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**Citation:** VICTORIA-URIBE and LOFTHOUSE, 2006. Across the pond : a comparison of the Mexican & British SMEs and their dealings with sustainability. IN: Proceedings of Corporate Responsibility Research Conference 2006,

**Additional Information:**

- This is a conference paper

**Metadata Record:** <https://dspace.lboro.ac.uk/2134/2301>

Please cite the published version.

The Corporate Responsibility Research Conference 2006

## Across the pond: A comparison of the Mexican & British SMEs and their dealings with sustainability.

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### Abstract

Small and Medium Enterprises (SMEs) are widely recognized as an important part of the worldwide economy, acting both as the backbone of local economies and as consumers of natural resources. In light of this, since the 1990's, research to investigate how to make them more sustainable through the use of sustainable design tools, has been carried out. This paper reports the findings from a doctoral research project which aims to investigate how sustainable design has been introduced into British SMEs and whether these approaches can be transferred to their Mexican counterparts. Whilst it is recognized that British and Mexican SMEs have different contexts and challenges, initial research indicates that they share common goals and may face similar problems in the way that sustainable design is communicated to them.

The objective of this paper is to present commonalities between both contexts, analyze the common issues that SMEs in both countries face and explore the existence of a possible gap in the current attempts to apply sustainable design in the Mexican context. It concludes that the lack of access to a network of sources of information is hindering the process for many SMEs.

**Keywords:** Mexico, UK, SME, sustainable design, context, differences, commonalities, support networks, successful examples, access to information.

### 1. Introduction

In recent years, there has been a dramatic increase in the level of damage inflicted on the natural environment (Lovelock, 2006). Damage which is caused by the destruction of natural resources, increases in air pollution, the destruction of the ozone layer and the spills of toxic materials as byproducts of the industrial process. It is because of these problems that great importance has been given to raising environmental awareness among enterprises. Research has been carried out with this purpose and sustainable design is one concept which aims to accomplishing this without affecting the performance of the enterprises.

Whilst large, multinational companies such as 3M, Phillips and Electrolux are making fast improvements with new internal environmental policies (Charter and Belmane, 2000; Tukker, et al., 2000), the same cannot be said for Small and Medium Enterprises (SMEs). This seems to be even more noticeable in those SMEs located in developing countries like Mexico (Barrera, 2001; Cevallos, 2004; Gallagher and Zarsky, 2004), where several issues, that will be explained in detail in the following sections, are hindering the process of raising environmental and social awareness among SMEs.

For the purpose of this study, two countries have been chosen: Mexico and UK. Mexico was chosen because of its status as a developing country with a significant economic and productive weight in the Latin-American region and for the access that the research team has to relevant information. Mexico has just started the process of implementing sustainable measures, with not enough success (Romo, 2003). The UK has a strong economic and industrial presence in Europe. In recent years the British government has actively supported the implementation of sustainable measures in SMEs (Tukker, et al., 2000). The on-going nature of this implementation provides researchers with the opportunity to study the challenges which are arising and the solutions which are being employed.

Sustainable Design is a concept which addresses three main spheres of interaction for any given product (or service), during its whole life cycle; ecology, economy and society (Masera, 1999). With the application of sustainable design a product or service:

1. is environmentally friendly,
2. solves a necessity of society,
3. uses resources wisely,
4. provides financial revenue for the manufacturer. (Masera, 1999; Datschefski, 2004)

These characteristics are achieved through the application of a range of sustainable measures such as minimization of materials, life cycle assessment, focus on user needs, local sourcing and employee health. Therefore, sustainable design can be used as a tool for improving SMEs.

By comparing case studies from Mexico and UK this paper reviews the current situation existing in Mexican and British SMEs. The key objectives of this paper are:

- To assess the current status of sustainable design in Mexico, UK and their SMEs.
- To generate background for use in a comparative analysis between the Mexican and British contexts.
- To determine any possible gap in the application of the Sustainable Design in Mexican SMEs and if it is possible, to find similar resolved examples in UK that can be analysed for further inspiration.
- To identify the relevant aspects surrounding the gap and gather enough data to support the findings.

