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Changes to ISO 14001

Effects on companies

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Abstract

ISO 14001:2004 is the most commonly used standard for third-party certification of Environmental Management Systems (EMS) in the world. It is currently undergoing an upgrading process, which will affect all the companies certified to ISO 14001.
A first draft has been produced, the Committee Draft 1 (CD1).

The thesis has two research questions:
What are the most likely changes in the new version of ISO 1400 standard compared with the current version (ISO 14001:2004)?
How will these likely changes affect the EMS of companies that are already using ISO 14001?

From the CD1, seven major categories of changes were identified: strategy, leadership, environmental aspects and the value chain, environmental performance indicators, evaluation, communication and environmental design.
The first two groups bring substantial change in the nature of ISO 14001, demanding that companies address their EMS on a strategic level as well as previously on an operational level. This will mean a considerable change on the EMS of most companies. The CD1 also places greater demands on the top management, with the need to understand the organisation and its context, and to take the environmental performance into the general strategic planning of the company.
The other five groups can be seen as more of an extension of the former requirements of the ISO 14001 standard. Some of them will still however bring substantial change for companies, such as the need to add the value chain in the evaluation of environmental aspects.

These seven groups formed a framework, which was used for gap analysis of the EMS of two Swedish companies, Nolato Gota and Haldex Landskrona. The two companies researched here are in the forefront of the corporate sustainability field.
The resulting gap between the EMS of the companies and the CD1, identified in the gap analysis, revealed that the companies need to make a number of changes and updates in their ISO 14001 to meet the new demands as proposed in the CD1.
Other companies than Nolato and Haldex, that are less mature in the implementation of ISO standards and other voluntary sustainability guidelines and initiatives, will most likely need to change their EMS more fundamentally.

Keywords:
ISO 14001
CD1
EMS
Upgrade ISO 14001

Executive Summary

ISO 14001:2004 is the most commonly used standard for third-party certification of Environmental Management Systems (EMS) in the world. It is the foundation for the environmental programmes of all organisations that use it. ISO 14001 was published in 1996 and the first update was launched in 2004.

In 2010, the process of the third upgrade to ISO 14001 was initiated. The aim is for the new version to be published in 2015. The changes that will be made in this upgrade will affect the EMSs of all the companies that currently use the standard. Companies are obviously concerned with the outcome of the upgrading process, in particular with knowing whether the changes will be fundamental or more superficial.

From this background, two research questions arose:
What are the most likely changes in the new version of ISO 1400 standard compared with the current version (ISO 14001:2004)?
How will these likely changes affect the EMS of companies that are already using ISO 14001?

This subject is a recent one and there has been little actual research done on it. In order to find out the likely changes, the author had to base it on primary research. This was done mainly by comparing the current version of ISO 14001 with the proposed changes, which have now been published as a Committee Draft, the CD1. Interviews with experts helped in this process, both in pointing out the differences that the author had not foreseen and in confirming the ones that he had.

Gap analysis was used as a research method, which compares a current state with a proposed or desired state. When comparing what is with what should be, gaps become easily apparent and easily analysed. In this case, the research focused on the current EMS of a company and the proposed changes of CD1. The resulting gaps identified the areas on which the company needs to focus to fulfill the requirements in CD1. In order to understand the changes to the standard proposed in CD1, a detailed analysis of the difference between the ISO 14001:2004 and CD1 was done.
The major changes to the standard were summarised into seven categories by the author. In order to make this information more useful, the categories were compiled in the form of question, to assess if companies fulfill the requirement of CD1. This became the framework for the gap analysis.
Two Swedish companies- Nolato Gota and Haldex Landskrona- were used as objects for the research. Their EMS were compared with the framework as a gap analysis. The resulting gaps were identified and analysed, and recommendations were made to the companies vis à vis what they will need to change to fulfill the requirement of the CD1.
The seven categories identified as major changes in the CD1 are as follows:

1. Strategy

Companies will now need to focus on EMSs from both strategic and operational point of view. This is a major change for most companies.

- Companies need to evaluate the environmental issues that have implications on the broader organisational goals.
- They need to determine the external and internal issues relevant to their purpose and how that might affects the outcome of the EMS.
- They need to systematically determine who are the interested parties in their environment and to determine their needs and requirement.

- The information from these interested parties needs to be used and considered when forming the EMS.
- When forming the scope of the EMS, companies need to assess and take into account the internal and external issues relevant to the EMS, as well as the needs and expectations from the interested parties.
- The companies need to include an assessment of the part of the value chain, that they can influence and control, in the scope of their EMS.
- The scope of the EMS needs to be available in a documented form.
- Companies need to determine the risk and opportunities to the EMS.

2. Leadership

There is much more demands towards the top management in the CD1.

- The top management needs to understand the organisation and its context.
- The top management needs to give consideration to environmental performance in the general strategic planning of the company.
- The environmental policy needs to be appropriate to the general purpose and context of the organisation.
- The environmental policy needs to have commitment to support environmental protection specific to the context of the company.
- The company needs to evaluate the appropriateness of the availability of the environmental policy for each interested party.

3. Environmental aspects the value chain

Companies now need to take the value chain into account when assessing environmental aspects.

- The company needs to map the value chain.
- The company needs to evaluate what processes and products in the value chain have substantial environmental impact and what control and influence it has over these.
- The company needs to establish criteria for evaluating the supply of goods, services and outsourced processes, taking a life cycle perspective.
- The company needs to identify specific environmental requirements deemed appropriate for the procurement of goods and services or outsourced processes.

4. Environmental performance indicators

Companies now need to have environmental indicators for each of their environmental objectives.

- The company needs to set performance indicators for each of its environmental objectives. Ideally, these should be monitored and measurable.

5. Evaluation

There are new increased demands on evaluation.

- The company needs to add the value chain perspective when evaluating its environmental impact.
- The company needs to determine the criteria against which the environmental performance is evaluated.
- The company needs to maintain knowledge and understanding of its compliance status.

6. Communication

There are increased demands on external communication for companies, especially as a strategy.

- The company needs to develop a communication strategy, i.e. determine the need for internal and external communication. This strategy needs to include what will be communicated, when to communicate, with whom to communicate and how to communicate, methods, tools and approaches.
- The company needs to evaluate the communication requirements from each interested party.
- The company needs to evaluate the need to communicate information relating to potential impacts associated with use and end-of-life of the product and the deliverance of service.

7. Environmental design

This is a new feature to the ISO 14001. Although the demands are not strenuous, they will be new for many companies.

- The company needs to take into account significant environmental aspects in its design and development process.
- The company needs to assess the opportunities for integrating the EMS with the design process, in order to manage the environmental aspects that have significant impacts.

These seven groups were used as a framework for the gap analysis for the EMS of two Swedish companies, Nolato Gota and Haldex Landskrona. These companies are in the forefront in the field of corporate sustainability. The resulting gap between the EMS of the companies and the framework in the gap analysis revealed that they will have to make changes in most of the above groups. The following table summarises the changes they will need to make to be in accordance with the new ISO regulation.

	Changes to the EMS according to CD1's requirements	
Category	**Nolato Gota**	**Haldex Landskrona**
Strategy	Significant	Significant
Leadership	Significant	Significant
Value chain	Some	Some
Performance indicators	Some	Some
Evaluation	None	None
Communication	Some	Some
Environmental design	Some	None

It is apparent from the tables above that even companies that are in the forefront of corporate sustainability will need to change their EMSs in most of the above categories. Other companies than Nolato Group and Haldex, that are less mature in the implementation of ISO standards and other voluntary sustainability guidelines and initiatives, will most likely need to change their EMS more fundamentally in order to comply to the proposed standard changes.
The changes to the ISO 14001:2004 proposed in the CD1 would change the EMS of companies certified to ISO 14001 in a substantial way.

Table of Contents

List of Figures

List of Tables

Abbreviations

EMS	Environmental Management System
EP	Environmental Policy
ISO	International Organisation for Standardization
HLS	High Level Structure
FCSG	Future Challenges Study Group
CD1	Committee draft
SMEs	Small and Medium sized Enterprises
GRI	Global Reporting Initiative
TC 207	ISO Technical Committee – Environmental Management
DIS	ISO Draft International Standard

1 Introduction

In recent decades, there has been growing concern regarding human pressure on the environment. This resulted in the birth of the modern environmental movement, which has had an impact on all parts of society. Governments responded by setting up new laws and regulations for environmental protection, various environmental organisations were formed, and many companies adopted an Environmental Management Systems (EMS) to implement good standards of environmental behaviour.

By far the most commonly used and influential standard for third-party certification of EMS in the world today is the ISO 14001. There are an estimated 250,000 organisations that use the standard. (BusinessGreen, 2012). ISO 14001 is commonly used as a foundation for all other environmental activities in organisations. There has been a steady growth in the number of organisation that use it. The number of companies achieving environmental certification to ISO14001 has risen four-fold since 2008 (BusinessGreen, 2012). This means that ISO 14001 is of great importance in the field of environmental management.

All changes to the structure and requirements of the standard affect numerous organisations. Its only upgrading to date was done in 2004, and was only a minor change. ISO 14001 is currently in an upgrading phase. The plan is that the new version of the standard will be launched in the first part of 2015.
This time, there has been a more systematic approach to the upgrading process. A research group was formed to assess the need for change. In addition, thousands of users were consulted about their perception of ISO 14001 and their wishes for improvements. This update will probably bring a more substantial change to the standard compared to the previous one. After years of work involving thousands of practitioners all over the globe, a first draft version was produced. This is the first committee draft (CD1) and was published in March 2013 (ISO/TC 207/SC 1, 2013)[1].

This thesis will firstly evaluate the likely changes that will be made to the ISO 14001, judging from the CD1.
Secondly, it will assess how these likely changes will affect the EMS of companies that are already using ISO 14001.

1.1 Problem Definition

Companies currently using the ISO 14001 standard will have to update their EMS in accordance with the changes that will be implemented. These companies are understandably concerned about what changes will take place, and how these will affect them and their existing EMSs, whether it is officially certified or not. They are especially concerned about whether these changes will be of a fundamental nature.
This is an area that has been little researched due to the recency of the upgrading process of ISO 14001.

1.2 Research Questions

What are the most likely major changes on the ISO 14001:2004 current update that are being made on the standard?

How will these likely changes affect the EMS of companies that are already using ISO 14001?

[1] In this thesis, the document will be referred to as CD1.

1.3 Method

The initial data collection for this thesis was done in the form of literature research in the LUBsearch, in Google Scholar, and on the website of the ISO organisation. The search words were "ISO 14001," "ISO 14001 update," "the effect of adopting ISO 14001," and likewise. Many relevant documents about the upcoming change were provided by Torbjörn Brorson, the supervisor of the thesis. Additionally, many relevant books about environmental management in general and ISO 14001 in particular were found in the IIIEE library.

The first step in the research approach was to gather enough information about the nature of environmental management, the ISO organisation, ISO 14001, and the upcoming change to the standard. This step was undertaken with a general focus on the ISO organisation and ISO 14001, but gradually the focus narrowed on the upcoming changes to the standard.

The second step of this research was to conduct phone interviews with experts in the field. Initially, the contacts where provided by Torbjörn Brorson. During the general research, names of relevant experts appeared. Some of these experts were contacted and many granted interviews.
The interviewees were of three general types, all of them knowledgeable about the subject. The first type were experts directly working with the actual updating process of ISO 14001. A good number of them were part of the formation of the first environmental management system standard and have since been involved in the use of ISO 14001 as well the previous and on-going updating processes. The second type were either consultants or individuals working in environmental management in the corporate sector. The third type were people who work in environmental management in the companies under research.

The third step of the research was focused on finding out the difference between the ISO 14001:2004 and the CD1. In order to do this, a detailed comparison of the two was carried out by the author. The experts interviewed helped in pointing out significant changes as well as confirming others. Little literature research could be done on this particular subject, as very little had been written about it. The identified changes on ISO 14001 from CD1 were divided into seven comprehensive categories. Each category was summarised into a few questions. This formed the framework for a gap analysis.

The fourth step in the research was to perform a gap analysis. The EMS of two companies, Nolato Gota and Haldex Landskrona, was put into the framework in order to find out how they will have to change their EMS according to the CD1. The information about their EMS was in the form of documents from the companies and in form of interviews. Resulting gaps found in the gap analysis were analysed. From this arose some general recommendations to the companies on how to fill the gaps.

In the fifth step, the research focused on analysing the findings from the gap analysis, comparing the similarities and dissimilarities between the companies. In the discussion section, the author considered what the likely explanation for the findings was.

The sixth step drew all that was learned together into a conclusion.

Interviews played an important role in this thesis. The subject matter was under-researched since it was, and still is, in the process of taking shape. Therefore, it was very important to interview individuals who were and/or are a part of the process of upgrading the standard. Some of the individuals interviewed did not want to be directly quoted or directly linked to certain opinions. For this reason, there will be no direct quotation of or direct opinion expressed by particular individuals interviewed. Rather, the author analysed the general consensus of the interviewees and used the information in that manner in the thesis.

The nature of the subject matter of this thesis has not been thoroughly researched to date. The theory used—a gap analysis—is therefore fairly uncomplicated.

The research is a qualitative research made on a moving target (i.e., the democratic process of creating an updated version of ISO 14001 is complicated), and as such can be liable to some unexpected biases. The author therefore aimed to use very similar expressions to analyse the companies, the resulting gaps, and the recommendations resulting from the gap analysis.

Gap analysis

Gap analysis is a method that is used in various fields to find the general differences between an actual performance and the performance that is either desired or required. Gap analysis seeks to answer questions "where are we?" (current state) and "where do we want to be?" (target state). Gap analysis consists of firstly listing characteristic factors, like attributes, competencies and performance level of the present situation ("what is"), secondly listing factors needed to achieve future objectives ("what should be"), and then thirdly highlighting the gaps that exist and need to be filled. Gap analysis helps organisations reflect on who they are and ask who they want to be in the future (Zack, 2002, p. 257- 259).

When the general expectation of performance in the industry is understood, in this case with the CD1, it becomes possible to compare this expectation with the company's current level of performance. Such analysis can be performed at the strategic or operational level of an organisation. This thesis will use the understanding from Dagmara Nawrocka about gap analysis in regard to environmental management (Nawrocka, 1997).

The difference between gap analysis and environmental audits needs to be explained in the field of environmental management (Nawrocka, 1997, p. 33-35). One of the main differences is that gap analysis is used more to analyse the status of the current EMS compared to the requirements of a certain standard, in this case CD1 of ISO 14001. This means most often only one exercise, compared to a more regular frequency of environmental audits. Gap analysis is used mostly to analyse the actual functioning of the EMS, but only indirectly at the environmental performance that derives from it. Environmental auditing includes the assessment of compliance with all the requirements of the chosen standard, for example, the 55 "shalls" of ISO 14001. The audit includes, for example, assessment of the environmental organisation, its management and equipment performance. It is broader in technical dimension (Nawrocka, 1997, p.33-35). Gap analysis analyses the EMS as such, rather than the

details of the activities that derive from the EMS. As such, gap analysis is very useful for this research, as its focus is on the broad outlook of the EMS.
In this thesis, the gap analysis is done only on the sections of ISO 14001 likely to be significantly changed. These likely changes form seven categories. They were summarised into specific questions under each category, and form the framework for the gap analysis. The EMSs of the companies are then placed into this framework, revealing gaps. Some recommendations are derived from these gaps.

1.4 Limitation and Scope

The main limitation is embedded in the nature of the thesis, in that the focus is on the first draft of the updating process of ISO 14001. How the finalised version of the standard will look is not quite certain. However, one of the main influences on the updating process is the new High Level Structure (HLS) of all ISO management systems standards.

The HLS forms a framework, or platform, that managerial standards of ISO need to incorporate and that is completely set; nothing can be changed or deleted from that framework, only added to, as will be explained later. This means that the changes deriving from the HLS are set in stone. Additionally, the experts interviewed agreed that the main outlines of the changes will stay as they are now. There might be some changes in the wording, but the main outline is likely to remain the same.

The companies under research are quite similar in nature. They are industrial companies in the high tech end of the spectrum. They are both Swedish and are environmentally focused; both have been certified according to ISO 14001 for quite some time and report at the Group level according to the Global Reporting Initiative (GRI). Nolato Group uses the ISO 26000 guiding standard for Social Responsibility, and Haldex is in the process of implementing this standard. These are companies that are in all likelihood performing better in their EMS than general companies around the world that have adopted ISO 14001.

The scope of this thesis is the changes that are being made to ISO 14001 in consequence of the CD1. The whole ISO 14001 is under consideration.

Excluded from the scope is the nature of the ISO organisation in general, the particular focus on the process of changing the standard, a detailed analysis of the values and criticisms of ISO 14001, and the likelihood of the eventual change of the standard.

1.5 Audience

The primary audience are people who are working directly in environmental management systems according to ISO 14001—whether they are working in companies with EMS, as consultants in environmental management, or as public officials involved in the field.

