ISO 14001 and EMAS in Small and Medium-Sized Enterprises - Obstacles to Implement these Environmental Management Approaches in SMEs and How to Improve the Potential of these Approaches for the Usage in SMEs

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Abstract

With a growing interest in Environmental Management practices in recent years, a group of Environmentalists has evolved stating that Environmental Management Systems (EMS) in companies can lead to competitive advantage. While Small and Medium-Sized Enterprises (SMEs) have strong economic as well as environmental impact, some studies indicate that the competitive gain through the implementation of EMSs is positively influenced by the size of the company, promising fewer advantages to SMEs from an EMS implementation. This article analyses the current alternative of EMS standards available for SMEs in relation to the characteristics of SMEs. The article concludes with recommendations to improve the implementation of EMS standards to better suit the needs of SMEs.

Keywords: small-and-medium-sized enterprise (SME), ISO, EMAS, environmental management system (EMS), implementation

Introduction

Purpose of the Paper

In the last couple of years a new group of Environmentalist has evolved, promoting a potential to gain competitive advantage through the implementation of Environmental Management Systems (EMSs). Several researches have been conducted into the potential competitive benefits of the implementation of EMSs in companies. These researches have identified several competitive advantages that could be gained from implementing EMSs, from cost savings to increased profits. Nevertheless, some researches have stated that the magnitude of these benefits potentially deriving from the implementation of an EMS depend upon the characteristics of the company (e.g. Stoeckl, 2004). Companies showing the strongest evidence for competitive benefits through the implementation of EMSs seem to be larger corporations in certain industries.
Reports emphasizing the competitive wins from an EMS usually include the oil industry, the chemical or the automotive industry as shown in the SustainAbility/UNEP report (2001). The EU Eco-Management and Audit System (EMAS) and the EMS standard of the International Organization for Standardization (ISO) ISO 14001 are the most commonly used and most often discussed Environmental Management Systems. Especially the standardised approaches of EMAS and ISO 14001 appear to be better suited for larger companies as stated by Gerstenfeld/Roberts (2000). NORMAPME a European organisation representing SMEs to the International Organization for Standardization (ISO) stated that the ISO 14001:2004 revision, although especially intended to make it more user-friendly for SMEs, “did not account for the needs of SMEs and thus would not foster increased acceptance” (ISO Strategic SME Group report, 2005, p.6). It appears that SMEs have certain characteristics which seem to make it difficult for them to benefit from EMSs or even to implement such a system. This leads to the question whether Small and Medium sized Enterprises could benefit from the implementation of an EMS and what could be done to improve the applicability of ISO 14001 and the EMAS approach for SMEs. The purpose of this paper is to review the literature about this topic, to describe the special circumstances for an EMS implementation in SMEs and to develop from these characteristics recommendations for the improvement of the ISO 14001 or EMAS application in SMEs.

Structure of the Paper
In order to derive at recommendations to improve the potential for ISO 14001 and EMAS to provide a useful EMS approach for SMEs this paper will:
1) Provide a definition of SMEs and discuss their economical and environmental impact;
2) Briefly describe the ISO and EMAS standard as well as alternative EMS approaches and show their usage in SMEs;
3) Describe the characteristics of SMEs and the impact of these characteristics upon the implementation of EMSs;
4) Arrive to a conclusion about the potential of ISO 14001 and EMAS for SMEs and develop recommendations to increase this potential.

SMEs and their economical and environmental impact

Definition of Small and Medium-Sized Enterprises
There is no common world wide definition of what constitutes small and medium-sized enterprises (SMEs) as noticed by many researchers (e.g: Megginson et al., 1988, p.9). Studies generally use quantitative, mainly based on the number of employees, or qualitative definitions of SMEs, the later being mainly based on management and ownership characteristics.

Most researchers use the definition of the US Small Business Administration, referring to enterprises with less than 250 employees as SMEs. A more detailed definition based mainly on the number of employees has been provided by the EU as taken from a report of the European Research Advisory Board (EURAB Working Group 9, 2004, p.4):
“The EU defines an SME principally as an enterprise with less than 250 employees. Additional criteria relate to turnover and independence.
• SMEs with less than 10 employees are micro enterprises.
• Those with 10-49 employees are small enterprises.
• Those with 50-249 employees are medium-sized enterprises.”

