance premiums. But inevitably, as the environment declines, it is the poorest and most vulnerable, not to mention future generations who end up paying the highest price.

Environmental economics advocates addressing this market failure by making polluters pay directly. This is known as the 'polluter pays principle'. Policies include taxing 'environmental bads' and/or subsidising 'environmental goods', so that polluters have a direct incentive to switch to less environmentally damaging activities. Environmental taxes are thus a way of internalising environmental externalities to ensure that the true social costs of production are revealed in prices. Examples of environmental taxes include carbon taxes (where industry is taxed for every unit of carbon dioxide emitted, which incentivises firms to find energy efficient and low carbon alternatives), congestion charging (where motorists pay a fee for entering the 'congestion zone', which encourages them to make fewer journeys in these areas), and fuel duties (where petrol is

taxed to encourage motorists to buy more fuel efficient vehicles or use their cars less frequently). One example of how taxation could be applied to an environmentally damaging activity, air transport, is given in Box 4.1

Taxing air travel

The UK government recently endorsed a massive expansion of air travel capacity in its 'Aviation White paper' (DTI, 2003), as aviation passenger numbers are predicted to double by 2020. The increased demand for air travel in the UK has been partly driven by the emergence of competitive low cost airlines which have created a downward pressure on fare prices and made air travel more affordable to the masses. Environmental groups such as 'Greenpeace', 'Friends of the Earth' and New Labour's green think tank 'SERA' (Socialist Environment and Resource Association) have criticized government plans to meet this increased demand by building new airports and runways. They argue that these developments are likely to stimulate demand even further, which will have a devastating impact on the environment. Aviation emissions contribute three times more carbon dioxide than any other transport source and is one of the major causes of human-induced climate change. The government itself acknowledges that carbon dioxide emissions from aviation could be 25% of Britain's total contribution to global warming by 2030 (DTI, 2003)

Instead of increasing capacity, environmentalists have called for a demand-management approach using environmental taxation to raise the cost of flying. Sewell (2003) highlights that aviation receives £9 billion in hidden subsidies annually due to the fact that there is no value-added tax on the purchase of aviation fuel, passenger tickets or aircrafts, not to mention aircraft servicing, air traffic control, airline meals or baggage handling. Even the cost of landing slots is subsidized by duty free airport sales. Because of this, the price of flying is still relatively low and consequently demand for air travel continues to rise at an alarming pace. While car drivers are made to pay directly for the pollution they cause via fuel taxes, vehicle excise duty, congestion charging and road tolls, air passengers are currently exempt from such taxes. Aviation is thus a classic example of an industry which has externalized the environmental and social costs it imposes on society.

Environmental taxation is a favoured policy tool in many countries (particularly in Europe), because it is both an efficient and flexible way of engendering environmental reform. Environmental taxes are efficient because the polluter is made to pay directly, and flexible because the polluter can decide whether to pay the tax or find more environmentally friendly

alternatives. However, a key problem with environmental taxes is that many polluters may feel that it is easier to pay the tax than to change their behaviour. For instance, despite fuel duties, many people still prefer to use their cars rather than take public transport. Taxes therefore have to be set high to stimulate a behaviour change. Nevertheless, raising taxes is a very contentious political issue, and many politicians fear a backlash from voters. A good example of this is the UK fuel duty protests of 2000, in which the road lobby blockaded motorways to protest at fuel tax rises. The government relented by agreeing not to raise the fuel duty any further.

Environmental taxes can be unpopular with voters for a number of reasons. Firstly, they are seen to penalise the poor more than the rich, as the rich are in a better position to absorb extra costs. They can also be deeply unpopular if it is felt that the taxes have been introduced primarily to increase government coffers rather than to protect the environment. For this reason, there is increasing pressure on governments to 'hypothecate' environmental taxes, which means that the money raised is funneled directly into services that improve the environment. For instance, in Sweden a tax on fertiliser and pesticide has been spent on research into environmentally sensitive agriculture (ECOTEC, 2001). In the US a gasoline tax has been dedicated to improving transportation infrastructure (Parry, 2002). In Australia and the UK, most landfill levies are used to fund waste management programmes, including recycling (BDA group, 2003). One of the reasons that the UK road lobby was so successful at provoking a public outcry about the rise in fuel duty was that the government had not hypothecated the money to fund improvements in public transport.

Tradeable permits

Originally developed in the US, tradeable permits are another increasingly popular market-based instrument. Tradeable permits work by establishing a target level of environmental quality, defined by 'total allowable emissions'. Permits are then allocated to polluters, with each permit enabling the recipient to emit a specified amount of pollution. Because polluters are allowed to trade these permits among themselves, those who pollute least are rewarded (as they can sell their permits at a profit), and those who pollute most are penalised (as they have to buy extra permits to match their emissions).

Like environmental taxation, the key advantage of tradeable permits is their flexibility, for by letting polluters decide whether to buy more permits or invest in greener alternatives to reduce their emissions, they help to reduce the negative impact of environmental protection on the competitiveness of industry. Tradeable permits are therefore an increasingly popular policy tool within both political and industry circles.

The U.S pioneered emissions trading when it established the 'Emissions Trading Program' (ETP) under the Clean Air Act of 1976. Emission permits have since been used in the US for controlling water and air pollution including lead, CFC, sulphur dioxide and nitrous oxide emissions. In 2005, Europe commenced its own fledgling Emissions Trading Scheme (EETS) which enables member states to buy and sell emissions permits to help reach their Kyoto protocol targets.

While tradeable permits are slowly becoming more common in environmental policymaking, they have been criticised by some in the Green movement who believe that giving polluters a permit to pollute is tantamount to giving them the 'right' to pollute, and takes attention away from the need to reduce resource consumption among polluters who can afford to buy more permits.

Box 4.2 Mitigating climate change with carbon trading

Proposals for carbon trading schemes emerged in Europe as a response to the Kyoto Protocol, a 1997 international treaty to mitigate climate change that came into effect in 2005. The 166 nations who have ratified the Kyoto protocol treaty are legally bound to reduce emissions of six greenhouse gases (collectively) by an average of 5.2% below their 1990 levels by the period 2008-2012. The European Emissions Trading Scheme (EETS), which began in 2005, is mandatory for all member states as a way of meeting their Kyoto obligations to reduce carbon dioxide emissions. It works by capping the amount of carbon dioxide that each country can emit, and then allowing permits to be issued that grant power plants and other large point sources the right to emit a stated amount of carbon dioxide over a fixed time period. This is also known as a 'cap and trade' scheme. Each member state is obliged to submit a National Allocation Plan (NAP), which estimates appropriate caps on emissions for different industries. Once the European Commission has approved the NAP, caps are set in place, and permits are then issued and traded to achieve those caps.

Environmental NGO's became highly critical of the first phase of the EETS (2005-2007) when it became clear that many countries had abused the system by giving their industries such generous caps that they did not need to reduce emissions beyond current levels. Environmental groups have thus pressed for much stricter caps in the second phase (2008-2012). The second phase will involve caps for all greenhouse gas emissions, not just carbon dioxide. The European Commission is also considering including aviation as a target industry under the scheme due to the significant and rapidly increasing emissions produced by this sector.

Aubrey Myer's (2006) has called for a 'contraction and convergence' model for capping global emissions, which places emphasis on the distributional equity of emissions over time. The idea is to ensure that developed countries contract their emissions to such an extent that developing countries can still increase theirs (to keep pace with growing populations), while total global emissions are reduced. Myers describes it as:

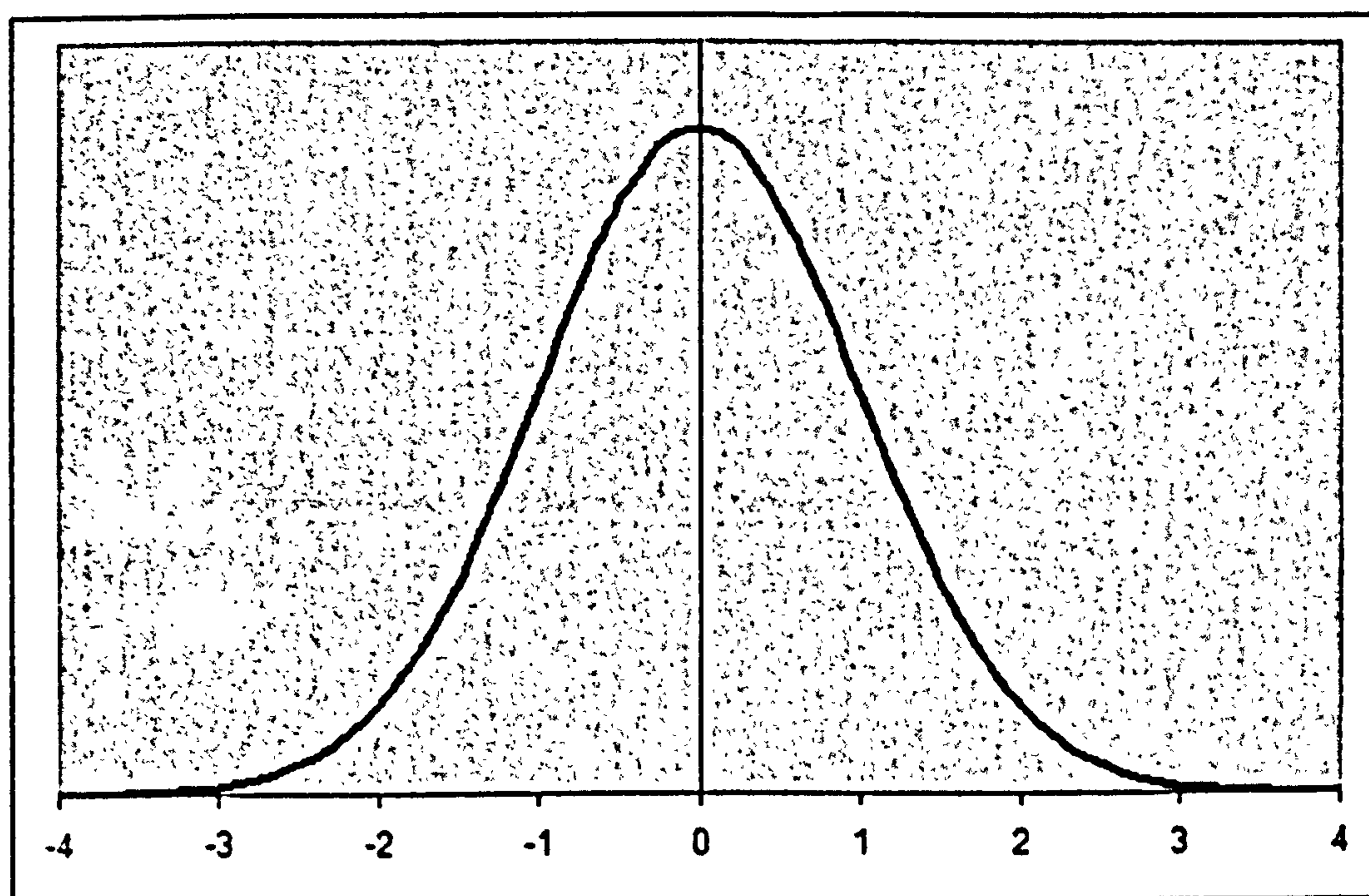
"A straightforward model for an international agreement on greenhouse gas emissions. It sets a safe and stable target for concentrations of greenhouse gases in the atmosphere, and a date by which those concentrations should be achieved, based on the best scientific evidence. The atmosphere being a "global good", C&C declares that all citizens of the Earth have an equal right in principle to emit, and will actually be given an equal right by this future date, the individual allowance for each citizen being derived from the "safe" global target. So from the grossly inequitable situation we have now, per capita emissions from each country will "converge" at a far more equitable level in the future; while the global total of emissions will "contract". (Myers, 2006)

