

Edith Cowan University
Research Online

ECU Publications Pre. 2011

2008

Small and medium enterprises and the environment: barriers, drivers, innovation and best practice: A review of the literature

Beth Walker

Janice Redmond

Lynnaire Sheridan

Calvin Wang

Ute Goeft

Follow this and additional works at: <https://ro.ecu.edu.au/ecuworks>



Part of the [Business Commons](#), and the [Sustainability Commons](#)

Walker, B., Redmond, J., Sheridan, L., Wang, C., Goeft, U. (2008). *Small and medium enterprises and the environment: barriers, drivers, innovation and best practice: A review of the literature*. Perth, Australia: Edith Cowan University.

This Report is posted at Research Online.

<https://ro.ecu.edu.au/ecuworks/7062>

Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.
- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author's moral rights contained in Part IX of the Copyright Act 1968 (Cth).
- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.



swan catchment
council

Small and
Medium
Enterprise
Research
Centre



Small and medium enterprises and the environment: barriers, drivers, innovation and best practice.

A review of the literature

March 2008

**Professor Beth Walker
Dr Janice Redmond
Dr Lynnaire Sheridan
Dr Calvin Wang
Ms Ute Goeft**

Acknowledgements

This research was conducted by the Small & Medium Enterprise Research Centre (SMERC) at Edith Cowan University, in conjunction with the Swan Catchment Council and was funded by an ECU Industry Collaborative Grant.

We acknowledge the participation of the following people as the key contributors in the completion of the project.

Mr Tony Soteriou	Program Manager, Sustainable Production, Swan Catchment Council
Mr Peter Male	Industry Project Coordinator, Swan Catchment Council
Mr Mick Pattison	Industry Program Coordinator, Swan Catchment Council
Mr Scott Favacho	Industry Project Coordinator, Swan Catchment Council

EDITH COWAN UNIVERSITY
LIBRARY

Table of Contents

Executive Summary	4
Background to the Study	6
Framework Development	6
The Selection of Works	7
The Literature Review	8
Introduction	8
Barriers – the SMEs and their owners	9
<i>Characteristics of SMEs in general</i>	9
<i>Resources including financial, human and time</i>	10
<i>Personal interest, motivation and knowledge of (or lack of) the environment:</i>	
“ <i>What’s in it for me?</i> ”	12
Barriers - Governments and agencies	13
<i>Communication</i>	13
<i>Engagement and stakeholders</i>	14
<i>Legislation and compliance issues</i>	16
Drivers	19
<i>Voluntary engagement</i>	19
<i>Stakeholders</i>	19
<i>Legislation</i>	22
<i>Resources, motivation and knowledge</i>	23
Conclusion	24
References	25

Executive Summary

Small and medium enterprises are the largest business sector in every economy in the world¹, and generate the majority (up to 60%) of global economic output². In the Australian context, a small business or enterprise is one that employs up to 20 staff while a small and medium sized enterprise (an SME) is a business that employs up to 200 staff. By this definition, more than 99% of all actively trading businesses (more than 1.95 million enterprises) in Australia are SMEs³. There is a growing body of research supporting the need for SMEs to become engaged in the adoption of environmental management practices^{4,5,6,7,8,9,10,11,12,13}. This is because SMEs are more 'pollution-intensive' than 'big business'^{7,12,14,15}, with some estimates suggesting that the contribution of this sector to pollution may be as high as 60-70% of all pollution globally^{5,13,16}.

These are newly emerging facts, however whereas there is a growing concern about the effects of SMEs on the environment, much of the previous research in the general field of business and environmental management relates to large business. This is a problem because small businesses are not simply scaled down versions of big businesses^{17,18,19,20}. Small businesses have several key points of difference to big business, primarily focused on economies of scale and resources. Because of these differences, they need to be engaged appropriately if they are to participate in better environmental practices^{2,4,8,21}.

In regard to the environment, SMEs are less likely to have environmental plans or implement environmental management practices than large firms^{6,7,8,22,23,24}. This is often due to SME owner-managers believing that there is a cost associated with environmental management with no immediate commensurate economic benefits flowing back to their businesses^{7,23}. A recent Australian study²¹ found that 98% of small and medium enterprise respondents rated environmental issues as 'important' or 'very important', yet only 61% of respondents acknowledged that their business had an impact on the environment and only 26% had an environmental management plan.

Several researchers claim that providing knowledge and information to this sector has the potential to make a very positive contribution to small and medium enterprises participation in environmental management practices^{4,13,26,27,28}, particularly if it is drawn from local experience²¹. Moreover, this participation need not be at a cost to operators with a growing body of literature showing that SMEs can achieve cost-saving efficiencies, generate additional revenues and enhance productivity while creating a potential competitive advantage^{6,7,10,21,23,24,25}. Nonetheless, there is little synthesised evidence available to assist agencies involved in environmental policy, planning, education or engagement with this sector.

There are two perspectives to viewing the barriers and drivers of small business participation in environmental management. From the perspective of the SME owner-manager, there are three main areas that reflect the barriers preventing them from engaging in good environmental practices. These are the characteristics of SMEs in general, resource availability (including financial, human and time), and their owner-manager's knowledge, interest and motivation relating to good environmental management.

From the government or agency perspective, there are two primary barriers. One is how to communicate the message to business owners without duplication and the other is how best to engage SMEs. However, both communication and engagement are potentially complicated by the fact that governments are also enforcers and monitors of legislation. These roles sometimes put them in adversarial positions with the very constituents that they are trying to communicate with and engage.

In summary, there are a significant number of SMEs in Australia that are not participating in good environmental management practice due to both the real and perceived barriers of cost, time and lack of return on investment. For many businesses the key question asked is “what’s in it for me?”. This is a real problem because of the sheer number of SMEs and their collective environmental footprint. Because of the difficulty of engaging with them, most SMEs fly under the radar when it comes to planning and implementing good environmental management practices. This will only change if the barriers can be reduced and the businesses educated in the importance of

good environmental management practices. This will only happen if a clear whole of government approach to an engagement and communication strategy is implemented.

Background to the Study

This report focuses on the evidence found to answer the research question, “*what barriers, drivers, best practice and innovations have been identified globally on small and medium enterprises (SMEs) and the environment?*”. A total of 113 published works are included in this report.

In addition to this report, a CD was developed (copy enclosed with this report) to provide a reference guide for stakeholders interested in small and medium enterprise and the environment. The CD provides over 350 examples from the literature and internet searches completed for this report including links to environmental guides, checklists and projects designed for small and medium enterprise use. Where available a link to, and summary of the report or article, is included on the CD. The CD also contains the other component of this project which was the development of an online information source for small and medium enterprise use.

Framework Development

The research question focused on four discrete components: barriers, drivers, best practice and innovation. However, it is weighted by the reality that there is a greater volume of literature on barriers and drivers than best practice and innovation.