The Committee for Economic Development in the US (1974, p.14) has developed qualitative characteristics, rather than the quantitative based on employee count, for the definition of small businesses. Small business in their definition show at least two of the following features:
1) Management is independent, since the manager usually owns the firm.
2) Capital is supplied and ownership is held by an individual of a few individuals.
3) The area of operations is primarily local, although the market isn’t necessarily local.
4) The firm is small in comparison with the largest competitors in its industry.”

Economic importance of SMEs
The reason for more and more researchers turning their attention to the topic of SMEs in the last years, is their increasing importance especially in Europe and the US with global companies taking their productions sites to “low wage” countries. SMEs become a growing percentage of the overall number of businesses in a country.
Overall importance is best expressed through the data of Table 1 taken from the final EURAB (European Research Advisory Board) report on “SMEs and ERA”:

“The European Union’s SME population is extremely large and very heterogeneous. There are between 8 and 12 million SMEs in the EU-15, depending in particular upon how one counts the self-employed, and a further 2.5 million SMEs in the new Member States. They account for over 99% of all enterprises and for two-thirds of all employment in the enterprise sector. The SME sector is a very diverse group, ranging from the local corner shop to sophisticated hi-tech start-ups.”

<table>
<thead>
<tr>
<th></th>
<th>% of all enterprises</th>
<th>% of persons employed in enterprises</th>
<th>% of turnover of enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>89.1</td>
<td>EU 78.5</td>
<td>US 28.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 11.1</td>
<td>EU 20.9</td>
</tr>
<tr>
<td>Small</td>
<td>9.1</td>
<td>19.8</td>
<td>21.3 25.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.5</td>
<td>19.0</td>
</tr>
<tr>
<td>Medium</td>
<td>1.5</td>
<td>1.5</td>
<td>16.1 14.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19.7</td>
<td>11.8</td>
</tr>
<tr>
<td>Large</td>
<td>0.3</td>
<td>0.3</td>
<td>33.8 49.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38.8</td>
<td>59.1</td>
</tr>
</tbody>
</table>

Table 1: Quantitative Definition of SMEs by the EU, taken from EURAB Working Group 9 Executive Report (2004, p.4)

In some, especially the smaller, member countries of the EU the importance of SMEs is even greater, shown at the fact that in the Netherlands only 1% of the enterprises have more than 100 employees, 8% between 10 and 100 employees and 91% of all enterprises have less than 10 employees (Sturkenboom et al., 2001, p. 231).

But the importance of SMEs for countries in the EU and US is also shown in their percentage of the GDP, as “SMEs are estimated to account for approximately 65% of GDP in Europe (…) SME share in GDP (…) [is] 45% in the United States” (EURAB Working Group 9, 2004, p.5)

Environmental Impact of SMEs

SMEs as a whole do not only have a huge economical impact they also seem to have a huge environmental impact. The EU Commission states in their “Report on SMEs and the Environment” (2000) that little is known about the contribution of SMEs to pollution and waste in the EU, although it is clear that they do make a very considerable collective contribution (probably around 50% overall).

50% percent contribution stated by the EU is derived from a Dutch report stating 50% as the level of contribution to the emission of different listed substances, quoted in the EU Commission report.

Other literature sources offer more detailed data for the UK where SMEs are supposed to account for around 60% of carbon dioxide emissions (Stokes/Rutherford, 2000), 60% of commercial waste and 80% of pollution incidents (NetRegs Report, 2005). These few statistical evidences show that, although SMEs individual contributions towards environmental degradation are relatively small, SMEs at large have a huge environmental impact.

Environmental Management Systems and their Usage in SMEs

Brief Description of ISO 14001 and EMAS

As mentioned before the ISO 14001 standard and the EU Environmental Management and Audit Scheme (EMAS) are the most commonly used EMS approaches.