4. Ecological Modernisation

Since the 1990s, environmental economics has become increasingly influential in defining the response of governments to the environmental crisis. In fact, it has become so influential that many of its core principles have been incorporated into a political programme called 'ecological modernisation'. Ecological modernisation (EM) is now the policy strategy and discourse adopted by most governments, businesses and reformist environmentalists on the environment (Revell, 2005; Berger et al, 2001). For instance, EM has been described as the new name for environmental politics in the European Union (Pepper, 1999), and is the perspective guiding the World Commission for Environment and Development (Strandbakken and Stø, 1997).

Informed by environmental economics, ecological modernisation revolves around the imperatives of competitiveness, eco-efficiency, and technological innovation. EM policy strategies also emphasize market-based solutions to environmental problems. A core tenet of this model is that industrialised countries are becoming more environmentally sustainable as a result of technical progress in resource and energy efficiency, which has enabled economic growth to be 'decoupled' from environmental degradation. This idea relates to a concept known in economics as the 'Environmental Kuznets Curve' (or EKC), which is informed by empirical research indicating an inverted U-shaped relationship between pollution and income per capita.

Fig. 4.2 The Environmental Kuznets Curve



The curve suggests that while pollution initially increases with rising incomes, it then begins to decrease once a certain threshold of income has been crossed. The central inference is that the wealthier people become, the more their environmental impacts are reduced over the long term as society becomes rich enough to clean up the environmental fall-out of its own growth, and to invest in greener production processes. In this model economic growth is thus part of the solution rather than the problem.

Like environmental economics, advocates of ecological modernisation propose that decoupling economic growth from environmental degradation can only be achieved by reducing the material and energy throughput of the economy. Science and technology are seen as crucial institutions for attaining this goal, and policymakers following this path call for major technological innovations to slash the resource use of industry by fourfold and even tenfold. The 'business case for sustainability' – the idea that environmental reform can be profitable, or that 'pollution prevention pays' - is a key rhetorical device used by politicians to encourage technological innovation and a shift towards 'clean production'. Eco-efficiency is emphasized as a way of lowering production costs and increasing profits, while new markets for environmentally friendly products and services are highlighted as potential sources of future growth (Revell, 2007). Policymakers advocating ecological modernisation see the market as the best medium for solving environmental problems, for if market failures are corrected, the most efficient (or eco-efficient) allocation of resources will result.

The Stern Review

A groundbreaking report on the economics of climate change written by the economist Nicolas Stern (2006) and commissioned by the UK's finance minister Gordon Brown, has caused shock waves around the world by suggesting that climate change is not only the '*greatest and widest-ranging market failure ever seen*', but that "*tackling climate change is the pro-growth strategy for the longer term*". (Stern, 2006,p1-2). Reflecting the central EM idea that environmental protection is a pre-requisite for long term economic growth, Stern argues that "*mitigation – taking strong action to reduce emissions – must be viewed as an investment...if these investments are made wisely, the costs will be manageable and there will be a wide range of opportunities for growth and development along the way. For this to work well, policy must promote sound market signals, overcome market failures and have equity and risk mitigation at its core*". He asserts that "*tackling climate change.... can be done in a way that does not cap the aspirations for growth of rich or poor countries*" (Stern, 2006; p1-2).

Despite EM's growing prominence within mainstream environmental politics, the principles which constitute its foundation have been challenged by other emerging and more radical branches of economics which have called for a less reductionist and more precautionary approach to environmental problems. The remainder of this chapter explores what one particular branch – 'ecological economics' - offers as an alternative and competing paradigm to that presented by environmental economists.

5. Ecological economics

"Ecological economics is a transdisciplinary effort to link the natural and social sciences broadly, and especially ecology and economics...One of the basic organizing principles of ecological economics is...a focus on (the) complex interrelationship between ecological sustainability (including system carrying capacity and resilience), social sustainability (including distribution of wealth and rights, social capital and coevolutionary preferences), and economic sustainability (including allocative efficiency in the presence of highly incomplete and imperfect markets)" (Costanza, 2003:1)

Ecological economics is in part an outcome of recent developments in systems ecology, which focuses on the complex non-linearity of ecological processes and the resilience of ecosystems to maintain themselves in the face of stress and shock (Turner et al. 1995). Ecological economics thus has its intellectual roots in the natural sciences, which is a key reason why some mainstream economists refuse to regard it as a legitimate branch of economics. While the neo-classical purist implicitly views the environment as external to the economy, ecological economists see the economy as contained within the ecological and biospheric systems of the earth, and therefore economics is viewed as a subset of ecology. Key authors in ecological economics include prominent economists such as Herman Daly (1995) and David Pearce (1999), as well as ecologists such as Robert Costanza (1991) and Anne-Marie Janssen (1984).

To address the differences between ecological and environmental economics, it is useful to explore the challenges that the former poses for the latter. Key faultlines between the two branches include:

- i. Reductionism versus 'coevolution'
- ii. The sustainability of a circular economy
- iii. Safe minimum standards and the substitutability of human and natural capital
- iv. Quantitative growth vs qualitative development
- v. The valuation of environmental resources

I. Reductionism versus 'coevolution'

In contrast to the reductionist approach taken by environmental economics, ecological economics sees all relationships (economic, social, ecological) as endogenous and coevolutionary. Norgaard (1997) highlights that natural and human systems cannot be separated from one another; in fact, they are so intimately interconnected that they evolve together and reflect one another. In the ongoing feedback between evolving systems, a change in any one system affects the other, and the characteristics of each system places selective pressure on the rest. Ecological economics thus emphasizes the need to understand the integral dynamics between social, economic and ecological systems, and humankind's role in shaping the biological as well as cultural evolution of the planet. By treating the environment as separate from humankind, environmental economics is accused of undermining the dynamic and unified relationship between humans and nature.

Ecological economists also regard it as folly to assume that we can leave decisions about resource allocations to the market and to 'benign' interventions by government (using environmental valuation and CBA) to manage the environment on behalf of society. Norgaard (1997) highlights the inherent unpredictability of coevolutionary processes, as nothing can be said with certainty to determine anything. Power is diffuse in the coevolutionary model - all can and will transform in unpredictable ways, and human agency is just one aspect among many others that determine future development. Challenging the idea that the environment can be 'managed', or that environmental change can be predicted with any accuracy, ecological economists advocate a far more ecocentric and precautionary approach to economic analysis and policymaking. Conservation and environmental protection measures - particularly protection of eco-system resilience - take precedent, unless the cost to society is unacceptably large (Turner et. al, 1995).

ii. The sustainability of a circular economy

One aspect of this ecocentricism is that while environmental economists do not believe in predetermined limits to growth, ecological economists assert that there are environmental limits that should constrain economic activity even in a circular economy. Using Georgescu-Roegen's (1971) 'entropy' based model, which forms a core intellectual foundation for ecological economics, Daly (1991, 1992) argues that there are limits to physical growth even in the most resource efficient economy, because perfect recycling is precluded on thermodynamic grounds. Daly asserts that environmental economists have rather missed the point with the circular economy, for while they may have grasped the implications of the first law of thermodynamics and the limits it imposes, they have not grasped the implications of the second law. The second Law of thermodynamics states that *'when energy is transformed from one state to another, some energy is lost as heat'*.

This law highlights that the transformation of energy/matter involves some degradation of quality: a shift from order to disorder (or entropy). The circular economy assumes that everything goes round in a closed loop with nothing wasted. However, the law of entropy tells us that in reality there will always be some waste. Economic activity involves transforming materials from one state to another, and this dissipates energy in the process. Economic activity thus necessarily increases entropy (disorder) in the universe.

Under the second law of thermodynamics, every day the universe gets more and more disordered. Any local increase in order (eg production of a good) is paid for by an increase in disorder elsewhere (eg bi-products of toxic waste, pollution). Any system without an external energy source increases entropy. There is thus a major flaw in the circular economy; a closed system will eventually use up all its available energy and turn it into waste. For example, recycling requires energy to power treatment plants. As long as the recycling process is powered by fossil fuels, it will contribute to air pollution. Recycling therefore reduces one environmental problem (waste) only at the cost of increasing another (air pollution). Because of the entropy problem, ecological economists like Daly (1992) argue that the circular economy is simply not sustainable, and that solving the entropy problem requires the creation of a renewable energy economy. By harnessing solar power (the earth's external energy source) energy can be added into the system, replacing what has been lost. Using solar power the circular economy then becomes a feasible goal, as the energy required to recycle is unlimited and environmentally benign. The real significance of renewable energy is thus not that it does not run out but that it does not generate waste (Jacobs, 1997).

iii. Safe minimum standards and the substitutability of human and natural capital

Ecological economics emphasizes the extreme scientific uncertainty surrounding complex ecological processes and functions, arguing that because we do not know enough about the long-term impacts of pollution and other environmental hazards, and because new effects can occur due the inherent unpredictability and interrelatedness of environmental systems, it may not be possible to identify sustainable levels of economic growth, or the 'optimal' level of environmental protection as emphasized in environmental economics. As ecosystems do not always clearly signal when their carrying capacity or assimilative capacity has been breached, market prices cannot be relied upon to indicate whether a system is approaching its threshold of resilience. Rather than a simple cost-benefit approach, ecological economists thus advocate the application of the 'precautionary principle' in environmental policymaking, which involves the adoption of 'safe minimum standards'.