1.6 Disposition

The paper follows the structure below:

Chapter 1, Introduction, presents the nature of the problem addressed in this research. It describes the methodology used to collect data to address the research question. The content provided identifies research limitations, provides a thesis outline and describes the audience, for whom this research may be useful.

Chapter 2, Literature analysis, is a literature analysis. It firstly explores briefly the main method and secondly explores environmental systems and the ISO organisation. Following this, ISO 14001 is explored in more details, including the two most influential parts of the update of the standard, the High Level Structure and the work of the Future Challenges Study Group.

Chapter 3, Findings, presents the findings of the research, presenting firstly the likely changes of the standard. These changes are summarised into concrete questions to evaluate if the EMS of the companies meet the requirements of the CD1. These questions form the framework for the gap analysis. Later, the EMSs of two Swedish companies are placed in the gap analysis. Lastly, the resulting gap between the EMS of each company and what will likely be required from the standard's change are explored. Relevant recommendations then emerge.

*C**hapter 4, Analysis,*** presents the general analysis of the research. The results of the gap analysis of the two researched companies, Nolato Gota and Haldex Landskrona, are compared, drawing out the similarities and dissimilarities. Lastly, findings are analysed in regards to their relevance for other companies.

Chapter 5, Discussion, presents a discussion on the likelihood of the changes proposed in CD1 coming to fruition in the next version of ISO 14001. The effects of HLS and FCSG are explored in regards to their certainty of approval into a new standard. Lastly, the possibility of the use of the information from this research for other companies is discussed.

Chapter 6, Conclusion, is the conclusion of this paper and draws together the whole paper in a concise manner, answering the original research questions.

2 Literature analysis

2.1 Environmental Management System

Environmental Management System (EMS) refers to the management of an organisation's environmental issues in a comprehensive, systematic, intentional and, usually, documented manner. It includes the structure of the organisation, the general planning, and the policy for environmental issues.
For developing, implementing and maintaining an EMS, some resources are needed. Formally, an EMS is defined as "a system and database which integrates procedures and processes for training of personnel, monitoring, summarizing, and reporting of specialized environmental performance information to internal and external stakeholders of a firm" (Sroufe, 2003, p. 417).

Traditionally, the goals of an EMS have often been described as increasing compliance and reducing waste (Melnyk, Sroufe, Calantone., 2003). In recent years, its scope has increased to also include areas such as climate change, life cycle thinking, social responsibility, biodiversity, or the restoration of animal habitats (Potoski, and Prakash, 2005, p. 237).

In practice, an EMS aims to act in many areas, including the following:

- It enables the organisation to manage its environmental matters.
- An effective EMS aids organisations to deal with the planning, controlling and monitoring of policies. It provides a controlling structure that focuses on instant and long-term impacts of products, services, and processes on the environment.
- It creates a structure and consistency for organisations to deal with environmental concerns by allocating resources, assigning responsibility, and measuring and monitoring practices.
- It increases responsibility and ownership of environmental policies in an organisation and thus enhances accountability.
- It sets a structure for attaining objectives and desired outcomes, and for the training required to do so.
- It facilitates the understanding of legal requirements and thus increases awareness on a product or service's impact, significance, priorities, and objectives.
- It emphasises continual improvement of the system and in that way enables the implementation of policies and objectives. Additionally, this aids in reviewing and auditing the EMS, thus finding future opportunities.
- It influences contractors and suppliers to adopt an EMS on their own.

By far the most popular and influential EMS in the world is ISO 14001. In the most recent count, there are more than 250,000 organisations certified to the standard (BusinessGreen 2012). According to the experts interviewed, there is probably three times this number working with ISO without official certification. There is no standardised EMS in the world that rivals it in popularity.

2.2 International Organisation for Standardization

The twentieth century brought a growing understanding of the importance of standards for international cooperation and for trade in particular. Contrasting standards can create barriers to trade, giving some societies and organisations advantages over others. The aim of international standards is to provide clear identifiable references that are agreed upon and can

thus foster fair competition in market economies. Equally, standards promote trade through enhanced overall product reliability and compatibility (Murphy, and Yates, 2009, p. 13-21).

The International Organisation for Standardization (ISO) is the largest standard developing organisation in the world. The origin of ISO can be traced back to 1926 with the International Federation of the National Standardizing Associations (ISA). This Organisation focused heavily on mechanical engineering and was more effective on paper than in reality. It was disbanded in the middle of the Second World War in 1942. In 1946, it merged with the newly founded UNSCC (United Nations Standard Coordination Committee), only two years old at the time. Together, they formed the present day ISO, which has its headquarters in Geneva, in Switzerland (ISO, 1997, p. 15-20).

The name of the organisation, ISO, is itself standardised. It is not, as many believe, an acronym but is derived from the Greek word "isos" meaning "equal", referring to the fact that if two objects meet the same standard, they should be equal. If ISO were an acronym, each language would translate the name into its own language, creating their own acronym. This would bring various different acronyms and would most definitely lead to confusion (ISO, 1997, p.43-47).

Since 1949, ISO has published more than 19,000 International Standards. These standards span various fields from agriculture, construction and mechanical engineering to managerial standards. ISO is a voluntary organisation whose members are recognised standard authorities, with each member representing one country. Each of the 164 member countries has one secretariat representative in Geneva. Additionally, each member country has a specific member body or institution which may differ in structure from country to country. Most of ISO's actual work is done by the 2700 technical committees, subcommittees, and working groups. Committees are made up of representatives from member countries interested in the particular field of a specific ISO subject. Each committee and subcommittee is headed by a secretariat from one of the member countries (Murphy, and Yates, 2009, p. 23-26).

2.3 The ISO Standardisation Process

If a member body belonging to a member country is interested in the work of a committee (e.g., for forming or upgrading a standard), it is entitled to be a member of that committee. The standards are reached by consensus. In the case of ISO 14001, 75 per cent of the members of that committee have to agree upon the standards proposed. Each member body represents the interests of their country, be they those of manufacturers, consumers, professionals, the government, and so on.

In order for an ISO standard to be published, it needs a six stage process (ISO/IEC/Dirctives,, Part 1, 2012, p. 27-40):

> *Proposal stage*—the need for a standard is assessed and members interested in being part of the formation of the standard are brought together.
>
> *Preparatory stage*—the working draft of the standard is formed.
>
> *Committee stage*—the completed draft is sent out to be commented upon. This stage can take some time, especially until a consensus is reached. The output of this stage is the Draft International Standard (DIS).
>
> *Enquiry stage*—the DIS is circulated among all member bodies and voted upon. It needs to receive at least 75 per cent of the votes; otherwise it will be returned to the lower stages for further changes.

> ***Approval stage***—if the DIS passes 75 per cent of the vote, it becomes a Final Draft.
>
> ***Publication stage***—the Final Draft is circulated to all the member bodies for a final vote. If the standard passes this stage with 75 per cent of the vote, it officially becomes an ISO standard and is published accordingly.

The current update of the ISO 14001 that is being used as the basis for this research is a draft from the committee stage. The first draft, called Committee Draft 1 (CD1), has now been published.
The whole standardisation process can be long and time consuming. However, it welcomes participation and is transparent and open to scrutiny. Most of the experts interviewed agreed that the process is good and particularly inclusive. Comments are transparent and traceable. One of the main benefits with this process is that it aims to be multi-stakeholder—for example, by reaching out to developing countries as well as to smaller companies.

For a standard of this nature to work and for it to have a sufficient level of support, there is a need for people from all over the world to be part of its creation. It is a process that takes a considerable amount of time and costs a good deal of money, but a fundamentally better alternative approach does not seem to be available, according to the experts.

Experts agreed that the meeting of people face to face is very important, since much of the actual negotiation is done in non-ISO social settings. People negotiating need to have direct contact. The socialising that takes place in the evenings is essential in order to be able to make compromises and to find common ground. If there is no social contact and only debate, agreements would seldom be reached. If there were no face-to-face meetings, everyone would still only see their own objectives and would be less likely to seek compromises. The committee members sitting at the international negotiating level become like ambassadors of the negotiation results. They go back to their national bodies and explain the compromises and why they were made.

The main negative side of this whole process is the exact flip side of the positive ones—as it is so inclusive, the process is vastly time-consuming and costs a significant amount of money. Due to this, it is almost only feasible for governmental bodies to be directly part of this process.

2.4 ISO 14001

Prior to the formation of ISO 14001, the corporate world had gained a rather negative image regarding environmental issues. There had been a number of widely reported accidents with drastic effects on the environment such as Bhopal in 1984 and Basil in 1986. Additionally, the increased environmental activism of the 1980s created a greater consumer awareness of the environmental issues. More environmental regulations were enacted and some organisations started to use their adherence to these regulations as marketing tools (Krut, and Gleckman, 1998, p. 11-23).

The 1992 Rio Conference on the Environment reflected increased global concerns about the environment and called for a world commitment to its protection. These environmental concerns in connection with the 1986 GATT negotiations in Uruguay, which were an impetus for the removal of non-tariff trade barriers, were of great influence behind the origin of ISO 14001 (The British Assessment Bureau, 2013).
In preparation for the 1992 Earth Summit in Rio, business leaders were asked by the UNCED's Secretary General Maurice Strong to advise on business and the environment.

A group was formed under the name of The Business Council for Sustainable Development, and became an influential force in the actual Rio conference, expressing a need for global standards vis-à-vis environmental performance (DeSimone, and Popof, 2000, p. 23-34).

ISO reacted to this development by forming in 1991 the ISO Strategic Advisory Committee on the Environment (SAGE). This committee worked for two years and was a preparatory group. Following this, the TC 207 was established, a technological committee that until the present day (September 2013) has the responsibility for the environmental series within the ISO 14000 series. Just as the ISO 9000 quality standard series were inspired by the precursor British BS 5750 standard of 1979, so too were the ISO 14000 environmental standard series based on the British standard BS 7750 instituted in 1992 (Carr, and Thomas, 1997).

When the ISO 9001 quality management standard was in the process of being formed, many organisations had limited interest in the process and did not really believe in its success. They were thus surprised by the overwhelming acceptance of ISO 9001. Many of these organisations were concerned with the development of the ISO 14001 and were more engaged in its developments (Munro, and Harral, 2005). The British standards of BS 7750 were relaxed in order to be made acceptable for countries outside of Europe. In particular US companies, which can be subjected to costly civil suits, were very hesitant to approve a stringent environmental management standard. Their fear was that if they violated the standard, this might result in litigation. They also feared that the extensive documentation required by the ISO 14001 might be used against them in legal action for violating environmental regulations (Munro, and Harral, 2005.)

In the corporate world, two groups started to form with different motivations towards the establishing of ISO 14001. The first group really was concerned about the role of industry in achieving a sustainable economy. They wanted to show that the industrial sector was willing to take part in contributing to sustainability development.
The second group saw the development of ISO 14001 more as threatening their position. Starting from the time of the first 1992 Rio Conference, many companies felt at that time that governments would act by implementing a wide range of regulations on environmental issues. They began to take the lead in environmental management systems development to prevent governments leading that development.

The approach of these two groups merged together in the first edition of ISO 14001.
Some of the first group were quite disappointed about the outcome of the first edition of the standard. Many in this group were hoping to see a management system that was mainly aimed at improving the environmental performance of the organisation, rather than focusing so exclusively on the managerial system. They were trying to distance the ISO 14001 from the few year old ISO 9001, which they believed was more focused on processes than on actual outcomes (Munro, and Harral, 2005).

2.5 A Brief Review of the Benefits and Drawbacks of ISO 14001

The benefits of ISO 14001 certification

The benefits of obtaining ISO certification far exceed the fulfilment of doing your part for the environment. Research has shown that adopting the ISO standard can result in better conformance to environmental regulations, which translates into a reduction of the risk for the organisation. The environmental alertness, together with the required documentation for the certification to ISO 14001, support organisations in conforming to environmental regulations. Such an organisation will always be prepared for inspection by a regulatory

agency- since they thoroughly follow the standard, there is little likelihood of violation of the environmental regulations (Potoski, and Prakash, 2005, p. 236-243).

In certain circumstances, the adoption of ISO 14001 can create greater marketability (Durdevic, Searcy, Karapetrovic, 2013) and better use of resources (Roy, Boiral, Lagace, 2001). Many organisations that applied the standard have found that it increased value creation with higher quality goods and services (De Jong, Paulraj, Blome, 2013) as well as levels of safety (Matias, and Coelho, 2002, p. 3857-3862). Additionally, it has been shown that a certification to ISO 14001 improves the image of an organisation, (Durdevic, et al., 2013) and on certain occasions, increases its profits (De Jong, et al., 2013) and (Ferron, Funchal, Nossa, Teixeira, 2012). In some cases, the certification and documentation has assisted some organisations in acquiring capital, (Paulraj, and De Jong, 2011) in defending itself during environmental litigation and in getting insurance or permits (Florida, and Davidson, 2001, p. 64-72).

For some companies, embracing the standard has increased the market range of their goods and services. This is in particular true for companies from the developing world wanting to reach markets in the developed world (Bansal, and Bogner, 2002).Various corporations and even governments have been requesting for suppliers that are ISO 14001 certified to uphold their environmental-friendly image and values (Schylander, and Martinuzzi, 2007).

Some organisations have found that the in-depth analysis required by the ISO 14001 certification has resulted in a more streamlined process, which translates into an increased efficiency in the use of resources and raw materials, which in turn lowers the organisation's costs (Puvanasvaran, Perumal, Tian, Vasu, Muhamad, 2012). Many companies have found ways to capture emissions and increase recycling, especially in the early phases of adopting the standard. In the long run, this has reduced the amount of raw materials and utilities used (Schylander, and Martinuzzi, 2007). Studies have found that reducing the quantity of possibly dangerous substances in an end-product can result in drastic reduction of hazardous chemicals. This leads to a safer internal environment for employees and in some cases the possibility of reduced insurance premiums (Benito, and González-Benito, 2005). Additionally, this can improve employee morale who feel that the workplace is safer and that they are contributing to the environmental effort (Heras-Saizarbitoria, Landín, Molina-Azorín, 2011).

The drawbacks of ISO 14001 certification

The fundamental criticism on ISO 14001 has to do with the fact that it is primarily focused on the EMS rather than on the actual environmental performance of a company. This means that it is theoretically possible for an organisation to have a well-run EMS without any actual improvements in its environmental performance (Searcy, Morali, Karapetrovic, Wichuk, McCartney, McLeod, Fraser, 2012). Proponents of the standard claim that although organisations can theoretically implement the standard without actual improvements, most companies do improve their environmental performance. The systemic look at the environmental issues of an organisation will almost always translate into concrete improvements for a company.

To be ISO 14001 certified requires regular external auditing. This costs a lot of money and time. Many have argued that smaller to medium sized companied find it difficult to cope with this demand (ISO/TC 207/SC1/SME Task Group, 2006, p.4). Questions have also risen in regard to the fairness of the certification process, since auditors are much harsher in some countries than others. It has also been argued that third-party assessment does not differentiate between organisations that barely meet the standard and the ones that surpass it.

Many also feel that since an organisation has to fulfil many requirements with ISO 14001, this ought to reduce other regulatory requirements. They feel that they are inspected twice rather than just once- by the ISO auditing, and by other regulatory bodies.

Finally, many argue that the ISO standards do not reflect the variety of size of businesses in the world. Most companies in the world are small to medium sized businesses, and for them to comply with the request of ISO 14001 can be difficult in terms of expertise and finance. The ISO organisation has also been concerned with this for some time and issued a research group to analyse what could be done to help them reach the standard more easily, and to see the value in adopting it (ISO/TC 207/SC1/Strategic SME Group, 2005, p.13). Some of the modifications of the current draft are addressing these concerns.

2.6 The First Upgrade of ISO 14001 in 2004

When the first process of updating ISO 14001 started, the ISO community had two aims: to make clear what clarification was needed regarding the requirements in ISO 14001, and to better integrate ISO 14001 with ISO 9001 (Munro, and Harral, 2005). To reach both of these aims, some modifications were needed and some additions were made to 16 of the 20 definitions in ISO 14001.

In order to integrate ISO 14001 with ISO 9001, the structure and operation of the standard was formalised, which translated into more documentation, more performance measurement, and an increased emphasis on reporting to top management. Additionally, there was an increased focus on legal requirements.

In some places of ISO 14001:1996, vague descriptions were clarified. For example, in regards to the EMS, the 1996 version states that the "organisation shall establish and maintain an environmental management system" (ISO 14001:1996, 4.1). This is a very lose requirement: there is nothing about a written system, training, and so on. The 2004 upgrade states that the "organisation shall establish, document, implement, maintain and continually improve an environmental management system in accordance with the requirements of this international standard and determine how it will fulfil these requirements" (ISO 14001:1996, 4.1). This version really clarifies that the organisation actually needs to fulfil this requirement.

Most of the changes were rather minor ones. For example, the 2004 upgrade to the requirements on environmental policy added that an organisation would now have to take into account the scope of the EMS while defining the policy. Additionally, the policy should comply with applicable legal and other requirements, and it should be communicated (ISO 14001:1996, 4.1).

