Integration of management systems – Towards more sustainable management systems

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Abstract
The development of the standards for management systems such as ISO 9001, ISO 14001 and OHSAS 18001 are moving towards a higher degree of compatibility. At the same time, organisations with more than one management system increasingly consider to or integrate these management systems. The paper discusses this development and presents different levels of integration. The aim is to suggest the next steps in order to improve integration that promotes more sustainable management systems. Expansion to stronger product-oriented management and stakeholder focus in the standards for management systems are suggested and the need for a common integrated ISO standard is discussed. Finally, the need for changes in lifestyle and needs is presented as the next step towards more sustainable management systems.

1. Increasing compatibility of standards

In recent years, the revision of ISO 9001, ISO 14001, EMAS and OHSAS 18001 has resulted in an increasing number of similarities between the different standards and has made them more compatible. This development is shortly presented below.

In 1987 and 1994, the first two editions of ISO 9001 were published. With the latest revision of ISO 9001 in year 2000, among other things, the focus on customers and continuous improvements was strengthened. It made the system more orientated towards the product chain in which it operates. Another important revision was the greater alignment with ISO 14001:1996 in order to enhance their compatibility (ISO, 2000).

ISO 14001 was first published in 1996 and was then revised in 2004. The content of the revision was relatively minor, though the compatibility with ISO 9001:2000 and the connection with EMAS II were improved (Dansk Standard, 2004). A common standard for auditing, ISO 19011:2002 for quality and/or environmental management system, was also developed and it shows an example of an integrated standard because of the major similarities in the two systems.

An ISO standard for occupational health and safety has not yet been developed. Currently, there is no plan in ISO for such a standard, because it has been voted for twice and then turned down at both times. In stead, international certifying bodies developed OHSAS 18001 with the basis in BS 8800 due to a demand in industry. OHSAS 18001 was published in 1999 and can be viewed as a de facto standard which is used internationally. The standard was developed to be compatible with ISO 9001:2000 and ISO 14001:1996 in order to facilitate integration with other management systems (BSI, 1999).

In 2004, ISO decided to develop an international standard providing guidelines for social responsibility and this is expected to be published in 2008.

The developments of the standards for management systems toward compatible standards enhance the integration of the standards in practise.

2. Three levels of integration

The increasing compatibility between the standards promotes the integration of the systems at company level with the potential of reducing administrative burdens due to internal coordination, competitive advantages and progress towards a more sustainable management system. A distinction between three different levels can be made: Correspondence, Generic and Integration as presented below (Jørgensen, Remmen and Mellado, 2006):

Correspondence
Cross references and internal coordination in order to reduce add-on problems of different parallel management systems, reduce duplication of paperwork and confusion between demands of different standards. From an administrative point of view the following benefits could be obtained:

- Minimisation of documentation and records;
- Less bureaucracy and reduction of paperwork;
- Cost savings by optimisation of time and resources assigned to the system;
- Simplification of internal and external audits.

However, correspondence can be viewed only at the first step towards an integrated management system. The generic level goes one stop further.

Generic
A prerequisite for integration is an understanding of generic processes and tasks in the *management cycle* – the plan-do-check-act, and the potential benefits of such integration are:

- More focus on interrelations – synergies as well as trade-offs – between quality, environment, occupational health & safety, and social accountability;
- Objectives and targets are set up, coordinated and balanced;
- Organisation and responsibilities are defined in one place.

Integration
An even more ambitious level of integration is concerned with *creating a culture* of learning, stakeholder participation and continuous improvement of performance in order to realize external benefits and to contribute to sustainable development. To realize this ambition, focus of the management system has to be on the synergy between customer-based quality, product-oriented environmental management as well as corporate social responsibility.

The third and highest level, namely integration is necessary to reach, in order to move towards a more sustainable management system. The current question is, how can the standards and the compatibility be further developed in order to promote more sustainable management systems in industry?

3. Towards more sustainable management systems

Industry and sustainability have growing attention. The concept of sustainability is becoming more operational at company level, whereas earlier the concept was primarily discussed at international and national level. The unsustainable production processes and products can be found in all parts of the product chain, whether it regards quality, environment or health and safety. In order to find solutions to reduce these impacts and become more sustainable, it is necessary to have a more holistic view on production processes and products and to be aware of the interdependence of various stakeholders in order to reduce these impacts. Product development, new technologies and closer stakeholder collaboration are some of the elements necessary in order to find more sustainable solutions.