Safe minimum standards, such as quotas or limits on resource use, emission permits, ambient standards or hunting seasons, are a precautionary instrument to safeguard 'critical natural capital' – those environmental goods and services that are critical to the healthy functioning of ecosystems and biodiversity. By preserving a critical minimum stock of natural capital, safe minimum standards are seen as a buffer against unexpected environmental behaviour and the risk of irreversibility.

In contrast, environmental economics adopts less stringent ideas of environmental conservation, as no aspect of the environment is considered inviolable - including critical natural capital. Instead, environmental economics takes the view that depletion of natural capital is justified as long as the 'Hartwick rule'¹ is observed, i.e that there is an equivalent increase in human capital which ensures that the total capital stock remains the same. This means that the income derived from natural resources must be invested in other forms of capital which can yield the same amount of income. Thus as long as fossil fuel or tropical rainforest exploitation results in a corresponding increase in human capital such as roads, buildings, electricity, schools or incomes, the exploitation is deemed acceptable to environmental economists. This is known as a 'weak' perspective on sustainability.

Reflecting Julian Simon's cornucopian beliefs, those advocating weak sustainability argue that, as natural capital becomes more and more scarce, there are increased incentives to search out alternative supplies or artificial and natural substitutes. For example, dwindling stocks of hardwood timber have led to softwood and manufactured substitutes. Environmental economists are thus optimistic about the possibility of finding suitable technical substitutes for natural capital. In contrast, ecological economists take a strong sustainability approach, which assumes that technology will not necessarily be able to remove resources constraints, and that there are no substitutes for some (critical) natural capital. Instead of viewing natural capital as interchangeable with human capital, ecological economics views human capital as derived from natural capital and therefore dependent on natural capital. The ecological health of the planet therefore takes precedence over the economic needs of humans.

iv. Quantitative growth vs qualitative development

Daly (1987) argues that environmental economics confuses quantitative economic growth (i.e increases in the biophysical scale of the economy, as measured by national accounts or 'GDP'), with qualitative development in the non-physical characteristics of the economy (indicated by an improvement in the 'quality of life'). Daly and other ecological economists highlight that the neo-

¹ The Hartwick rule is named after the economist John Hartwick, who defined his theorem in Hartwick (1977)

classical model of GDP measures a nation's prosperity by the volume of goods and services bought and sold, but ignores the social and environmental cost of doing business. They argue that the use of GDP as a measure of standards of living is misconceived if increased consumption leads to degradation of natural capital, which in turn results in a reduction in the quality of life and general wellbeing of society. For instance, a study by Daly and Cobb (1987) found that economic growth in the US during the 1950s and 1960s caused welfare per capita to increase, but further economic growth in the 1970s and 1980s actually caused overall welfare to decline. They concluded that after a critical threshold, the negative aspects of affluence started to outweigh the positive aspects, and that further economic growth could lead to a reduction in the quality of life.

Marylin Waring's celebrated book 'If Women Counted: A new Feminist Economics' (1988) outlines a scathing critique of GDP for ignoring the environment, domestic and unpaid work, and subsistence production. She highlights how GDP records environmental degradation as ultimately welfare producing rather than reducing, as oil spills and pollution are counted as having a positive effect on economic growth.

Exxon Valdez oil spill as 'welfare producing'

On March 24th, 1989, the supertanker 'Exxon-Valdez' tragically crashed into reefs off the port of Valdez on the Alaskan coast, dumping an estimated 11 million gallons of crude oil into the sea in a matter of 7 or 8 hours (Buchholz and Rosenthal, 1998). The oil spill was one of the worst in history, devastating the ecology of Alaska's pristine 'Prince William Sound'. A massive clean up operation ensued, at a total cost of US \$2 billion. Since GDP records every monetary transaction as positive, the Exxon Valdez oil spill was by inference counted in the national accounts of the United States as welfare producing rather than welfare reducing.

Because of these criticisms of GDP, ecological economics advocates the use of alternative indexes such as 'Green Gross Domestic Product' (Green GDP) or 'Green National Product' (GNP), which factor in the environmental consequences of economic growth and therefore offer a more realistic measure of the quality of life. Examples include:

- Nordhaus and Tobin's (1972) 'MEW' (Measure of Economic Welfare), which subtracts the costs associated with environmental 'bads' (such as pollution) from GDP, while adding qualitative benefits such as the value of services (versus the sales price of products), the value of leisure time, household production and government spending.

- Daly and Cobb's (1987) Index of Sustainable Economic Welfare (ISEW), which weights personal consumption with factors such as the cost of environmental degradation, depreciation of natural resources, capital adjustments, income inequality and domestic labour
- Pearce and Atkinson's (1993) 'genuine savings' model, which adjusts GNP by taking account of resource depletion, environmental degradation and changes in environmental services to measure genuine savings.

v. The valuation of environmental resources

Ecological economics challenges environmental economics' reliance on contingent valuation and cost-benefit analysis in deciding environmental policy. Because the latter puts a monetary value on environmental goods and services by assessing what people are willing to pay for them, environmental value is ascribed mainly in terms of nature's utility or value to human beings. However, ecological economists emphasize not just the instrumental but the intrinsic value of nature, i.e its inherent worth regardless of what humans ascribe to it. Ecological economists thus question whether it is possible to put a monetary value on the environment at all. They also highlight that aggregating private willingness to pay may not adequately capture the 'true' social value of healthy ecosystems and interrelationships.

Ecological economists have much sympathy with Mark Sagoff's famous and devastating critique of contingent valuation in his book 'The Economy of the Earth' (1988). Sagoff's essential argument is that people value the environment as citizens not consumers. People have economic preferences as consumers, but they also have moral preferences as citizens. Because the environment is a 'public good', people tend to react more as citizens than consumers, and this makes it very difficult for them to put a monetary value on nature. This is evidenced by the problems encountered in contingent valuation surveys. Firstly, large numbers of people refuse to participate in such surveys. Secondly, the meanings of those that do respond are not always clear, as people are unsure about how to reply to questions such as 'how much are you willing to pay for the protection of the blue whale'. Thirdly, what people are willing to pay for environmental protection is usually less than the compensation they would need for its loss. Sagoff highlights that this is an important finding, as it means that willingness to pay consistently underestimates environmental losses and therefore allows too much environmental degradation. Sagoff concludes that contingent valuation may thus misrepresent the way in which people value the environment.

Confirming Sagoff's analysis, Burgess et. al's (1999) study of a contingent valuation exercise regarding the pevensey levels in southern England found that the participants had difficulty in fragmenting their experiences of nature in the way required by the response analysts. Moreover, participants expressed anger and concern when informed that their responses could be used as a basis for environmental policymaking. They concluded that contingent valuation exercises were fundamentally flawed because putting a monetary value on nature was an alien concept to participants.

Another problem with contingent valuation and cost-benefit analysis is that current preferences are not necessarily a good indication of true welfare (O'Neil, 1993). For instance, people may prefer shopping malls to wetlands because they have no idea how ecologically important wetlands are. Consequently, what people are willing to pay for wetland preservation may be comparatively little compared to the value they ascribe to having their favourite shops in close proximity. CBA is therefore criticized for undervaluing environmental resources.

Detractors of cost-benefit analysis conclude that the central problem is that it can - and does - result in immense environmental degradation, particularly as the benefits of 'development' are so often considered to outweigh the costs to the environment. This is particularly true in developing countries, whose development needs are greatest.

Ecological economists thus challenge the central emphasis of CBA in environmental policymaking, arguing that environmental economics' reliance on preference-based valuations may result in aesthetically attractive environmental goods getting assigned higher prices than life supporting critical natural capital. Ecological economics supports the protection of critical natural capital via standards and regulations rather than monetary valuation methods.

As part of its focus on social sustainability, ecological economics also supports the expansion of the field of economics to include more participative methods of environmental decision-making than cost-benefit analysis. This may include consensus or democratic decision-making methodologies where stakeholders participate in reaching objectives and priorities about resource allocations that affect them, as in the case of lay panels, round-table meetings or citizens juries (Aldred and Jacobs, 2000). The narrow focus on CBA by environmental policymakers is criticized as exclusionary and elitist, assigning the ultimate decision-making power to non-elected policymakers and economic 'experts' instead of encouraging wider public involvement in solving environmental problems. Ecological economists thus support the political model of 'deliberative democracy' and the reform of institutions to increase stakeholder participation in environmental decision-making, especially those affected by a particular issue (Costanza et. al, 1997).

Ecological economists view a sustainable society as requiring a strong democracy where different viewpoints, values and aims are aired in free and open debates, and where citizens are well informed and given an equal standing with so-called experts (Prugh et al., 2000; O'Hara, 1995).

5. Summary

Environmental economics is one of the fastest growing academic fields and, (as the dominance of ecological modernisation discourse attests), its analysis has greatly influenced policymakers around the world. This is a significant achievement given that only a few decades ago environmental considerations held little or no sway within policymaking.

Environmental economists view sustainable growth as entirely possible as long as the circularity of the economy is increased, which effectively decouples environmental degradation from economic growth. If environmental externalities (such as pollution and waste) are internalised within prices, the market system can successfully deal with environmental problems by limiting demand for environmental 'bads' while increasing the appeal of environmental 'goods'. With the help of natural resource economics, scarce resources can be used sustainably. Moreover, environmental economists argue that if environmental goods and services are given a monetary value in economic decision-making, they are more likely to be protected.

In favouring the notion of 'sustainable growth' and the commodification of the environment, environmental economists are sometimes seen as materialist philistines by those in the Green movement. Environmental economists, on the other hand, see themselves as true environmental champions because putting a monetary value on environment goods and services ensures that they count in the 'real world' of finance and economic decision-making.

As we have explored in this chapter, there are strong criticisms of environmental economics emerging from more radical schools of thought such as ecological economics. While still on the fringes of academic inquiry, the emergence of this school indicates an increasing recognition among scholars that an understanding of the dynamic and complex physical systems on which economic activity depends is crucial to furthering the field of economics. Some of the critiques emerging from ecological economics are slowly being integrated into environmental economics (such as the need for a renewable energy *and* circular economy). Nevertheless, some would argue that these very different approaches represent fundamentally opposing paradigms and therefore may never be fully reconciled.