A small change was also made to the communication section, demanding that an organisation establish a method in communicating with external parties. The old version mentioned nothing similar to this (ISO 14001:2004, 4.4.3).

The section about documentations was changed considerably, bringing a need to document the scope of an EMS, objectives, targets, and environmental policy. Additionally, the 2004 upgrade made it a requirement to identify and thus develop the documentation necessary to fulfil the demands of the standard (ISO 14001:2004, 4.5.4).

In a few sections, the wording became more precise and demanding regarding the implementation of the identified processes. For example, the 1996 version required organisations to identify non-conformities. The 2004 upgrade demanded in addition that organisations take action to address the identified non-conformities (ISO 14001:2004, 4.5.3).

Similarly, the 1996 version demanded the calibrating and maintenance of monitoring equipment. The 2004 upgrade added to this that this equipment should actually be used to monitor and measure the key environmental characteristics (ISO 14001:2004, 4.5.1). A new section was also included called "Evaluation of Compliance" which emphasised that an organisation must demonstrate how it complies with legal and other requirements (ISO 14001:2004, 4.5.2). Another example is found in the section dealing with emergency response. In the 1996 version, organisations were asked to establish and maintain procedures to identify and respond to potential environmental emergency situations. The 2004 upgrade added that an organisation would actually have to use these procedures and not only establish and maintain them (ISO 14001:2004, 4.4.7).

Significant changes were made to the section on management review in which material on management review inputs and outputs was added. The material on management inputs added audit results, changes in the environmental aspects, communications and complaints from external parties, legal changes, previous management reviews, the status of previous corrective and preventive actions, follow-up actions, and recommendations for improvement. It was much more detailed than the 1996 version. Management output needed to include decisions and actions regarding the environmental policy, objectives, or targets, and to improve an organisation's EMS. Overall, outputs should reveal an organisation's commitment to continuous improvement (ISO 14001:2004, 4.6).

Some of the experts interviewed stated that many people where disappointed with the 2004 upgrade and that so much time and effort had gone into changing the standard but that this was not translated into substantial change. However, the changes were actually not meant to be extensive in nature, but were rather designed as a refinement of the existing standards. In retrospect, one could say that the ISO community reached its goals with the changes of 2004.

2.7 Major Factors Influencing the CD1

In this section, the two most influential factors affecting the upgrade on ISO 14001 as described by the experts interviewed will be explored. These are the High Level Structure (HLS) and the report from the Future Challenges Study Group (FCSG). According to some of the experts interviewed, the challenge to deal with these two inputs means that there is hardly any room for additional reports as a major input.

2.7.1 High Level Structure

Over the years, ISO published various managerial standards of different shapes and structures. For organisations operating several managerial standards, having different managerial structures can be difficult. There was pressure on the ISO organisation for some time to integrate all ISO managerial standards into a unified format that would make them easier to work together. This was for example one of the suggestions from the ISO SME Task Group (ISO/TC 207/SC1/SME Task Group, 2006), which explored how to increase the benefit of ISO 14001 from small- to medium-sized organisations. The ISO organisation thus produced a document called the High Level Structure that was furnished with a well-defined and structured identical core text along with common terms as well as essential definitions.

The aim of the HLS is to enhance the consistency and alignment of ISO management system standards by providing unifying and agreed upon high level structure. This greatly helps organisations with more than one ISO managerial standard. With the HLS, the general standards of ISO 14001 will be aligned and each of them will have discipline-specific requirements, as needed. The HLS easily walks organisations through the steps needed to

implement and operate any type of management system, whether environmental, health and safety, quality, or even food safety.

The aim of these changes is that the common approach to new management system standards will increase the value of such standards to users. It is particularly aimed at organisations operating a single management system that is designed to meet the requirements of more than one management's systems standard. This is often called an integrated management system.

The HLS is applicable to all the ISO Type A managerial system standards. A Type A management system standard is defined as a "standard that is intended to provide the market place with relevant specifications for the management system of an Organisation to demonstrate its capability to meet internal and external requirements (e.g., by assessment of that capability by internal or external parties)" (ISO Guide 83, 2011, p. 2).

Under the HLS, ISO 14001 will change from its present day 4 sections to 10 sections. With the increase of six additional sections, each section becomes clearer in its structure.

The ISO organisation has imposed a strict prohibition of the deletion any part of the HLS text in the formation of other managerial standards. Text can only be added where it is needed to make the managerial standards work for specific requirements, but nothing can be removed from the core text. This actually makes certain changes to the ISO 14001 very predictable.
The new HLS structure contains 10 clauses that are applicable to all ISO type A managerial standards, as outlined below (ISO Guide 83, 2011):

Clause 1—Scope

The nature of the scope in different managerial standards varies according to the different subject matter. The HLS describes this very briefly.

Clause 2—Normative references

The nature of the normative references in different managerial standards varies according to the different subject matter. The HLS describes this very briefly.

Clause 3—Terms and definitions

This clause contains definitions of the terms that are deemed to be an integral part of the common text for all the managerial standards. Altogether there are 22 terms defined, all of which have to be included in clause 3 of each independent managerial standard. Each specific standard will additionally use other definitions necessary for that specific subject.

Here follows two examples of definitions from clause 3:
"3.01 Organisation: Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives.
3.05 Top management: Person or group of people who directs and controls an Organisation (3.01) at the highest level.
Note 1 to entry: Top management has the power to delegate authority and provide resources within the Organisation.
Note 2 to entry: If the scope of the management system (3.04) covers only part of an Organisation then top management refers to those who direct and control that part of the Organisation."

Clause 4—Context of the Organisation

Clause 4 contains four sub-clauses:
The first sub-clause is called "understanding the organisation and its context": the organisation shall determine external and internal subjects relevant to the aim of the organisation and deemed to influence the intended outcomes.

The second sub-clause is called "understanding the needs and expectation of interested parties": the organisation shall identify both the relevant interested parties and their needs and requirements from the organisation.

The third sub-clause determines the scope of the management system. In the scope setting, the organisation needs to take note of the two previous sub-clauses.

The fourth sub-clause explains that any managerial system is a continuous process of ongoing change and that the organisation therefore needs to focus on regular improvements and to put in place processes to facilitate this.

Clause 5—Leadership

Clause 5 contains three sub-clauses:
The first sub-clause is concerned with leadership and commitment, presenting an increased focus on the role of top management to lead and to be committed to the managerial system. For example, the policy and the objectives of a specific managerial standard must be established and in accordance with the general strategy of the organisation.

The second sub-clause regards policy and emphasises the role of top management. Additionally, it requires the policy of the managerial standard to be available to interested parties.

The third sub-clause is called "organisational roles, responsibilities and authorities": the role of top management is made very clear. They should assign the relevant roles, responsibilities, and authorities, and communicate this within the organisation. Top management is responsible for the overall system and for reporting on its performance

Clause 6—Planning

The organisation needs to identify the risks and opportunities that come from evaluating its external and internal issues, as was done in 4.1. Next, the organisation needs to plan how to address both risks and opportunities, and later to evaluate the effectiveness of these actions.
The organisation needs to also establish relevant objectives that need to be consistent with the policy and ideally be measurable, monitored, communicated, and updated. All the above requirements need to be fully documented.

Clause 7—Support

The organisation is required to provide sufficient support for the managerial system, so that the necessary people have the proper competence and awareness of the EMS and its benefits. The organisation needs to determine the need for both external and internal communication.
The last part of this clause is focused on the documented information, the creation and the updating as well as the control of the documented information.

Clause 8—Operation

This clause leads from the information in clause 6.1 on risks and opportunities. The organisation needs to plan, implement, and control the processes that are deemed to address the information identified earlier. The organisation needs to have criteria to assess the outcome, and these need to be fully documented.

Clause 9—Performance evaluation

Clause 9 contains three sub-clauses:
The first sub-clause relates to monitoring, measuring, analysing and evaluating. The organisation needs to assess what needs to be monitored, how it is done, when it is done, and when and how this is analysed and evaluated.

The second sub-clause focuses on what is demanded from the internal audit.

The third sub-clause identifies what is demanded in the management review.

Clause 10—Improvement

The first part of this clause deals with nonconformity. The organisation needs to have a detailed structure of how to deal with nonconformity, and this structure needs to be reviewed regularly.
The second part emphasises the need for continuous improvement.

There are significant new elements in the HLS that help to elevate the status and importance of environmental management in companies to a more strategic level, in particular clauses 4 and 5 and parts of clause 6. This however does not dilute in any way the operational focus of ISO 14001, which has often been seen as its chief strength. The new strategic focus encourages companies to better integrate the EMS into the core part of their business, rather than running it as a parallel managerial system, as is often the case. Often, these two systems have little to do with one another. The new text recognises the use of the broad concept of risk and the need to understand risk in the context of the management system. It also encourages everyone to view preventive action as a broader concept than one which simply prevents an incident from reoccurring.

ISO 14001 is the first one of the major managerial standards to adopt the new HLS structure.
The following table identifies the changes that the CD1 will make to the standard compared to the 2004 version. These changes are related to the HLS and will therefore not be able to be changed.

Table 2-1. Correspondance between ISO 14001: 2015 and ISO 14001:2004 (CD1, p. 38-40)

ISO 14001: 2015		**ISO 14001: 2004**	
Context of the organisation (title only)	4		
Understanding the organisation and its context	4.1		
Understanding the needs and expectations of interested parties	4.2		
Determining the scope of the	4.3	4.1	General requirements

environmental management system			
Environmental management system	4.4	4.1	General requirements
Leadership (title only)	5		Resources, roles, responsibility and authority
Leadership and commitment	5.1	4.4.1	Environmental policy
Policy	5.2	4.2	Resources, roles, responsibility and authority
Organisation roles, responsibilities and authorities	5.3	4.4.1	Planning (title only)
Planning (title only)	6	4.3	
Actions to address risks and opportunities (title only)	6.1		
General	6.1.1		
Environmental aspects	6.1.2	4.3.1	Environmental aspects
Legal requirements and voluntary obligations	6.1.3	4.3.2	Legal and other requirements
Environmental objectives and planning to achieve them (title only)	6.2	4.3.3	Objectives, targets and programme(s)
Environmental objectives	6.2.1	4.3.3	Objectives, targets and programme(s)
Environmental improvements programmes	6.2.2	4.3.3	Objectives, targets and programme(s)
Support (title only)	7	4.4	Implementation and operation (title only)
Resources	7.1	4.4.1	Resources, roles, responsibility and authority
Competence	7.2	4.4.2	Competence, training and awareness
Awareness	7.3	4.4.2	Competence, training and awareness
Communication (title only)	7.4	4.4.3	Communication
General	7.4.1	4.4.3	Communication
Internal communication	7.4.2	4.4.3	Communication
External communication and reporting	7.4.3	4.4.3	Communication
Documented information (title only)	7.5	4.4.4	Documentation
General	7.5.1	4.4.4	Documentation
Creating and updating	7.5.2	4.4.5	Control of documentation
Control of documented information	7.5.3	4.4.5	Control of documentation
Operation (title only)	8	4.4	Implementation and operation (title only)
Operational planning and control	8.1	4.4.6	Operational control
Value chain planning and control	8.2	4.4.6	Operational control
Emergency preparedness and response	8.3	4.4.7	Emergency preparedness and response

Performance evaluation (title only)	9	4.5	Checking (title only)
Monitoring, measurement, analysis and evaluation (title only)	9.1	4.5.1	Monitoring and measurement
General	9.1.1	4.5.1	Monitoring and measurement
Evaluation of compliance	9.1.2	4.5.2	Evaluation of compliance
Internal audit	9.2	4.5.5	Internal audit
Management review	9.3	4.6	Management review
Improvement (title only)	10		
Nonconformity and corrective action	10.1	4.5.3	Nonconformity, corrective action and preventive action
Continual improvement	10.2	4.1	General requirements

2.7.2 Future Challenges Study Group

When the revision of the second edition of ISO 14001 started in the year 2000, Netherlands was the only country to vote against the revision and the scope of the revision. The Dutch representatives argued that before starting a new revision there should be a mapping of the expectations and requirements by organisations using an EMS. The process carried on without following the Dutch suggestion. This was the first upgrade to the standard and the outcome of that change proved to be rather limited (Netherlands Normalization Institute, 2000).

The Dutch resistance was not in vain. When ideas began to surface that another upgrade to ISO 14001 was needed, around 2007–2008, they were given the opportunity to lead a group that would indeed explore what changes were really required to be made to the ISO 14001. This group was given the name the Future Challenges Study Group (FCSG). It started its work in 2008 and published its final report on the future challenges of the EMS and ISO 14001 in 2010 (ISO/TC 207/SC1/Future challenges Study group, 2010)[2]. The group looked into the future challenges facing the EMS, including stakeholders' needs, since ISO 14001 was first published in 1996. The group not only analysed ISO 14001, it also considered new approaches in the field of EMS.

The study group came up with 11 themes to be explored in the work of upgrading ISO 14001.They recommended subjects that needed to be explored further, without specific ways how these should be implemented.
Each of these themes will now be briefly explored (FCSGR):

1. *EMS as part of sustainability and social responsibility*

This theme is highly influenced by the ISO 26000 guidance on social responsibility. ISO 26000 is only a guidance in these issues and not a standard as such that can be certified.
The recommendation of the FCSG was that more focus should be put on transparency and accountability in connection with environmental management, environmental issues, and environmental performance.

[2] This report will be referred to in this thesis as FCSGR.

Additionally, the group recommended that more attention should be placed on the value chain influence. The scope of the standard should be enhanced to include the responsibility to the upstream and downstream issues where relevant.
Environmental management should be more clearly linked to sustainable development, and the concept of prevention of pollution should be clarified and broadened.

2. EMS and improvement of environmental performance

Although it is obvious to most people that the aim of an enhanced EMS is actually to improve the environmental performance of the organisation using it, this did not receive enough focus and, according to the FCSG, should be made clearer and should be emphasised more. The FCSG recommended that the requirement of enhancing the environmental improvement of the organisation that adopts it should be stated clearly in ISO 14001.
The FCSG also recommended strengthening the performance evaluation, since this is the key for any organisation to evaluate whether they are increasing their environmental performance.

3. EMS and compliance with legal and other external requirements

From the perspective of the regulatory authorities, the compliances with legal requirements are of paramount importance for an EMS. Since the term "legal requirements" has a different meaning in different countries, it has proved difficult to standardise what is meant precisely by this concept.
The FCSG recommended that ISO clearly describe the approach of achieving legal compliance and what is meant more precisely by this concept, and that they clarify the meaning of demonstrating the commitment to legal compliance. It also suggested that it might be wise to look into the concept of demonstrating knowledge and an understanding of the organisation's compliance status.

4. EMS and overall strategic business management

In practice, ISO 14001 has been used more as an operational management system and has not been a part of strategic business management (King, Michael, Terlaak, 2005, p 8-11). As such, it has formed a parallel managerial system from the "real" managerial system of organisations. This was not the idea from the original standard.

The FCSG said that theme four had actually several sides to it and that each needed to be addressed:

- ***The integration of the EMS with the overall business management of the company***, referring to areas such as corporate purchasing, the design processes, engineering, and such. Products and process information can be included in this part.
- ***The EMS part of overall sustainability and sustainable development*****,** addressed in theme 1.
- ***The integration of the EMS with other managerial systems*****,** such as ISO 9001.
- ***The issues of risk management (in the business sense) and environmental management*****,** since environmental risks can have a major risk for an organisation as a whole.

The recommendation of the FCSG was that more focus should be placed on the benefits and opportunities that organisations have from an EMS on a strategic level, not only in its introduction but also in its requirements.
It also recommended that there should be a clear link between the EMS and the strategic level of the core business, both on a product level and service level as well as with regards to stakeholders.

5. EMS and conformity assessment

When an organisation is certified to an international standard such as the ISO 14001, the issue arises of the uneven evaluation of the organisation in and between countries. This is almost an unavoidable drawback of the certification processes. This is an issue that should be of paramount importance when designing standards.
The FCSG acknowledged that many of the problems regarding these issues derived from reasons beyond the control of the ones for updating the ISO 14001 standards. However, steps should be taken to reduce the possibility of this happening.
The recommendation of the FCSG was that the requirements in ISO 14001 be clear and explicit, and when necessary, a clearer guidance in the Annex A be provided. The purpose of this annex is to avoid a misinterpretation of the requirements.

6. EMS and uptake in small organisations

The issue of the suitability of Small to medium organisation (SME) for the use of ISO 14001 has been an issue since the standard first appeared. There has been much research about this issue and one of the most well known is the ISO report: The Global Use of Environmental Management System by Small and Medium Enterprises (ISO/TC 207/SC1/Strategic SME Group, 2005), which presents several ways to adapt the ISO 14001 so that it can be used by SME more easily.

The FCSG pointed out that the ISO organisation should maintain the applicability of the ISO 14001 for SME. They recommended the use of the general guidelines of ISO organisation for SME, called CEN guide 17, which gives guidance in how to write standards that take micro and SME enterprises into account.