The population of interest is small and medium enterprises, in particular owner-managers. Since the issue of engaging small and medium enterprise in environmental management practices is not unique to Australia, a global search was conducted which included literature from the following key geographic areas: Canada, Europe, the United Kingdom and the United States. While these countries do use different definitions of small and medium enterprise, the work being conducted on environmental management practices in these countries could provide valuable

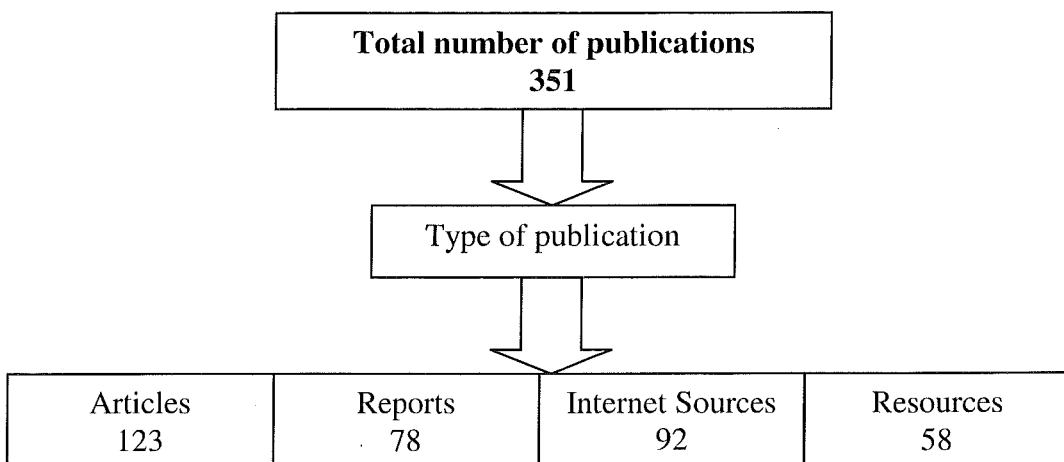
guidance for engaging with this business sector in Australia and were therefore included where appropriate.

A framework was developed to guide the literature review. This framework covered the review question, scope of the review, search methodology and criteria for selecting literature.

The Selection of Works

The search was conducted using two principal sources: library databases and the internet. A snowballing method was utilised to extend the search (i.e. using the references cited in a piece of work and then reviewing the original source). The search began by focusing on the four discrete components: namely; barriers, drivers, best practice and innovation (in environmental management) as keywords in conjunction with the terms small and medium enterprise or small business. The search later expanded to explore various countries by naming each with the keywords described. Reference lists for each item were checked and original resources then reviewed and included where appropriate. A reference list of the publications used in formulating this report is provided at the end of the report. Figure 1 provides a schematic of the types of publications included in the review.

Figure 1. Summary of selection process of published works.



The Literature Review

Introduction

At the start of the review of the literature, the different components of the research question were considered, these being drivers, barriers, best practice and innovation and their correlation to small and medium enterprises' environmental management practices. What quickly came to light was the lack of academic literature on the latter two components (i.e., best practice and innovation). What seems to be the case is that there is a reasonable amount written on the barriers and drivers in response to the problems with engaging SMEs, as factors influencing them are typically behaviour based and therefore relatively easy to identify. The academic literature has also tended to focus on how to improve stakeholder engagement rather than seek and assess more applied solutions. Best practice and innovation in environmental management are very much about the development and effectiveness of possible solutions; they are applied business practices and as such have yet to receive sufficient academic interest. As a consequence, most examples of innovation are yet to be really evaluated on any sort of long term or longitudinal basis so should still be seen as "works in progress". The same applies with regard to best practice, in that it is really too early to say if any of the applied programs do have long term benefits or do bring about behaviour change in the owners of SMEs. Because of the difficulty of finding academic literature regarding innovation and best practice, as opposed to general information, this literature review covers only the barriers and drivers. Innovation and best practice are however covered in a more applied way in the CD provided.

It should also be noted that throughout this review, the terms small and medium enterprises, SMEs, small enterprises and small business are used interchangeably as the literature does not often distinguish between them. This itself is an issue in reporting results of research about the impact of business on the environment. Only rarely are contributions based on business size included (e.g., micro vs. small vs. medium vs. large), which can make it difficult to differentiate and determine where the focus of attention is most needed to reduce negative impacts on the environment.

As is often the case when dealing with a dichotomous issue, in this instance barriers and drivers of environmental management practices in SMEs, barriers can be turned into drivers and conversely drivers can become barriers. With this in mind, all of the literature reviewed is written from a certain perspective, that being the reporting of findings or results and subsequent interpretation of those findings by the author or authors. Sometimes it may very well look like the absolute obvious is being stated, however, it is important to continue to state the obvious, as it is in this way that reports such as these may be used to assist in policy development and change.

Barriers – the SMEs and their owners

There is a secondary aspect to the issue of both barriers and drivers, that is, the perspective from which the issue is viewed. From the perspective of the owner-manager of an SME, there are three main barriers preventing them from engaging in good environmental practices. These are: the characteristics of SMEs in general, resource availability (including financial, human and time), and, lastly, their personal interest, motivation and knowledge of (or lack of) environmental management. From the government or agency perspective, there are really only two barriers; one is how to communicate the message to the business owners without duplication, the second is how best to engage SMEs. There is an additional issue to consider with regard to barriers and one that is cited for most business practices, that of legislation, which by its very nature is the most complex and contentious of issues. Put simply, should legislation overall be strengthened or is education, self assessment and monitoring a better alternative? Which works best for this issue, the carrot or the stick?

Characteristics of SMEs in general

The characteristics of SMEs such as their heterogeneous nature, size, lack of resources, limited management capacity and skills, have often been cited as barriers to their engagement in other management areas, such as human resource management²⁹, strategic planning^{30,31,32}; and training^{33,34}. So it is not surprising that they do not engage readily in good environmental management practices.

In terms of their heterogeneity, SMEs cover all 17 ANZSIC codes, are operated in urban, rural, regional and remote areas, are owned and operated by both men and

women of all ages, who have varying educational and ethnic backgrounds³. This heterogeneous nature makes it very difficult to communicate with them as a discrete group and, therefore, to co-ordinate efforts to target specific technical assistance towards them^{4,14,24,35}. This communication issue is exacerbated by the lack of capacity for environmental training^{4,14,24} and the fact that they are often less active in organisations that may be of assistance to them, for example, trade associations³⁵.

Many of these problems stem from the fact that 'smallness' creates limitations on their resources and this is a consistent theme in the global literature^{7,26,27,36,37,38,39,40,41,42,43,44,45,46,47}. In relation to good environmental management practices, size does matter. Size is intrinsically linked to the next key barrier, which is resources, including financial, human and time.

Resources including financial, human and time

Controlling costs in general is of concern to all businesses but especially to SMEs as they are more prone to the vagaries of market forces⁴⁸. Continuous pecuniary uncertainty means that financial resources are not typically allocated to activities outside of core business such as environmental improvements^{8,49}. When it comes to matters outside core business functions, implementation decisions may be negatively affected by, for example, the need to use available funds elsewhere in the business⁴⁹, a lack of accessible capital³⁵ and any slow down in the economy⁴⁴. This is magnified in small enterprises as these businesses are often funded by the personal capital of the owner, which places an added pressure on all financial business decisions⁵⁰.

When a business owner allocates funds to non-core functions, they often do not know how to spend the money appropriately to get the full benefits. For example, the business may develop an environmental management system on paper and then fail to use support that is available (i.e., training or consultants) to implement the activities required due to the extra associated costs involved⁵¹ thus effectively cancelling out the potential benefits. Environmental management is not alone as a non-core business activity that is often ignored by SMEs. Other examples include general up-skilling and training^{34,52,53}. Therefore, the challenge for governments and agencies is to make environmental management an extremely important core activity that a business needs to engage in, if behaviour change is to come about.

Possibly the single biggest reason given as to why SMEs do not engage in environmental management is the perceived cost. Businesses both small and large are driven by profit, so factors that affect the bottom line, especially in a negative way are always going to be difficult to overcome. Whereas the majority of businesses seek to gain an immediate return on investment⁶, the return from investment on implementing or changing environmental management practices may not be immediate compared to other investments such as equipment.

Further, there is little clear evidence that there will be a return on investment or, if there is a return, whether it will be sufficient to make the time and cost from implementation to results worthwhile^{6,54}. When small business owner-managers cannot see or realise the advantages of implementing environmental management practices, it may well affect the decisions they make about reducing (or not) their business impact on the environment^{6,25}. For this reason, the necessity to make a strong business case (that is an economic and social rationale) for SMEs to engage in good environmental management is vital. Critically though, many SME owner-managers do not believe this case has been made⁵⁴. The reasons could be that all of the stated barriers may well come into play, thus making it difficult to pin-point one key issue. In addition, the current lack of evaluation of best practice and innovation in environmental management makes it very difficult to provide a convincing business case as there is insufficient knowledge of what does work and is economically and socially viable. Further it can seem like an enormous (and costly) task to make changes in several departments when all the businesses want to pursue is their core function, that is make a product or provide a service.