EMAS

The EU Environmental Management and Audit Scheme (EMAS) was created by the EU in 1993. Its purpose was to provide a system which companies could voluntary implement in order to improve their environmental performance. The concept of the EMAS was to establish a management system together with a reporting system to allow legal compliance. The main focus of EMAS was on the audit which had to be conducted by independent auditors being certified by governmental institution. Companies passing the registration are allowed to carry the EMAS logo and are published in a publicly available list.

In 2001, EMAS was revised and published as EMAS II. One of the most significant changes was that the new EMAS II includes all the requirements of ISO 14001 in order to link it better to the more established ISO standard. EMAS is not as widely used as the ISO 14001, although the EMAS was the earlier standard. Potential reasons for this might be the fact that EMAS is not as internationally accepted as the ISO 14001, registrations outside the EU are very rare. The other potential reason is that EMAS II includes all ISO 14001 requirements and adds to these requirements, making compliance to EMAS more difficult than
compliance to ISO 14001. On the other hand no evidence is so far presented that compliance to EMAS has economical benefits over compliance to ISO 14001.

A detailed list showing the number of registrations for ISO 14001 and EMAS for every country worldwide is provided by the German Federal Environment Agency. This list (latest update January 2006) shows that the highest number of EMAS registration is found in Germany (1,491) followed by Spain (522) and Italy (394). Comparing the registrations for ISO 14001 and EMAS, even in these countries with high numbers of EMAS registration, it shows that the EMAS is not as common as the ISO 14001 even in the EU. Germany is the country with the highest EMAS/ISO 14001 ratio (1/3.5). Spain (1/15) and Italy (1/18), although having the second and third highest number of EMAS registrations, show a far lower ratio between ISO 14001 and EMAS registration. Unfortunately no data is provided about the number of registrations in SMEs.

ISO 14001
ISO 14001 is a standard published by the International Organization of Standardization (ISO). The standard was published first in 1996 (ISO 14001:1996) and later revised as ISO 14001:2004. The ISO standard was inspired by the earlier published EMAS, focussing on management processes and structures to create a management system allowing the company to incorporate environmental aspects in management decisions as well as process routines. The ISO 14001, especially the revised ISO 14001:2004 is closely linked to ISO 9000 (more exactly ISO 9001:2000) the quality management standard. Both standards aim at continuous improvement and offer guidelines for organisations to restructure their operations achieve higher quality and/or better environmental performance. Both standards, ISO 9000 as well as ISO 14001, are so called ‘Assurance” standards, enabling companies to assure their customers of the quality or ‘environmental friendliness’ of their processes.

The assurance is achieved through third party audits. Therefore ISO 14001, as well as ISO 9000, are often implemented by companies for ‘external reasons’, meaning that the motivation for the implementation is to influence external parties.

Alternative EMS Approaches
A variety of other Environmental Management System approaches exist. Most of these alternative approaches are only regionally accepted systems. The ISO Strategic SME Group Report (2005) provides a non-exclusive list of alternative approaches. The list mixes alternative EMS approaches, meaning different theoretical concepts, with implementation initiatives, mainly cooperation initiatives. In this part of the paper only the alternative theoretical concepts will be briefly stated:

European Approaches:
- BS 8555 is a new British approach to EMS which is especially designed for SMEs, other than the older BS 7750. BS 8555 uses a 6 staged implementation approach. The BS 8555 is also designed to lead to an ISO 14001 certification. More information is available under: http://www.iema.net/acorn/bs8555
- Eco-Lighthouse is a Norwegian EMS approach especially designed for SMEs. More information is available under: www.eco-lighthouse.com
- EKOSCAN is a Spanish EMS standard, mainly used in the Basque country. More information is available in English under: http://www.ems-database.org/ms-506/systemdes.asp?code=3
- Environmental Diploma Gothenburg is a Swedish EMS approach. More information is available under: www.ems-database.org/ms-506/systemdes.asp?code=17
- Green Dragon is a Welsh standard using a 5 staged implementation approach. More information is available under: http://www.greendragonems.com/english/index.asp
- Green Network “Growing responsibility”
- PIUS is a German EMS approach (Produktions-Integrierter Umwelt-Schutz) with a special focus on SMEs. More information about the PIUS approach is available under: http://www.pius-info.de/en/pius_info_pool/index.html
- PREMA (Profitable Environmental Management) is a more global EMS approach especially designed for SMEs and public organisations developed in Germany. It has so far been mainly used in China. More information is available under: www.pruma.de/concept/concept.asp