There is an increasing pressure from regulation and markets for development of more sustainable products. For instance Integrated Product Policy and Extended Producer Responsibility (for packaging, cars and electronics) are increasing the legal, market and financial pressures on manufacturing industries to develop sustainable products (Maxwell and van der Vorst, 2003). Another example is the increasing focus on the social conditions of workers at suppliers in third world countries. Customers and consumers become less willing to accept violations of human rights, health and safety, freedom of association and discrimination etc.

The concept of sustainable management systems could be the value basis, building on a balance between economy, environment and social responsibility. For industry to become more sustainable, the responsibility of their activities should be expanded from the production site to the whole product chain. With a product-oriented approach the focus shifts from within the companies to the entire product chain (figure 1).

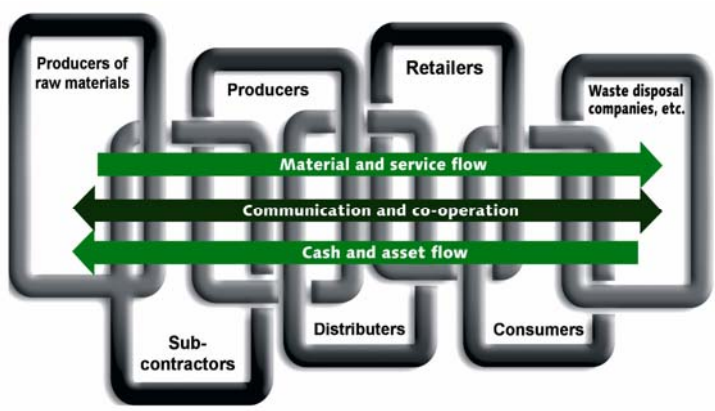

Figure 1. Communication and cooperation in the product chain (Remmen and Münster, 2003).

In the following, it is discussed to what extent the standards for management systems today support the requirements for industry to develop more sustainable products.

In relation with the quality management systems ISO 9001:2000, industry is already experienced in dealing with the product chain in relation with the focus on customer needs and demands to suppliers. With the demand for increased customer focus, the ISO 9001 standard places increased focus on value and money flow in the product chain (Dansk Standard, 2000b). By this, ISO 9001 place higher demands on the product chain than EMAS

and ISO 14001 do today. With the revision in 2000 of ISO 9001 for quality management systems (QMS), the focus on customers and continuous improvements became stronger. The circles and arrows in ISO 9001:2000 symbolise a dynamic and continuous process (see Figure 2). With focus on the customers, their demands and their satisfaction, the organisation has to be more oriented towards the product chain in which it operates.

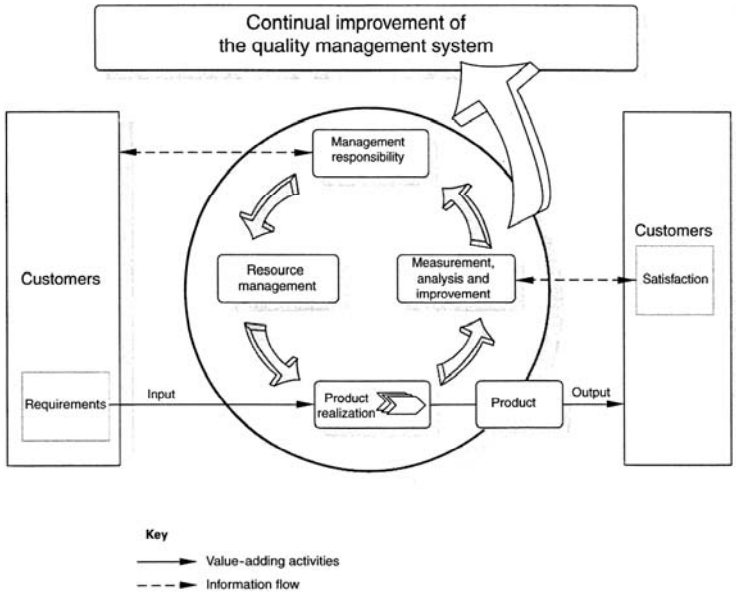

Figure 2. Model of process-based quality management system (Dansk Standard, 2000b).