In relation to human resources or human capital, many small businesses employ less than five staff⁵⁵, therefore it is highly unlikely that the business would have dedicated environmental staff. Even when a business has more staff, the staff may lack expertise to assist or be reluctant to get involved in changing work behaviours^{38,55}. The key to this is the owner-manager themselves, as they are the leaders of their work teams, so if they believe it to be a sound (economic and/or social) business decision to be good corporate citizens and participate in environmental practices, then they will do so, and they will also direct their staff to follow suit.

The last resource issue for SMEs is time. Time constraints^{56,57}, time pressure⁴⁴, and limited discretionary time⁵⁸ all have an impact on what can be achieved environmentally by SMEs. These factors all play a role in reducing the capacity of small and medium enterprises to engage in good environmental management practices. This issue cannot be viewed in isolation as it is intertwined with small and medium enterprises' focus on the core tasks of the business, the manager's perception of environmental issues and allocation of resources. This leads on to the owner-managers motivation, or what's in it for them?

***Personal interest, motivation and knowledge of (or lack of) the environment:
“What’s in it for me?”***

Many owner-managers of small and medium enterprises do not see environmental issues, or the need to act in an environmentally responsible way, as a significant issue for their business^{4,25,45}. Some have an overall lack of knowledge about effective environmental and sustainability issues⁵⁹ or of specific practices that they can implement²¹ and are fearful of doing things wrong⁶⁰. They lack an understanding of both environmental problems and risks³⁷ and of the potential benefits of environmental improvements⁵. They lack the expertise and confidence of doing something that is not core business as most small business owners are good technicians but poor managers^{9,61}. Many either perceive that their business has no impact on the environment⁷ or consider the impact to be small and therefore insignificant^{4,62}. The final deterrent is that they see environmental responsibility as too costly^{28,36,39,45,46,56,57}. So they pose the question, “what’s in it for me?”

Whereas all of these barriers portray an essentially negative reaction to this issue, the reality is that many small business owners struggle to run a successful operation^{63,64} and, as has been mentioned above, have severe limitations placed on them. So if governments and agencies want and demand that this business sector changes its environmental behaviour, they first of all need to understand where SMEs are coming from. This is critical if any sort of engagement is going to take place.

A negative internal culture toward the environment⁴⁰ and favouring economic interests over social or environment considerations⁶⁵ clearly has a counterproductive affect on SME participation and engagement in good environmental practices. If SME

owner-managers see no threats or advantages for their businesses from engaging in good environment behaviour^{42,62}, lack awareness of the potential benefits and cost-saving⁴¹, have a poor image of environmentally friendly goods²⁶, see their business size as inappropriate for such matters⁶⁰ and view environmental activity as peripheral to their core business³⁷, then they will continue to perpetuate the 'what's in it for me' attitude.

Considerable effort by some national governments and agencies has been expended to convince businesses that there are competitive advantages available from the implementation of environmental management practices. Advantages include, for example, growing interest in and demand in green products and/ or services, financial benefits from reduced production or services costs and increased marketing opportunities^{6,36,40,42,66,67,68}. However, many small and medium enterprises still see environmental practices as an extra burden on business^{65,69}, a cost that cannot be passed on to the customer^{23,46} and that the advantages are small unless expensive consultation or wholesale operational changes are undertaken²³. Therefore, despite the efforts of some governments and agencies, most small and medium enterprises do not participate in good environmental management as they do not see the benefits of investments in this area²³ or are very sceptical of the competitive advantages that might to be gained⁶⁷. This highlights the difficulty of trying to bring about behaviour change within this business cohort and it also says something about the current "message". It would appear that in many cases the "message" is not getting through, so it may well be time to review the whole communication and engagement process.

Barriers - Governments and agencies

Communication

Environmental engagement by small and medium enterprises is hampered by a lack of information that is specific to the particular needs of a business, by information that is inadequate, the use of inappropriate language (either too technical or too academic), or difficult to access^{26,27,42,58,59,70}. Examples are websites that require high software compatibility and the latest versions of programs, very large documents or documents in PDF format that require the installation of Adobe software. While the latter software is freely available, it requires another 'click' (as well as download time)

making it harder for many small and micro business owners who are not necessarily highly computer literate^{71,72}.

This directly impacts on business' engagement with government by impeding environmental awareness and eco-literacy leading to specific gaps in their environmental knowledge^{5,8,13,26,40,45,46,47,62}. For example, some small and medium enterprises do not appear to know how to act in an environmentally responsible way^{2,58}, where to go to access the support options available to meet their needs⁴¹, (including funding and training options⁶⁰), or what skills they need⁴¹.

When attempting to engage on environmental issues with small and medium enterprises, their size differences need to be considered⁷³. There is also a need to provide information in a way that offers an explanation of the benefits of participation⁷⁴ and gives a specific message that the business owner-managers can immediately identify with⁷⁰. And if the recommended processes do not bring quick results, motivation can become an issue⁷⁵. All these highlight the very real and on going difficulty of engaging with SMEs.

Engagement and stakeholders

The second main barrier for governments is how best to engage with this business sector. Having demonstrated that SMEs are an enormously heterogeneous group, there are also multiple stakeholders in the supply chain of any business transaction. Business owner-managers often find that there is little pressure or support from internal (the business) or external stakeholders (e.g., governments, environmental organisations, SME support organisations, customers, others in the supply chain, big business, landlords) to implement environmental management practices^{66,75,76}. Most SMEs are looking for equal commitment from all sides³⁷ so that when they consider their involvement, they do not have to be concerned about a lack of a level playing field⁶⁵.

Early overseas experience suggests that environmental support programs were not working with small firms and that confusion and lack of awareness among businesses about the provision of support exacerbated the problems⁷⁷. There are still reports of ineffective business support and institutional infrastructure^{56,62} (e.g., due to the lack of

a national policy, outdated methods of engagement, complexity of the infrastructure and lack of clarity about who SMEs need to approach for assistance, inability or capacity to cater for SMEs or a lack understanding of the constraint on SMEs). In particular, it has been suggested that the role of trade associations is a missing link⁵. While these factors indicate that there is a need for more support, this will not help if small and medium enterprises continue to fail to make themselves aware of, take up or value external advice^{62,78}.

Supply chain barriers have been identified²⁷ including the fact that initiatives rarely extend beyond first level suppliers⁴⁹, that the processes in supplying environmental friendly products are not always seen as cost effective⁷ and anxiety that those businesses not performing environmentally will be cut from the supply chain⁷⁴. From a business perspective, engagement is not seen as economically expedient unless all competitors are involved, thus there is little motivation to reduce the gap between attitude and behaviour⁶². A gap is also evident in the higher level of knowledge of producers compared to purchasers and therefore, training for all participants in the supply chain is required to rectify this situation⁷⁹.

The “message” to owner-managers of small and medium enterprises is that competitive advantages can be gained by increasing market share due to the growing appeal of green products and/or service and that financial benefits will result from reduced production or services costs^{6,36,40,44,66,67,68}.

However, an absence of pressure or demand from customers for “green behaviour” is a common finding in the literature^{45,46,66}. Contributing factors to a lack of effort by SMEs to address environmental issues^{48,66} are the perception that the additional costs to purchase environmentally friendly products will not be paid by customers⁵ and that environmental improvements do not have a direct relationship with customer satisfaction²³. Even when local social demand has been shown, its impact is not strong⁷⁴. It would appear that a gap exists between customers' attitudes and purchasing behaviour, with price and performance being key determinants of purchasing rather than the “green” credentials of the business providing the goods or service⁷⁹.