Non-EU Approaches:
- Ecostage is a 5 staged Japanese EMS approach going even further than ISO 14001 in its later stages. More information is available under: http://www.ems-database.org/ms-506/systemdes.asp?code=23
- The EcoAction 21 Certification and Registration Scheme is an EMS launched by the Japanese Ministry of the Environment. The focus of this EMS
is especially on SMEs and public institutions. More information in English is available under: www.ems-
database.org/ms-506/systemdes.asp?code=24
A comprehensive overview of all of the above
discussed Environmental Management Systems is also
provided by the EMS-Database available under:
www.ems-database.org showing the results of an
Adelphi Consult research into available alternatives to
ISO 14001 and EMAS.
It is important to note, that most of these approaches
have a stronger focus on the economic impact of the
EMS than ISO 14001 or EMAS. This feature is
especially important for SMEs which are often subject
to financial constraints, therefore not able to afford to
implement a system without harming their financial
performance. The economical focus is supported by the
staged implementation approach allowing companies to
run implementation at their own pace, due to their
financial capacities (the issues of financial constraints
is discussed in more detail below).

Adoption of Environmental Management in
SMEs
Hitchens et al. (2003) conducted a survey in the UK,
Ireland (ROI), Germany and Italy of SMEs which
adopted ‘Environmental Initiatives. The findings of the
survey show that only a relatively small percentage of
these companies, which were classified as
environmental friendly due to the adoption of different
environmental initiatives, had implemented an EMS.
The initiatives were mainly limited initiatives in the
area of waste reduction and energy efficiency.

<table>
<thead>
<tr>
<th>Initiative</th>
<th>UK/ROI</th>
<th>Germany</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste reduction</td>
<td>96.8</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>68.7</td>
<td>81.3</td>
<td>69.7</td>
</tr>
<tr>
<td>Re-usable packaging</td>
<td>71.8</td>
<td>75.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Solvent reduction</td>
<td>65.6</td>
<td>53.1</td>
<td>42.4</td>
</tr>
<tr>
<td>Materials change</td>
<td>53.1</td>
<td>96.9</td>
<td>94.0</td>
</tr>
<tr>
<td>Environmental management</td>
<td>62.5</td>
<td>40.6</td>
<td>30.3</td>
</tr>
<tr>
<td>Environmental communication</td>
<td>–</td>
<td>53.1</td>
<td>–</td>
</tr>
<tr>
<td>Eco-design</td>
<td>18.7</td>
<td>46.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 2: “ENVIRONMENTAL INITIATIVES ADOPTED by
SMEs”, taken from Hitchens et al. (2003, p.53)

Another study into the usage of EMSs was conducted
by Strategic SME Group of the ISO (International
Standards Organisation) Subcommittee responsible for
the creation of the ISO 14001, the Environmental
Management Standard. This study conducted in 2005
covering 1,134 SMEs (although the number of
correspondence is not consistent throughout the report)
in 71 countries found that only 909 of these companies,
or 80.2% had an EMS in place. Of these 909 having an
EMS in place 91% used ISO 14001 and EMAS the
other 9% only used alternative EMS approaches.

Characteristics of SMEs and their
Implications for EMS Implementation

Characteristics of SMEs
SMEs have peculiar characteristics compared to larger
companies, influencing their abilities to implement
Management Systems. A list of important
characteristics has been provided by Vickers (1990):
• Flat Management Structure;
• Low Profit Margins and Cash Flow problems;
• Little emphasis on training and development of staff
at any level;
• High turnover of key personnel;
• Informal and/or irregular quality controls;
• Dependency of a single client or narrow customer
base;
• Lack of purchasing muscle;
• Vulnerability to competition;
• Flexibility and therefore a potential to change
rapidly;
• Lack of long-term strategic focus;
• Lack of in-depth resources.