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Study 3

- Revell, A., Stokes, D. and Chen, H. (2007) "*UK SMEs and the Environment: Turning Over a New Leaf?*" Presented at the Corporate Responsibility Research Conference, Leeds, July 15-17th, 2007

UK SMEs and the Environment: Turning over a New Leaf?

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ABSTRACT

Previous studies on the environmental practices of SMEs in the UK and beyond have portrayed owner-managers as laggards who underplay their firm's environmental impacts and resist environmental management due to its perceived cost. Yet a new cross-sectoral survey of 220 UK SMEs suggests that this intransigent stance may be slowly changing. Responses indicate a high percentage of owner-managers actively involved in recycling, energy efficiency, responsible buying and selling, and efforts to reduce their carbon emissions. Owner-managers saw it as their responsibility to help solve environmental problems and were willing (at least in principle) to accept the costs of environmental regulations and taxation. Business owners were motivated not just by the 'push' of environmental concern and legislation but by the 'pull' of potential cost savings, new customers, higher staff retention and good publicity for their firms. The survey also found that owner-managers had resonance with the Stern Review's (2006) conclusions that the benefits of strong early action on climate change outweigh the costs, and that a transition to a low-carbon economy will bring opportunities for business growth. This indicates that SMEs may be coming round to the idea that there is a business case for sustainability, although some respondents were still unsure of the potential profitability of environmental action. The paper argues that a possible trigger for owner-managers' increasing environmental pro-activeness is the unprecedented levels of recent media and policy attention in the UK on issues such as climate change, which has heightened public concern and galvanised support for urgent environmental action. The paper argues that policymakers need to capitalise on this current mood of environmental goodwill within the business community by

targeting SMEs with stricter regulatory controls (whilst maintaining high levels of implementation and enforcement), combined with market-based incentives and local infrastructure developments.

Keywords: SMEs, environmental management, owner-manager, environmental action.

1. INTRODUCTION

Over the last decade, the degradation of the natural environment has become a major concern of scientists, governments, business leaders and the public at large. In a recent report, the Intergovernmental Panel on Climate Change (IPCC, 2007) concluded that there is now undeniable evidence that climate change is the result of human activities, and that urgent action must be taken to avert environmental collapse.

Commissioned by the UK government, the Stern Review (2006) stressed the dire economic as well as environmental consequences of continuing to adopt a 'business as usual' attitude towards environmental issues. This groundbreaking report on the economics of climate change made a positive case for action, asserting that "*tackling climate change is the pro-growth strategy for the longer term*". (Stern, 2006; p1-2). Stern concludes that global warming has the potential to shrink the global economy by 20%, yet taking action now could result in a mere 1% decrease in global GDP. Hitherto, the stance of many economists was to argue that the costs of mitigating climate change would outweigh the benefits to the economy. The Stern review has thus been particularly influential in dispelling complacent 'business as usual' attitudes and focusing the minds of political and business leaders on environmental issues. The outgoing Prime Minister Tony Blair even called it, "*the most important report on the future ever published by this government*" (BBC, 26th Jan, 2007).

Since the 1990s, environmental and social responsibility has featured ever more prominently within political and business agendas and 'corporate social responsibility' (CSR) is now a household phrase. The recent groundswell of support for urgent action to mitigate climate change has resulted in a new spate of green rhetoric from business leaders, who seem increasingly willing to accept that the benefits of acting now to reduce polluting emissions may outweigh the costs to their firm in the long term. Even US businesses, known for their recalcitrance regarding green issues, seem to be turning over a new leaf; for instance, major polluters (such as America's power utilities) have recently begun to lobby for 'strong federal action' to reduce carbon emissions (The Economist, June 2007).

While empirical evidence suggests that larger companies are increasingly integrating environmental management into their corporate strategies (see Groenwegen, 1996), previous research has shown that small and medium-sized enterprises (SMEs) lag behind in this respect. Research on the environmental practices of SMEs (see Hillary, 2000) has portrayed small firm owner-managers as:

- Ignorant of the environmental impact of their enterprise;
- Lacking the tools and resources to tackle environmental problems;
- Resistant to voluntary action due to the perceived cost, time, and resources required to reduce environmental impacts;
- Sceptical about the business benefits of sustainability;
- Difficult to engage in anything to do with reducing their environmental impact.

Nevertheless, the unprecedented levels of media coverage and policy focus on environmental issues in the wake of reports such as the Stern review and Al Gore's high-visibility 'An Inconvenient Truth' film and campaign may have encouraged small business owners to think more carefully about their environmental impacts.

In the UK, public concern about climate change has risen sharply; according to a recent poll by YouGov reported in *The Economist* (2007a), 85% of the public are now convinced that global warming is actually taking place and almost as many think that it will accelerate without urgent action. Public awareness of environmental issues has been heightened by the publication in early 2007 of the government's climate change bill, which set ambitious targets of a 60% reduction in carbon emissions by 2050. The bill has spurred a frenzy of green political rhetoric in the UK as the main parties try to outdo each other on 'eco-friendliness':

"It would be hard to exaggerate just how fashionable climate change has become in Britain in a short time ... This week David Cameron, the Tory leader, and Gordon Brown, the chancellor and Labour's leader-in-waiting, clashed head-on as each brandished claims to be the more ostentatiously and radically green. The spur was the publication, on March 13th, of the government's climate change bill. Britain

has longed fancied itself a world leader on the matter...Indeed, climate change has become as much a political battleground as health, education or immigration” (The Economist, 2007b).

Corporate culture has responded to this upsurge of environmental activity, and large firms have been stepping up their CSR activity accordingly (BBC, 27th June, 2007). For instance, major UK retailers such as Marks and Spencer and Tesco have recently introduced new policies to protect the environment and to trade more sustainably, whilst high profile companies such as Barclays Bank, HSBC, British Land PLC, and BSkyB have pledged to become ‘carbon neutral’.

Nevertheless, SMEs represent such an important part of the UK economy that reform cannot succeed without the active support of their owner-managers. It is therefore critical to understand if the hitherto indifferent and intractable small firm sector is also shifting its position. The aim of this research is thus to explore how the attitudes and practices of owner-managers have changed, if at all; to identify the main barriers and drivers of environmental reform; and to explore owner-managers views on policy initiatives that might improve the environmental performance of SMEs.

2. LITERATURE REVIEW

2.1 The Environmental Impacts of SMEs

SMEs account for over 95 % of private sector firms in most industrialised economies (Schaper, 2002). In the UK, SMEs (employing less than 250 people) account for 99.8 % of the four million plus businesses in the private sector (Small Business Service, 2006: Table 1). This number is set to grow due to more flexible production methods, outsourcing of large firms, and increases in franchising and self employment (Stokes and Wilson, 2006).

The large population of SMEs ensures that this sector has a significant impact on the

environment. A commonly quoted estimate of SME's cumulative environmental impact is that they contribute up to 70% of all global pollution (Hillary, 2000). The Marshall report (1998), estimates that SMEs in the UK are responsible for as much as 60% of industry's carbon dioxide emissions, whilst the Environment Agency (2003) estimates that UK SMEs are responsible for 60% of commercial waste, and 80% of pollution accidents. Due to this collective impact, scholars and policymakers are increasingly recognising the integral role that small firms must play in resolving environmental problems.

2.2 Drivers and Barriers of Environmental Reform

Despite their potential to affect the environment and society, previous studies have found that small firm owners tend to be ignorant of their firm's environmental impact (Environment Agency, 2005; 2003; 2002; Hillary, 2000), and are "*difficult to reach, mobilise or engage in any improvements to do with the environment*" (Hillary, 2000; p18). Policymakers have tended to put this laggardness down to owner-managers' lack of understanding of the business benefits of environmental reform. As environmental standards typically target large rather than small firms (Gunningham and Sinclair, 2002), the UK government has placed much emphasis on the potential of market drivers to encourage the 'greening' of the SME sector. The 'business case for sustainability' is stressed in key policy documents such as the Department of Trade and Industry's 'Sustainable Development Policy' (2000), which expounds encouragingly on the opportunities arising from green consumerism, the development of green technology markets, the cost benefits of efficiency gains, and the good publicity that can result from environmentally sound business practices (DTI, 2000; Revell, 2007).

The academic literature also cites numerous benefits of environmental management. For instance, Welford and Gouldson (1993) and O'Laire and Welford (1996) highlight that environmental reform can result in improved competitiveness, product quality, materials efficiency and staff commitment, along with positive pressure group and community relations, lower insurance premiums, cheaper finance and improved media coverage.

However, whilst there is no doubt that these market drivers have the potential to encourage environmental action, studies show that in reality SMEs often find the market more of a barrier than a driver of environmental good practice (Revell 2007; Drake et al., 2004; Rutherford et al, 2000; Hillary, 2000). This has encouraged many owner-managers to be somewhat sceptical of the 'business case for sustainability' (Revell and Blackburn, forthcoming).

For instance, while cost savings from eco-efficiencies tend to be the key promise of government-funded environmental initiatives such as 'Envirowise' and 'Action Energy', the Environment Agency's latest 'Netregs' survey (2007) of 4,489 UK SMEs in 15 different sectors found that only 13% were motivated to undertake environmental measures to reduce costs (down from 16% in 2005). Similarly, Groundwork's survey of 300 firms (Smith and Kemp, 1998) and Baylis et al's (1998) survey of 914 firms found that only 12% and 18% of UK SMEs respectively were motivated by cost savings.

Revell's (2007) interviews with 40 SMEs in the UK's construction and restaurant industries found that respondents did not perceive the paybacks from eco-efficiency measures to be worth the investment in time and resources required to pursue them. For instance, many owner-managers felt that the extra labour involved in setting up recycling systems and ensuring employees separated waste properly would cost the firm more than the compensation gained from reduced waste fees. Moreover, the market was reportedly doing little to signal to business owners that product value could be raised or customers won by improving their firms' environmental performance.

Similarly, Drake et al.'s (2004) interviews with 42 UK SMEs in the baking and refrigeration industries found a lack of faith in the so-called 'win-win' opportunities of environmental management, with most believing that green credentials did not sell more products. Drake concludes that a lack of consumer demand is a key barrier for firms, and that government policy should be focused on stimulating consumers as well as businesses to embrace environmental good practice. These findings are not confined to the UK alone; McKiever and Gadenne (2005) surveyed 116 Australian SMEs and found that only 19%

equated improved environmental performance with increased sales.