ISO 9001:2000 also provides some requirements for the purchasing process that include you as the customer. These requirements address the following topics (ISO, 2006):

- requirements regarding the purchasing information that should be provided so that suppliers clearly understand their customers' needs
- the ways in which supplied products can be verified as meeting the requirements of the customer

Though ISO 9001:2000 focus on customer needs and satisfaction and suppliers, the main focus is on the organisation and how the organisation are able to comply with customer needs. In order to move towards a more global perspective, the organisation could focus more on TQM.

The illustration of the EMS in ISO 14001:2004 illustrates the system elements (plan-do-check-act) and continuous improvements but it does not relate to the stakeholders and the product chain (figure 3). With point of departure in QMS (figure 2), the model for EMS could be developed with the purpose of stating the importance of the organizations' relations with relevant stakeholders and the product chain. A closer relation between ISO 14001 and the relevant stakeholders could also promote environmental improvements in the product chain because the certified company will have to be more conscious about stakeholder interests and react on it. In ISO 14031:1999 about environmental performance evaluation, the relation between the organisation and environmental conditions and interested parties are illustrated (figure 2). But as long as it is not included more clearly in ISO 14001, only few organisations will probably include this on their own initiative.

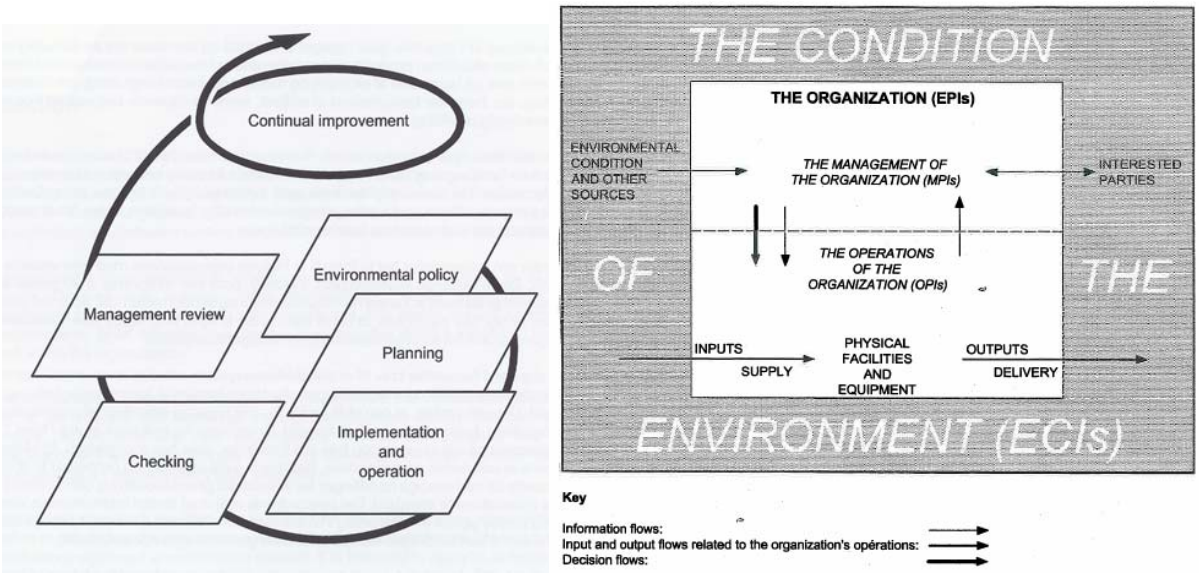

Figure 3. Environmental management system (left) (Dansk Standard, 2004). Interrelationships of an organization´s management and operations with the condition of the environment (right) (Dansk Standard, 2000b).

In ISO 14001 the demand for life cycle considerations is vaguely formulated. In EMAS II the demands for indirect impacts have been strengthened: *"An organisation ought to consider both direct and indirect environmental aspects of its activities, products and services"* (European Parliament, 2000, Annex VI, 6.1). In Annex VI, both the direct and indirect environmental aspects as well as the organisation are described. The environmental statement today must, among other things, include: *"A description of all significant direct and indirect environmental aspects which result in significant environmental impacts of the organisation and an explanation of the nature of the impact as related to these aspects"* (European Parliament, 2000, annex III, 3.2.b).

EMAS II could increase the attention of the registered companies to its impacts in all parts of the product chain; though, without placing direct demands on the individual company to reduce their indirect impacts. These demands can be viewed as the first step to companies' implementation of POEM in a future perspective.