7. EMS and environmental impacts in the value/supply chain

In the ISO 14001, organisations look into environmental aspects that are under their control. Some interpret this to mean areas that are only directly under their control, usually meaning in-house production or services, and leaving out the rest. Some other companies have also included aspects only partly under its control, either up or downstream in the production. There has been an increased focus lately on the organisations to take more responsibility on both of these issues (Seuring, and Müller, 2008, p. 1699-1700).

The FCSG gave as its recommendation that organisations should address the whole value chain and life cycle thinking in the assessment of their environmental aspects.

8. EMS and engaging stakeholders

The current version of the ISO 14001 does establish certain requirements for what is called interested parties, instead of the term stakeholders. According to the 4.3.3., "the view of interested parties shall be considered in the organisational objectives, targets and programmes." Although the requirements are very clearly stated, how they should be applied in practice is not clear at all.
The ISO 26000 used the term stakeholder extensively and in all practical terms in the same way as the ISO 14001 uses interested parties.
The recommendation of the FCSG is to use the term stakeholder instead of "interested parties", and to give an approach on identifying, consulting and communicating with the stakeholders on environmental issues.

9. EMS and parallel or sub systems (GHG, energy)

There has been a proliferation of various standards and management systems for various different requirements in the field of environmental management, for example with the energy use and regarding climate change. ISO 14001 has been designed to be applicable as a generic managerial standard to many types of environmental concerns.
The FCSG recommends that this general applicability of the standard should be more emphasised as well as the benefits of addressing environmental issues in an integrated manner with a broader perspective. It also recommends the benefits of clarifying the applicability of the ISO 14001 to the more specific aspects such as the energy use.

10. EMS and external communication (including product information)

The current version of ISO 14001 states some requirements for the organisation to communicate in regards to their EMS with the environmental policy, how to respond to the relevant communication from external parties and the need to decide in what way the communication to the external world is conducted.
The FCSG recommend adding requirements to an external communication strategy. This would include defining the objectives of this strategy, identifying the relevant stakeholders, and in what and when the strategy should be communicated.

11. Positioning of EMS in (inter)national policy agendas

Internationally, from the environmental perspective regarding for example climate change and resource use, the EMS and ISO 14001 have had little focus. FCSG claimed that there are clear indications that ISO 14001 can help organisations reduce the climate gases emissions and increase the resource efficiency.
The FCSG recommended that these benefits should be pointed at and examples of these should be published.

Many of these themes had a direct effect on the CD1. The experts interviewed for this research agreed that it was very important to have the FCSG report before the actual work had processed with the upgrade. The report acted in some ways as one of the guiding lights for the whole process. Additionally, many of the comments that were made on the CD1 frequently mentioned the FCSG to justify a support for their argument (ISO/TC 207/SC1/WG 5, 2013).

3 Findings

3.1 Likely Changes

The author identified seven themes of substantial changes to ISO 14001 from the current draft of ISO 14001 (CD1). Two of these themes have subcategories. Some of these points have overlapping issues but they are sufficiently different to merit standing as a separate theme. There is a particular link between the themes of strategy and leadership. Some of the points expressed could belong to either of the two groups. Nonetheless, for the purpose of clarity, it was decided to separate the two groups.
As mentioned previously, the two greatest influences on the current draft are the new ISO HLS for managerial standards and the FCSG report. Additionally, according to the experts interviewed, there was a very strong desire not to reduce the demands from the current version.

One of the recommendations of the FCSG was that ISO 14001 would be aligned with ISO 26000, the guidance on social responsibility, both in language and principles (FCSGR, p. 3). Throughout the current draft, there is indeed a stronger feeling of relationship to social responsibility. This is of course not always concretely apparent, but themes such as the value chain and interested parties involvement are part of social responsibility. There are also four environmental themes in ISO 26000, with one of them, the prevention of pollution, already converted in the current edition of ISO 14001. Although the other three themes are not explicitly mentioned in the CD1, there is the catch all "or other relevant environmental issues" (CD1, 5.2). This is mentioned here since social responsibility is not one of the seven themes that the author judged to be part of the major change. This is not because of lack of importance but rather because the issue is fused throughout parts of the draft.

We will now explore the 7 themes of substantial changes to ISO 14001 as found in the CD1:

1. More focus on strategy and business concepts

The new draft contains clauses concerning the understanding of an organisation and the context of the organisation, and demands an understanding of the needs and expectations of interested parties. This significant change of the standard aims at ensuring that the organisation includes strategic considerations when establishing the scope of its EMS, making its core commitments and developing its environmental policy.

This is a substantial change from the current version, where the only direct requirement is the identification and evaluation of environmental issues in general. This has to be done after the environmental policy has been established. It is suggested in the Annex that an initial review of issues should be done prior to developing the policy, but this is not a set requirement.
Therefore, it is not clear whether this should be on an operational level or on a strategic one. The experts interviewed agreed that most organisations use this only on an operational level.
The CD1 includes both the operational and strategic level, with requirements for general consideration of risk and opportunities as well as assessment of the operational environmental aspects. In its introduction, it is stated that "environmental management encompasses a full range of issues, including those with strategic and competitive implications" (CD1, Introduction.) This whole distinction between strategic and operational levels in the EMS is new for many organisations and they may find some difficulties in dealing with separating strategic and operational environmental issues. This focus should be directed during the

development of the EMS and occasionally after that, in a similar manner to when operational environmental aspects are reflected upon.

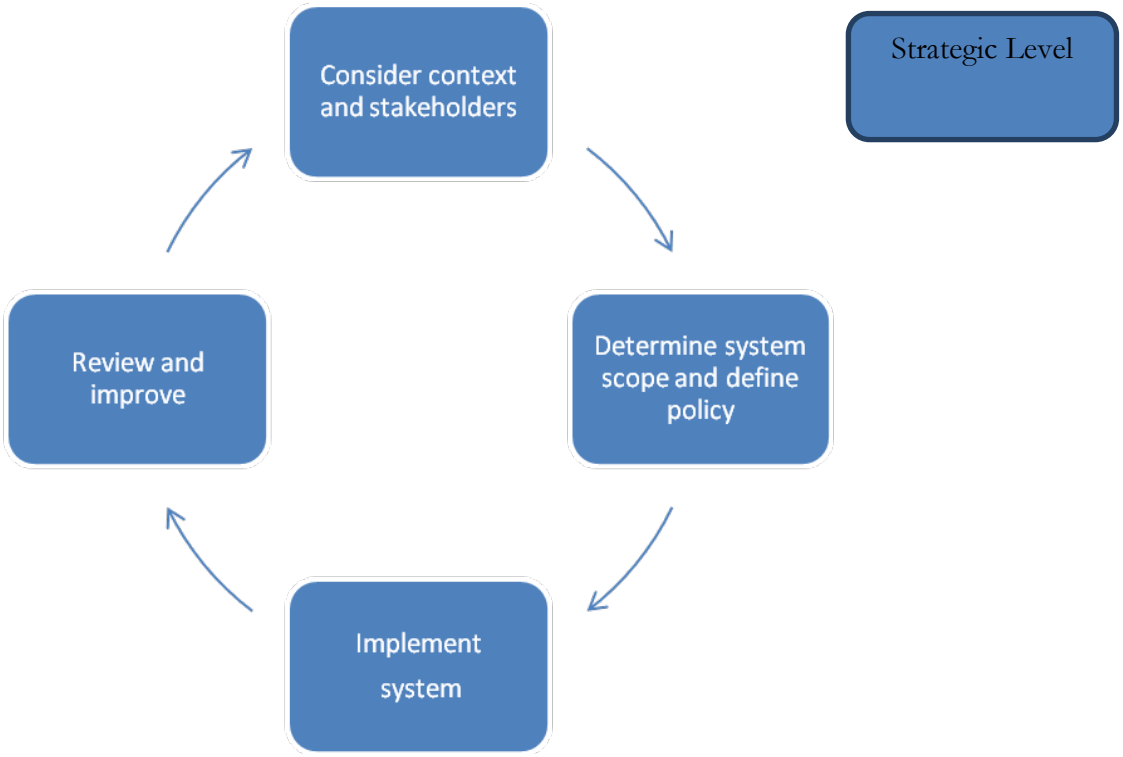

Figure 3-1. EMS on a strategic level. (CRA Europe, 2013)

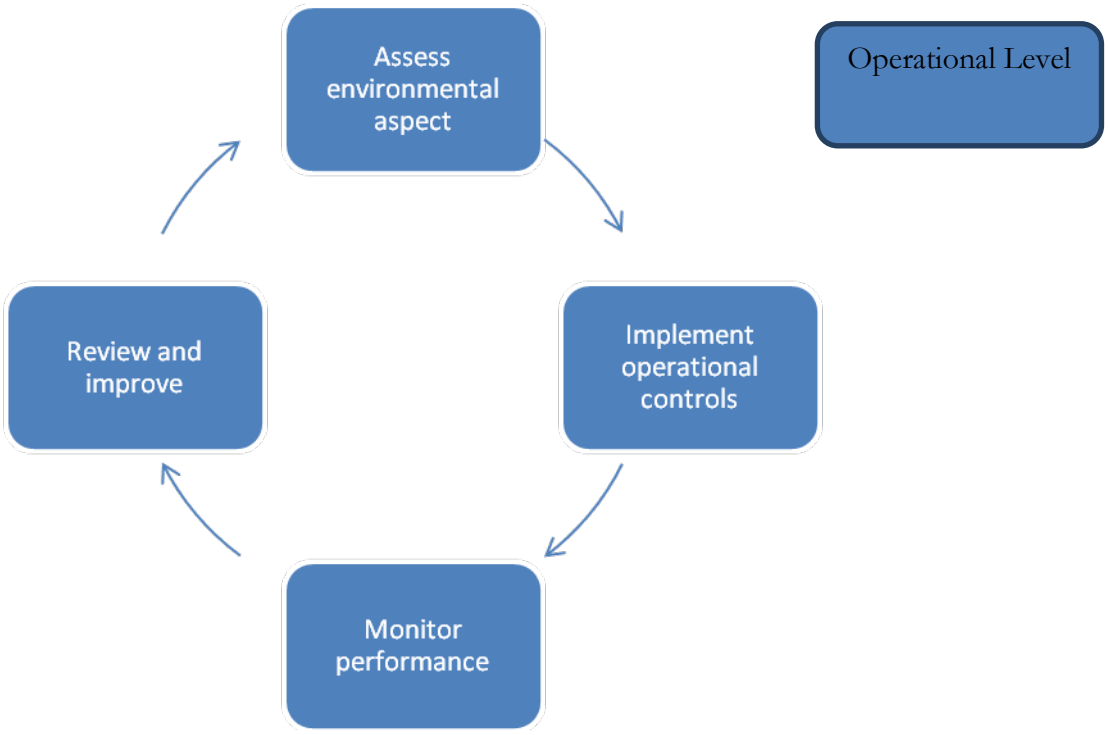

Figure 3-2. EMS on an operational level. (CRA Europe, 2013)

In order to understand the organisation and its context, an awareness of internal and external issues is needed in regards to what is relevant to the organisation's purpose and what can affect the efficiency of the EMS (CD1, 4.1). This means that there is a need for the strategic consideration of environmental issues that have implications on broader organisational goals. This is in accordance with the recommendations of the FCSG, which stated that environmental management should be much better integrated with the general business strategy (FCSGR, p.8). Clause 4, a new clause, refers to the implications of external environmental conditions, which, in the opinion of some of the experts interviewed, is an indirect push towards addressing climate change adaptation (CD1, 4.1, 4.2).

In CD1, the data from environmental impacts assessment and the identification of legal requirements is more of an operational issue (CD1, 6.1). Prior to this, the organisation needed to carry out a form of strength-weakness analysis as a starting point for its EMS, an analysis done by both assessing the context of the organisation and determining the needs of interested parties (CD1, 4.1, 4.2).

There is added attention on understanding the external as well as the internal context of the organisation (CD1, 4.1). The needs and expectations of interested parties becomes a concern to the organisation since it now needs to determine this (CD1, 4.2). Determining this context becomes a crucial point when setting the scope of the EMS and planning actions to address risks and opportunities (CD1, 4.3, 6.1).

The new clause (CD1, 4.2) which addresses the consideration of the needs and expectations of interested parties demands the identification of these relevant parties and their requirements from the point of view of the EMS. The standard does not recommend how or when these needs should be assessed since they vary greatly in significance and nature from one organisation to another.
When the organisation has assessed its inner and outer context as well as the needs of the interested parties, this becomes important raw material in determining the scope of the EMS. Furthermore, the environmental policy needs to mirror the direction of the organisation that is the general strategic policy (CD1, 4.3, 5.2).

There is a requirement for more details in the scope of the EMS. Importantly, the scope needs to evaluate the external impacts on the organisation. This is likely to include the impacts that climate change may have on the organisation (CD1, 4.3). It is also emphasised that the organisation should not only limit negative impacts but that it also needs to take advantage of opportunities (CD1, 6.1). It is also important for the organisation not to overlook the addition of important input to the scope of the system through information on the needs of interested parties. Additionally, the scope of the EMS can include outsourced processes.

The current draft presents a change derived from the HLS. The CD1 introduces specific requirements for the management of risk and opportunities, addressed indirectly to some degree in the current version in the identification and evaluation of environmental aspects and legal requirements. These are much broader in CD1, containing the potential business risks and opportunities arising from environmental impacts. An organisation now needs to evaluate these on a broader scale than before, which might prove to be a challenge to some organisations (CD1, 6.1).

According to most of the experts interviewed, the aim of these new requirements is greater integration of environmental management in business processes. The intention is to ensure that environmental issues are promoted to the strategic level and are included as one of the inputs of longer-term planning. This might then translate to greater business benefits from improved environmental performance and could be a part of removing obstacles that hinder environmental improvements and harmonising business and environmental goals.

2. More focus on commitment and leadership

The whole clause about leadership is new for ISO 14001. It stresses the fact that management has a major role in directing environmental management. This clause 5 contains the links between the strategic objectives of an organisation and its environmental objectives and policy. This is a major difference from the old version.

In the current version of the standard what is asked of top management, those who "control or direct organisations at the highest level" (CD1, 3.11), is to define the organisation's environmental policy, to appoint a management representative responsible for the EMS and for reporting back to them, and to undertake the management review (ISO 14001:2004). This has often resulted in a situation where top management has very limited contact with meaningful environmental management. They instead have relied on environmental management to take care of it from start to finish.

Now, there is a clear definition of top management and on how the EMS needs to be aligned with the organisation's overall strategy. There is a need to consider environmental performance as part of strategic planning. The integration of the EMS into the core business process is required by top managers (CD1, 5.1).

The new version of the standard demands more from top management, including (CD1, 5.1):

- Understanding the organisation's context, in terms of its environmental risks, opportunities, and interested parties;
- Ensuring that the environmental policy and objectives are compatible with the strategic direction of the organisation;
- Considering environmental performance in strategic planning;
- Ensuring the integration of the EMS into the organisation's business processes;
- Ensuring that adequate resources are available;
- Communicating the importance of effective environmental management;
- Ensuring that the environmental management system achieves its intended outcomes and promotes continual improvement; and
- Directing and supporting staff to contribute to the effectiveness of the EMS, and supporting those responsible for environmental management.

These new responsibilities for top management far exceed the ones in the current version. They are meant to encourage them to be more focused on environmental management and to increase their support. This strong criterion gives auditors more authority to test the involvement and support from top management with regard to environmental management. Top management's strong involvement is needed to foster organisational behaviour change.

Expanded role of environmental policy

In CD1, the role of environmental policy and policy commitment is expanded by the need to include the support for environmental protection. This is however specific to the context of the organisation, so there is a degree of flexibility in its application. There are no specific factors mentioned that need to be addressed. In the current version, the organisation's only commitment is to prevent pollution. The new version on the other hand asks an organisation to address its environmental impacts more widely, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues (CD1, 5.2). This means that the organisation's policy commitment is increased.

The organisation needs to assess the need for each interested party to be provided with the environmental policy, as appropriate.

3. More focus on environmental aspects and the value chain

In the CD1, the environmental aspect is expanded from the current version to include the life cycle perspective (CD1, 8.2). Some organisations have done this anyway with ISO14001, but many have not done this at all. Life cycle perspective considers the impact of the organisation's products/ services in its entirety.
The life cycle perspective is not the same as life cycle assessment.

Throughout the upgrades of ISO 14001, what the organisation needs to plan for and control has gradually become more explicit. The first addition already specified the environmental aspects that can be controlled, and the ones that can only be influenced. Later on, it became apparent that in some countries, especially in the United States, environmental aspects were seen as the one category that may be controlled and influenced. Thus, in the second addition, it was made more explicit that there are two categories of environmental aspects: those that you can control and those that you can influence.
A number of examples of how that would work out in the value chain were given in the Annex (ISO 14001:2004, A.3.1). Now, one step further has been taken. The new draft explicitly addresses the concept of value chain and the concept of the life cycle approach. According to some of the experts interviewed, this was already present behind the scenes but is now much more clearly expressed.