Hillary's (2004) review of 33 studies of EMS (environmental management system) adoption amongst SMEs found that a key reason for non-adoption was an absence of pressure from customers. Other studies confirm this lack of pressure for 'greening' the supply chain with evidence that, where pressure is exerted, it tends to be concentrated on larger, first tier firms and often does not cascade further down the supply chain to smaller firms (Revell, 2007; Drake et al. 2004; Verheul, 1999; Bianchi and Noci, 1998; Merritt, 1998; Rowe and Hollingsworth 1996).

Simpson et al.'s (2004) cross-sector survey and telephone interviews with 64 UK SMEs found that 75% saw environmental measures as a cost, and 80% of respondents were against any link between environmental improvement and increased customer satisfaction. Rather than perceiving new market opportunities from green consumerism, SMEs were also more inclined to imagine markets closing to them if environmental standards became stricter. Simpson et al. (2004) concluded that there was little competitive advantage to be gained by SMEs adopting environmental good practice, as product or process differentiation could too easily be copied by competitors. Moreover, even where 'win-win' opportunities were perceived, owner-managers very often lacked the strategic ability to translate their environmental actions into a competitive advantage.

Supporting this, McKiever and Gadenne (2005) note that poor levels of strategic awareness amongst SMEs has resulted in few firms incorporating environmental messages in product marketing. Bianchi and Noci (1998) report that SMEs find it difficult to publicise their environmental efforts to external stakeholders, and so typically fail to reap the benefits of an enhanced reputation from their green activities.

These studies suggest that 'win-win' outcomes from environmental management have yet to materialize for most small businesses. Instead, many researchers highlight the predominance of 'push' over 'pull' factors in motivating improvements. For instance, the Observatory of European SMEs' (2002) surveyed 7,600 SMEs in 19 countries, and found

that regulation was overwhelmingly the most important driver of environmental reform. Masurel (2007) found that satisfying legislation and 'moral duty' were the key motivating forces for Dutch SMEs. Drake et al. (2004) found that regulation was not only an important driver of environmental activity but also played a wider role in shaping definitions of 'the environment' and raising owner-managers' awareness of environmental problems. They highlight that firms are reluctant to make changes involving financial risk and so prefer to wait for regulatory certainty before acting to reduce environmental impacts.

2.3 The 'Value-Action' Gap

Perez-Sanchez et al. (2003) argue that the values and attitudes of owner-managers are highly influential factors in determining whether SMEs embrace environmental good practice. Studies from all over the world show that SME owner-managers have strong altruistic feelings towards the environment, with environmental issues seen as an important issue by 80-90% of respondents (Schaper, 2002). Nevertheless, numerous studies also highlight a significant 'value-action' gap, where the extensive barriers experienced by owner-managers mean that their generally positive environmental attitudes rarely translate into concrete action (Tilley, 1999; Schaper, 2002; Mckiever and Gadenne; 2005, Hitchens et al; 2005).

These barriers include external factors such as the lack of consumer demand and supply chain pressure for environmental reform. They also include internal barriers, such as owner-managers' perception that their firms' impact is negligible (Environment Agency, 2003, 2002; Smith and Kemp, 1998; Hillary, 1995); that environmental management is a cost burden which can result in a loss of competitiveness (Revell and Blackburn, forthcoming, Simpson et al, 2004; Rutherford et al, 2000; Smith and Kemp, 1998; Petts et al, 1999); that there is not enough time or money for environmental management (Revell, 2007; de Bruijn and Hofman, 2001, Verheul, 1999) ; and that the responsibility for environmental reform lies with others, especially government (Vernon et al, 2003; Rutherford et al. 2000). Studies have found that owner-managers have a poor

understanding of the knowledge and skills required for environmental management and a sceptical attitude to using external support (Tilley, 1999; Hillary, 2000; Perez-Sanches et al. 2003).

Such barriers have encouraged a great deal of inertia towards environmental reform amongst SMEs, and where improvements are undertaken they are typically ad hoc 'end of pipe' measures rather than strategic innovations and pollution prevention measures (Schaper, 2002).

2.4 Closing the Value-Action Gap

A particular problem in reviewing published literature in a dynamic context is that it reports on research carried out some time before publication takes place. Many articles are based on studies undertaken several years before because of the lead time for peer review and publication. This is particularly important in this context, as the current media and policy focus on issues such as climate change may be having an effect on business owners.

Whilst studies in the past have highlighted a culture of environmental inaction amongst SMEs (Hillary, 2000), the Environment Agency's latest 'Netregs' survey (2007) indicates that UK owner-managers are undergoing a steady improvement in their environmental practices and awareness. The report found that since their previous survey of over 5,000 SMEs in 2005 (Environment Agency, 2005), there has been a significant increase in the number of firms engaged in activities to reduce environmental harm (48%, up by 17% since 2005) along with impressive increases in the number of SMEs developing an environmental policy (40%, up by 26% since 2005). The survey also found an increase in the awareness of owner-managers regarding their environmental impacts, particularly amongst larger SMEs. Levels of awareness of environmental legislation had also increased by 7% since 2005.

Interestingly, the Netregs (2007) report found that while SMEs saw the main benefit of addressing environmental issues as reduced risk of prosecution and good customer

relations, the most important driver of reform was in fact owner-managers' concern for the state of the environment, with approximately two-thirds of respondents claiming to be motivated by this reason (up 10% from 2003's findings). In contrast, 30% of businesses were driven by the need to comply with regulations, and just 13% by the prospect of reduced costs. Interestingly it was the smallest firms which were most likely to be motivated by environmental concern; they were also far less motivated by commercial benefits or legislative pressure.

Supporting this finding, Vernon et al's (2003) study of micro-firms in the UK found that altruism was one of the most important drivers of environmental action. Recent studies in other countries such as the Netherlands, Northern Ireland and Canada confirm that environmental concern and 'satisfying moral duty' are highly motivating factors for SME owner-managers (Masurel, 2007; Environment Agency, 2005, Dulipovici, 2002).

Simpson et al (2004) found that many UK SMEs were investing substantial resources in environmental improvements without an expectation of return. Just over three-quarters of owner-managers saw the environment as a key business issue and just under two-thirds were proactively involved in improving their firm's environmental performance, despite the fact that the majority of respondents saw environmental measures as a cost that could not be passed on to customers.

These results suggest that moral imperatives may now be playing more of a role in spurring SMEs into action. Owner-managers may also becoming increasingly convinced that initiating the greening process now may bear fruit in future. In Simpson et al's (2004) study, respondents highlighted the changing demands of important customers and perceived a possible trend for greater demands for environmental management in the future. Similarly, in McKiever and Gadenne's (2005) study, 40% of owner-managers reported that the growing trend towards 'clean and green' was beginning to have an impact on their business, and 44% felt that the trend would impact their business in the future.

The results of these recent studies indicate that something may be shifting in the SME

population. It therefore seems timely to investigate whether the growing trend for 'clean and green' in the UK is now sufficiently strong to overcome the considerable barriers to environmental reform experienced by small firm owner-managers.

3. METHODOLOGY

3.1 Research Design

The research design was quantitative with some qualitative support. The principle research instrument was a questionnaire survey sent to 2,500 small firm owner-managers, all of whom were tenants of the Workspace Group in London and the South East. 220 usable responses were obtained between December 2006 and February 2007. Additionally, 10 interviews involving telephone, email and face-to-face discussions and observation were conducted to add further depth to the findings.

The questionnaire was structured to collect data on the following topics:

Section A – Owner-managers' attitudes to environmental and social responsibility issues

Section B – SME current environmental practices

Section C – Drivers for environmental management

Section D – Barriers to environmental management

Section E – Proposals for change

Section F – Networks

Section G – Respondents and business profiles

220 replies from a mail out of 2,500 questionnaires implies a fairly reasonable response rate of 8.8 percent. Although this sample presents good opportunities for analysis as a single group, its size does present some issues of representation that were further evaluated. Non-response could affect the validity of the research if there are reasons why one group of tenants were more likely to reply than others. However, the follow up letter to the original e-mailing did give further opportunities for responses (100). To test whether the

characteristics of the respondents from the original responses were similar to the non-respondents at this time (i.e. those who responded later), a T-test was conducted for the demographics (e.g. age, educational qualification), attitudes towards environmental issues, and current practices. The results indicate that the characteristics of the respondents from the original responses were similar to the non-respondents (i.e. the T-test is not significant $p < 0.05$).

To enrich the findings from the quantitative research, telephone, email and face-to-face interviews were conducted with 10 survey respondents using a semi-structured interview guide. The interview guide was structured to collect information on the following topics: information about firm; specific environmental and social responsibility practices; drivers of environmental reform; barriers to environmental reform; help and support; and contribution to Corporate Social Responsibility (CSR). The interviews were open-ended to encourage more detailed responses from interviewees, and were recorded and subsequently transcribed for analysis. Five of the 10 were face-to-face interviews conducted in the workplace, supplemented by observation of environmental practices and internal literature.

3.2 Sample

Of the 220 respondents surveyed, two thirds were micro-sized enterprise owners (headcount less than 10). 27% were defined as 'small' (headcount between 10-49) and only 5% were medium-sized (headcount between 50 – 249). Firm size was in fact slightly larger than average for London and the UK; however, this is to be expected as the sample was from those leasing space and therefore excluded those very small enterprises working from home.

The creative industries formed the largest business sector (33%). This is possibly due to the fact that this sector encompasses a wide array of activities, from film and television to architecture and computer software development. It is also a very populous sector in London. The rest of the sample included business and professional services (17%),

charities and voluntary organisations (16%), wholesale and retail firms (6%), manufacturing companies (4%); construction (3%) and transport, travel and storage (2%).

INSERT FIGURE 1 NEAR HERE

3.3 Limitations of the Research

Whilst an 8.8% response rate presents good opportunities for analysis of the sample as a single group, its small size does present some issues of representation. The nature of the sample excluded those businesses whose owners work from home, hence micro-firms, were not well represented. Moreover, as the research was London-based, there were a high percentage of business services, creative industry and non-profit enterprises, which offers potential for further bias. However, statistical analysis suggests that neither size nor industry sector had a significant bearing on response. An ANOVA analysis was used to test whether business profile was associated with owner-managers' attitudes and environmental practices, and the results found that, overall, neither size nor sector significantly affected the survey responses.