In principle, ISO 14001 holds demands for product oriented environmental management in certified companies as among other things, the scope for the standard states that: *"It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence."* (Dansk Standard, 2004). Most companies, however, do not consider themselves to have an influence on environmental performances other than from their own production processes. For instance, companies producing energy consuming products to households must be considered to have an influence on the energy consumption of the products. Therefore, the use of these products must be an environmental aspect to be included in the company's EMS.

The standard for occupational health and safety management systems, OHSAS 18001 is illustrated with the same type of figure as ISO 14001:2000 (figure 3). OHSAS 18001 also has main focus on the production processes and the specific site of the organisation and it does not include considerations of the product chain. On the contrary, the concept of corporate

social responsibility, CSR, has a strong focus on suppliers and other stakeholders. Industry is becoming increasingly interested in CSR, with focus on human rights, child labour, forced labour, work hours, health and safety etc, and often focuses especially on suppliers in order to meet the customers' demand for satisfactory working conditions before buying a product.

The present development of a guideline for Social Responsibility (SR) in ISO currently discusses the focus of the standard. One question is whether to include occupational health and safety in the organisation (the site) together with the product chain. If the organisation itself is to be included, the forthcoming SR-guideline will be the first to include both the organisation (the site) and the product chain in the same standard. As ISO does not have a standard for occupational health and safety, it would be a good idea to include it in a standard for SR. Good health and safety conditions in an organisation are important to improve the social element in the concept of sustainable management. But the forthcoming standard for SR will only be a guideline and not a standard as basis for certification.

The importance of stakeholder cooperation and communication in relation to activities of environment, health and safety and CSR is often emphasised, but today this is not reflected in the standards. For both ISO 14001 and OHSAS 18001, a strengthened focus on the environmental and health and safety impacts in the product chain and a clearer focus on stakeholders would make these standards more compatible with ISO 9001. This would also move the certified companies towards a more sustainable management system with a more holistic approach to their activities by realising that the production is part of a big production system from cradle to grave and that the companies have a responsible for improvements and reduction of impacts in the product chain.

Demands for product oriented management in quality, environment and social responsibility should be strengthened in the standards, because only few organisations work seriously with this on their own initiative. Standards are developed to secure high standards, and to secure high standards, the demands must be continuously strengthened in order to meet the demands of current knowledge and current expectations in society.

4. Need for an integrated ISO standard for IMS?

Instead of standardising each standard for management system, the development of the standards could converge towards one basic structure building on continuous improvements. This creates an opportunity for developing a unified system based on a common standard, extended with for instance quality, environment, health and safety and social responsibility. The common standard could be the basis for the different kinds of areas within which a company would like to comply. On top of the common standard, individual standards of e.g. quality, environment and occupational health and safety should still exist, but these standards should only cover demands for one area. It should not be possible to become certified only according to the common standard as there would be no substance in the system. A certification only makes sense in connection with one or more subject areas. (Jørgensen and Simonsen, 2002).

The development of the standards moves towards greater compatibility as presented earlier in this paper. The question is whether the creation of a common standard, would promote more sustainable management systems, as basis for an integrated management system with supplements for each of the four areas: quality, environment, occupational health and safety

and social accountability. The described model for an integrated standard for management systems would probably motivate more organisations to integrate their management systems, because it would be easier to find out what to add in order to implement a new subject area and to use the same common standard for both areas. Integration of management systems does not in itself promote more sustainable management systems. This depends on the level of integration. The first two levels of correspondence and generic (presented in part 2) may increase the consciousness in the organisation of the interrelations between quality, environment and occupational health and safety. At level three, integration concerns the creating of a culture of learning, stakeholders and focuses on continuous improvements and synergies between the subject areas and creates a good basis for working towards a more sustainable management system.

Figure 4 illustrates the different standards and the transverse connections between them. The actual management systems can be viewed as a transverse connection between the different standards, where the standards have a number of similarities and common activities (for instance policy, aims, documentation, and evaluation).

The second transverse connection is the life cycle perspective of the products and the need to co-operate with stakeholders and other networks in relation to the product chain (figure 4). Companies' internal focuses on processes are rather insufficient. It is necessary also to include the companies' external relations and the entire product chain. Though, the internal approach to EMS forms a good basis for extending this focus. The company needs to intercept changes in surroundings through co-operation, openness and dialogue, and to react on this by changes in strategies and the management systems, in order to adapt new demands and conditions in the surroundings.