These objectives have the purpose of obtaining guidance on how to understand and solve the current problems that are hindering process of raising environmental awareness and social responsibility in Mexican SMEs.

## 2. Methodology

The findings reported in this paper represent the initial stages of a doctoral research project. In the majority, they have emerged from an in depth literature review of books, journal articles, websites of proved reputation, with the aim of understanding the state of the art in sustainable design thinking and identifying successful case studies from which to draw useful lessons.

The Mexican case studies reflected on in this paper were sourced from an environmental corporative report, gathered by three of the principal actors in the Mexican context (CMP+L, GTZ and Canacintra). Due to the limited amount of Mexican case studies available, all of the well documented cases found during the literature were used in this research (see Table 1).

Table 1: Mexican case studies analyzed during the research

<b>Case studies from Mexico</b>		
<b>Company</b>	<b>Product / Service</b>	<b>Source of information</b>
Artesanos Purépechas	Wood handicraft furniture	Masera (1999)
Aceros América, S.A de C.V	Car chasis manufacture	CMP+L (2001)
Procesos Galvano, S.A de C.V	Electroplating	
Cromoduro, S.A de C.V	Electroplating	
Cleaver Brooks de México, S.A de C.V	Boiler manufacture	
Congeladora Ceuta S.A de C.V.	Food procesing	GTZ / Canacintra (Fundación Sinaloa EcoRegión, 2002)
Quetzal, Papel Artesanal.	Paper manufacture	

Most of the British cases came from reports available on the Envirowise website (Envirowise, 2005b). The rest were published on the Design Wales website (Design Wales) or on companies' own websites. Table 1 lists the SMEs investigated during this study. In the UK it is common practice to publicize successful sustainability case studies. As such there were a much broader range of cases to select from. In light of this the case studies which: provided information about the *process* of reducing the environmental impact; used measures that had a direct impact in their processes; and/or stated the commitment of management levels, were selected (see Table 2).

Table 2: British case studies analyzed during the research

<b>Case studies from UK</b>		
<b>Company</b>	<b>Product / Service</b>	<b>Source of information</b>
Bovince Ltd.	Printing company	Interview with its quality manager; (Geerts and Smith, 2001; Hall, 2001)
Macmillan Distribution Ltd	Book distributor	Envirowise (2005b)
Broadland Wineries	Wine bottling	
Pentos Office Furniture Plc	Furniture	
bpi.industrial	Plastic moulding	
Fulleon Ltd	Fire alarms	
Abbey Corrugated	Corrugated board	
Kappa Packaging	Packaging	
Terinex Ltd	Packaging	
Frost Electroplating	Electroplating	
Phil Oakley	Fishing rods	Design Wales (2005)
Transco Plc.	Gas transporter	

In addition to the literature review, an in-depth, semi structured interview was carried out with the environmental and quality manager of Bovince Ltd., a printing company located in London, renowned for its success in applying sustainable design (Geerts and Smith, 2001; Hall, 2001). Through the interview enabled first hand information and insights to be gathered about the process of implementing sustainable measures and provided the opportunity to better understand the SMEs' perspective of environmental awareness and social responsibility.

### 3. Reflecting on the key actors which influence the uptake of sustainable design in Mexico and the UK

Mexico and the European Union (and by default the UK) have similar definitions regarding what is considered to be an SME, based on number of employees: Micro (1-10 employees), Small (11-50 employees) and Medium (51-250 employees) (Contacto PyME, 2005; European Commission, 2005). In addition the European definition also states the expected annual turnover to this classification (European Commission, 2005).

The type of governmental approach and level of support offered along with the additional support networks available to SMEs strongly influence uptake of sustainable design. As illustrated in Figure 1, these two actors have the important role of being the columns that support the performance of the SMEs.