Barriers in SMEs for the Implementation of
EMSs
As previously mentioned, most researches derive a
series of barriers to the implementation of EMS based
on the characteristics of SMEs. This section of the
paper offers an overview of the barriers commonly
mentioned. The different barriers are named and
grouped different by different researchers often
depending on the level of detailed applied. Due to the
scope of this paper, the approach is rather
comprehensive, grouping barriers, which are by some
researchers listed separately, under super-ordinate
concepts. A more detailed description of these barriers
can be found in the quoted studies.

Lack of commitment
One obstacle for the implementation is that some
SMEs, even if they are aware of the existence of
Environmental Management Systems and have
information about them, often do not see the need for
implementing an EMS in their company (ISO Strategic
SME Group Report, 2005). SMEs often find it difficult
to assess the environmental impact of their operations or
see no significance in their pollution due to their small company size (ISO Strategic SME Group Report, 2005). The findings of the ISO Strategic Group Report correspond with a study about the attitudes of individuals in SMEs conducted by Petts (2000). The existence of lack of commitment as a barrier to the implementation is also supported by Kirkland/Thompson (1999).

**Aversion to formalised systems/high costs of certification**

An obstacle for the implementation of EMSs often found in combination with the lack of commitment is a missing attitude of SMEs towards the implementation of formalised management systems in general (ISO Strategic SME Group Report, 2005). This obstacle does not only concern the implementation of Environmental Management Systems, but especially micro to small businesses prefer informal management systems instead of formalised systems. A research into the application of the quality management standard ISO 9001:2000 (as a Quality Assurance System) and/or Total Quality Management (TQM) amongst Australian SMEs showed that overall 24.6% had an informal Quality Assurance System and 20.1% an informal TQM system in place (Xydias-Lobo/Jones, 2003).

One often quoted reason for choosing an informal system instead of a formalised system is that they are, especially ISO 14001, are still thought to require registration (ISO Strategic SME Group Report, 2005, p.9). This might be due to the fact that ISO 14001 and ISO 9000 (ISO 9001:2000) are discussed together, whereas the last requires certification. The certification of ISO 14001 as well as ISO 9000 is commonly associated with increased paper-work and therefore high costs (ISO Strategic SME Group Report, 2005). The high costs of certification, being stated by the ISO report as often exceeding the net profits of an SME in a year (p.9), was named a barrier to the implementation by 23% of the SMEs in the survey conducted for the report. It was the 3rd most often mentioned barrier. The ISO states that refined version of the standard ISO 14001:2004 “should reduce the paper burden demands” (ISO Strategic SME Group Report, 2005, p.9).

The high costs of certification are in this paper discussed under an ‘aversion to formalised systems’ instead of under ‘lack of financial resources’ under which they are usually discussed. This is because the barriers these costs create do not represent a financial barrier, meaning that companies cannot financially bear the costs, but rather one of creating sentiments. Most companies do not behold the certification as to give them a competitive edge as “certification in itself has no value if there is not an outside use” (ISO Strategic SME Group Report, 2005, p.9). Outside use can only be achieved through marketing benefits but SMEs often face difficulties of realising these benefits (Stoeckl, 2004). Therefore most SMEs perceive the costs as an unnecessary evil and too high.

**Lack of information**

Many SMEs do not have sufficient information about the EMSs or are even unaware of the existence of these systems (ISO Strategic SME Group Report, 2005). Especially grave is the unawareness of governmental support to the implementation of EMSs. In the aforementioned research, the ISO Strategic SME Group found that “50% of respondents did not know whether their government provided assistance, while 20% said there was none available”. Only “19% [of the respondents] noted that there was information and [that] awareness activities followed by guides, tools and web support” (2005, p.9). The lack of information is often also depends upon a lack of financial resources to spend upon search for these information.