The third transverse connection is the learning organisation, the dynamic and innovative dimensions, internally by building up relevant competencies in the companies. Handling an integrated management system can be complex, and it will require continuously rebuilding, updating and innovative development within the different areas of the management system. The Danish pharmaceutical company Novo Nordisk views the road towards sustainable development as a learning process*: "Moving up the learning curve, there is no magic formula for sustainable development. That is why we need to create the appropriate learning processes. By putting our thinking into practice, we also build up our competencies. In this learning process, we identify best practices which we can apply in new areas of sustainable development"* (Novo A/S, 2000).

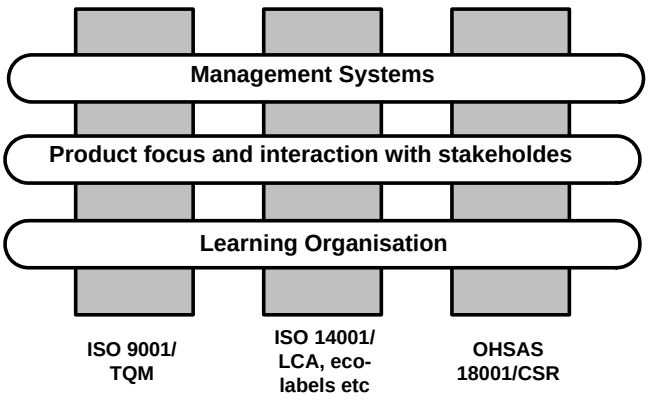

Figure 4. Integration of standards and types of organisational change (Inspired by Jørgensen, 2001).

For companies with an integrated management system, it would be natural also to integrate reporting of the different areas of the management system. The reporting could enter into a sustainable perspective, where the company relates its activities to sustainability as a method of working towards a more sustainable production. Figure 5 illustrates the connection between management of knowledge, integrated management systems and sustainability reporting.

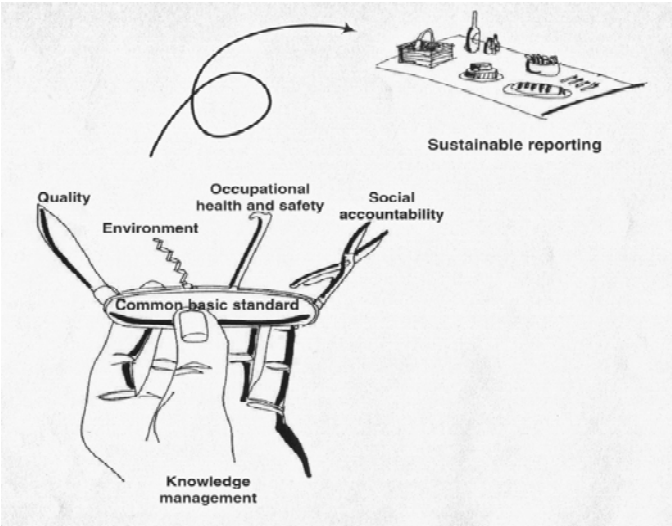

Figure 5. Knowledge management and a basic standard as the basis for integrated management and sustainability reporting (Jørgensen, 2001).

Global Reporting Initiative has published a guide for reporting in regards to sustainable development: *"Sustainability reporting guidelines on Economic, environmental, and social Performance"*. The aim of the guidelines is to assist organisations in reporting information on the three elements: economy, environment and social issues. These elements are handled separately in the report guidelines, but over time, the reporting framework will move towards a more integrated reporting structure. (GRI, 2002). The companies' reports regarding sustainable development do not imply that the companies are becoming sustainable. Sustainability reporting can support the companies' activities towards a more sustainable production and it can help create company values regarding a sustainable production.

5. IMS in the Danfoss Group

In this part, experiences with integration of management systems for quality, environment and health and safety Danfoss in Denmark is presented. The Danfoss Group employs more than 18,000 employees with net sales of about 2.2 billion EUR. They develop and produce mechanical and electronic products and controls e.g. Refrigeration & Air Conditioning, Heating & Water and Motion Controls. On the home page, the Danfoss Group states: *"We aim to meet the expectations of our stakeholders by being a highly respected company, improving quality of life by mastering advanced technologies in customer applications, while focusing on environmental and social responsibility."* (The Danfoss Group, 2006).