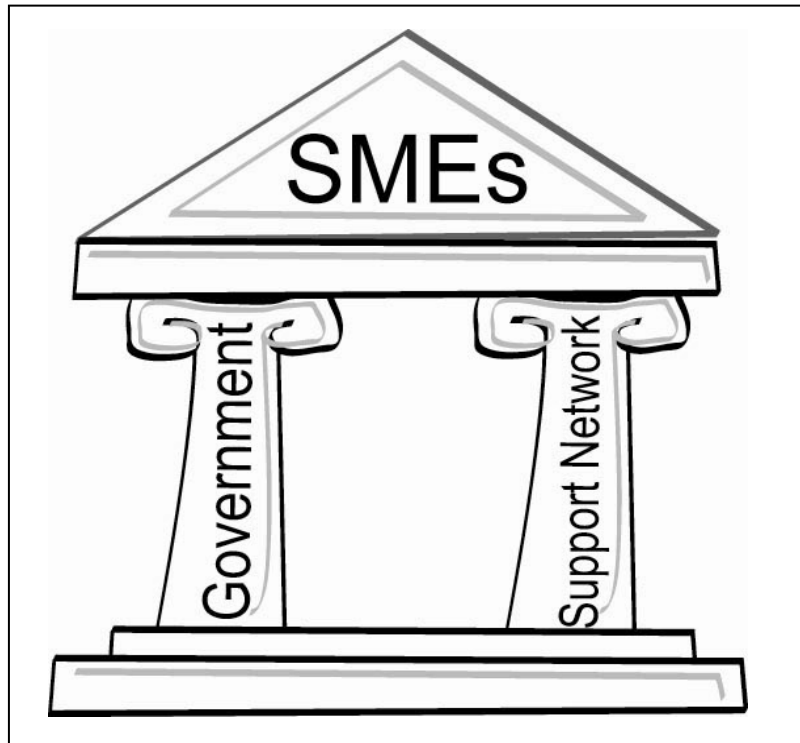


Figure 1: The role of the Government and the Support Networks as columns for the SMEs' performance.

### **3.1 Governmental approach and support**

There are considerable cultural, financial and historical differences between Mexico and the UK, and as such there are various differences in the level and type of support provided by government.

British government interest in enforcing sustainable practices amongst its SMEs comes from the need to stimulate environmental change in industry (Smith, 1999). The Department of Trade and Industry and the Department of Environment, Transport and Regions have started to recognize the importance of environmental performance and social responsibility (Charter and Belmane, 2000). They are incorporating these concepts into their programs addressed to businesses regulations; and their policies are aimed at preventing pollution. Local governments have great importance as sources of information for SMEs that aim to apply environmental practices like Sustainable Design. They usually work in conjunction with business links and industry chambers to carry out these endeavors (Charter and Belmane, 2000).

The key driver for Mexican government comes from external pressures exerted through the NAFTA trade agreements signed with the United States of America and Canada, and the FDI (Foreign Direct Investment) policies (Gallagher and Zarsky, 2004). Different branches of the Mexican Ministry for Natural Resources (SEMARNAT), such as the National Institute of Ecology (INE) and the Federal Ministry for Environmental Protection (PROFEPA), have been in charge of developing and enforcing environmental policies and support structures for industry. However at regional and local governmental levels, the situation is different. The lack of resources and technical knowledge render these branches

unable to provide assistance to any endeavor aimed toward the application of sustainable measures (Gonzalez, 2005).

Mexican environmental policies are considered to be of a good standard by organizations such as the FDI (Gallagher and Zarsky, 2004), but these policies have an “end of the pipe” focus, and are only concerned with establishing limits to reduce the environmental impact, particularly the air pollution and waste level. They do not enforce prevention, continuous improvement and development of nearby communities (Barrera, 2001). In addition to this, due to the recurrent financial crisis and the necessity of attracting foreign investors, it is argued that the government does not do enough to enforce these standards when it comes to foreign enterprises (Gallagher and Zarsky, 2004). This sets a poor precedent for local SMEs, who see no reason to comply with those standards. It can, also be expensive to both government and SMEs to enforce these standards (Ayala, 2003).