This is a significant barrier and whereas this report focuses only on the environmental behaviours of business, at the end of the day, business transactions ultimately have both a seller and a buyer. Accordingly, some of the responsibility for the demand for products and services being produced in an environmentally friendly way rests also with the end consumer. It is not good enough for the “general public” to want “green” products and expect business to shoulder all of the associated costs.

Legislation and compliance issues

Governments globally have legislated to drive improved environmental behaviour in business^{7,25,40,69,74,80,81}. However, as it costs an SME to implement and maintain environmental practices^{23,24,26,37,39,42,54,68,69,75,82}, these costs may be more than the fines imposed for breaches of legislation. Therefore, there is a need for concurrent action (e.g. tax incentives) to support small and medium enterprise participation. This is particularly important as regulations are difficult to monitor, given the sheer number of small businesses²¹ and are ineffective if not regularly enforced^{69,70}. A specific difficulty in Australia is the three tiers of government and working out exactly who should be the regulator and enforcer²¹. Many businesses will chance their luck if they know that monitoring is *ad hoc*.

Legislation can bring varying responses from the SME sector⁶⁹. For example, in a comparative review of small firm responses to regulation in the UK and the Netherlands, it was shown that on some issues small and medium enterprises comply (e.g. due to changes in legislation, effort was made not to dispose of oil and chemical in a hazardous manner) yet in other areas (e.g., waste and energy efficiency) these were rarely priorities and responses varied⁶⁹. Unfortunately, when some small and medium enterprises respond to legislation, they often look only to stay within compliance levels³⁵ rather than aim for ‘best practice’ as it is seen as costly⁶⁹. Hence, regulation is often resisted due to the perceived impact on profits, lack of awareness of existing environment legislation and lack of ability to interpret how it affects them^{4,37,66}.

Although legislation exists in most industrialised countries²⁴ (e.g., in Australia, the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Department of the Environment, Water, Heritage and the Arts,

and covers the assessment and approval process of national environmental and cultural concerns⁸³), there is often a lack of specific policies and regulations targeting small and medium enterprises (e.g., emissions)²⁴. Often when policies and regulations do exist, the small and medium enterprise owner-manager is aware that there will be minimal if any monitoring of their business. So they often take the 'calculated' risk of not complying and having their fingers crossed that they will not be exposed.

At the other end of the spectrum, some business owners are looking for more policing to occur to ensure that those who comply are not disadvantaged by those who practice 'environmental free-riding'^{65,69}. This happens when businesses have tried to do the right thing but feel they are not supported by large purchasers, in particular governments, who do not insist on suppliers having demonstrable good environmental practices. When discussing the effects of environmental legislation in the United Kingdom, the majority of small and medium enterprises felt that as the requirements of environmental legislation were implemented, markets would close and this could threaten their survival.

Environmental management systems such as ISO 14001 and Eco-Management and Audit Scheme (EMAS), are globally known, but are designed for large business not small business^{66,84}. For SMEs, these systems are expensive to implement and maintain, particularly if consultation is required before or after implementation^{8,37,67,85}. They are also time intensive⁸ and disrupt core business as they often require resources to be diverted⁶⁶. A study in Europe looking directly at this issue found that it is the lack of human, rather than financial, resources which cause the greatest problem with implementation of these systems⁶⁶.

Other causes of low levels of uptake of environmental management systems are similar to the issues associated with environmental engagement by small and medium enterprises overall. These are a lack of technical knowledge regarding implementation, awareness of benefits, negative perceptions of bureaucracy, resistance to change within company culture, little external pressure from stakeholders such as customers and suppliers, difficulties involving and motivating personnel and a lack of external feedback and incentives^{1,84}.

When the motivation to implement environmental management systems is based on certification, this can also have a negative impact on the outcomes⁸⁵. However, other issues may also need to be considered when outcomes are assessed, as it has been suggested that obstacles may vary between instruments, across countries and may also be related to commitment⁴⁶. Those businesses that do implement environmental management systems have been found to be less likely to implement technical innovations and favour end-of-pipe technologies⁸⁶ (e.g., a smoke stack filter that reduces harmful emissions into the atmosphere).

To conclude on the barriers to environmental management among SMEs, there is support for greater education and training in this sector^{68,87,88,89} as well as a stronger regulatory framework to counteract the imbalance between the barriers and drivers which widen the gap between small business environmental attitudes and behaviour⁶². Unless more favourable conditions are offered to SMEs to engage in environmental management to address the “what's in it for me” question then the owner-manager will not commit to these practices. Fortunately, there are number of factors which drive the adoption of better environmental management practices, and greater attention to these may provide the catalyst for change.

Drivers

Before beginning this section, it should be pointed out that factors that act as drivers or barriers depend on the extent to which they exist (on a continuum from weak to strong). Therefore, the factors termed as drivers are not effective *per se* as catalysts for better environmental behaviour unless there is a concurrent absence or reduction of the obstacles (barriers) discussed in the previous section. The drivers of environmental behaviour in small business are relatively under-researched⁹⁰, and more needs to be done to help SME owner-managers adopt environmental initiatives⁷⁸ as poor environmental performance is not simply the outcome of negative attitudes by SME owner-managers to the environment.

Six key drivers of environmental management practice have been identified. These are: voluntary engagement, stakeholders, legislation, resources, motivation and knowledge. The context of their use as drivers appears to be critical to the results received^{91,92}. That is, if the context is right, the more likely it is that a positive response will be elicited. Therefore, a process needs to be followed that acknowledges the available drivers and the capacity of each to bring benefits to small and medium enterprises. This means engaging effectively with SMEs and communicating the message in the manner most appropriate to this sector.

Voluntary engagement

While the majority of SMEs have not engaged in environmental management, there are nevertheless a considerable number of enterprises that do participate voluntarily in environmental management practices^{5,23,40}. Businesses willing to participate in environmental initiatives have reported beneficial outcomes⁴⁰ but the competitive nature of business can prevent others from voluntary environmental action⁹³. This lack of action can certainly be influenced and possibly changed by stakeholder engagement.

Stakeholders

Research has clearly shown that stakeholders have an important role to play in increasing small and medium enterprise performance in environmental management^{56,62}. Stakeholders can be separated into two categories, internal and

external. Internal stakeholders include the owner-manager, staff and other shareholders in the business. External stakeholders include government, agencies, environmental management organisations, financial institutions, customers, suppliers, the local community and the general public.

Internal and external stakeholder pressure appears to be one of the drivers with the greatest potential to encourage change, particularly with regard to implementing technological innovation⁸⁶, yet to date stakeholders have in the main been underutilised as drivers. This is because stakeholders are not always supportive or ready to assist. For example, internal stakeholders have been found to resist cultural change^{45,94,95}, and employees of small businesses can be difficult to motivate or get involved^{38,68,84}. One of the many criticisms of external stakeholders is the lack of co-operation they have with each other⁹⁶. However, both categories of stakeholders are vital to drive environmental behaviour.

Within the workplace, employee support is considered pivotal to driving environmental behaviour^{86,88,96,97}. For example, employees can be motivated by better working conditions resulting from implementation of better environmental practices⁹⁸. It has also been shown that management support of environmental practices is a driver of environmental performance^{46,80,99,100}. In some cases, the motivation of internal stakeholders is to portray a green image^{27,45,84,101}. Exemplar firms, profiled as best practice case studies can also help promote the benefits of good environmental management to others⁶².

Support from external stakeholders is also crucial^{86,102,103}. Three key external stakeholders have the ability and/or the authority to make a positive influence on environmental behaviour in small and medium enterprises. These are governments, trade or business associations, and the general public as consumers or customers.