The current edition of ISO 14001 emphasises the need to address the impacts of activities, products, and services of an organisation. The focus is very much on controlling the organisation's own activities. The FCSG report urged to expand the focus of organisations in their environmental scope. It suggested that the new version should address life cycle thinking and the value chain perspective more clearly in the identification and evaluation of environmental aspects (FCSGR, p. 12).

The new draft now expands the standard with the requirements to control or influence upstream and downstream processes. Specifically mentioned are outsourced activities and the procurements of goods and services. This also captures the process behind the design and development of the organisation's good and services. The aim here is to capture the environmental impacts that occur over which the organisation has some control (CD1, 8.2).
The current draft makes it clear that the subject of value chain should be in relation to significant aspects. Organisations now need to determine if they do have the opportunity for control or influence in the value chain (CD1, 8.2). The draft clearly defines what it means by

the value chain, supply chain, and lifecycle, which are essential in seeing where and how organisations can wield control or influence (CD1, 3.34A, 3.34B, 3.34C).

How influential the concept of value chain will be for environmental management largely depends on how external auditors will evaluate the processes applied to the planning and control of the concept. The approach used for assessing the significance of value chain aspects will likely be a starting point. However, the auditors will most likely be interested in how the organisation determines those significant aspects it can or should control or influence. A small-step approach would evaluate whether an organisation involves the consideration of the environmental characteristics in purchasing decisions. A larger step would address the opportunities to influence suppliers, not only with a view to improving the environmental characteristics of what is purchased, but also to adopting good environmental management practices with organisations throughout the value chain.

4. More focus on environmental performance indicators

CD1 aims to emphasise that the final goal of an EMS must be to improve the environmental performance of an organisation. The final goal of an EMS should not only be that it runs well; it must also be an actual environmental performance. This has been done by introducing the concept of environmental performance indicators. Each organisation should set performance indicators for each of its environmental objectives, and these indicators should provide the basis of monitoring and measurement. Thus, it is not only important for an organisation to establish these objectives; it must also measure the results of these objectives (CD1, 9.1.1). This change is not a fundamental one to the previous additions to ISO 14001, but it is an aspect which is made much more explicit in this draft. Organisations are given more concrete guidelines on how to apply the concepts of environmental performance improvement.

Each objective is now required to have one or more defined indicators connected with it, from which the performance will be evaluated. It is not specified what these indicators should consist of, thus giving a considerable amount of flexibility.

This change is derived from the recommendations of the FCSG, who argued that the objective of ISO 14001 should be the improvement of environmental performance itself, (FCSGR, p. 5-6) in contrast to the current version which implies that this improvement is achieved only by improving the EMS.
The organisation is asked in the new draft to develop a programme and determine how it will achieve its environmental objectives (CD1, 6.2.2):

- What will be done?
- What resources will be required?
- Who will be responsible?
- How it will be integrated into the organisation's processes?
- When it will be completed?
- How the results will be evaluated?

Some of the experts interviewed expected indicators will be used for monitoring and measuring performance against specified criteria, such as discharge consent limits or energy intensity targets.

5. More focus on compliance and evaluation of performance

The requirement related to the compliance status of an organisation with respect to legal and other requirements is enhanced in the current draft. There are more detailed requirements associated with evaluating the organisation's environmental performance. This includes the incorporation of the value chain perspective on the organisation's environmental impacts and the requirements to determine the criteria against which performance is evaluated. It defines more clearly the monitoring requirement, and demands that the monitoring and measuring should be predetermined beforehand.
Evaluation compliance is extended with the requirement that the organisation should maintain knowledge and understanding of its compliance status. The organisation should be aware of its compliance status and not rely on external parties to inform it of possible noncompliance activities (CD1, 9.1.2).
The expert who mentioned this agreed that what this means is that an organisation cannot wait for the inspection from a foreign body to check if its compliance status is good.
The FCSG emphasised that an organisation needs to assess its compliance with the environmental laws on a regular basis. Although it acknowledged the difficulty in maintaining complete compliance at all times, it is very important for an organisation to know when it is not in compliance, in order to restore compliance as soon as possible (FCSGR, p. 7). This is a pragmatic acknowledgement of the value that a well-run EMS can add to an organisation by minimising risk. This also harmonises the ISO 14001 stance with that of many jurisdictions where the commitment to compliance is seen as a pledge, rather than a guarantee of perpetual compliance.

The current draft requires the organisation to find applicable legislation and understand the compliance requirements. The draft states the need to (CD1, 9.1.2):

- Evaluate compliance and take action if needed;
- Take any necessary action (i.e., to address noncompliance, actual or potential); and
- Maintain knowledge and understanding of its compliance status.

In the Annex, more information explains that compliance evaluation should not only include periodic compliance audits, but can also comprise of (CD1, A.9.1.2):

- Site inspections and observations;
- Review of records; and
- Comparing the results of monitoring against regulatory requirements.

6. More focus on external communication

The requirement for external communication and the quality of the data that form the basis of external communications are explained more explicitly in the new draft. The draft requires the users to evaluate the need for external as well as internal communication. The organisation also needs to specify what is looked at when making this evaluation (CD1, 7.4). So in fact, the organisation needs a communication strategy. It needs to answer the questions of what to communicate, when to communicate, how often and to whom to communicate, and so on. There are no special requirements for external communication beyond the legal requirements or voluntary obligations (CD1, 7.4.3). The organisation also needs to communicate information relating to potential impacts associated with the use and end-of-life of products and the delivery of services (CD1, 8.2).

According to some of the experts interviewed, environmental communication strategy is more important than an annual report. The annual report is most often part of the general sustainability report, and many stakeholders will not be able to digest this information so easily. In its communication strategy, the organisation has to decide what is communicated, when it is communicated, how it is communicated, and to whom it is communicated—and all communication must be related to the organisation's environmental performance. An annual report or any periodical report is only one of the many means to meaningful communication with various stakeholders.

7. More focus on ecodesign

CD1 contains a slight shift relating to the design, development, and change of products and services. In the current version, the only mention of design is in the Annex, where it is clearly stated that this is not a requirement. However, the new draft states that "the organisation shall consider the result of the evaluation of significant environmental aspects as input in the process of the *design*, development or change of its products and services" (CD1, 8.2). Additionally, the Annex clarifies that an organisation needs to assess how to integrate EMS requirements into various business functions such as design and development, especially product, process and facility design and development (CD1, A.4.4).

Most of the experts interviewed did not think that this would radically affect organisations, but that this is an aspect they need to address to some degree. This is an issue that is partly related to the above-mentioned issue of value chain and there will be a need for an organisation to assess the design of the value chain concerning important environmental aspects (CD1, A.6.1.2). How this will play out is not certain and depends largely on how the auditors decide to address the issue.

3.2 Concise Questions Compiled from the Identified Changes

We have now explored the seven major categories of change that the CD1 brings with it. In order to have a better use of these categories, and to be able to use them in a gap analysis, they will be made more concise and converted into question format. The questions of each category will be used in the gap analysis to assess whether the companies meet the requirement of the CD1.

Strategy

1. Has the company evaluated the environmental issues with implications on the broader organisational goals—for example, climate change, raw material use, fluctuation in energy prices, and so on?
2. Has the company determined the external and internal issues that are relevant to the company's purpose and which might affect the outcome of the EMS?
3. Has the company determined who the interested parties in its environment are?
4. Has the company determined the needs and requirements from these interested parties?
5. Was the information from these interested parties used and considered when forming the EMS?
6. What was the method used in finding the interested parties?
7. What was the method used in evaluating their effect on the company?

8. What was the method used to evaluate their needs and their expectations of the organisation?
9. What was done with all of this information?
10. When forming the scope of the EMS, did the company first assess and take into account the internal and external issues relevant to the EMS (question 2) and the needs and expectations of the interested parties (question 6 to 9)?
11. Did the scope of the EMS include the assessment of the value chain? If so, what part of the value chain can the company influence and control and should thus be included under its scope?
12. Is the scope of the EMS available in a documented form?
13. When planning for the EMS, has the company used the information from question 2 and questions 6 to 9 to determine the risk and opportunities to the EMS that stem from:
    a. Significant environmental aspects?
    b. Legal requirements and voluntary obligations?
    c. Other business risks and opportunities that affect the EMS and need to be addressed?
14. Does the company have plans to address these risks and opportunities, integrate them into its EMS, and evaluate the effects of the plan?

Leadership

1. Does the organisation's top management understand the organisation and its context (questions 1 and 2 from the strategy part)?
2. Does the top management give consideration to environmental performance in the general strategic planning of the company?
3. Is the environmental policy appropriate to the general purpose and context of the organisation (questions 1 and 2 from the strategy part)?
4. Does the environmental policy have commitment to support the environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, and other relevant environmental issues?
5. Has the company evaluated the appropriateness of the availability of the environmental policy (EP) for each interested party?

Environmental aspects and value chain

1. Has the company mapped the value chain?
2. Has the company evaluated what processes and products in the value chain have substantial environmental impact?
3. How are they evaluated?
4. Has the company evaluated the control and influence that it has in the value chain?
5. What has the company done to have influence in its value chain?
6. Has the company established criteria for evaluating the supply of goods, services, and outsourced processes, and does it take a life cycle perspective in the process?
7. Has the company implemented the above-identified criteria?

8. Has the company identified specific environmental requirements that it deems appropriate for the procurement of goods and services or outsourced processes?
9. Has the company communicated these requirements to its suppliers and others who need to know of them, including its contractors?

Environmental performance indicators

1. Has the company set performance indicators for each of its environmental objectives, ideally, in a monitored and measurable way?
2. Has the company considered the use of ISO 14031 as a guide for these performance indicators?

Evaluation

1. Has the company added the value chain perspective when evaluating its environmental impact?
2. Has the company determined the criteria against which the environmental performance is evaluated?
3. Does the company maintain knowledge and understanding of its compliance status?

Communication

1. Has the company developed a communication strategy—that is, has it determined the need for internal and external communication? This strategy needs to include answers to the following questions:
    a. What will be communicated?
    b. When to communicate?
    c. With whom to communicate?
    d. How to communicate—methods, tools and approaches?
2. What is the basis of this evaluation?
3. Has the company evaluated the communication requirements from each interested party?
4. Has the company evaluated the need to communicate information relating to potential impacts associated with use and end-of-life of its products and the delivery of its services?

Environmental design

1. Has the company taken into account significant environmental aspects in its design and development process?
2. Has the company assessed the opportunities for integrating the EMS with the design process, in order to manage the environmental aspects that have significant impacts?

3.3 The Impact of CD1 on the EMS of Certified Companies

3.3.1 Nolato Gota

3.3.1.1 Background[3]

Nolato Group is a Swedish company that specialises in the development and production of injection-moulded plastic products. It was founded in 1938 in Torekov under the name Nordiska Latexfabriken, which was then shortened to Nolato in 1982. In the year 1984, Nolato Group was listed on the stock exchange.

The company has grown extensively and acquired many other companies since its founding. In the first decades, Nolato group was only operative in Sweden but from the nineties the company became international. In 1998, the first significant unit outside Sweden was established in the US. The same year, the first company of Nolato Group became certified to ISO 14001. In 2001, the first manufacturing unit was established in China.

Although Nolato Group is head-quartered in Sweden, the majority of its operations are now based outside the country. In the year 2012, the average number of employees was 8,421, 90 per cent of whom worked outside Sweden. Nolato Gota is a unit of Nolato Group located in Götene, in Sweden. This research will focus on Nolato Gota.

Nolato Group is a high-tech company that positions itself as a company with a high amount of specialisation and is thus able to be very accommodating to the customers' needs. The company has great experience with injection-moulded products, in particular with highly-automated products, and can therefore be cost-effective. Added to conventional injection moulding, Nolato Group also specialises in overmoulding, welding, decoration, automation and robot application of gaskets, and assembly. They also offer the services of their technical department in product development, since they are the specialist in their particular field.

The business model that Nolato Group uses is a combination of good expertise on their subject with long-term creative cooperation with their clients. They aim to create added value for the customer with advanced polymer technology, expertise in development and design, and efficient production.

The business model for Nolato Gota is more focused on their own specific production. They define themselves as a manufacturer of injection-moulded products for specific customer segments. They are competitive due to their experience in highly-automated production- cost-effective.
Nolato Gota emphasises that the flexibility of their organisation is due to short decision paths, easily changeable production capacity and good knowledge of their customers. They offer the customer assistance at all stages of the product production, from the design stage, material and production technologies, and all processes to product delivery.

Nolato Gota specialises in the development and production of injection-moulded plastic products. Additionally they also specialise in overmoulding, welding, decoration, automation and robot application of gaskets, and assembly. They emphasise that their experienced technical department can be involved in product development according to the customer wishes.

[3] The information for the whole analysis of Nolato Gota is derived from Nolato Gota website and interviews with employees of Nolato Gota.

Nolato Gota adopted the ISO 14001 for the first time in 1998, only two years after the birth of the standard. Additionally to this, they are also certified to ISO 9001, ISO 26000 and the Nolato Group reports according to GRI.

The EMS at Nolato Gota

The EMS of Nolato Gota is run together with quality management system. The EMS is based on the Swedish document Miljömanual, meaning environmental manual. In this document, the operation of the EMS is broken down in units that fit well with the ISO 14001:2004. It is well structured and organised and covers a lot of the areas of ISO14001, as the contents' list of the document below shows (Nolato Gota, 2012, p. 4-5):

- Introduction
    - Table of Contents
- Document control
    - Distribution list
- Process Flow
- Environmental Policy
- Organisation
    - Management Representative
- Training, awareness and competence
- Information exchange
- Environmental assessment / environmental aspects
- Legal and other requirements
- Environmental Objectives
    - Significant environmental aspects
    - Overall environmental
    - Targets
- Environmental programme
- Operational control
    - Energy consumption
    - Raw materials and material with hazardous content
    - Transportation
    - Purchase and management of chemicals and hazardous waste
    - Plastic recycling
    - Waste disposal
- Emergency Preparedness
- Monitoring and Measurement
- Non-conformance, corrective and preventive action
- Internal environmental audits
- Management review
- Document for environmental aspects
- Document for hazardous waste
- Waste and chemicals

The content of these chapters are self-explanatory and present the procedures in a clear and concise manner. For example, the environmental manual regarding significant environmental aspects states (Nolato Gota, 2012, p.23-24):[4]

[4] Authors translation.

"The environmental review is the basis from which the company's management assesses annually which environmental aspects are significant. This is done annually in coordination with quality management system.
The assessment is made by considering the following:
Environmental considerations

- Degree of environmental impact
- Severity of impact
- Likelihood that the impact will occur
- Impact duration"

3.3.1.2 Nolato Gota gap analysis

Following the findings from the likely changes resulting from CD1, questions were formed to process this information even further, questions that any company already using ISO 14001 may be able to answer easily.
These questions form a framework for gap analysis, making it easier to grasp the changes that companies need to make on their EMS. How the companies will address the resulting gap that they may have after this comparison will depend on the nature and situation of the company.

Table 3-1: Nolato Gota gap analysis.