4. FINDINGS

4.1 Attitudes towards Environmental Management

Owner-managers expressed highly positive attitudes towards taking action on the environment (as shown by Table 1), which indicates their levels of agreement with key statements derived from the literature on environmental strategy and policy. Over 80% agreed that environmental issues should be a very high management priority (Statement 1, Table 1), and in contrast to other studies (see Vernon et al, 2003; Rutherford et al, 2000), owners were much more inclined to emphasise their own role in solving environmental

problems rather than putting the onus on government to take the lead. Almost 90% of respondents disagreed that the government should be left to tackle environmental issues (Statement 3, Table 1), and 64% thought that it was their own responsibility to solve environmental problems (Statement 4, Table 1). A cross-tabulation of these attitudinal results with respondents' financial standing indicated that small firms describing themselves as financially 'thriving' were particularly positive about their ability to tackle environmental concerns on their own, probably because they have more resources to devote to environmental management than those that are ailing.

INSERT Table 1. ATTITUDES TO ENVIRONMENTAL STRATEGY AND POLICY
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Respondents were also much less likely to underplay their firm's environmental impact than in previous studies, with three quarters of respondents disagreeing that their businesses were too small to have an impact (Statement 2, Table 1). Respondents were also significantly more positive about the relative costs and benefits of environmental action, as well as the potential business opportunities arising from solutions to environmental problems. 77% of respondents agreed with the Stern Review (2006)'s conclusions that the benefits of strong early action on climate change outweigh the costs (Statement 7, Table 1) and 61% of respondents agreed that the transition to a low-carbon economy will bring opportunities for business growth (Statement 8, Table 1). However, there was still some ambivalence as to whether environmental measures could actually increase profits, with just over a third disagreeing and a third reportedly unsure (Statement 9, Table 1).

4.2 Environmental Practices

Despite their equivocal stance on the profitability of environmental management, the majority of respondents were proactively engaged in measures to reduce their environmental impacts, as shown by Table 2. 91% of respondents claimed to be engaged in recycling (Statement 1, Table 2) and 85% in energy efficiency measures (Statement 3,

Table 2). 68% of owner-managers were adopting sustainable office practices such as minimising paper usage (Statement 2, Table 2) and 70% were involved in responsible buying and selling, such as buying fair traded and locally produced products, and/or developing products with environmental benefits (Statement 11, Table 2). Around half of the sample were attempting to reduce carbon emissions (Statement 5, Table 2) and using environmentally-friendly products (Statement 4, Table 2).

INSERT TABLE 2 ENVIRONMENTAL PRACTICES NEAR HERE

However, only 24% of the sample had adopted EMS or written a formalised environmental policy document (Statement 7, Table 2). This finding corroborates the Environment Agency's (2005) study which found that 25% of SMEs had written an environmental policy, and only 6% had adopted an EMS. This suggests that SMEs tend to undertake environmental measures in an ad hoc, piecemeal way and lack a more strategic focus to environmental management. Moreover, like Bianchi and Noci's (1999) study, the majority of owner-managers were not communicating their environmental efforts to stakeholders (Statement 7, Table 2) and were therefore not capitalising on any goodwill that might have arisen from their green activities.

4.3 Environmental Drivers

Business owners were increasingly positive about the business case for sustainability, as shown by Table 3. Nearly two-thirds of respondents claiming to be motivated by the potential to attract new customers (Driver 2, Table 3), and just under three-quarters by the potential for cost savings derived from energy and resource efficiency measures (Driver 14, Table 3). This may explain the very high numbers engaged in recycling and energy saving measures.

Previous research has indicated the predominance of 'push' over 'pull' motivations to tackle environmental issues, with regulations having the most significant potential to drive reform amongst SMEs. Whilst government policies are still clearly an important catalyst

for action, this research indicates much more of a mix between potential pull and push motivations, with pull factors such as attracting customers (Driver 2, Table 3), good publicity (Driver 1, Table 3), retaining staff (Driver 15, Table 3) and breaking into new markets (Driver 3, Table 3) ranking only marginally less highly than the push factors of legislative controls and fiscal incentives (Drivers 12 and 13, Table 3). The fact that the majority of SMEs felt that being environmentally responsible could attract new customers and result in good publicity makes it all the more interesting that owner-managers were not communicating their environmental practices to stakeholders in any formalised way.

INSERT TABLE 3 ENVIRONMENTAL DRIVERS NEAR HERE

Supporting other studies, subsequent interviews with survey respondents indicated that one of the most important motivators of environmental reform was owner-managers' own personal concern for the environment. Responses revealed a perception that a shift was occurring in the stance of business owners due to this heightened concern:

"Things have been changing nowadays as you can hear or see from TV regarding environmental issues - that's why there is a shift from negative to positive attitudes [amongst SMEs]. So I think sometimes [environmental action] is really down to individual belief" (Restaurant owner)

"Since the beginning of the year we heard so much about climate change and we heard on TV what needs to be done. This makes a huge difference compared to last year, which I am really happy about. Let's hope that this will continue. Let's hope that people do not just talk about it for a few months and then forget about it" (Food distribution company manager)

4.4 Barriers to Environmental Reform

In previous research, a significant barrier to environmentally sound business practices has been the general perception amongst SMEs that environmental management is a cost

burden which can result in 'free riders' gaining competitive advantage (Revell and Blackburn, 2007; Revell, 2007; Hillary, 2000). It is interesting to note that in this study less than half of the sample (45%) was concerned about a loss of competitiveness, as shown in Table 4 (Barrier 1). Clearly SMEs may be coming round to the idea that environmental management offers potential business benefits.

INSERT TABLE 4 BARRIERS TO ENVIRONMENTAL REFORM NEAR HERE

However, it is equally important to note that a clear majority (63%) saw increased costs as a major barrier to further improvements (Barrier 2, Table 4), and that over two-thirds of SMEs were still sceptical or unsure as to whether being environmentally-friendly could increase profits. Concern about rising costs were significantly correlated with environmental practices and attitudes; the higher that costs were rated as a barrier, the less likely respondents were to act to reduce impacts or to have predominantly positive attitudes. This has important connotations, as it indicates that SMEs' proactive behaviour may wane once the so called 'low hanging fruit' of efficiency gains have been achieved and environmental measures begin to have negative financial impacts.

Confirming previous studies, a major barrier to environmental action for some SMEs was a perceived lack of time to devote to environmental management, with 53% rating this as an obstacle (Barrier 3, Table 4). However, arguably the amount of time owner-managers are willing to spend on environmental responsibility reflects the degree to which it is considered key to the business agenda. Although over 80% of respondents claimed that environmental reform should be a top management priority (Statement 1, Table 1), the fact that more than half reported lack of staff time as a barrier to improvements suggests that owner-managers still find it difficult to translate good intention into action. Policymakers thus need to introduce further incentives to overcome the 'value-action' gap.

One possible incentive is to make voluntary action easier and more convenient for small firms by improving the local infrastructure. Over half the SMEs in this study (53%) reported that poor infrastructure to support environmental activity was a major barrier to

reform (Barrier 8, Table 4). For instance, case study respondents mentioned that a lack of recycling facilities at their business sites had created obstacles to better waste management practices.

Another interesting finding was that only just over a third of respondents cited lack of information as a barrier (Barrier 7, Table 4), yet 57% reported that they would like more information on how to be environmentally-friendly (Statement 6, Table 5). Clearly many owner-managers are open to receiving more information, but do not feel that this is a key reason why they have not implemented environmental measures. This suggests that there is a good case for policymakers to invest in further educational and partnering schemes with business owners to enhance their understanding of environmental management techniques. However, it also suggests that it may not be a good idea to rely on owner-managers taking the initiative for finding out about these schemes themselves, as most do not feel they lack the requisite knowledge to undertake reforms.

4.5 Encouraging Change

Respondents were generally positive about the potential role of legislation in encouraging environmental reform within the SME sector. Table 5 indicates that 60% of SMEs agree that regulations ensure a level playing field amongst firms (Statement 5, Table 5), and that there should be more legislation to control the environmental impacts of all businesses (Statement 3, Table 5). Respondents were also positive about the role of market-based measures, with 65% agreeing that eco-taxes should be used to switch businesses away from high-carbon goods and services (Statement 2, Table 5). Moreover, 53% argued that carbon pricing schemes and trading were essential to reduce emissions (Statement 1, Table 5).

INSERT TABLE 5 ENCOURAGING ENVIRONMENTAL CHANGE NEAR HERE

The survey also revealed that over two-thirds of respondents were involved in local networks, (mainly trade associations or other industry bodies) and a high percentage were

very positive about the potential role of these partnerships in encouraging environmental reform. 70% of respondents agreed that businesses should not act alone but together in networks to tackle environmental issues (Statement 10, Table 5), and 67% agreed that trade associations and networks should play more of a role in helping businesses become environmentally-friendly (Statement 12, Table 5). . This finding is in line with previous research which has highlighted the influence that trade associations and industry networks can have in encouraging environmental reform and innovation amongst SMEs (Bowen, 2002; Boleat, 1996, North et al., 1997, Hunt, 2000; Smith and Kemp, 1998).

Nevertheless, it is interesting to note that only a relatively low percentage (22.2%) of SMEs were involved with the specific organisations that promote environmental and sustainable practices in London. Owner-managers clearly prefer sector-specific networks versus generic bodies with specific environmental or social agendas. In order to investigate the effect of environmental networks on attitudes and current practices, a Chi-Square analysis was used. The results indicated that involvement with networks such as London Better Together, London ReMade, and WRAP affected the importance of owner-managers' current environmental practices, but not their attitudes. Although membership of these networks was relatively low, their impact on the actions of SMEs can thus be very high.

5. DISCUSSION

The findings of this research confirm some of the conclusions of the survey by the Environment Agency (2005) which reports an improvement in the environmental practices and awareness of SMEs in the UK. The fact that three-quarters of respondents in this study disagreed that their firm was too small to have an environmental impact indicates a major change compared to previous studies highlighting very low levels of awareness regarding the 'ecological footprints' of SMEs.

Policymakers and environmentalists will indeed be heartened by the results, for not only were small business owners in this study showing highly positive attitudes towards

environmental management, but they were beginning to take practical steps to become more environmentally responsible, with high percentages involved in recycling, energy efficiency, responsible buying and selling, and efforts to reduce their carbon emissions. Policymakers can also take heart that owner-managers were increasingly convinced that environmental problems require urgent action, and were therefore ostensibly welcoming of further policies that tackle key issues – despite the additional costs that this could impose on their business. The fact that SMEs were prepared (at least in principle) to accept these costs is all the more remarkable considering that small firm owners are usually the first to complain about the impact of government policies - particularly regulation - on their business.