Another recognized problem is that most of the governmental programs only reach medium and big sized companies, instead of the small ones (Barrera, 2001). For example, the Mexican government offers small grants to support SMEs who wish to reduce their environmental impact. However, most of these grants are denied, either because the request to obtain the grant lacks proper financial information or the internal procedures of the company are not aimed to prevent the pollution. This is contradictory, since as was mentioned before, governmental policies are not focused on prevention, but in the “end of the pipe” (Barrera, 2001).

When comparing both contexts, it is possible to conclude that in the British context there is an agreement between policies and aims. Also the involvement of local councils is a key factor to increase in environment awareness and social responsibility among the British SMEs. In the Mexican context, there are contradictions due to the fragmented status of the links between government and companies, especially at the local levels.

Finally, it seems that external stimuli, in the form of environmental policies created by trade agreements, are becoming an important reason to apply Sustainable Design. This is because in order to be able to compete in foreign markets as well in the internal ones, companies must comply with these environmental policies.

### **3.2 Support networks**

The Mexican support networks consist of people from the industry chambers or academic centers dedicated to the research and application of clean production techniques. The support networks fall into one of the following categories (Romo, 2003):

- Industry chambers, such as CONIECO (National Chamber of Entrepreneurs committed with the Environment) and one of the main actors in Mexican industry the CANACINTRA (National Chamber of the Transformation Industry).

- Academic and research centers, the most prominent being the CMP+L (Mexican Centre of Cleaner Production), sponsored by the Polytechnic Institute of Mexico.
- Non-governmental organizations, foundations created by international cooperation enterprise, in particular, the GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit), who has worked in conjunction with CANACINTRA to offer workshops aimed at explaining and guiding SMEs through the application of Sustainable Design.
- International institutions, such as the PNUMA (United Nations Program for the Environment) and the CEPAL (Economy Commission for Latin America and the Caribbean).

Although there is progress in the creation of support networks for the SMEs, the links between the networks and the enterprises are not strong enough. This is because the process of creation has found initial reluctance from the SMEs and the attempts of the networks to promote cooperation between SMEs are still isolated cases. Coupled with the lack of financial resources and weak links between academia and industrial activity, the effectiveness of those support networks and the quality of information has been reduced (Casalet, 1999; Romo, 2003; Gonzalez, 2005).

In the UK, the most prominent provider of support is Envirowise, a government-funded programme that works through local networks and offers environmental and business assistance. Envirowise claims to have helped to save more than 1.3 billion pounds to the British industry (Envirowise, 2005a). Other support is provided by Business Links (a government funded initiative) or green business clubs (a synergy between local governments and companies). There is conflicting opinion regarding the suitability of Business Links as a source of advice. Smith (1999) identified that SMEs prefer Business Links as a source of information, as they are independent of commercial pressure. Where as Charter and Belmane (2000) have found that SMEs do not see Business Links as the best source of advice.

Universities and research centers also contribute support via consultancy and research projects. For example, Design Wales, a program linked with University of Wales Institute Cardiff, offer local SMEs ecodesign support for product and packaging design. Funding initiatives such as the EPSRC Sustainable Technologies Initiative are also aimed specifically at SMEs. They do however require a considerable financial commitment from the company which can limit the accessibility of this approach to larger, more successful SMEs. Another player is Groundworks, an environmental regeneration charity, which operates through local networks and has a central unit which advises companies (Charter and Belmane, 2000; Tukker, et al., 2000).

Charter and Belmane (2000) recognize that one of the most cited needs among British SMEs is the need for accessible, high quality advice. They recognize two further problems, that Green Business Clubs are also not seen as a suitable source of advice since they are not used to working with small business and also that there are only a small number of professionals with knowledge in



Sustainable Design. The lack of professionals with knowledge in Sustainable Design mirrors the situation in Mexico.

From what can be inferred from the case studies, British companies appear to be mildly aware of the advantages of applying sustainable measures. This has created a new market for design consultancies, such as Design Wales which include among their services, support to SMEs and their environmental issues. A similar process is starting in México, but the role of creating the market falls on actors such as the CMP+L, rather than the companies (Romo, 2003).