Support from government is important through incentives and the provision of information and training programs⁹¹. There is some evidence of government incentives being offered to small and medium enterprises in the United Kingdom and Nordic countries^{41,56}. In the UK many of these are not taken up due to a lack of awareness of their existence or because they lack relevance^{41,56}. Small businesses are

looking to government to take the lead on environmental issues²¹ and if they are not seen to be treating environmental management as a priority, then it is unlikely that businesses will view it any differently. Greater consideration of what is needed and more promotion of the incentives available to this business sector will show a genuine commitment on the part of the government.

Trade and business associations are also important^{69,92} and may be the missing link in communicating environmental issues to the small and medium enterprise sector⁵. Associations have direct contact with SMEs and can relate to them on a similar level. This capacity should help them to deliver relevant messages directly to the business and provide appropriate advice and support. Whereas most trade or business associations do not have the financial capacity to deliver advice and support, they could be used as a conduit by governments to disseminate environmental information.

The literature recommends that attention be paid to the extent, level of coordination and activity level of support networks^{41,85}. Support does not need to be expensive; in fact, high quality, low-cost support is preferred by small and medium enterprises⁸⁸. The ability to share information through networking and business partnerships and to have access to external expertise is important⁹⁵. However, there are some unrealistic expectations being placed on small and medium enterprise environmental engagement by stakeholders (e.g., zero waste, cutting carbon emissions) and there is also confusion created by conflicting messages provided in the media⁷⁵ (e.g., the capacity for business to gain advantage from environmental initiatives).

Customers are key stakeholders to all businesses and so have a significant effect on implementation of environmental practices^{7,44,46} particularly through market forces^{35,40,46,49,96,104} and overall public commitment^{66,105}. It should also be restated that even though customers are the key drivers for all businesses, they also need to accept some responsibility for helping businesses achieve “greener” productivity. This is not to say that businesses should be able to simply charge more or pass on additional costs to customers, or that customers should just pay more, rather, these required behaviour changes should be seen as partnerships with all stakeholders, including all of the supply chain.

Legislation

Support from government is important through legislation although other incentives are often preferred by governments, researchers and SMEs over legislation. For example, in Nordic countries governments now seek to help enterprises develop a longer-term approach to business management and part of this includes the provision of financial incentives for environmental improvement. Researchers support education and information initiatives and technology assistance, while SMEs generally support education and local initiatives over legislation.

Legislation is still considered a driver of environmental action^{2,40,44,46,96}, however the context in which legislation is developed is also important⁹². Legislation may have a greater effect on behaviour change than other strategies such as formal environmental management systems⁸⁴. Evaluation studies have shown that changes in legislation can increase small and medium enterprise efforts to reduce the environmental impact from their operations (e.g., disposal of oil and chemicals in the UK⁶⁹). Importantly environmental education and training of small and medium enterprises is largely driven by regulations⁴¹ and businesses do participate in industry specific regulation programmes¹⁰⁶. For these reasons, legislation as a method of persuading small and medium enterprises is supported in the global literature^{7,24,25,40,69,74,80,81}. Moreover, the need to reduce risks along with concern regarding the potential of future legislation and a desire to reduce the need for regulation can all help drive small and medium enterprises' environmental engagement.

It is acknowledged that developing legislation is difficult, has disparate demands and can be politically unpopular¹⁰⁷; however, it is a tool government can use effectively. To be more effective, environmental legislation needs to pay attention to specific policies and regulations that relate to small and medium enterprises¹⁴ (e.g., emissions); they need to be simplified¹⁰⁸ particularly to reduce common problems across countries or industries³⁷, communicated appropriately through education and training⁹⁴ and be enforced and enforceable²⁵.

Moreover, when developing legislation, consideration needs to be given to the fact that small and medium enterprises have minimal relations with government and can be isolated and difficult to reach with environmental messages⁶⁹. Without effective

communication environmental issues may become another legislative barrier to which lip-service is paid¹⁰⁹. Ideally, a combination of incentives and regulation should be provided with appropriate infrastructure developments because of the link to core business^{25,81}. So some carrot and some stick.

Whilst legislation and implementation of formal environmental management systems are thought to be the best drivers of environmental behaviour^{7,16,110}, they are certainly not the whole solution. Legislation is both difficult and expensive to monitor and requires formalised standards, benchmarks and procedures. Whereas formal environmental management systems are used as a matter of course in big business, they are rarely used by small enterprises as they are seen to be irrelevant and/or too expensive to implement^{7,66,111}. And because of the diversity and number of small businesses, many simply fly under the radar when it comes to legislative compliance and will continue to do so unless they are better engaged in the whole process.

Resources, motivation and knowledge

Business is about the bottom line. Although there is not overall consensus in the literature about whether or not competitive advantage can be gained by small and medium enterprises from environmental management practices^{6,21,23,25}, recent research has shown that the ratio of positive economic benefits rise as the firm environmental performance improves⁷⁸. Identified benefits include: bank loans based on environmental performance, competitive advantage and marketing potential driven by public purchasing, improved company culture, improved image and reputation; improved trust and understanding, improved ability to meet legal and regulatory requirements, improved environmental performance, increased employee motivation, increased attractiveness to potential recruits, reduced risk management concerns, resource savings, and waste reduction^{7,23,25,38}. In some cases, such as in European and Nordic countries, there are also economic incentives available related to tax relief and regulatory flexibility¹⁰³.

Small and medium enterprise owner-managers do tend to participate in practices that give them some gain or advantage^{40,45,84,110,112}. Waste reduction is a very obvious practice²³ for three reasons. First, there is money to be made in waste²³, second, businesses have felt empowered to act because it is something tangible and

straightforward (you order the skip, fill it up and it is collected) and third, perhaps of most significance, there are often existing infrastructure and support systems in place.

Waste reduction is a good example of a relatively straight forward good environmental practice. This is because it is a well documented and supported procedure, so there is existing knowledge about it. This broad acceptance of knowledge being power can be used to turn existing barriers into drivers. It has been shown that one of the barriers to business engagement is lack of knowledge about environmental management issues in the broad sense including legislation and good environmental practices. There is a significant body of literature that supports a substantial increase in education and training to enhance small businesses awareness and knowledge^{59,68,87,88,89,105,113}. It is also considered that enhancing awareness and involvement among small and medium enterprises will increase the pressure to compete. It is crucial that SMEs are involved in education program development and design to ensure that it is specific, practical and focussed on small and medium enterprise operations.

Conclusion

In conclusion, there are substantial barriers to changing the environmental management behaviour of small and medium enterprises. There is no silver bullet. This is a whole of government as well as a whole of business sector and community issue. The global literature supports this statement. One of the biggest facilitators of change is education, as opposed to legislation, so carrot rather than stick. But this is also the harder of the two options and will take longer to bring about change. However, if the barriers can be neutralised and the drivers ramped up, and governments and agencies think about the issue from the perspective of the business owner-manager, then that will go some way to bring about the desired behaviour and mind set change.

References

1. Culkin, N. & Smith, D. (2000). An Emotional Business: A guide to Understanding the Motivations of Small Business Decision Takers. *Qualitative Market Research: An International Journal*, 3 (3) p. 147-157.
2. Gerstenenfeld, A. & Roberts, H. (2000). Size matters: barriers and prospects for environmental management in small and medium enterprises. In Ruth Hillary (Ed). *Small and medium enterprises and the environment*. (pp.106-118). Sheffield: Greenleaf.
3. Australian Bureau of Statistics 2005, *Characteristics of small business*. Canberra: Commonwealth Government of Australia.
4. Condon, L. (2004). Sustainability and small to medium sized enterprises- How to engage them. *Australian Journal of Environmental Education*, 20 (1), 57-67.
5. Revell, A. & Rutherford, R. (2003). UK environmental policy and the small firm: Broadening the focus. *Business Strategy and Environment*, 12, 26-35.
6. Luetkenhorst, W. (2004). Corporate social responsibility and the development agenda, *Intereconomics*, 39 (3), 157-166.
7. McKeiver, C. & Gadenne, D. (2005). Environmental management systems in small and medium businesses. *International Small Business Journal*, 23 (5), 513-537.
8. Williams, H., van Hooydonk, A., Dingle, P., & Annadale, D. (2000). Developing tailored environmental management systems for small business. *Eco-management and Auditing*, 7, 106-113.
9. Redmond, J., Walker, E. A. & Wang, C. (2008). Issues for small businesses with waste management: Resources or attitude? *Journal of Environmental Management* (in press).