**Lack of financial resources**

The implementation of an EMS causes high costs to a company which the company needs to cover. Often especially micro or small businesses do not have the financial resources to cover such an investment. The costs of an EMS implementation have been grouped by Biondi et al. (2000, p.58) in three main categories: - “costs relating to the necessary technical measurements to guarantee the improvement of environmental performance”

Biondi et al. argue that most companies undertaking an EMS implementation usually have taken environmental efforts before, which is supported by the data provided by Hitchens et al. (2003) as shown in the section ‘Adoption of Environmental Management in SMEs’. “[T]herefore”, they argue, “the majority of financial input connected with ‘technical’ aspects is related to plant management, control and maintenance (rather than the purchase of new equipment)” Still these costs were estimated as “the third most significant cost incurred by participation in EMAS pilot projects, estimated at an average 15.91% of total costs” (Biondi et. al., 2000, p.58). Companies implementing an EMS will also face costs for updating
their plant and machinery throughout the continuous improvement process, a key part of the EMAS as well as the ISO 14001.

- “costs relating to [the actual] EMS implementation [process]”

Biondi et al. state that “[c]osts incurred by SMEs in structuring their EMSs are considered the most significant financial input” and that “these costs will be attributed mainly to initial environmental review activities” (2000, p.58). The results of the study by Biondi et al. showed these costs to be the most significant costs of the participation in EMS projects with 20.09% of the total costs.

Another important cost factor related to the EMS implementation are the costs of management not being able to conduct other necessary tasks. Biondi et al. state that this “is evident especially in those small firms where the management team has multiple roles and commercial pressure must take priority” (2000, p.59).

- “costs incurred in obtaining third-party verification”

The certification costs are often a huge barrier for companies to conduct an ISO 14001 or EMAS implementation as discussed before.

Lack of necessary skills and other resources

The lack of necessary skills, being environmental management as well as technical skills, is a major barrier for companies to implement an EMS as stated by Biondi et al. (2000). This barrier becomes higher the smaller the company is. Biondi et al. (2000, p.60) state that SMEs especially experience difficulties with the “initial environmental review”, the “definition of objectives […] their environmental policy and programmes”, as well as the internal auditing and environmental reporting. EMAS and ISO 14001 are often “too detailed and complex for SMEs” but at the same time SMEs often “encounter a lack of clarification on what is exactly required for an effective EMS in certain situations” (Biondi et al., 2000, p.60). The reason for this contradictory experience with EMAS and ISO 14001 is that these EMSs try to address a large variety of organisations from large and complex organisations, addressed by exhaustive requirements in order to provide for all issues arising in these organisations, to SMEs or public organisations. This also results in the lack of clarity mentioned by Biondi et al. as these standards try to allow enough flexibility for all kinds of organisations to fit into these schemes. Therefore SMEs with their often limited knowledge about environmental management face a difficult task to identify the appropriate requirements and to understand the actions they need to undertake to fulfil these requirements.

Risk adversity

Stoeckl (2004) states “that businesses that are unable to diversify risk […] will view environmental programmes […] less favourable than firms that are large enough to diversify their investments (p.146), due to their high up front costs and uncertain financial benefits. This opinion is correspondent with the findings of a study by the Australian Bureau of Industry Economics (1994). The Australian Bureau of Industry Economics argue in their study that SMEs invest less due to their “greater uncertainty about the future” as well as “constraints with respect to cash flows” (p.37).

4.3 Advantages of SMEs for the Implementation of EMSs

Literature on the implementation of Environmental Management Systems in Small and Medium sized Enterprises usually focuses on the multitude of barriers and obstacles to the implementation of EMSs, resulting from the characteristics of SMEs. This sometimes leads to the impression that SMEs only have disadvantages for the implementation of EMSs. Nevertheless the special characteristics of SMEs also provide advantages for the implementation of EMSs.

Shorter and more transparent communication

The fact that due to their size SMEs usually show a communication structure favourable to the implementation of new systems or in general favourable for organisational changes has been outlined by different authors (Churchill/Lewis, 1983; Duffy, 2004). This is also the case for the implementation of EMSs as stated by Welford/Gouldson (1993).

Higher education and commitment of employees

Employees in SMEs on average tend to be higher and broader educated than employees in larger corporations which tend to work with more specialised employees. At the same time employees of SMEs tend to be more committed to their companies and to conduct stronger efforts to enable the company in undertaking changes. These characteristics have been found supportive for the implementation of new management systems by different researchers (Duffy, 2004; Ketola/Roberts, 2001; Wright, 2001).