Strategy	
1. Has the company evaluated the environmental issues with implications on the broader organisational goals- for example climate change, raw material use, fluctuation in energy prices and so on?	Nolato Gota has not done so in the manner required from CD1.
2. Has the company determined the external and internal issues that are relevant to the company' purpose and that might affect the outcome of the EMS?	Not done so on the level that the EMS addresses
3. Has the company determined who the interested parties in its environment are?	This has not been done in the manner that affects the EMS of Nolato Gota. This has been done at the Group level; Sustainability Report 2012.
4. Has the company determined the needs and requirement from these interested parties?	This has not been done in the manner that affects the EMS of Nolato Gota
5. Was the information from these interested parties used and considered when forming the EMS?	Not when forming the EMS
6. What was the method used in finding the interested parties?	This has not been done in the manner that affects the EMS of the unit in Nolato Gota
7. What was the method used in evaluating their effect on the company?	This has not been done in the manner that affects the EMS of the unit in Nolato Gota
8. What was the method used to evaluate their need and expectations from the organisation?	This has not been done in the manner that affects the EMS of the unit in Nolato Gota

9. What was done with all of this information?	This has not been done in the manner that affects the EMS of the unit in Nolato Gota
10. When forming the scope of the EMS, did the company first assess and take into account the internal and external issues relevant to the EMS (question 2) and the need and expectation from the interested parties (question 6 to 9)?	This has not been done in the manner demanded in CD1
11. Did the scope of the EMS include the assessment of the value chain? If so, what part of the value chain can the company influence and control and thus should be included under its scope?	Not in any systematic way
12. Is the scope of the EMS available in a documented form?	No
13.When planning for the EMS, has the company used the information from question 2 and questions 6 to 9 to determine the risk and opportunities to the EMS that stem from: a. Significant environmental aspects? b. Legal requirements and voluntary obligations? c. Other business risks and opportunities that affect the EMS and need to be addressed?	This has not been done in the manner required by CD1
14. Does the company have plans to address these risks and opportunities, integrate them into its EMS and evaluate the effects of the plan?	This has not been done in the manner demanded in CD1
Leadership	
1. Does the organisation's top management understand the organisation and its context (questions 1 and 2 from the strategy part)?	Since the evaluation of the organisation and the context has not been done in accordance to CD1, this has not been done.
2. Does the top management give consideration to environmental performance in the general strategic planning of the company?	This has not been done in the manner demanded in CD1
3. Is the environmental policy appropriate to the general purpose and context of the organisation (questions 1 and 2 from the strategy part)?	This has been done but not in the manner that is required in the CD1
4. Does the environmental policy have commitment to support environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues?	No
5. Has the company evaluated the appropriateness	No

of the availability of the EP for each interested party?	
Environmental aspects and the value chain	
1. Has the company mapped the value chain?	Not in a systematic way
2. Has the company evaluated what processes and products in the value chain have substantial environmental impact?	No
3. How are they evaluated?	No
4. Has the company evaluated the control and influence that it has in the value chain?	No
5. What has the company done to have influence in its value chain?	No
6. Has the company established criteria for evaluating the supply of goods, services and outsourced processes, and does it take a life cycle perspective?	No
7. Has the company implemented the above-identified criteria?	No
8. Has the company identified specific environmental requirements that it deems appropriate for the procurement of goods and services or outsourced processes?	Yes
9. Has the company communicated these requirements to its suppliers and others who need to know of them, including its contractors?	Yes
Environmental performance indicators	
1. Has the company set performance indicators for each of its environmental objectives, ideally in a monitored and measurable way?	Yes
2. Has the company considered the use of ISO 14031 as a guide for these performance indicators? (This is not required by the draft.)	No
Evaluation	
1. Has the company added the value chain perspective when evaluating its environmental impact?	No
2. Has the company determined the criteria against which the environmental performance is evaluated?	Yes
3. Does the company maintain knowledge and understanding of its compliance status?	Yes
Communication	

1. Has the company developed a communication strategy- that is, has t determined the need for internal and external communication? This strategy needs to include answers to the following questions: a. What will be communicated? b. When to communicate? c. With whom to communicate? d. How to communicate- methods, tools and approaches?	This has not been done at Nolato Gota. However, the Nolato Group reports according to GRI and has a communication strategy.
2. What is the basis of this evaluation?	No
3. Has the company evaluated the communication requirements from each interested party?	No
4. Has the company evaluated the need to communicate information relating to potential impacts associated with use and end-of-life of the product and the deliverance of service?	No
Environmental design	
1. Has the company taken into account significant environmental aspects in its design and development process?	No not in a systematic manner
2. Has the company assessed the opportunities for integrating the EMS with the design process, in order to manage the environmental aspects that have significant impacts?	No

3.3.1.3 Resulting gap

By conducting gap analysis on the current ISO 14001 at Nolato Gota site, resulting gaps appears. These gaps will now be explored in more details.

Strategy

The change in the strategy section is the greatest change that has been made to the ISO standard. Not surprisingly, Nolato Gota shows some gaps in its EMS compared to what the CD1 demands.

Nolato Gota has not evaluated in a systematic way how the environmental issues that have implications on the broader organisational goals affect the company. This means that the company has to evaluate on a broader strategic level what these environmental threats and opportunities are. These could range from climate change and raw material scarcity to fluctuation in energy prices. The top management needs to be involved in this evaluation, since one of the requirements of the new draft is for the top management to understand the company's context and from which standpoint the EMS is established (CD1 5.1).

Although Nolato Group has determined who the interested parties are with ISO 26000, this does not seem to have reached the level of Nolato Gota. There it has not been done in a systematic way and most likely does not meet the requirements of the new draft.

In order to establish the scope of the EMS according to CD1, one first has to go through the process of understanding the organisation and its context on a strategic level and to understand the needs and expectations of the interested parties. Most likely, only a few companies can claim to have done this. Nolato Gota is in the same position.

Nolato Gota, as a company that has been using ISO 14001 since 1998, has obviously been evaluating the environmental risk all along. However, the steps that need to be taken in order to do it according to the CD1 standards are different. Companies now have to go through the steps of first understanding the organisation and its context (CD1 4.1), and to understand the needs and expectation of the interested parties (CD1 4.2). Lastly, armed with information gathered in the previous steps, the scope of the EMS is then formed. (CD1 4.3) Only after going through these steps is there sufficient information to actually evaluate the risk and opportunities and to take action to address this. This process has not been done in Nolato Gota.

Leadership

In the CD1, the role of the top management is more prominent that before. The top management is now expected to understand the organisational context, which was not a requirement in the older version. This placed stronger responsibility of information on the leadership.

Not surprisingly, Nolato Gota does not meet all the new requirements regarding leadership in CD1. It does not systematically include the environmental performance in its general strategy. This is quite an environmentally concerned company so this is not a big step for the company to take.

CD1 asks that the EP be appropriate for the context of the organisation. The evaluation of this context is done in the first step in the strategy section (CD1 4.1). This has not been done in the new way of the standard so this needs to be updated. It is not likely to be a big task for the company. After this has been done, the new version demands a commitment to support environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues. In the current version it was done only to prevent pollution. This has not been done by the company.
Lastly, the CD1 asks for the evaluation of the appropriateness of the EP to the interested parties. To be able to do this, the second step in the strategy section needs to be taken (CD1 4.2). This has not been done by Nolato Gota.

Value chain

The CD1 asks for a systematic evaluation on what may have substantial environmental impact in the value chain. This is something that most companies have not done, including Nolato Gota. One of reason for that is that often customers have very specific requirements for material use, transport and such, on which Nolato Gota has little control over. However, this form of evaluation is required even if Nolato Gota actually has very little room to manoeuvre and can change little.

Firstly, the players in the value chain need to be mapped. After this has been done, what control and influence Nolato Gota can yield in the value chain needs to be evaluated. This information is then used to form criteria for evaluating the supply of goods, services and outsourced processes. The CD1 specially mentions specifying environmental requirements as appropriate for the procurement of goods and services. These need to be communicated to the suppliers including the contractors.

Additionally, the information that is found by the above mentioned process also needs to be added to the perspective of the environmental impact.

Environmental performance indicators

There are no gaps in this section.

Evaluation

For many companies, it is likely that there will be significant changes with the evaluation in CD1. This will not be an area that requires much change at Nolato Gota.
The only change for Nolato Gota will be to add the value chain perspective when evaluating its environmental aspect. This is very much related to the three points about the value chain.

Communication

Many companies are unused to developing a communication strategy so this will be a new challenge for them. Although Nolato Group has a very open approach to communication and they follow the GRI reporting, they do not meet these requirements on a ground level at the Nolato Gota. They have a list of who has been communicated to but no communication strategy. They have not answered the following questions: what will be communicated, when to communicate, with whom to communicate; and how to communicate, methods, tools and approaches.
This will be a change in approach to communication for Nolato Gato. Perhaps they only need to work better with the GRI.

Environmental design

Environmental design is a new requirement in the ISO 14001 and not many companies are doing this at the moment. These requirements are mild and not very demanding.
Nolato Gota claims that environmental issues are a concern of all of their business operations (Nolato Gota, 2012, p. 4). The environmental issues are not included in any systemic way in the design process. In some form this is required.
The new draft requires the assessment of the opportunities to integrate the EMS with the design process and then to manage the environmental aspects that have significant impacts. This is new for most companies. Nolato Gota has not done this.

3.3.1.4 Recommendations

Strategy

The broad recommendation is that Nolato Gota looks at the environmental management from both strategic as well as operational points of view. The gaps in this section are directly related to this new emphasis in the CD1. This is largely due to the HLS, so this will not be changed in the following version of the standard.
CD1 structures the approach that is required for companies to shift their perspective to the strategic level. Although this might pose as a challenge for companies to reframe there view on their EMS, there are actually concrete steps described in the CD1.

- Nolato Gota needs to evaluate the environmental issues that have implications on the broader organisational goals.
- Nolato Gota needs to determine the external and internal issues that are relevant to it and which might affect the outcome of the EMS.
- Nolato Gota needs to determine in a systematic way who are the interested parties in its environment.
- Nolato Gota needs to determine in a systematic way the needs and requirement from these interested parties.
- When restructuring or changing the EMS, Nolato Gota needs to consider the information from these interested parties.
- When restructuring or changing the EMS and reforming the scope of its EMS, Nolato Gota needs to first assess and take into account the internal and external issues relevant to the EMS, then secondly the need and expectation from the interested parties.
- Nolato Gota needs to include the assessment of the value chain in the scope of the of the EMS, that is what part of the value chain the company can influence and control and thus should be included under its scope.
- Nolato Gota needs to have the scope of the EMS available in a documented form.
- Nolato Gota needs to use the information from question 2 and questions 6 to 9 when planning for the EMS to determine the risk and opportunities to the EMS that stem from:
    a. Significant environmental aspects
    b. Legal requirements and voluntary obligations
    c. Other business risks and opportunities that affect the EMS and need to be addressed
- Nolato Gota needs to address these risks and opportunities, integrate them into its EMS and evaluate the effects of the plan.

Leadership

In general, Nolato Gota needs to increase the involvement of its top management with the EMS. This is connected to the above part about strategy, which is raising the EMS to a general strategic level. This is done by the top management really understanding the context of the company in relation to EMS. This is probably not a big step for Nolato Gota since they are quite committed to environmental issues in general.
Nolato Gota will have to apply some changes in this leadership section, but not great ones.

- Nolato Gota top management needs to understand the organisation and the context of it from the EMS point of view (question 1 and 2 in the strategy section).
- The top management needs to give consideration to environmental performance in the general strategic planning of the company.

- Nolato Gota needs to make its environmental policy appropriate to the general purpose and context of the organisation (question 1 and 2 in the strategy section).
- The environmental policy needs to have commitment to support environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues.
- Nolato Gota needs to evaluate the appropriateness of the availability of the EP for each interested party.

Value chain

The value chain in general needs to be addressed from the point of view of EMS. Firstly, all the players in the value chain need to be mapped. Secondly, the control and influence that Nolato has in the value chain need to be assessed.
With this information in hand, criteria needs to be set to evaluate the supply of goods, services and outsourced processes, specifying environmental requirements as appropriate for the procurement of goods and services. These need to be communicated to the suppliers including the contractors.
Additionally, the information that is found by above mentioned process also needs to be added to the perspective of the environmental impact.

- Nolato Gota needs to map the value chain with respect to environmental issues.
- Nolato Gota needs to evaluate what processes and products in the value chain have substantial environmental impact.
- Nolato Gota needs to evaluate the level of control and influence that it has in the value chain.
- Nolato Gota needs to evaluate what the company can do to affect the value chain.
- Nolato Gota needs to establish criteria for evaluating the supply of goods, services and outsourced processes, while taking a life cycle perspective in the process of doing so.

Environmental performance indicators

Since there are no gaps in this section, no direct recommendation will be given. A small pointer is that Nolato Gota might want to look into the use of ISO 14031 and how practical this is.

Evaluation

The only recommendation here is that Nolato Gota now needs to add the value chain perspective when evaluating its environmental impact.

- Nolato Gota needs to add the value chain perspective when evaluating its environmental impact.

Communication

Nolato Group is an open company that wants to communicate effectively with its environment and does this. A sign of this is their adoption of the GRI. However, the communication part does not seem to have reached the plant level. This will be a change in approach to communication for Nolato Gota. Perhaps they only need to work better with the GRI.

- Nolato Gota needs to develop a communication strategy, i.e. determine the need for internal and external communication. This strategy needs to include:
    a. What will be communicated
    b. When to communicate
    c. With whom to communicate
    d. How to communicate, methods, tools and approaches
- Nolato Gota needs to evaluate the communication requirements from each interested party.
- Nolato Gota needs to evaluate the need to communicate information relating to potential impacts associated with use and end-of-life of the product and the deliverance of service.

Environmental design

The new draft creates a need to address environmental design. Nolato Gota now needs to take account of significant environmental aspects in its design process. The company will also need to assess the opportunities to integrate the EMS with the design process, in order to manage the environmental aspects that have significant impacts.
Both of these requirements do not demand more from Nolato Gota than to assess how they can use the aspect better in the environmental design process. Although this is a change, it is not a very demanding one.

- Nolato Gota needs to take into account significant environmental aspects in its design and development process.
- Nolato Gota needs to assess the opportunities for integrating the EMS with the design process, in order to manage the environmental aspects that have significant impacts.

3.3.2 Haldex Landskrona

3.3.2.1 *Background*[5]

Haldex is a Swedish company that was founded in 1887. It changed its named several times, as well as its production. In the beginning, the company produced clocks, taximeters and typewriters. Now, the company manufactures air controls and brakes for commercial vehicle systems. Their headquarters and main manufacturing site are in Landskrona, in Sweden. The company started to work with ISO 14001 in the year 2000.

[5] This information is derived from Haldex Landskrona website and interviews with employees of Haldex Landskrona.

Haldex today has its operation in the global arena. The manufacturing takes place in ten products units located in Sweden, Hungary, Germany, China, Brazil, India, Mexico and USA. In 2012, the average number of employees was 2,200. Haldex unit in Landskrona will be the focus of this research rather than the whole company.

There has been great change in the company in recent years. In 2008, about 6,000 people worked at the company. Now, only 2,200 work there. Haldex restructured its business and sold of its spring wire division in 2009. In 2011, the all-wheel drive traction systems division was sold and hydraulic systems division was divided from the company.
Haldex is a high-tech company that positions itself as a company with a high amount of specialisation and is able of being very accommodating for the customers' needs. The company has great experience in commercial vehicle systems. They operate two main product sections- air controls and brakes. The first one includes air management system, air suspension system and electronic braking systems. The second one is made from actuators, automatic brake adjusters and electronic lining wear sensors.

The business model that Haldex uses relies on the quality of their manufacturing expertise. They often have long-term close and creative cooperation with their clients, where they aim to foresee the needs of their clients and respond to them in a flexible manner.
Haldex places a lot of emphasis on the flexibility of the organisation through short decision paths, easily changeable production capacity and good knowledge of their customers. They offer customers their assistance in all stages in the product production from the design stage, material and production technologies, all processes, to product delivery.

Haldex adopted the ISO 14001 for the first time in 2000, only four years after the birth of the standard. Additionally to these, they are certified to the ISO 9001 and are working on adopting ISO 26000. They report on a corporate level according to GRI.

The EMS at Haldex in Landskrona

The EMS of Haldex in Landskrona is run together with quality management system, as is the case at Nolato. Their EMS is based around the Swedish environmental handbook Miljöhandbook. In this document, the operation of the EMS is broken down in units that fit well with the ISO 14001:2004. It is well structured and organised and covers a lot of the areas of ISO14001, as the contents' list of the document shows (Haldex, 2011a):

- Purpose
- Scope
- Responsibilities/Authorities
- Overview of the EMS
- Environmental policy
- Environmental aspects
- Environmental performance
- Legal and other requirements
- Objectives, targets and action plan
- Resources, roles, responsibility and authority
- Competence, training and awareness
- Communication
- Documentation
- Document control
- Operational control
- Emergency plan and response

- Legal and other requirements
- Non-conformance and corrective and preventative action
- Records
- Internal review
- Management review

The content of these chapters are self-explanatory and present the procedures in a clear and concise manner. For example, the environmental manual regarding significant environmental aspects, states (Haldex, 2011a, p. 4):[6]

"In order to map its environmental impact, the company needs a continuous identification and evaluation of environmental aspects. These environmental aspects refer to activities, products or services that could affect external environment such as air, water, land, natural resources, flora, fauna and humans and their interactions. This evaluation of the identified environmental aspects leading to significant environmental aspects forms the basis of the preparation of the environmental policy and environmental objectives."

3.3.2.2. Haldex Landskrona gap analysis

As mentioned earlier, following the findings from the likely changes from CD1, concrete questions were formed to process this information even further, questions that any company already using ISO 14001 may be able to answer easily.
These questions form a framework for gap analysis, making it easier to grasp the changes that companies need to make on their EMS. How the companies will address the resulting gaps will depend on the nature and situation of the company.
The questions for Haldex Landskrona will now be answered:

Table 3-2: Haldex Landskrona gap analysis.