Moreover, their positive reactions towards policy initiatives to reduce carbon emissions such as carbon pricing and eco-taxation suggests that the stark warnings of Stern and the scientific community regarding climate change may be having an effect. These findings lend credence to the idea that the recent upsurge in media coverage on environmental issues may have been a catalyst for a sea-change in the hearts and minds of SME owner-managers.

Policymakers may well argue that owner-managers' newfound environmental pro-activeness is the result of a growing resonance with political rhetoric emphasising the business case for sustainability. The majority of SMEs in this study clearly supported Stern's (2006) assertions that 'the benefits of strong early action on climate change outweigh the costs', and that 'the transition to a low-carbon economy will bring opportunities for business growth'. This indicates the possible influence of Stern in convincing business owners that there is indeed a business case for making environmental reforms. Certainly it appears that owner-managers are increasingly willing to accept the idea that future economic growth is predicated on long term environmental protection, and that environmental solutions may also result in business opportunities. As public concern for the environment has risen in the UK, many SMEs are clearly becoming more confident that being environmentally responsible can result in good publicity, which in turn may win customers and help to retain staff - even if owner-managers are not always good at actually

communicating their environmental efforts to stakeholders. SMEs are also clearly convinced that measures such as recycling and saving energy can help to reduce costs.

However, it is evident from this research that many owner-managers are still unsure about whether environmental protection can result in increased profits, and, like other studies, the majority still see cost as a potential barrier to environmental good practice. Arguably, this may be because SMEs tend to only perceive clear financial benefits from efficiency measures such as recycling and energy efficiency, and remain concerned that other environmental measures will be prohibitively costly. This has important implications in terms of what might drive the greening of SMEs in the future, and whether owner-managers will be willing to invest in more radical and comprehensive improvements once the so-called 'low hanging fruit' of efficiency gains are gone. Their ambivalent feelings about the financial benefits and cost of environmental protection also suggests that owner-managers are concerned that there may be market sector 'winners' and 'losers' as a result of environmental change, and that environmental pro-activeness may not always result in economic gains for all firms.

Arguably, SMEs' proactiveness may be as much to do with the strength of their concern for the state of the environment as to do with self-serving perceptions of the business case for sustainability. This is certainly borne out by the Environment Agency's (2007, 2005, 2003) surveys and other studies, which have found environmental concern to be the most significant driver of environmental action amongst SMEs. The fact that owner-managers are increasingly seeing it as their responsibility to help solve environmental problems may be one reason why SMEs seem more willing to bear the costs of eco-taxes and legislation to achieve environmental goals.

Despite their good intentions, the SMEs in this study tended to focus on ad hoc measures such as energy and resource efficiencies rather than strategic activities such as EMS adoption, environmental policy writing and stakeholder communication. This confirms previous studies which highlight the reactive and piecemeal nature of environmental reform within the SME sector (Schaper, 2002). The fact that owner-managers are not

communicating their environmental activities to stakeholders indicates that whilst they are increasingly willing to reduce environmental impacts, SMEs are weaker in the area of policy and strategy. It certainly suggests that if owner-managers were to market their efforts to improve the sustainability of their firm in a more strategic way, they may be more likely to see a direct relationship between environmental action and profitability. This fits more generally with the pattern of SMEs adopting emergent rather than deliberate strategies (Stokes and Wilson, 2006).

6. RECOMMENDATIONS

These findings highlight the important role that policymakers can play in encouraging more strategic and comprehensive environmental reforms amongst the SME sector. Arguably, small firms need to be targeted with a mix of policies which include: environmental regulations; market-based instruments (MBIs); infrastructure developments; networks and voluntary initiatives. The cases for each of these are developed below.

6.1 Environmental Regulations

Tougher legislation whilst maintaining high levels of implementation and enforcement is key to ensuring the greening of the SME sector. This is particularly as policy initiatives in the UK have tended to focus on large rather than small firms, and therefore SMEs have been under comparatively less pressure to reduce their environmental impacts.

Regulatory certainty also helps to ensure that environmental management becomes more integrated into long-term business strategies. For instance, the government's new climate change bill has outlined binding five year carbon budgets in order to reach its carbon reduction targets. Set fifteen years ahead, this gives a clear indication of future public policy and thus gives business the certitude it needs to make consistent environmental investments.

Nevertheless, as Drake et al. (2004; p. 184) highlight, "*environmental legislation does not*

guarantee subsequent innovation. Regulatory compliance can become an end in itself, rather than marking a transition to ecological modernisation". Regulation can encourage reactive rather than proactive behaviour, along with antagonistic perceptions of environmental and commercial interests, or government and business interests. Regulations thus need to be flexible enough to encourage SMEs to be innovative, to find solutions that fit the highly heterogeneous nature of their individual business contexts and to engage in compliance-plus behaviour. Along with this, full engagement between regulators and SMEs is to be encouraged as it helps business owners to understand their regulatory obligations and to find ways of reducing impacts at least cost.

6.2 Market-Based Instruments (MBIs)

MBIs such as taxes, subsidies and tradable permits have become increasingly popular policy tools for encouraging environmental change amongst producers and consumers. However, key to ensuring that MBIs are effective is to set prices high enough to incentivise a behaviour change. For instance, studies have found that the UK landfill tax has failed to be a major driver of change in SME waste management practices because owner-managers find it easier - and less costly - to pay the tax rather than change their waste practices (Revell 2007, Simpson et al, 2004). Ensuring that prices reflect the true social cost of production should thus be a major priority for policymakers, otherwise MBIs will do little to change 'business as usual' attitudes within the SME sector.

6.3 Infrastructure Developments

Another important factor in motivating behavioural change is the ease with which environmental measures can be carried out. Improvements in the local infrastructure are a crucial factor in supporting environmental management as they can offer SMEs a convenient green alternative to current practices. For example, public transport investments can facilitate a reduction in vehicle emissions, and curb-side collection encourages higher rates of recycling.

6.4 Networks

Owner-managers' positive attitudes regarding the potential influence of local business and environmental networks should encourage policymakers to continue to develop partnerships to support environmental management. Networks can help to build relationships between SMEs and government, and play a key role in building the kind of cooperative relationships and trust needed for collective action to solve environmental problems.

Local networks, particularly those that focus on certain aspects that interest the owner-manager (e.g. business sector; women entrepreneurs) are more likely to attract active membership than generic regional or national networks (Stokes and Wilson, 2006). This is reflected by the fact that in this study, there was a higher percentage of members in local industry bodies than in environmental networks. It is important therefore to build environmental concern and actions through existing networks rather than a set of new ones. The relatively high impact of the specialised networks on a relatively few owners indicates the importance of their contribution, which could be magnified significantly if integrated into local trade networks.

6.5 Voluntary Initiatives

Clearly there should be continuing support for information provision via environmental best practice programmes and eco-labeling schemes to make the most of owner-managers' reported willingness to take voluntary action. Whilst training and technological assistance from government can certainly help small firms, voluntary initiatives tend to be much more effective if backed up by clear environmental policies and enforcement of regulations. This research thus corroborates the findings of other studies which recommend that UK policymakers avoid a singular focus on a voluntary approach for SMEs (see Revell, 2007; Revell and Rutherford, 2003; Simpson et al, 2004; ten Brink, 2002; Rutherford et al, 2000).

Clearly, the interplay of policy tools and the dynamics of the policy mix targeting SMEs are of utmost importance in encouraging reform in such a vast and heterogeneous sector of the economy. As all policy instruments have both strengths and weaknesses, it is often a combination of policies that has the most success. Gunningham and Sinclair (2002) suggest that in some contexts a sequenced approach, which escalates from cooperative to more interventionist approaches, is the best way to encourage environmental reforms. Education initiatives are clearly needed from the outset to ensure that SMEs have the expertise and capacity to carry out environmental improvements. However, where these fail to encourage wide-scale reforms (as they have in the UK), there is justification for the introduction of policies such as economic incentives and sanctions (accompanied by continued funding for education initiatives to ensure that SMEs can respond to such policies). In other situations, a mix of instruments used concurrently may be the most effective method. Studies suggest that firms in different sectors and contexts are likely to respond differently to the same incentives. The right combination of policies is thus most likely to be found if the varying circumstances of SMEs are recognized.

7. FUTURE RESEARCH

If the results of this study can be generalised to the wider population of UK, it is heartening to think that environmental management is now beginning to feature more highly on the business agendas of SMEs. Although the findings obtained in this research can only be generalised for SMEs in the London area, other research has indicated that the business population of the capital city is a good barometer for the rest of the country. Examining whether these findings can be generalised to the whole of the UK and other countries is therefore an important area for future inquiry.

Further empirical research is also needed to confirm whether a major shift is indeed occurring in the hearts and minds of UK business owners, as recent studies can only describe their results in terms of an emerging rather than an established trend. As such, this study can be considered an exploratory piece of research indicating a promising trend

towards greater environmental pro-activism amongst owner-managers. Further clarification is needed regarding the kinds of environmental reforms that SMEs are undertaking (for instance whether energy saving practices are primarily confined to ad hoc measures such as turning off lights when not in use, or whether more strategic investments are being made, such as use of low carbon technologies). This is critical to discerning whether owner-managers' newfound pro-activism is merely a temporary response to a perceived transient wave of environmentalism within society, or an indication of longer-term strategic changes in business practices.

It is also important to highlight that the data for this research was collected within a short period of time and therefore only provides a snapshot of the attitudes and practices of SMEs regarding environmental and social responsibility. A longitudinal study can expand this view over a longer time-frame, which may help to eliminate variables that can produce anomalies in the results.

Furthermore, both qualitative and quantitative research is needed to delve deeper into the barriers and drivers of environmental reform and the dynamics between 'push' and 'pull' factors. For instance, how will current changes in public attitudes, corporate culture, market dynamics and government policy influence the environmental behaviour of SMEs in the future? Which combination of drivers and policy tools are most likely to effect change? How far can the market encourage environmental reform before further legislative and fiscal measures are needed to stimulate innovation amongst SMEs?

Finally, it would be useful to explore SMEs' awareness of and reactions to media and policy reports to assess their influence on firm behaviour. For instance, a longitudinal study on SME attitudes and behaviour after important publications such as the Stern review (2006) might draw insights into emerging perceptions and changing discursive practices regarding environmental issues.