Higher flexibility

SMEs tend to operate in an environment requiring them to be highly flexible and open for changes which
enables SMEs to adopt faster to a new management system as stated by Welford/Gouldson (1993).

**Common Reasons for SMEs to Implement EMSs**

To analyse the impact the characteristics of small and medium sized enterprises have upon the implementation of an Environmental Management System it seems appropriate also to take a look at the reasons SMEs have to implement these systems. Gerstenfeld/Roberts (2000) state mainly external pressure to be the reason for implementing EMSs in SMEs. They identified 3 different sources of pressure on SMEs to implement EMSs, being (pp.110-111):

1) “Legislative pressures”, which are mainly “fear of fines, liability or closure”. Gerstenfeld/Roberts quote the Environmental Data Services Report (ENDS) 1995, stating that “what little action SMEs are taking appears to be driven by legislation”. The opinion that legislative pressure is generally “the most significant driving force in persuading firms to effect an environmental improvement” (Griffin et al., 1995, p.5) is shared by other authors (Biondi et al., 2000; Simpson et al., 2004; Stoeckle, 2004).

2) “Business-to-business pressures”, is referred to by Biondi et al. as “the need to satisfy customer requirements” (2000, p.61), being stated by them as the second most prominent driver for SMEs to implement EMSs. This seems especially true for SMEs acting as suppliers for larger corporations. Biondi et al. state that “[t]he relationship between proactive large companies and supplier SMEs represents on of the most powerful forces for promulgating the diffusion of EMS” (2000, p.62). This phenomenon has also been evident and well researched for the quality management standard ISO 9000 (Ghobadian/Gallear, 1996; McAdam/McKeown, 1999; Meyer, 1998; Romano, 2002).

3) “Stakeholder pressures” Gerstenfeld/Roberts (2000) argue that SMEs feel the pressure from local stakeholders like local authorities, residents, and interest groups stronger than larger companies. This opinion is supported by Welford/Gouldson (1993) and Stoeckl (2004). The local pressure from stakeholders is especially increased through the introduction of so called Regional Environmental Management Systems (REMS) like the Local Agenda 21, which are implemented by an increasing number of countries (Dyllick/Hockert, 2002).

Hillary (1999) also states that the implementation of EMSs in SMEs could be based on external pressures, listing in addition to the afore mentioned also insurance costs, reduced opportunities for financial backing, waste disposal charges, fewer landfill sites and pressure in the supply chain.

Nevertheless Hillary also states the existence of internal drivers for the implementation of EMSs in SMEs in form of the following expected benefits:

- Aspiration of employees and stakeholders,
- Reduction of waste production,
- Increased customer satisfaction,
- Ability to produce better products, and
- Potential of new market opportunities

Also Biondi et al. (2000, p.62) found in their study that the internal motivation of seeing EMSs as “a huge opportunity for them” can be a driver for the implementation of EMSs in SMEs, but that it has “significantly lower prominence than the others” mentioned before. They also state that this motivation is mainly found in SMEs with a high understanding of the standards.

**Conclusion**

The discussion of the barriers for implementing an ISO 14001 or EMAS Environmental Management System experienced by SMEs show that these standards, although the most common EMS approaches among SMEs, have distinctive drawbacks for SMEs. The drawbacks derive from the fact that ISO 14001: 2004, although revised also with the purpose to improve the applicability for SMEs, as well as EMAS are not designed especially for SMEs but are intended to serve a large variety of organisations. Since these different organisations have very different characteristics it results in the fact that none of this organisation types is perfectly served. For SMEs the insufficiencies of these EMS standards seem to be especially grave since SMEs very often do not have the knowledge or resources to accomplish from these unclear standards a sufficient Environmental Management System.