10. Shirlaws. (2007). *Opportunities and challenges for SMEs: The next five years*. UK: Global Futures and Foresight.
11. Schaper, MS & Raar, J. (2001). Not so easy being green? *Australian CP*, 71 (5), 40-42.
12. Blackman, A. (2006). Introduction: Small firms and the environment. In A. Blackman (Ed.), *Small Firms and the Environment in Developing Countries: Collective Impacts, Collection Action* (p.1019). Washington DC: Resources for the Future.
13. Hillary, R. (2000a) Small and medium sized enterprises and environmental management systems: Experience from Europe. St. Galler Umweltmanagement Forum. London: Network for Environmental Management and Auditing.
14. Rajendran, D. & Barrett, R. (2003). Managing environmental risk in small business: An agenda for research, Paper 16th Annual Small enterprise Association of Australia and New Zealand Conference 28 September - 2 October 2003.
15. Williamson, D., Lynch-Wood, G., 2001. A new paradigm for SME environmental practice. *The TQM Magazine*, 13 (6), 424-432.
16. Stokes, S., Chen, H. & Revell, A. (2007). Small businesses and the environment: Turning over a new leaf? A Report for the Workspace Group PLC. Kingston University.
17. Beaver, G. (2002). *Small Business, Entrepreneurship and Enterprise Development*. Harlow: Financial Times Prentice Hall.
18. Burns, P. (1996). Introduction: The significance of small firms. In P. Burns and J.Dewhurst (Eds). *Small Business and Entrepreneurship*. (2nd ed., pp. 1-19). Basingstoke: Macmillan.

19. Gibb, A. A., & Davies, L. (1992). Methodological problems in the development of a growth model of business enterprise. *The Journal of Entrepreneurship*, 1 (1), 3-25.
20. Keats, B., & Bracker, J. S. (1988). Toward a theory of small firm performance: A conceptual model. *American Journal of Small Business*, 12 (4), 41-58.
21. Walker, B., Redmond, J., & Goeft, U. (2007). Bellevue Sustainable Industry Project. Final report. Report to the Swan Catchment Council August 2007.
22. Redmond, J., Walker, E.A., & Wang, C. (2006). Small business environmental management: Rhetoric or reality? Paper presented at Institute of small business & entrepreneurship 29th National Conference Cardiff, Wales. 31 October-2nd November 2006.
23. Simpson, M., Taylor, N., Barker, K. (2004). Environmental responsibility in SMEs: Does it deliver competitive advantage. *Business Strategy and the Environment*, 13, (3), 156- 171.
24. D'Souza, C & Peretiakko, R. (2002). The nexus between industrialization and environment. *Environment Management and Health*, 13, (1), 80-97.
25. Revell, A. & Blackburn, R. (2004). UK SMEs and their response to environmental issues: Executive Summary, Small Business Research Centre, Kingston University: Surrey.
26. London Assembly, Environment Committee. (2006). Buying recycled: A review of sustainable procurement by the private sector in London. Retrieved from <http://www.london.gov.uk/assembly/reports/environment/buying-recycled.pdf> May 2007.

27. The National Centre for Business and Sustainability. (2006a). Bringing innovation to existing approaches to influence the behaviour of small businesses. Retrieved from www.defra.gov.uk/science/project_data/DocumentLibrary/SD14007/sd14007_351 May 2007.
28. Bustamante, L. & Jennings, S. (2006). Regional Greenhouse Gas Abatement - Business Program; Stage 3: Local Centres Pilot Project. Southern Metropolitan Regional Council, WA.
29. Webster, B. J., Walker, E. A., & Dorney, B. (2004). *Training and improving productivity in the small business sector*. Proceedings of the 17th Annual Small Enterprise Association of Australia & New Zealand Conference. Brisbane. September 26-29,2004.
30. Upton, N., Teal, E.J., Felan, J.T., 2001. Strategic business planning practices of fast growing family firms. *Journal of Small Business Management*, 39 (1), 60-72.
31. Sandberg, WR, Robinson, RB & Pearce, JA 2001, 'Why Small Businesses Need a Strategic Plan', *Business and Economic Review*, 48 (1), 12-15.
32. Beaver, G. (2003). Management and the Small Firm, *Strategic Change*, 12, 63-68.
33. Westhead, P. & Storey, D.J. (1996). Management Training and Small Firm Performance: Why is the Link So Weak? *International Small Business Journal*, 14,13-24.
34. Storey, D.J. (2004). Exploring the Link, amongst Small firms between management Training and Firm Performance: A comparison Between UK and Other OECD Countries. *The International Journal of Human Resource Management*, 15, 112-130.

35. Rothenberg, S. & Becker, M. (2004). Technical assistance and the diffusion of environmental technologies in the printing industry: The case of SMEs. *Business and Society*, 43 (4), 366-397.
36. Canadian Business for Social Responsibility. (2003). Engaging Small Business in Corporate Social Responsibility: A Canadian Small Business Perspective on CSR. Retrieved from www.cbsr.bc.ca/files/ReportsandPapers/EngagingSME_FINAL.pdf May 2007.
37. ECOTEC. (2000). Report on SMEs and the Environment; Analysis of the replies given by 6 European Union Member States to a European Commission's questionnaire on Small and Medium-Sized Enterprises (SMEs) and the Environment. Report commissioned by the European Commission and Retrieved from <http://ec.europa.eu/environment/sme/pdf/smestudy.pdf> May 2007.
38. Jenkins, H. (2004). Corporate social responsibility—engaging SMEs in the debate: Initial research findings. Report by: The ESRC Centre for Business Relationships, Accountability, Sustainability and Society. Retrieved from <http://www.brass.cf.ac.uk/uploads/CSRandSMEs.pdf> May 2007.
39. Lekas, D. (2006). Nanotechnology Startup Concerns, Information Needs, and Opportunities to Proactively Address Environmental, Health and Social Issues: Focus on Firms in Connecticut and New York. Retrieved from www.nanotechproject.org/file_download/87 May 2007.
40. Observatory of European SMEs. (2002). European SMEs and Social and Environmental Responsibility. Background material Ireland. Retrieved from http://www.eim.nl/observatory_7_and_8/en/reports/2001/background/IR_TR4.doc May 2007

41. Hilton, M., Archer, E., & van Nierop, P. (2000). Professional Education and Training for Sustainable Development in the UK and the Netherlands: Summary. Retrieved from <http://www.eurofound.eu.int/pubdocs/2000/68/en/1/ef0068en.pdf> May 2007.
42. Tinch, R., Peters, M., Monahan, J., Metcalfe, P., & Diaz-Rainey, I. (2004). Powergen Energy Monitor 2004. Retrieved from http://www.eon-uk.com/libraries/uk/downloads/whoweare/Powergen_Energy_Monitor2004.pdf May 2007.
43. Cochius, T. (2006). Corporate Social Responsibility in Dutch SMEs: Motivations and CSR Stakeholders. Retrieved from <http://www.basisboekmvo.nl/images/mvo-scriptie/4%20Timo%20Cochius.pdf> May 2007
44. Netregs. (2003). SME-nvironment 2003: A survey to assess environmental behaviours among smaller UK businesses. Retrieved from http://www.netregs.gov.uk/commondata/acrobat/sme_2003_uk_1409449.pdf#page=8 May 2007.
45. Studer, S., Welford, R., & Hills, P. (2005). Drivers and Barriers to Engaging Small and Medium-Sized Companies in Voluntary Environmental Initiatives. Retrieved from http://www.hku.hk/cupem/home/PDF_file/Report-final.pdf May 2007.
46. Nutek. (2003). Environmental work in small enterprises - a pure gain? Retrieved from <http://www.nutek.se/content/1/c4/23/21/envworksmenterpr.pdf> May 2007.
47. Hilton, M. (2001). Design for sustainable development: Success factors. Report for European Foundation for the Improvement of Living and Working Conditions. Retrieved 26 April 2007 from <http://www.eurofound.eu.int/pubdocs/2001/06/en/1/ef0106en.pdf>.