Danfoss has chosen to integrate the three different management systems, because the systems have a number of common elements. They would like to manage these common elements

centrally in the organisation, and not on the specific site. These elements include (The Danfoss Group, 2005):

- Management responsibility
- Resources and infrastructure
- Aim, control and measurement
- Employees, development and education
- Communication
- Document control and registration
- Continuous improvements and corrective actions
- Process control, maintenance and calibration

The main reason for integrating the systems is to meet the expectations of the customers by having a lean business system (to slim and simplify the management systems, and to avoid conflicts between the systems); furthermore, to improve the attitude among employees. The many central standards secure uniformity and at the same time, the IMS at the local site have decentralised development and responsibility of each local part in the systems. The view of Danfoss is that quality, environment and occupational health and safety are not special in themselves and they should not each have a system, because the system should reflect their businesses - not the contrary. All the procedures in the three management systems are important for the business, and the formulation of the systems follows the organisation and tasks. (The Danfoss Group, 2005).

Today, Danfoss only has one system and one audit with the same auditor-team for all three systems, and all three systems are audited during the same period, which saves time and expenses. Before this procedure, they audited the different systems at any time of the year, which resulted in extra time and work resources spent in the organisation. Danfoss also have multiple-site certificates for a number of companies in the same division.

A number of barriers for integration of the management systems were experienced (The Danfoss Group, 2005):

- Lack of knowledge among employees and management
- You know what you have – not what you get
- Reinvention of bureaucracy
- Lack of demand internal and external
- Certifying bodies

Lack of knowledge about the project, changes to be made and resistance towards changes are often seen in a process of change. The risk of replacing the existing bureaucracy with a new one and the lack of demand for these changes internally and externally was other barriers. At the beginning the certifying bodies were also resistant towards auditing all three systems in the same days, but Danfoss had it their way.

When the integration process finishes, Danfoss want to continue by linking their IMS with Lean business, 6 sigma, TQM and Business excellence. Until today, The Danfoss Group has primarily worked with correspondence and generic processes regarding IMS, but with the plan of linking more areas to their management system, they will begin by working with the third and most ambitious level of integration.

6. Change of lifestyles and needs

It is not sufficient to implement more sustainable management systems with focus on integration, the learning organisation, products, the product chain and stakeholders, in order to achieve a more sustainable development. Changes towards a more sustainable management systems in industry also demand changes in the organisation of society, where lifestyles and needs require changes as illustrated in Figure 6. Røpke has listed seven strategies for *environmental* improvements, arranged according to their different levels of radicalism from least to most extensive solutions, Figure 8 (Røpke, 1991).

In the following, the changes of lifestyles and needs are discussed in the context of environment. But similar discussions of strategies for health and safety/CSR and quality are obvious.

Strategy	**Level (where is changed)**	**Content (what is changed)**
Filter strategy	1. Clean-up after Production and Use	Treatment of smoke, waste water etc. Combustion and deposition.
Cleaner Production	2. Process	Limitation of emission from a certain process by technological changes without affecting the product.
	3. Part of Product	Limitation of emissions from process or from pollution of product use/disposal through smaller product changes, for instance material substitution.
	4. Product Elaboration	Radical changes of the products elaboration which influence the functional characteristics.
Cleaner Needs	5. Type of Product	The certain need is fulfilled with another type of product than before.
	6. Part of Structure	Smaller changes in the organisation of society, resulting in change of character of needs without changing traditional lifestyles.
	7. Structure of Society	More radical changes in organisation of society, where lifestyles and needs change.

Figure 8. Strategies for environmental improvements - arranged according to increasing degree of radicalism (Røpke, 1991).

Industry can contribute to sustainable development through limitation of their environmental impacts by filter strategies and cleaner technologies, illustrated by level 1 to 4 and by level 5, where a certain need is fulfilled with another type of product (Figure 8). Implementation of environmental management systems, life cycle assessments and industrial symbiosis is a method, which the industry can use, in order to decrease environmental impacts from processes and products and in order to formulate more long termed environmental strategies. Industries' use of these methods is an important step towards reducing and closing the open material cycles and towards sustainable development. The strategies used today in Denmark are assessed to include level 1 to 4 in Figure 4. The way towards a more sustainable development, besides pollution prevention and cleaner technology, also includes more radical changes of the organisation of society, where lifestyles and needs must change. The strategies of cleaner needs, illustrated as level 5 to 7 in Figure 4, will demand radical changes of behaviour and attitudes in both industries, by the individual consumer and by the politicians.