Nevertheless, the major benefits of these established standards (especially ISO 14001), being the worldwide acceptance and acknowledgement, cause SMEs to use these standards if they choose to implement an EMS. When the reason for implementation is external pressure, which is the most often quoted reason for
SMEs to implement EMSs, SMEs often do not have a choice which standard to follow, but rather follow the standards demanded. In case of multinational corporations demanding the implementation of an EMS from their SME suppliers, the standard demanded is in general ISO 14001. Therefore work needs to be conducted to support SMEs in their implementation of ISO or EMAS based EMSs. The support for SMEs to implement ISO or EMAS based Environmental Management Systems could be of three different types:

• Creation of a new environmental ISO standard on which for SMEs the EMAS could also be based as it is now on the ISO 14001:2004.
• Creation/Promotion of staged EMS approaches guiding SMEs to an ISO or EMAS certification
• Creation of Cooperation Initiatives among SMEs

**Creation of a new environmental ISO standard for SMEs**

Similar to the British Standard BS 8555 being designed especially for the application in SMEs, with the established environmental standard BS 7750 still being the leading British environmental standard; the ISO could create a standard within the ISO 14000 family to address especially the needs of SMEs. Statistical evidence to the importance of the environmental impact of SMEs exists as mentioned before and is acknowledged by the ISO. Also the ISO has created specialised standards for important user groups like the special ISO quality standard for the automotive industry ISO/TS 16949:2002.

The ISO Strategic SME Group is their report comes to the conclusion, that “as long as ISO 14001 is marketed as a certified system, SMEs are unlikely to rush to adopt” (2005, p.41). They recommend lowering the barriers for adoption, whether they are real or only perceived, by fundamental changes and rethinking. It also acknowledges the benefits of a staged approach offering smaller companies to implement the EMS at their own pace, stating that “staged approaches might be supportive to ISO 14001 uptake and use”.

**Creation of staged EMS approaches ultimately leading to ISO or EMAS certification**

In case the International Organization for Standardization does not intend to create a specialised standard for the application in SMEs, alternatives should be created using a staged approach. Nevertheless, since the ISO and EMAS standards are world-wide recognised where the more regional alternatives are not, it might be wise to create these alternatives in a way that they ultimately lead to the potential of ISO or EMAS certification at the last stage. Some of the afore mentioned alternative EMS approaches already provide for the option of ISO certification at the last stage (e.g. PREMA and Eco-lighthouse) or even at an earlier stage (Ecostage). These approaches should be further developed and better marketed. An opportunity might be cross-marketing between ISO and the institutions offering these alternative approaches. This option would not harm the sales of both parties, an issue that needs consideration since most standard bodies are not charitable organisations.

Another option might be to develop tools especially designed to aid SMEs through the implementation of ISO 14001 without providing an own EMS approach. Some work is already done by researchers to develop implementation aids or tools especially designed for SMEs to support the implementation of ISO 14001 or EMAS (e.g. Ecomapping [www.ecomapping.org/english.html]).

**Stronger Cooperation initiatives**

Presently, a number of initiatives exist (as pointed out by Welford/Gouldson, 1993 or the ISO Strategic SME Group Report, 2005) that link together SMEs in their effort to achieve environmental improvements like the implementation of Environmental Management Systems. These initiatives for cooperation seem to be especially useful to address the problems of high information costs by splitting them. Also best practices could be shared allowing companies which lack the resources to develop their own solutions to use these experiences to implement an EMS.

Several examples of these initiatives exist world-wide, but evidence about the efficiency of these initiatives is mixed (ISO Strategic SME Group Report, 2005, pp.26-27), especially if larger companies are involved in such initiatives. These cooperation initiatives are so far mainly local approaches with a limited regional focus. An example of an international cooperation approach is Ecoprofit, (ECOlogical PROject For Integrated environmental Technology) a European multi-national public-private partnership combining academic as well as business sources to provide knowledge and consultancy to all sorts of enterprises, with a special focus on SMEs.¹
These initiatives appear to be the best solution to enable SMEs to implement an EMS without increasing the number of available standards. Avoiding an increase in the number of available standards is important for SMEs since SMEs have already enough problems to gain sufficient information about the available standards. More available standards would increase the obstacle of missing information. However, cooperation initiatives would also help to solve some of the other barriers described for SMEs to implement EMS. The barriers related to resource constraints could be solved as SMEs unit their resources, requiring the individual SMEs to devote fewer resources as usually needed. Therefore, further research on the potential and especially the design of successful cooperation initiatives is needed as the mixed evidence about the success of these cooperation initiatives shows.

Notes
1. More information can be found under: http://ecoprofit-interreg3c.com

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