Strategy	
1. Has the company evaluated the environmental issues with implications on the broader organisational goals- for example climate change, raw material use, fluctuation in energy prices and so on?	Not in the way the new draft requires. They have started in this way.
2. Has the company determined the external and internal issues that are relevant to the company' purpose and that might affect the outcome of the EMS?	Not in any systematic way
3. Has the company determined who the interested parties in its environment are?	They do this indirectly, because they evaluate the environmental goals with pressure from interested parties. However, not done in a systematic manner.
4. Has the company determined the needs and requirement from these interested parties?	Indirectly.
5. Was the information from these interested parties used and considered when forming the	They have used it from the beginning of their

[6] Authors translation

EMS?	EMS, but not used in forming the EMS.
6. What was the method used in finding the interested parties?	Various departments come together and discuss this. Not in a systemic way.
7. What was the method used in evaluating their effect on the company?	As above
8. What was the method used to evaluate their need and expectations from the organisation?	As above
9. What was done with all of this information?	It is used in setting environmental goals
10. When forming the scope of the EMS, did the company first assess and take into account the internal and external issues relevant to the EMS (question 2) and the need and expectation from the interested parties (question 6 to 9)?	Not in the manner required by CD1. It is done in a rudimentary way in the EP.
11. Did the scope of the EMS include the assessment of the value chain? If so, what part of the value chain can the company influence and control and thus should be included under its scope?	No
12. Is the scope of the EMS available in a documented form?	What has been done is available in the EP. The scope has not been fully done
13. When planning for the EMS, has the company used the information from question 2 and questions 6 to 9 to determine the risk and opportunities to the EMS that stem from: a. Significant environmental aspects? b. Legal requirements and voluntary obligations? c. Other business risks and opportunities that affect the EMS and need to be addressed?	Not in the manner required by CD1.
14. Does the company have plans to address these risks and opportunities, integrate them into its EMS and evaluate the effects of the plan?	Not been done
Leadership	
1. Does the organisation's top management understand the organisation and its context (questions 1 and 2 from the strategy part)?	Not in the manner required by CD1, since the preliminary evaluation has not been done.
2. Does the top management give consideration to environmental performance in the general strategic planning of the company?	Not in the manner required by CD1.
3. Is the environmental policy appropriate to the general purpose and context of the organisation (questions 1 and 2 from the strategy part)?	Not in the manner required by CD1.

4. Does the environmental policy have commitment to support environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues?	No
5. Has the company evaluated the appropriateness of the availability of the EP for each interested party?	No
Environmental aspects and the value chain	
1. Has the company mapped the value chain?	Not in any systematic way
2. Has the company evaluated what processes and products in the value chain have substantial environmental impact?	No
3. How are they evaluated?	
4. Has the company evaluated the control and influence that it has in the value chain?	No
5. What has the company done to have influence in its value chain?	
6. Has the company established criteria for evaluating the supply of goods, services and outsourced processes, and does it take a life cycle perspective?	Not taking a life cycle perspective
7. Has the company implemented the above-identified criteria?	No
8. Has the company identified specific environmental requirements that it deems appropriate for the procurement of goods and services or outsourced processes?	Yes it has
9. Has the company communicated these requirements to its suppliers and others who need to know of them, including its contractors?	Yes
Environmental performance indicators	
1. Has the company set performance indicators for each of its environmental objectives, ideally in a monitored and measurable way?	Yes
2. Has the company considered the use of ISO 14031 as a guide for these performance indicators? (This is not required by the draft.)	No
Evaluation	
1. Has the company added the value chain perspective when evaluating its environmental	No

impact?	
2. Has the company determined the criteria against which the environmental performance is evaluated?	Yes
3. Does the company maintain knowledge and understanding of its compliance status?	Yes, they have a law firm updating them regularly of any changes that affect the company.
Communication	
1. Has the company developed a communication strategy- that is, has t determined the need for internal and external communication? This strategy needs to include answers to the following questions: a. What will be communicated? b. When to communicate? c. With whom to communicate? d. How to communicate- methods, tools and approaches?	This has not been done in Landskrona. Haldex has GRI but they have not evaluated this with the question.
2. What is the basis of this evaluation?	Not been done
3. Has the company evaluated the communication requirements from each interested party?	No
4. Has the company evaluated the need to communicate information relating to potential impacts associated with use and end-of-life of the product and the deliverance of service?	No
Environmental design	
1. Has the company taken into account significant environmental aspects in its design and development process?	Yes. Every major change is looked at from an environmental perspective in monthly meetings.
2. Has the company assessed the opportunities for integrating the EMS with the design process, in order to manage the environmental aspects that have significant impacts?	Yes. Every major change is looked at from an environmental perspective in monthly meetings.

3.3.2.3 Resulting gap

By conducting gap analysis on the current ISO 14001 at Haldex Landskrona, the resulting gaps appear. These resulting gaps will now be explored further.

Strategy

The change in the strategy section is the greatest change that has been made to the ISO standard. Not surprisingly, Haltex Landskrona shows some gaps in its EMS compared to what the CD1 demands.
Haldex Landskrona has not evaluated in a systematic way how the environmental issues that have implications on the broader organisational goals affect the company. This means that the company has to evaluate on a broader strategic level what these environmental threats and

opportunities are. These could range from climate change and raw material scarcity to fluctuation in energy prices. The top management needs to be involved in this at some point, since one of the requirements of the new draft is the need for them to understand the company's context and from which standpoint the EMS is established (CD1, 5.1).
Haldex Landskrona has determined indirectly who the interested parties are in regards to the EMS. When forming their environmental goals, they take into account pressure from interested parties. However, this has not been done in a systematic manner and most likely does not meet the requirements of the new draft.

In order to establish the scope of the EMS according to CD1, one first has to go through the process of understanding the organisation and its context on a strategic level and to understand the needs and expectations of the interested parties. Most likely, only a few companies can claim to have done this. Haldex Landskrona is in the same position. The company does present a very rudimentary scope in the EP. This does not address many issues, including up-stream and down-stream parties.

Haldex Landskrona, as a company that has been using ISO 14001 since 2000, has obviously been evaluating the environmental risk all along. However, the steps that need to be taken in order to do it according to the CD1 standards are different. Companies now have to go through the steps of first understanding the organisation and its context (CD1 4.1), and to understand the needs and expectation of the interested parties (CD1 4.2). Lastly, armed with information gathered in the previous steps, the scope of the EMS is then formed (CD1 4.3). Only after going through these steps is there sufficient information to actually evaluate the risk and opportunities and to take action to address this. This process has not been done in Haldex Landskrona.

Leadership

In the CD1, the role of the top management is more prominent that before. The top management is now expected to understand the organisational context, which was not a requirement in the older version. This placed stronger responsibility of information on the leadership.
Not surprisingly, Haldex Landskrona does not meet all the new requirements regarding leadership in CD1. It does not systematically include the environmental performance in its general strategy. This is quite an environmentally concerned company so this is not a big step for the company to take.
CD1 asks that the EP be appropriate for the context of the organisation. The evaluation of this context is done in the first step in the strategy section (CD1 4.1). This has not been done in the new way of the standard so this needs to be updated. It is not likely to be a big task for the company. After this has been done, the new version demands a commitment to support environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems, or other relevant environmental issues. In the current version it was done only to prevent pollution. This has not been done by the company.
Lastly, the CD1 asks for the evaluation of the appropriateness of the EP to the interested parties. To be able to do this, the second step in the strategy section needs to be taken (CD1 4.2) This has not been done by Haltex Landskrona.

Value chain

The CD1 asks for a systematic evaluation on what may have substantial environmental impact in the value chain. This is something that most companies have not done, including Haldex

Landskrona. However, this form of evaluation is required even if Haldex Landskrona actually has very little room to manoeuvre and can change little.
Firstly, the players in the value chain need to be mapped. After this has been done, what control and influence Haldex Landskrona can yield in the value chain needs to be evaluated. This information is then used to form criteria for evaluating the supply of goods, services and outsourced processes. The CD1 specially mentions specifying environmental requirements as appropriate for the procurement of goods and services. These need to be communicated to the suppliers including the contractors.
Additionally, the information that is found by the above mentioned process also needs to be added to the perspective of the environmental impact.

Environmental performance indicators

There are no gaps in this section.

Evaluation

For many companies, it is likely that there will be significant changes with the evaluation in CD1. This will not be an area that requires much change at Haldex Landskrona.
The only change for Haldex Landskrona will be to add the value chain perspective when evaluating its environmental aspect. This is very much related to the 3 point about the value chain.

Communication

Many companies are unused to developing a communication strategy so this will be a new challenge for them. Although Haldex has a very open approach to communication and they follow the GRI reporting on a group level, they do not meet these requirements on a ground level in Lndskrona. They have a list of who has been communicated to but no communication strategy. They have not answered the following questions: what will be communicated, when to communicate, with whom to communicate; and how to communicate, methods, tools and approaches.
This will be a change in approach to communication for Haldex landskrona. Perhaps they only need to work better with the GRI.

Environmental design

Haldex does take the environmental design into account. No recommendations here.

3.3.1.4 Recommendations

Strategy

The broad recommendation is that Haldex Landskrona looks at the environmental management from both strategic as well as operational points of view. The gaps in this section are directly related to this new emphasis in the CD1. This is largely due to the HLS, so this will not be changed in the following version of the standard.
CD1 structures the approach that is required for companies to shift their perspective to the strategic level. Although this might pose as a challenge for companies to reframe there view on their EMS, there are actually concrete steps described in the CD1.

- Haldex Landskrona needs to evaluate the environmental issues that have implications on the broader organisational goals.
- Haldex Landskrona needs to determine the external and internal issues that are relevant to its and that might affect the outcome of the EMS.

- Haldex Landskrona needs to determine in a systematic way who are the interested parties in its environment.
- Haldex Landskrona needs to determine in a systematic way the needs and requirement from these interested parties.
- When restructuring or changing the EMS, Haldex Landskrona needs to consider the information from these interested parties.
- When restructuring or changing the EMS and reforming the scope of its EMS, Haldex Landskrona needs to assess and take into account firstly the internal and external issues relevant to the EMS, the secondly the need and expectation from the interested parties
- Haldex Landskrona needs to include the assessment of the value chain in the scope of the of the EMS, that is what part of the value chain the company can influence and control and thus should be included under its scope.
- Haldex Landskrona needs to have the scope of the EMS available in a documented form.
- Haldex Landskrona needs to use the information from question 2 and questions 6 to 9 when planning for the EMS to determine the risk and opportunities to the EMS that stem from:
    a. Significant environmental aspects
    b. Legal requirements and voluntary obligations
    c. Other business risks and opportunities that affect the EMS and need to be addressed
- Haldex Landskrona needs to address these risks and opportunities, integrate them into its EMS and evaluated the effects of the plan.

Leadership

In general, Haldex Landskrona needs to increase the involvement of its top management with the EMS. This is connected to the above part about strategy, which is raising the EMS to a general strategic level. This is done by the top management really understanding the context of the company in relation to EMS. This is probably not a big step for Haldex Landskrona since they are quite committed to environmental issues in general.
Haldex Landskrona will have to apply some changes in this leadership section, but not great ones.

- Haldex Landskrona's top management needs to understand the organisation and the context of it from the EMS point of view (question 1 and 2 in the strategy section).
- The top management needs to give consideration to environmental performance in the general strategic planning of the company.
- Haldex Landskrona needs to make its environmental policy appropriate to the general purpose and context of the organisation (question 1 and 2 in the strategy section)
- The environmental policy needs to have commitment to support environmental protection specific to the context of the company, such as sustainable resource use, climate change mitigation and adaptation, and

protection of biodiversity and ecosystems, or other relevant environmental issues.

- Haldex Landskrona needs to evaluate the appropriateness of the availability of the EP for each interested party.

Value chain

The value chain in general needs to be addressed from the point of view of EMS. Firstly, all the players in the value chain need to be mapped. Secondly, the control and influence that Haldex Landskrona has in the value chain need to be assessed.
With this information in hand, criteria needs to be set to evaluate the supply of goods, services and outsourced processes, specifying environmental requirements as appropriate for the procurement of goods and services. These need to be communicated to the suppliers including the contractors.
Additionally, the information that is found by above mentioned process also needs to be added to the perspective of the environmental impact.

- Haldex Landskrona needs to map the value chain with respect to environmental issues.
- Haldex Landskrona needs to evaluate what processes and products in the value chain have substantial environmental impact.
- Haldex Landskrona needs to evaluate the level of control and influence that it has in the value chain.
- Haldex Landskrona needs to evaluate what the company can do to affect the value chain.
- Haldex Landskrona needs to establish criteria for evaluating the supply of goods, services and outsourced processes, while taking a life cycle perspective in the process of doing so.

Environmental performance indicators

Since there are no gaps in this section here, no direct recommendation will be given. A small pointer is that Haldex Landskrona might want to look into the use of ISO 14031 and how practical this is.

Evaluation

The only recommendation here is that Haldex needs now it needs to add the value chain perspective when evaluating its environmental aspect.

- Haldex needs to add the value chain perspective when evaluating its environmental impact.

Communication

Haldex Landskrona is an open company that wants to communicate effectively with its environment and does this. A sign of this is their adoption of the GRI on a group level. However, the communication part does not seem to have reached the plant level. This will be a change in approach to communication for Nolato Gota. Perhaps they only need to work better with the GRI.

- Haldex Landskrona needs to develop a communication strategy, i.e. determine the need for internal and external communication. This strategy needs to include:
    a. What will be communicated
    b. When to communicate
    c. With whom to communicate
    d. How to communicate, method- tools and approaches
- Haldex Landskrona needs to evaluate the communication requirements from each interested party.
- Haldex Landskrona needs to evaluate the need to communicate information relating to potential impacts associated with use and end-of-life of the product and the deliverance of service.

Environmental design

No recommendations.

4 Analysis

When we compare the findings of Nolato Gota and Haldex Landskrona in the gap analysis, it becomes apparent that there are many similar requirements that these two companies likely need to address to comply with the future version of ISO 14001. Altogether, they were 39 questions in the gap analysis. Nolato Gota did not meet the requirements in 34 of the 39 questions. Haldex did not meet the requirements in 32 of the 39 questions.

The main difference between the two companies' gap analysis is in the seventh section, dealing with environmental design. Haldex Landskrona does include the significant environmental aspects in a systematic way in the design process.

Judging from the gap analysis, the companies are very similar in what they need to address to fully meet the new requirements of the CD1.

Tale 4-1: Changes to the EMSs of Nolato Gota and Haldex Landskrona according to CD1's requirements

	Changes to the EMS according to CD1's requirements	
Category	**Nolato Gota**	**Haldex Landskrona**
Strategy	Significant	Significant
Leadership	Significant	Significant
Value chain	Some	Some
Performance indicators	Some	Some
Evaluation	None	None
Communication	Some	Some
Environmental design	Some	None

Both Nolato Gota and Haldex Landskrona have been working with the ISO 14001 certification for a long time, and as such, can be considered to be environmental front-runners. Despite of this, most of the new requirements that will need to be addressed according to CD1 are not fully met by the companies, even if some issues are addressed to some extent. It most likely would not take much of an effort for the companies to adapt their existing EMS to fulfil the new requirements, for example regarding interested parties.

The CD1 introduces a completely new section to ISO 14001:2004, which assesses the organisation and the external pressure on it. This section has four steps, and comes directly from the HLS. If the assessment is not done according to the steps, the company does not fulfil the requirements and many other requirements are affected by this, since this assessment needs to be done at a strategic level, at the starting point of the unfolding of the EMS.

The first step (CD1 4.1) deals with the understanding of the organisation and its context. These are issues relevant to the general purpose of the company, and so are on a general strategic level. These are also issues that can affect the general operation of the EMS.

The second step (CD1 4.2) explores the need of the organisation to determine the interested parties relevant to the EMS, and to evaluate their requirements.
The third step (CD1 4.3) determines the scope of the EMS. The two previous steps are directly used in order to determine the scope. Without taking the previous steps, it is not possible to meet the requirement in this third step.

The fourth step (CD1 6.1) determines the risks and opportunities that affect the EMS. When planning for the EMS, the organisation needs to take the issues from 4.1 plus the requirements from the interested parties (4.2) and consider them when the organisation determines the risk and opportunities that affect the EMS.

When working with this format of 4 steps, neither Nolato Gota nor Haldex Landskrona fulfill many of the requirements.

Questions arise following the comparison of the two researched companies:
What can explains the very similar picture that we have drawn of the companies after processing them through the framework?
Can we assume that the similarity described above will be found in most companies already certified to ISO 14001? Or are there similarities with these companies that make them in some way different from other companies?

There are obvious similarities between Nolato Gota and Haldex Landskrona. Firstly, they both originate in Sweden, a country that has for a long time been one of the leaders in the environmental field (Environmental Leader, 2013). Secondly, both are quite similar business-types: they are specialised high-tech industrial companies, each with their own specialised niche industry. Thirdly, both companies have an international outlook- most of their production and employees operate outside Sweden. Lastly, and very importantly, they both use GRI. Added to this, Nolato Group has adopted ISO 26000 and Haldex is in the process of adopting it.

The adoption of GRI makes Nolato Got and Haldex Landskrona front-runners in the corporate sustainability field. In the world, more than 250,000 organisations are certified to ISO 14001 (BusinessGreen, 2012). The number of organisation that have adopted GRI is 5500 (Global Reporting Initiative, 2013). Most companies that have adopted ISO 14001 have not done so with ISO 26000 and GRI. The companies that have all three certifications are more progressive in this regard. They are likely to be more ambitious in their environmental management. This is not typical of other companies that have ISO 14001, neither in Sweden nor in the rest of the world.
From the above analysis, it can be inferred that companies that do not have ISO 26000 and GRI will have to change and adapt their EMS significantly more than the two companies researched for this thesis.