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Figure 1 Business Sector of Respondents

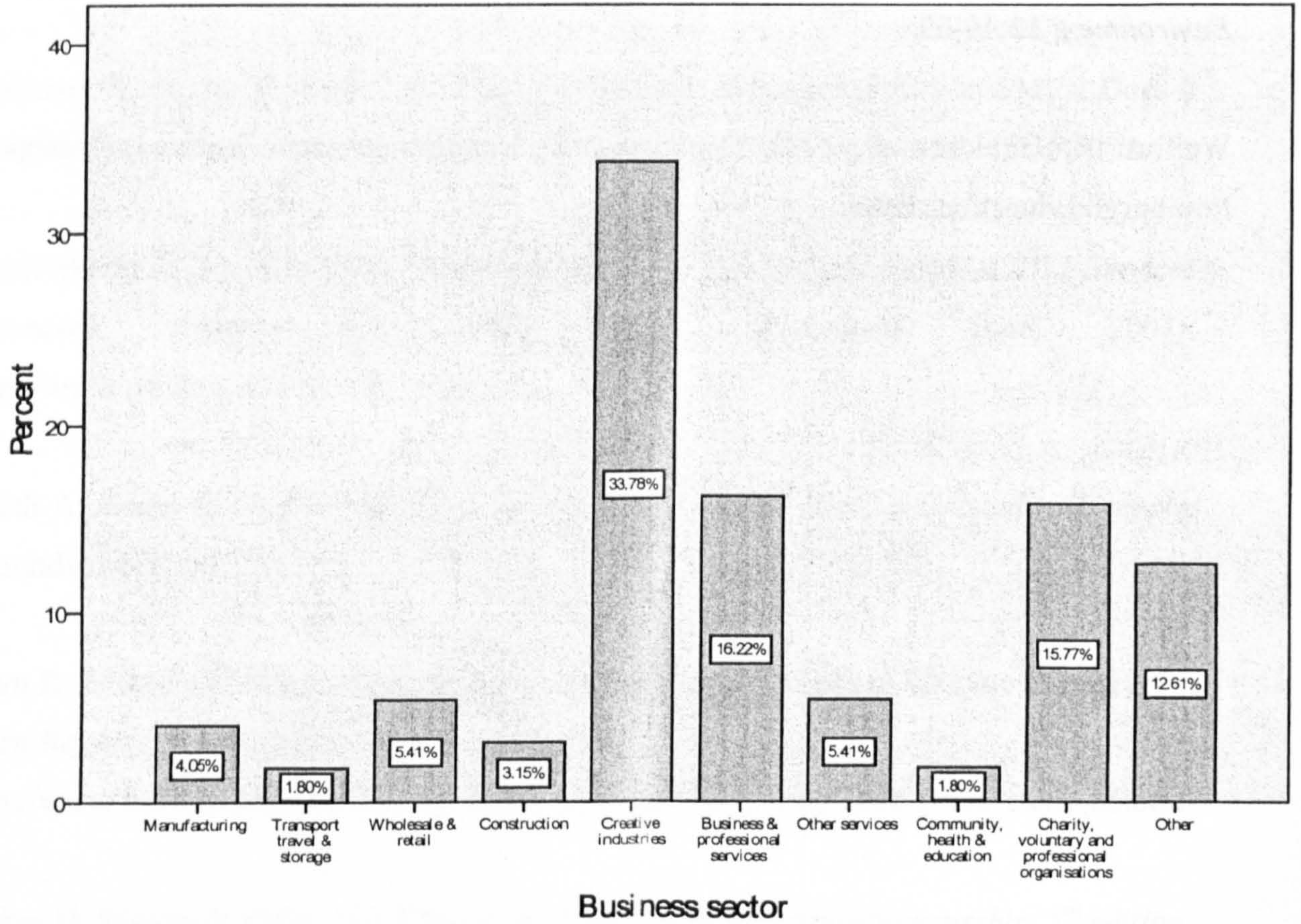


Table 1. Attitudes to Environmental Strategy and Policy

Statements	Strongly Disagree %	2 %	3 %	4 %	Strongly Agree %
1. Environmental issues should be a very high management priority	0.9	4.6	12.3	25.6	56.6
2. My business is too small to have an environmental impact	51.1	24.2	17.4	3.2	4.1
3. I believe in business-as-usual, leaving the government to tackle environmental issues	68.0	19.6	5.0	4.1	3.2
4. Business should regulate itself to improve environmental practices	8.7	12.3	24.7	24.7	29.7
5. It is not the individual responsibility of business owners to solve environmental problems	37.4	26.5	23.3	10.5	2.3
6. Business owners cannot be expected to help solve social issues	39.6	30.4	18.4	8.3	3.2
7. The benefits of strong early action on climate change outweigh the costs	4.6	6.4	12.4	29.4	47.2
8. The transition to a low-carbon economy will bring opportunities for business growth	2.3	6.0	31.2	30.3	30.3
9. Being environmentally-friendly can increase profits	3.7	11.0	33.3	29.7	22.4
10. It is the duty of every business owner to have policies that help improve society	5.5	5.1	12.9	31.8	44.7

Table 2 Environmental Practices

Practices undertaken	No %	Yes %
1. Recycling (e.g. recycle paper; donate computers; avoid disposable goods).	8.6	91.4
2. Sustainable office practices (e.g. adjust printer settings to draft quality; avoid duplication of papers at meetings; donate to charity rather than send Xmas cards)	31.8	68.2
3. Energy Efficiency (e.g. turn down unnecessary heating; turn off equipment and lights; monitor energy and water use).	15.0	85.0
4. Use environmentally friendly products (e.g. eco-cleaning products; products with minimal packaging; green energy supplier)	48.2	51.8
5. Work to reduce carbon emissions (e.g. use conference calls to reduce travel; promote alternative transportation for staff; use low CO2 cars).	47.3	52.7
6. Understand the impact of your business on the local economy (e.g. calculate and reduce carbon footprint; improve external area of premises)	73.5	26.5
7. Environmental management policies (e.g. have clear environmental policy with targets; communicate your environmental practices to customers, staff, and suppliers; set up a green team; ISO 14001)	75.5	24.5
8. Employment policies (e.g. flexible working hours; diversity and equal opportunities; recruit locally where possible; promote healthy work practices; encourage the disadvantaged to apply for jobs)	25.0	75.0
9. Support local networks (e.g. join a local organisation, support community events, offer professional expertise).	57.3	42.7
10. Provide support to young people (e.g. provide business role models; assist enterprise teaching in schools; offer work experience; mentor a business start-up).	55.5	44.5
11. Responsible buying and selling (e.g. buy fairly traded tea and coffee; buy locally; develop products with social and environmental benefits; responsible advertising)	31.4	68.6
12. Other (do you follow any other environmental socially responsible practices?)	81.8	18.2

Table 3 Environmental Drivers

Drivers	Not Important %	2 %	3 %	4 %	Very Important %
1. Good publicity for your business	10.0	7.8	26.0	26.9	29.2
2. Attract new customers	11.4	6.8	21.5	26.9	33.3
3. Potential to break into new markets	12.8	5.5	26.6	26.6	28.4
4. Local promotion for your business	15.1	12.3	29.7	23.3	19.6
5. Pressure from existing customers	15.1	17.8	33.8	19.6	13.7
6. Pressure from suppliers	25.1	21.0	32.4	14.6	6.8
7. Ability to attract public sector contracts	19.2	13.2	26.9	17.4	23.3
8. Pressure from business stakeholders (e.g. shareholders)	32.9	16.0	24.7	16.0	10.5
9. Encouragement from trade bodies	24.7	18.3	28.3	21.5	7.3
10. Encouragement from landlord	15.5	15.1	30.1	30.1	9.1
11. Information from networks/associations	14.6	14.2	35.2	27.4	8.7
12. Government regulations	6.4	7.3	25.1	34.7	26.5
13. Environmental taxes	7.8	7.8	22.4	30.1	32.0
14. Cost savings from energy or other resource efficiency	5.5	3.2	17.8	27.9	45.7
15. Ability to attract and retain staff	12.4	10.1	21.1	26.6	29.8
16. Joint initiatives with other tenants in the building	11.5	11.5	28.1	32.7	16.1
17. Pressure from staff	12.8	11.9	27.4	32.9	15.1

Table 4 Barriers to Environmental Reform

Barriers	Not Important %	2 %	3 %	4 %	Very Important %
1. Loss of competitiveness in the market	16.2	11.1	24.1	25.9	22.7
2. Increased costs	4.6	10.1	22.1	31.3	31.8
3. Lack of staff time to introduce measures	10.6	11.1	25.5	28.2	24.5
4. Very low impact of my business on the environment	17.1	18.5	39.3	16.6	8.5
5. Very low impact of my business on local community	18.1	20.9	34.9	15.3	10.7
6. Lack of relevance of environmental issues to my business	28.0	22.0	31.8	10.7	7.5
7. Insufficient information on how to act	13.0	17.7	30.7	26.0	12.6
8. Poor infrastructure to support activity (e.g. for re-cycling etc)	10.2	12.5	24.5	22.2	30.6
9. Lack of interest from suppliers	20.4	13.0	39.8	14.4	12.5

Table 5 Encouraging Environmental Change

Statements	Strongly Disagree %	2 %	3 %	4 %	Strongly Agree %
1. Carbon pricing schemes and trading are essential to reduce emissions	7.4	8.4	31.2	25.6	27.4
2. Eco-taxes should be used to switch businesses away from high-carbon goods and services	5.5	5.1	23.5	32.3	33.6
3. There should be more legislation to control the environmental and social impact of all businesses	5.1	8.3	26.3	29.5	30.9
4. Voluntary action to reduce the environmental impacts of one's business is risky as it can result in a loss of competitiveness if others don't follow suit	8.3	17.6	28.7	25.9	19.4
5. Regulations to enforce environmental and social responsibility ensure that there is a level competitive playing field	3.7	7.4	28.6	33.6	26.7
6. I need more information on how my business can help the environment	5.6	16.7	20.8	31.5	25.5
7. I need more information on how my business can become more socially responsible	6.5	20.8	23.1	27.8	21.8
8. I should be consulted more on how businesses can help the environment	6.0	16.1	36.4	25.8	15.7
9. My landlord can help my business become more environmentally friendly	2.3	7.3	17.4	34.9	38.1
10. Businesses should not act alone but together in networks to tackle environmental issues	3.7	6.0	20.3	39.6	30.4
11. Social responsibility can only be addressed in groups, not as individual business owners	23.6	21.8	26.4	18.1	10.2
12. Trade associations and networks should play more of a role in helping businesses become more environmentally friendly	4.2	5.6	24.8	42.1	23.4