Both in Mexico and the UK, support networks are being created, but with limited success, mostly because they fail to address the needs of the SMEs, reducing their effectiveness.

#### 4. Information requirements

SMEs appear to need several types of information in order decide if they going to apply sustainable measures and which measures they should apply. They need:

- information regarding legislation and governmental policies.
- a basic understanding of what sustainable design *is* – in terms of clear, understandable definitions.
- information about available certification and their requirements (e.g. in Europe companies can apply for EMAS and ISO 14001 certifications and in Mexico SMEs can apply for ISO 14001.)
- technical information (e.g. manufacturing processes, disassembly processes)
- information about sustainable design strategies (e.g. reuse of materials)
- access to relevant tools, (e.g. LCA, Ecodesign web)
- information about implementation methodologies (e.g. processes for implementing environmental policies in company such as EMAS)

Any SME that is going to try and implement Sustainable Design needs clear and concise information, but this is not always the available. There is confusion among Mexican SMEs, regarding environmental issues, due to the great array of concepts and disparity of opinions in terms, certifications and processes (Barrera, 2001; Romo, 2003; Cevallos, 2004; Gallagher and Zarsky, 2004). In the UK there is a similar situation; not all the information is entirely clear nor mainstream, although there are more sources of information.

In the UK information is provided in a number of different ways, via; workshops, websites, one-to-one meetings and guidebooks. Also, in the UK, the custom of making public the success of the sustainability measures is widespread and the benefits they bring companies in terms of education, are recognized (Lofthouse, 2004). These public reports act as additional sources of information. In Mexico the modes of delivery are via magazine articles, one-to-one meetings and workshops held by the support network (GTZ-Canacintra, CMP+L and CONIECO), though it should be noted that accessibility to these is very limited. In terms reporting, in Mexico it is not common practice to publicize

case studies, except if, like in the case studies used in this research, they are compiled by one of the support networks.

It also should be noted that the European Union, through one of their websites, offers a web toolkit dedicated to this purpose (European Commission, 2004). This site was created with the purpose of finding alternative ways to reach SMEs and provide them with tools suited to their needs (Møller and Erdal, 2003). The web toolkit provides a thorough explanation in the form of small nuggets about the EMAS (Eco-Management and Audit Scheme) certification and in general, how to start to implement Sustainable design measures. It also includes summarized case studies, classified per sector and country, to serve as examples. There is no parallel to the EMAS web toolkit on the Mexican side.

Despite the variety of sources, some British SMEs have reported difficulties in accessing reliable and relevant information for their particular needs (Smith, 1999). According to Lofthouse (2005), one of the consistent problems that designers have, is that usually the information is scattered, requiring valuable time to find and study it. This is likely to be a problem also experienced by SMEs. Although solutions aimed toward this particular issue are being developed in the form of web based tools, it is still necessary to study and determine if the SMEs are really aware of the existence of these tools.

Compared with their British peers, many employees in Mexican SMEs have to work with outdated equipment and the companies do not always have access to the Internet. Nevertheless it looks to be a feasible option to provide information. According to the Mexican Association of Internet (AMIPCI, 2006) in 2005, 42% of computers with internet access, belong to Enterprises. While it is still expensive for some sectors of the population to have access to web, it is also true that it is becoming a very important tool. In fact, the few case studies found during the research, were published in digital format.

## 5. Analysis

By studying the experiences of a wide range of SMEs it has been possible to identify a range of common barriers which impede the implementation of sustainable design. The following barriers were identified as being common to both Mexican and British SMEs:

- A lack of a clear and unified concepts terms, certifications and process regarding environmental impact and Sustainable design measures.
- A Lack of resources, either internal (enough capital to undertake the process) or external (governmental support).
- The fact that there are few active players that can offer guidance to them in the application process. In UK, there are not enough professionals, but there are more organizations in the support network.
- A Lack of financial and technical support amongst SMEs. Although this is relevant to both contexts, it is even more evident in Mexico.