48. Peters, M. & Turner, R.K. (2004). SME environmental attitudes and participation in local scale voluntary initiatives: some practical applications. *Journal of Environmental Planning and Management*, 47 (3), 449-473.
49. UNIDO and the World Summit on Sustainable Development. (2002). Corporate Social Responsibility: Implications for Small and Medium Enterprises in Developing Countries. Retrieved from <http://www.unido.org/userfiles/BethkeK/csr.pdf> May 2007.
50. Still, L. V. & Walker, E. A. (2006). The self-employed woman and her business: a profile. *Women in Management Review* 21 (4), 294-310.
51. Remade Kent & Medway. (2006). Envirowise communications channel audit: final report. Retrieved from <http://www.egeneration.co.uk/remade06/docs/construction/Envirowise%20final%20report%20web.pdf> May 2007.
52. Billett, S. (2001), "Increasing small business participation in VET: A hard ask", *Education and Training*, Vol. 43, No. 8/9, pp. 416-425.
53. Walker, E., Redmond, J., Webster, B., & LeClus, M. (2007). Small business owners: too busy to train? *Journal of Small Business and Enterprise Development*, 14(2), 294-306.
54. Revell, A. (2006). The ecological modernisation of SMEs in the UK's construction industry, *Geoforum*, 38(1), 114-126.
55. Australian Bureau of Statistics., 2003. Australia's Environment: Issues and Trends. Cat.no.4613.0. [Electronic version].
56. The British Chamber of Commerce. (2006). Energy Efficiency: The Challenge for Government and Small Businesses. Retrieved from http://www.britishchambers.org.uk/policy/pdf/Energy_Efficiency_report2006.pdf May 2007.

57. Bubna- Litic, K. & de Leeuw, L. (1999). Adding the Green Advantage: A Survey of Australian SME's. Research report. Retrieved from <http://www.ecobusiness.com.au/sme/survey.pdf>.
58. Schaper, M. (2002). Small firms and environmental management: Predicting green purchasing in Western Australian pharmacies, *International Small Business Journal*, 20, (3), 235-251.
59. Tilbury, D., Adams, K. & Keogh, A. (2005). A National Review of Environmental Education and its Contribution to Sustainability in Australia: Business & Industry Education. Report No.4 in a series of 5; 2005; Canberra: Australian Government Department of the Environment and Water Resources and the Australian Research Institute in Education for Sustainability (ARIES). Retrieved from www.aries.mq.edu.au/project.htm May 2007.
60. The National Centre for Business and Sustainability. (2006b). Behaviour Change: A Series of Practical Guides for Policy-Makers and Practitioners; Number 9; Encouraging Sustainability Amongst Small Businesses. Retrieved 26 April 2007 from http://www.defra.gov.uk/science/project_data/Document Library/SD14007/SD14007_3517FRP.doc.
61. Webster, B. J, Walker, E. A. & Brown, A. (2005) Small business participation in training activities. *Education + Training* 47 (8/9), 552-561.
62. Tilley, F. (1999). The gap between the environmental attitudes and the environmental behaviour of small firms. *Business Strategy and the Environment*, 8, 238-248.
63. Everett, J. and J. Watson (1998). Small business failures and external risk factors. *Small Business Economics* 11(4): 371-390.
64. Holmberg, S. R. and K. B. Morgan (2003). Franchise turnover and failure: New research and perspectives. *Journal of Business Venturing* 18(3): 403-418.

65. Tilley, F. (2000). Small firms' environmental ethics: How deep do they go? In R. Hillary (Ed), *Small and medium sized enterprises and the environment: Business imperatives*. pp.35-48. Sheffield, UK: Greenleaf.
66. Hillary, R. (1999). Evaluation of study reports on the barriers, opportunities and drivers for small and medium enterprises in the adoption of environmental management systems. Report to Department of Trade and Industry, United Kingdom 5 October 1999. Available from http://www.business-in-21.com/files/ems_sme_dti.rtf.
67. Bayerisches Landesamt fur Umwelt (2006). Ecological and economic effects of EMSs in enterprises in Bavaria: final report of the research project. Retrieved from http://www.izu.bayern.de/download/pdf/wirkungen_ums.pdf May 2007.
68. Katos, G. & Nathan, S. (2004). SME Delivery Mechanisms. Presentation of Key Quantitative Research Insights. Retrieved from http://www.sustainability.vic.gov.au/resources/documents/04_sept_15_TQA_final_report.pdf May 2007.
69. Rutherford, R., Blackburn, R.A., & Spence, L.J. (2000). Environmental management and the small firm. *International Journal of Entrepreneurial Behaviour and Research*, 6 (6), 310-325.
70. Advisory Committee on Business and the Environment's (ACBE). (1998). Advisory Committee on Business and the Environment's (ACBE) Eighth Progress Report to the Prime Minister and the Secretary of State for Trade and Industry, UK. Retrieved from www.defra.gov.uk/ENVIRONMENT/acbe/pubs/ar1998/acbe_1998 May 2007.
71. Wang, C., Walker, E. A., & Redmond, J. (2007). Evaluation of the IT Advisor/Coach Service in the South West Region of Western Australia. A report to the Small Business Centre Bunbury-Wellington, Perth, WA.

72. Bode, S. & Walker, E. (2003). Technology and small enterprise: Business benefit or bane? Paper presented at the 4th International We-B Conference, 24-25 November, 2003, Perth, Western Australia.
73. Friedman, A.L. and Miles, S. (2002). SMEs and the environment: evaluating dissemination routes and handholding levels. *Business Strategy and the Environment*, 11, 324-341.
74. Petts, J., Herd, A., & O'hEocha, M. (1998). Environmental responsiveness, individuals and organizational learning: SME experience. *Journal of Environmental Planning and Management*, 41 (6), 711-731.
75. Friedman, A.L., Miles, S., & Adams, C. (2000). Small and medium sized enterprises and the environment: Evaluation of a specific initiative aimed at small and medium enterprises, *Journal of Small Business and Enterprise Development*, 7, (4), 325-342.
76. Schaefer, A. (2007). Contrasting institutional and performance accounts of environmental management systems: Three case studies in the UK water & sewerage industry. *Journal of Management Studies*, 44 (4), 506-535.
77. Sear, L. & Green, H. (1996) Small business development and enterprise support. In, G. Haughton and C.C. Williams (eds), *Corporate City? Partnership, Participation in Partition in Urban Development in Leeds*, Avebury, Aldershot.
78. Hitchens, D., Clausen, J., Trainor, M., Keil, M., & Thankappan, S. (2003). Competitiveness, environmental performance and management of SMEs. *Greener Management International*, 44, 45-57.
79. Dawson & Probert. (in press). A sustainable product needing a sustainable procurement commitment: the case of Green Waste in Wales. *Sustainable Development*, DOI 10.1002/sd.307.