“Fulfilment of the overall aim - a sustainable production that does not threaten the biosphere/ecosystem and the conditions for future generations - depend on a radical change- of our ways of production and consumption. It will include radical changes of the industrial production systems, phase out of processes, products, - yes whole industries. The problem is, how and to what extent this change can be carried through.” (Søndergård et al., 1997, p. 293, translated from Danish).

In the book “Beyond Limits to Growth” the authors (Meadows, Meadows and Randers, 1992) believe that it is possible and necessary to make corrections and that it will lead to a preferred, content, justified and sustainable future. And if no corrections are made, certainly some kind of collapse will occur in the lifetime of the present generation. Even though, the writers believe that there should be limits to growth, they also stress that no limits are necessary for the *development*. It is a challenge, how to create a society, which is materially sufficient, a more human contention than the growth obsessed society, which we know from today. (Meadows et. al, 1992). However, overproduction and over consummation seems to continue in the industrialised countries. A sustainable development in a global perspective demands that the wealthiest countries adapt their lifestyles within the possibilities of the ecology of the world (Brundtland Commission, 1987). Though level 6 and 7 in Figure 8 provide for changes in the organisation and the society, apparently only a limited interest exists, for radical changes in our lifestyles today (Meadows, Meadows and Randers, 1992). *“It seems evident that the planet could not sustain the globalisation of a western consumer lifestyle, but governments are less willing to accept that there must be a limit to material consumption.”* (Welford, 1995, p.15).

It is not likely to be the case over time that most companies implement more sustainable management systems by themselves. Industry will need strong incentives for this, for which the society should be responsible. If changes regarding lifestyles and needs occur at society level, a consequence could be a decrease in the buying of products, because customers would have reduced needs, and because the products would last longer. A result of this would be less production, which would not necessarily be an advantage for this specific company. Therefore, the step towards changes at societal level would include difficulties. This is due to the fact that it could mean great economical expenses for companies.

The companies’ implementation of more sustainable management systems, together with changes in attitudes of the society would perhaps create fundamental changes of the value basis of companies. An example could be a company who produces different kinds of chemicals. Could this company create sustainable management? It is likely to, yes, but only if a number of products are taken out of production and only if the company places specific demands regarding amounts and use of other products. Such policies and actions would demand fundamental changes of the companies’ basic values, where economic growth is only wanted, if it does not have negative consequences for environmental or social conditions, causing the company not to be sustainable.

7. Conclusion

It is argued that companies with certified management systems should extent their focus to the entire product chain and strengthen collaboration with stakeholders in order to take the next step towards more sustainable management systems. Management for sustainability in industry should include quality, occupational health and safety and social responsibility in an

integrated management system and these areas should also be considered in a life cycle perspective.

The standards for management systems have become more compatible with new editions and integration of these systems can be implemented at three different levels: correspondence, generic and integration. The case of The Danfoss Group shows an example of an organisation integrating their management systems at the first two levels and they will soon begin working with the integration at the third level. The third and most ambitious level, the integration concerns the creation of a culture of learning, focus on stakeholders, continuous improvements and synergies between the subject areas. This creates a good basis for working towards a more sustainable management system. Dealing with an integrated management system is complex and there is a need for synergy between the different areas in order to create a dynamic and well functioning system. Integration of the standards also demands different types of organisational changes: integration of the actual management systems, product focus, collaboration with stakeholders and other networks, and the creation of a more learning organisation.

There is a risk that a number of companies make integrated management systems, but they do not move on to dealing with the life cycle perspectives, due to lack of sufficient incentives. The suggestion is that the standards for management systems strengthen these demands, and furthermore, changes in the structure of the standards should be considered. A common basic standard for all management systems with individual standards covering only specific elements of the specific area such as quality or environment could motivate more organisations to integrate the management systems.

Today, only few companies include environment, quality, occupational health and safety and social accountability in integrated management systems and only a few of them conduct sustainable reporting. The actual performance of a company in relation with a sustainable management system depends on the internal willingness and capability to make improvements as well as the external forces. An integrated management system with focus on sustainability only provides the opportunity for a company to improve its practices and the opportunity for a more comprehensive collaboration with stakeholders and improvements of products and processes. Moving towards more sustainable management systems, also demand changes in the organisation of society and change of lifestyles and needs.

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