5 Discussion

In the original plan of this thesis, the author had intended to put the likely changes that CD1 required into a scenario analysis. This would have been done to help companies better understand how best to address the changes required from CD1, and how best to prepare for them. After conducting research on the topic and interviewing the experts, the author came to the conclusion that this would not be needed. The experts agreed that the main outlines of the change that the CD1 brings will most likely stay. There will most likely be some changes in the wording and a shift in the emphasis, but most of the document will remain the same. The most substantial change that CD1 brings is the change from a sole operational focus to the inclusion of a strategic focus. This is based on the HLS and therefore will stay in its present form and cannot be altered in the later stages.

It is important to find out which of the changes present in the CD1 derive from the HLS and which do not. All the changes from the HLS are inalterable and will therefore remain in the finalised ISO 14001:2015, even in the unlikely event that CD1 would be substantially changed in a CD2. The requirements derived from the suggestions of the FCSG could possibly change. The likely changes were grouped into 7 theme groups earlier on in this thesis. Looking at each in particular will identify the likely changes:

Strategy requirements are mainly based on clauses 4 and 6.1. These primarily derive from the HLS.

Leadership requirements are based on clauses 5.1 and 5.2. They are to some degree based on the HLS but not to the same degree as the first group.

Value chain requirements are not at all based on the HLS.

Environmental performance requirements are indicators. This group is not based on HLS.

Evaluation requirements are not based on the HLS.

Communication requirements are based on the clause 7.4, which is only partly based on the HLS. However, the part that requires organisations to make a communication strategy is not in the HLS.

Environmental design requirements are not based on HLS.

As we can see, four of the groups (3, 4, 5 and 7) are not based on the HLS. In the communication group (6), the part that is addressed in this gap analysis is not based on HLS. The leadership group (2) is only partly based on the HLS and the strategy group (1) is almost completely based on the HLS.
This can give the wrong impression that the changes proposed in CD1 are not likely to remain the same. However, the strategy group (1) is the one which causes the most substantial changes for most companies in the EMS structure. Since these changes are almost entirely based on the HLS, it is possible to infer that these substantial changes will remain the same.

The other groups deal more with extending the current demands of ISO 14001.

Even if the groups are not based on the HLS, this does not mean that the subjects are likely to be changed. A great amount of work, from various countries and with many hands involved, has gone into making the CD1. All the experts interviewed agreed that the main outlines of the standard will most likely remain as they are in the CD1, although the wording and some of the emphasis might change.

What can other companies gain from the gap analysis performed on the two companies- Nolato Gota and Haldex Landskrona- researched in this thesis?

In order to answer this question, it is good to separate the companies that have adopted ISO 14001.
Some companies share a similar approach to social responsibility as the researched companies, and use GRI and ISO 26000. These companies are often rich, big and well run companies, usually described as financially more successful.
Other companies take a different approach to social responsibility than the two researched companies, and have adopted neither GRI nor ISO 26000. This group is much larger in number and contains a wider variety of types of companies.

The nationality of the companies, or the fact that they are in a similar industrial sector, most likely matters less than the difference in social responsibility management. Companies that have adopted ISO 14001, ISO 26000 and GRI are likely to have tackled the same issues in the area of social responsibility. How they address these issues might vary from country to country or industry to industry, but these standards do not demand a specific way of addressing issues, only that the issues be addressed.

The first group of companies, which have already adopted GRI and ISO 26000, will likely have to make very similar changes as the two researched companies, and would therefore gain a lot from this paper. They would have to focus mainly on the strategy and leadership groups, and to lesser degree on the value chain, performance indicators and communication.
The second group of companies, which run without GRI or ISO 26000, will most likely have to make greater changes to their EMS in all seven categories of change in the CD1. As such, a larger part of the framework used here will prove useful for them.

The greatest change of the CD1 is to lift the EMS to the broad strategic level. Today, the EMS functions most often as a parallel managerial system with limited impact on the main direction of companies. CD1 aims to address this at least partly. The impacts of this change will largely depend on how strictly these requirements are interpreted by the auditors in various countries. However, even if the auditors interpret this in a more liberal fashion, the top management will be forced to address environmental issues and will have to evaluate them. If this is interpreted more strictly, then the EMS will become in reality more integrated into the general managerial system and will have an effect on all major decisions.

6 Conclusion

Environmental management lies at the heart of corporate response to environmental concerns. ISO 14001 is by far the most commonly used standard for third-party certification of Environmental Management Systems (EMS) in the world. It is now in the process of being upgraded. Due to its popularity, this will potentially affect the corporate environmental management world considerably.

In the beginning of this research project, two questions were put forward in order to guide the process:
What are the most likely major changes on the ISO 14001 current update that are being made on the standard?

How will the likely changes affect the EMS of companies that are already using ISO 14001?

1. *What are the most likely major changes on the ISO 14001 current update that are being made on the standard?*

After researching the literature, conducting many interviews with experts in the field and analysing in details the difference between the ISO 14001:2004 and CD1, the author identified seven groups of likely changes: strategy, leadership, environmental aspects and the value chain, environmental performance indicators, evaluation, communication and environmental design.

The greatest changes to the current version of ISO 14001 were found in the first two groups, especially in the first one, regarding strategy. With these changes, it is no longer sufficient for companies to have an EMS on an operational level, it is now essential to have it on the strategic level as well. This will be a major change of approach towards environmental issues for most companies.
The other five groups enhance the previous requirements of ISO 14001:2004. Even the addition regarding the value chain, that will most likely prove to be a great change for most companies, is really just an extension of evaluating the environmental aspects.

2. *How will the likely changes affect the EMS of companies that are already using ISO 14001?*

The author used the changes that were identified in CD1 to compile them into questions and form a framework for the gap analysis. The EMS of two Swedish companies, Nolato Gota and Haldex Landskrona, were used for the gap analysis. Following the analysis, both companies were found to have gaps in most of the seven groups. This means that both Nolato Got and Haldex Landskrona will need to change their EMS in most of the seven groups in order to meet the requirements of the CD1. The researched companies were almost identical in the areas that they did not need to change, with the only major difference that Haldex meets the requirement regarding environmental design.

Both of these companies are in the forefront of corporate EMS. The fact that they need to make changes on most point that were identified as needing change to fall in line with the CD1 means that other companies currently using ISO 14001 will need to make even more changes. Suffice to say that the CD1 would cause substantial changes for the EMS of most companies that operate with ISO 14001 if accepted and published as a standard.

The greatest change of the new update is the increased importance of environmental management on the strategic level of companies, which was up to now only commonly run as a separate contained managerial system with limited effect on other parts of the company.

This update has the potential to change how corporations view environmental issues. It is potentially a small step in raising environmental issues to the level where they can become a natural integrated part of all the decisions of the corporate world. Ideally, if this is implemented well ands efficiently wolrdwide, corporations will become a vital part in the creation of a truly sustainable civilisation.

Bibliography

Bansal, P. and Bogner, W.C. (2002). Deciding on ISO 14001: economics, institutions, and context, *Long Range Planning*, Vol. 35 No. 3, pp. 269-90.

Benito, J. and González-Benito, O. (2005). An analysis of the relationship between environmental motivations and ISO 14001 certification. *British Journal of Management*, Vol. 16 No. 2, pp. 133-48.

BusinessGreen. (2012). ISO14001 environmental standard continues global march. Retrieved, 12 June 2013 from: www.businessgreen.com/bg/news/2187008/iso14001-environmental-standard-continues-global-march.

Carr, D A. and Thomas, W L. (1997). Devising a Compliance Strategy under the ISO 14000. *International Environmental Management Standards*, 15 Pace Envtl. L. Rev. 85 (1997)

Castro, K M. and Ellisen, E P. (1996). ISO 14000: Origin, Structure, and Potential Barriers to Implementation. *International Journal of Occupational and Environmental Health*, 26, 99-124.

CRA Europe. (2013). *ISO 14001 Revision – How to Address Strategic Environmental Issues, the Interests of Stakeholders and the Direction of the Business*. Retrived, 10 June 2013 from: http://www.cra.co.uk/news/iso-14001-revision-how-to-address-strategic-environmental-issues-the-interests-of-stakeholders-and-the-direction-of-the-business

De Jong, P., Paulraj, A. and Blome, C. (2013). The Financial Impact of ISO 14001 Certification: Top-Line, Bottom-Line, or Both? *Journal of Business Ethics*, January 2013.

DeSimone, L D. and Popof, F. (2000). *Eco-efficiency – The business link to sustainable development*. MIT Press, Boston. USA.

Durdevic, T., Searcy, C. and Karapetrovic, S. (2013). *The Role of ISO 14001 in Sustainable Enterprise Excellence*. Proceedings of the International Conference on Intellectual Capital, Knowledge Management & Organisational Learning ; 2013, p99

Environmental Leader. (2013). *Sweden 'Most Sustainable Country in the World'*. Retrieved, 28 August 2013 from: www.environmentalleader.com/2013/08/19/sweden-most-sustainable-country-in-the-world.

Ferron, R T., Funchal, B., Nossa, V. and Teixeira, A J C. (2012).Is ISO 14001 Certification Effective? An Experimental Analysis of Firm Profitability. *Brazilian Administration Review*, v. 9, Special Issue, art. 5, pp. 78-94, May 2012.

Florida, R. and Davidson, D. (2001). Gaining from green management: environmental management systems inside and outside the factory. *California Management Review*, Vol. 43 No. 3, pp. 64-84.

Global Reporting Initiative. (2013). *Sustainability disclosure database*. Retrived, 29 July 2013 from: http://database.globalreporting.org/

Griffith, A. and Bhutto, K. (2009). *Managing quality, safety and environment as one*. Proceedings of the Institution of Civil Engineers, Civil Engineering, Vol. 162.

Haldex. (2011a). *Miljöhandbok*. Haldex Landskrona, Sweden.

Haldex. (2011b*). Miljöpolicy*. Haldex, Landskrona, Sweden.

Haldex. (2011c). *Tillampning av villkor för verksamheten enligt gallande miljötillstånd*. Haldex Landskrona, Sweden.

Haldex. (2013a). *Riskanalys yttre miljö Haldex Landskrona*. Haldex Landskrona, Sweden.

Haldex. (2013b). *Miljögruppen*. Haldex Landskrona, Sweden.

Haldex. (2013). *Haldex website*. Haldex, Sweden. www.haldex.com/en-gb/Europe/

Heras-Saizarbitoria, I. and Landín, G A., and Molina-Azorín, J F. (2011). Do drivers matter for the benefits of ISO 14001? *International Journal of Operations & Production Management,* Vol. 31 No. 2, 2011.

Hortensius, D. (2005). Inside look at ISO 14001:2004 and outlook for environmental management. *ISO Management Systems,* May-June 2005.

Hortensius, D. (2009). ISO group works to improve alignment of management system standards. *ISO Management Systems*. September-October 2009.

ISO. (1997). *Friendship among equals – Recollections from ISO's first fifty years*. Geneva: International Organization for Standardization.

ISO Guide 83. (2011). *High level structure, identical core text and common terms and core definitions for use in management systems standards*. Geneva: International Organization for Standardization.

ISO/IEC Directives, Part 1. (2012). *Consolidated ISO supplement – procedures specific to ISO*. Geneva: International Organization for Standardization.

ISO/TC 207/SC 1. (2013). *ISO CD 14001.1*. Geneva: International Organization for Standardization.

ISO/TC 207/SC1/Future challenges Study group. (2010). *Final report on the future challenges of EMS and ISO 14001*. Geneva: International Organization for Standardization.

ISO/TC 207/SC1/SME Task Group. (2006). *The global use of environmental management system by small and medium enterprises*. Executive Report. Geneva: International Organization for Standardization.

ISO/TC 207/SC1/Strategic SME Group. (2005). *The global use of environmental management system by small and medium enterprises*. Executive Report. Geneva: International Organization for Standardization.

ISO/TC 207/SC1/WG 5. (2013). *Collated comments on ISO/CD 14001.1*. Geneva: International Organization for Standardization.

ISO 14001. (1996). *Environmental management systems – requirements with guidance for use*. Geneva: International Organization for Standardization.

ISO 14001. (2004). *Environmental management systems – requirements with guidance for use*. Geneva: International Organization for Standardization.

King, A., Michael, J L., and Terlaak. (2005). The strategic use of decentralized institutions: exploring certification with the ISO 14001 management standard. *Academy of Management Journal*. 48(6): 1091-106.

Krut, R. and Gleckman, H. (1998). ISO 14001 – A missed opportunity for sustainable global industrial development. Earthscan Publications. London. UK.

Matias, J.C.D.O. and Coelho, D.A. (2002). The integration of the standards systems of quality management, environmental management and occupational health and safety management. *International Journal of Production Research*, Vol. 40 No. 15,pp. 3857-66.

Melnyk, S A., Sroufe R P, and Calantone, R. (2003). Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management* 01/2003.

Munro, R A., and Harral, W M. (2005). The ISO 14001:2004 revision. *Quality Digest*, Mar 2005, Volume: 25 Issue: 2 pp.34-37

Murphy, C, N. and Yates, J. (2009). *The International Organisation for Standardization (ISO) – Global governance through voluntary consensus*. Routledge, Oxon, UK.

Nawrocka, D. (1997). *The Gap Analysis Tool for Implementation of EMS under ISO 14001 and EMAS*. International Institute for Industrial Environmental Economics at Lund University. Master thesis. Lund University. Sweden.

Netherlands Normalization Institute. (2000). *Towards a (re)Vision 2005*.Submitted by NNI to the TC 207/SC 1 meeting, 16 June 2000.

Nolato Gota. (2012). *Miljömanual*. Nolato Gota, Götene, Sweden.

Nolato Gota. (2013*)*. Miljöutredning 2013. Nolato Gota, Götene, Sweden.

Nolato Gota. (2013). Nolato Gota website. Nolato, Sweden. www.nolato.com/page/47/html/nolato-gota.html&lang=en.

Paulraj, A. and De Jong, P. (2011). The effect of ISO 14001certification announcements on stock performance. *International Journal of Operations & Production Management,* Vol. 31 No. 7, 2011

Potoski, M. and Prakash, A. (2005). Green Clubs and Voluntary Governance: ISO 14001 and Firms' Regulatory Compliance. *American Journal of Political Science*, Vol. 49, No. 2, April 2005, P. 235–248.

Puvanasvaran, A.L., Perumal A., Tian, R K S., Vasu, S V. and Muhamad, M R. (2012). Integration model of ISO 14001 with lean principles. *American Journal of Applied Sciences*, 2012, 9 (12), 1974-1978

Roy, M., Boiral, O. and Lagace, D. (2001). Environmental commitment and manufacturing excellence: a comparative study within Canadian industry. *Business Strategy and the Environment*, Vol. 10 No. 5, p. 257.

Schylander, E. and Martinuzzi, A. (2007). ISO 14001 – experiences, effects and future challenges: a national study in Austria. *Business Strategy and the Environment*, Vol. 16 No. 2, pp. 133-47.

Searcy, C., Morali, O., Karapetrovic, S., Wichuk, K. and McCartney, D., McLeod, S. and Fraser, D. (2012). Challenges in implementing a functional ISO 14001 environmental management system. *International Journal of Quality & Reliability Management*, Vol. 29 No. 7, pp. 779-796.

Seuring, S. and Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, Volume 16, Issue 15, October 2008, Pages 1699–1710.

Sroufe, R. (2003). Effects of Environmental Management Systems on Environmental Management Practices and Operations. *Production and Operations Management*. 12-3 (2003): 416-431.

The British Assessment Bureau. (2013). *ISO 14001 History*. Retrieved in 17 June 2013, from: www.british-assessment.co.uk/services/iso-certification/iso-14001-certification/iso-14001-history

Zack, Michael H. (2002). Developing a knowledge strategy. In *The strategic management of intellectual capital and organizational knowledge*. Editors Choo, Chun W. and Bontis, N. Oxford University Press. Oxford. UK.

Appendix - List of people who where interviewed

Almgren, Richard – CEO Green Business and Adjunct Professor University in Linköping

Ball, Richard - Head of Environment at Corporate Risk Systems at Corporate Risk Systems UK

Baxter, Martin - Head of the UK delegation to the ISO on environmental management. Part of the FCSG.

Enell, Magnus - Owner and senior advisor Enell Sustainable Business and Adjunct Professor KTH Industrial Ecology

Hortensius, Dick - Senior Standardization Consultant Management Systems at NEN. Convener of FCSG.

James, Alex - Founder of the sustainability consultancy The BriteGreen UK

Klingberg, Henrik – Senior Manager Quality and Environment Nolato Gota

Piper, Lennart - Lead Auditor at BMG TRADA Certification

Sandberg, Kristina - Business Area manager at SIS- Swedish Standards Institute

Terne, Paula - Environmental Manager Lindab AB Sweden

Wictorsson, Joacim – Fastighetschef Haldex Brake Products