80. Petts, J. (2000). Small and medium enterprises and environmental compliance: attitudes among management and non-management. In Ruth Hillary (Ed). *Small and medium enterprises and the environment*. (pp.49-60). Sheffield: Greenleaf.
81. Smith, D. & Skea, J. (2003). Resource Productivity Innovation: Systematic Review. Retrieved from [http://www.sd-research.org.uk/documents/RPI SystematicReview-FinalReportSept03.doc](http://www.sd-research.org.uk/documents/RPI%20SystematicReview-FinalReportSept03.doc) May 2007.
82. Anglada, M.L. (2000). Small and medium enterprise' perception of the environment: A study from Spain. In Ruth Hillary (Ed). *Small and medium enterprises and the environment*. (pp.49-60). Sheffield: Greenleaf.
83. Department of the Environment, Water, Heritage and the Arts. (n.d). Environment Protection and Biodiversity Conservation Act 1999. <http://www.environment.gov.au/epbc/about/index.html>.
84. IEFE. (2005). EVER: Evaluation of EMAS and Eco-label for their Revision: executive summary. Commissioned by IEFE – Università Bocconi, Adelphi Consult, IOEW, Office Heidelberg, SPRU, Sussex University, Valør & Tinge A/S. retrieved from http://www.adelphi-research.de/projektberichte/ever_final.pdf May 2007.
85. Hallinan, P. (2003). The SME battle against environmental performance: The Hackefors Model. 16th Annual SEAANZ Conference 28 Sept - 1 October 2003.
86. Henriques, I. & Sadorsky, P. (2007). Environmental technical and administrative innovations in the Canadian manufacturing industry. *Business Strategy and the Environment*, 16, 119-132.
87. UNEP. (2002). Cleaner Production: A Global Status Report. Retrieved from <http://www.uneptie.org/pc/cp/reportspdf/esgs2002CP.pdf> May 2007.

88. Hilton, M. (2002). Design for sustainable development: Success factors. Report to European Foundation for the Improvement of Living and Working Conditions. Retrieved from <http://www.eurofound.eu.int/pubdocs/2001/06/en/1/ef0106en.pdf> May 2007.
89. Buy Recycled Business Alliance (2007). Programs & Services. Retrieved from <http://www.brba.com.au/programsservices/index.cfm> May 2007.
90. Worthington, I. & Patton, D. (2005). Strategic intent in the management of the green environment within SMEs. *Long Range Planning*, 38, 197-212. DOI:10.1016/j.lrp.2005.01.001.
91. UNEP. (2004). Regional Sustainable Consumption and Production Report: Asia & the Pacific. Report Retrieved from [www.uneptie.org/pc/cp/reportspdf/4.%20Sustainable-UNEP%20\(Text\)%20p.%201-34.pdf](http://www.uneptie.org/pc/cp/reportspdf/4.%20Sustainable-UNEP%20(Text)%20p.%201-34.pdf) May 2007.
92. De Bruijn, T. & Lulofs, K. (2001). Promoting environmental management in Dutch SMEs: Policy Implementation in Networks. Retrieved from <http://doc.utwente.nl:81/fid/2303> May 2007.
93. Revell, A. (2003). The ecological modernisation of small firms in the UK. *Business Strategy and Environment Conference*. Leicester.
94. The Greening of Industry Network. (1999). International Forum on the Greening of Small and Medium-Sized Enterprises: summary report. Retrieved from <http://www.greeningofindustry.org/summary.html> May 2007.
95. Gunningham, N., Sinclair, D., & Burritt, P. (1997). Barriers and motivators for the adoption of cleaner production in Australia. Retrieved from <http://www.environment.gov.au/settlements/industry/corporate/eecp/publications/pubs/barriers.pdf> May 2007.

96. Baumast, A. (2002). Environmental Management Systems and Cultural Differences: An Explorative Study of Germany, Great Britain, and Sweden. Retrieved from <http://miami.uni-muenster.de/servlets/DerivateServlet/Derivate-678/baumast.pdf> May 2007.
97. EC Enterprise Directorate-General. (2005). Responsible entrepreneurship: A collection of good practice cases among small and medium-sized enterprises across Europe. Retrieved from http://ec.europa.eu/enterprise/entrepreneurship/support_measures/responsible_entrepreneurship/doc/resp_entrep_en.pdf May 2007.
98. Masurel, E. (2007). Why SMEs invest in environmental measures: sustainability evidence from SME sized printing firms. *Business Strategy and the Environment*, 16, 190-201.
99. Nutek. (2005). Successful and profitable: How environmental work can benefit your company. Retrieved from <http://www.nutek.se/content/1/c4/04/44/NUT%200106%20MAF%20Broschyr%20eng.pdf> May 2007.
100. Naffizger, D.W., Ahmed, N.U., & Montagno, R.V. (2003). Perceptions of environmental consciousness in the US small business an empirical study. *SAM Advanced Management Journal*, 68 (2), p.23-32.
101. Brunton, C. (2002). Business Attitudes Toward the Purchase and Use of Recycled Content Products. Retrieved from <http://www.brba.com.au/uploads/documents/Attitudes%20to%20RCPs%202002.pdf> May 2007.
102. Marsden, S. & Ashe, J. (2006). Strategic environmental assessment legislation in Australian States and Territories. *Australasian Journal of Environmental Management*, 9, 205-215.

103. TemaNord (2005). Environmental Incentives and Nordic SMEs. Impact on Performance and Competitiveness. (Nordic Council of Ministers, Copenhagen). Retrieved July 1 2007 from <http://www.norden.org/pub/velfaerd/naering/sk/TN2005543.pdf>.
104. Merritt, J.Q. (1998). EM into SME won't go? Attitudes awareness and practices in the London Borough of Croydon. *Business Strategy and the Environment*, 7, 90-100.
105. Minerals Council of Australia. (2005). Enduring Value - The Australian Minerals Industry Framework for Sustainable Development. Retrieved from <http://www.minerals.org.au/enduringvalue> May 2007.
106. Environment Canada. (2005). Improving the Effectiveness and Efficiency of Pulp and Paper Environmental Effects Monitoring: A Smart Regulation Opportunity. Retrieved July 1 2007 from http://www.ec.gc.ca/eem/pdf_publications/english/EEM_Smart_Regulation.pdf
107. Hodgson, Buselich & Halpin (2006). The WA collaboration: Facilitating integration of sustainability issues in a community and civil society context. *Australian Journal of Environmental Management*. 9, 20-27.
108. European Commission. (2006). Streamlining and Simplification of Environment Related Regulatory Requirements for Companies. Final Report from the BEST Project Expert Group. Retrieved from http://ec.europa.eu/enterprise/environment/index_home/best_project/best_2006_simplification_final_report.pdf.
109. Short, Jones, Carter, Baker & Wood. (2004). Current practice in the strategic environmental assessment of development plans in England. *Regional Studies*, 38 (2), 177-190.
110. Clement, K. & Hansen, M. (2003). Financial incentives to improve environmental performance: a review of Nordic public sector support for SMEs. *European Environment*, 13(1), 34-47.

111. Gunningham, N. (2003). Regulating small and medium sized enterprises. *Journal of Environmental Law*, 14 (1), 3-32.

112. Federation of Small Businesses in Scotland & Scottish Executive. (2002). Energy and Environment SME Toolkit: reduce costs maximise your profits. Retrieved 26 April 2007 from <http://www.fsb.org.uk/policy/rpu/scotland/assets/FSB%20and%20SEEO%20Energy%20and%20Environment%20SME%20Toolkit.pdf>.

113. EUROCHAMBRES (The European Chambers of Commerce and Industry). (2006). Energy Efficiency Action Plan: Best practices. Retrieved from http://www.eurochambres.eu/PDF/pdf_environment/060718%20Best%20Practices%20final.pdf May 2007.