Barriers which were identified as being specifically relevant to Mexican SMEs were:

- A lack of sources of information to acquire knowledge regarding the basic concepts of Sustainable design, the strategies, tools and benefits associated with them.
- A Lack of enforcement of environmental policies.

The study has also identified that there are a number of key success factors which appear to contribute to the successful implementation of sustainable design measures in SMEs. Common key success factors common to both British and Mexican SMEs are:

- The view that sustainable design or the application of environmental policies are a way of being competitive, increasing savings and becoming sustainable, leading to increased income.
- A sense of responsibility toward the community.
- Commitment from the management to the application of sustainable measures
- Commitment to educate the personnel within the company.
- Constant measurement and improvement (Hall, 2001).

Key success factors specific to the UK, appear to be:

- Access to an active network of sources of information
- external pressure from the supply chain and consumers
- Use of a relevant guide (e.g. Bovince used the Sigma guide (Hall, 2001; The Sigma Project, 2003)).

Key success factors specific to Mexico, were

- The will to challenge the cultural establishment predominant among the Mexican industry (Mexican companies see environmental regulations and improvements, more as a requirement or a luxury rather than a way to enhance their processes. (Romo, 2003)).
- The wish to participate in programs aimed to the prevention of pollution (CMP+L, 2001).

## 6. Conclusion

From this analysis, it can be concluded that the current situation of among British and Mexican SMEs is quite similar. A key deficit appears to be the lack of pertinent information and knowledge about Sustainable design, how to raise environmental awareness or how to reduce their environmental impact. Initial investigation suggests that the lack of concise, clear and organized information is one of the reasons that discourage SMEs from adopting Sustainable design measures. British SMEs seem to have suffered a similar problem in the past with accessibility of information (Charter and Belmane, 2000). Although their process is still ongoing, the current status of their progress reported in the available literature suggests that there is improvement in this particular area.

One of the biggest problems in Mexico, identified during the research was the fact that little information is freely available and it is too dispersed to be used in an effective way. Coupled with the language barrier, the excessive amount of similar terms and a lack of awareness/ understanding, any effort to obtain

information is hindered by confusion (Casalet, 1999; Barrera, 2001; Romo, 2003). Given the fragmented nature of Mexican support networks and the poor reach of governmental programs and the lack of information available, the enforcement of sustainable measures among SMEs, cannot be expected. From this, it is possible to conclude that, compared to their British peers; Mexican SMEs do not have the access to the same quantity of good quality, relevant information. Information that can help SMEs to reduce their environmental impact and improve their social impact.

Based on the success of the SIGMA guidebook and website, used extensively by Bovince and the approach of using free guidelines for SMEs such as the EMAS website (Møller and Erdal, 2003) it could be argued that 'information networks' either in the form of guidebooks or web based tools could help fill the knowledge gap of Mexican SMEs. Whilst support networks can have a beneficial effect in terms of guidance, online media appears to be one of the best options for reaching SMEs, due to the increasing number of companies that are getting access to the Internet. These 'information networks' could also help to promote successful case studies which would help to demonstrate best practice to SMEs of how to apply environmental measures.

Although filling the information gap is not the only recommended solution, it is possible to expect that an improvement in SMEs will be produced by providing them with a starting point. Further research should be aimed to study this gap; investigating why there is initial reluctance from SMEs to apply environmental measures in their process and assessing the quality and quantity of the existing possibilities of knowledge transfer; using the current British experience as a guide. This will establish a reference in order to be able to evaluate the performance of future tools aimed Mexican SMEs and studying the possible measures of improvement that could be taken.

This doctoral project will continue with further work, researching these particular issues among Mexican SMEs. Qualitative data will be collected through interviews and questionnaires. These questionnaires have the purpose of probing the opinion of Mexican SMEs regarding their needs, their current knowledge of Sustainable design, their interest in the topic and in any possible tool developed in the future. The information obtained from these questionnaires is going to be reported and used to develop the next stage of the project.

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