



ISO 14001 in environmental supply chain practices

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ARTICLE INFO

Article history:

Received 11 March 2009
 Received in revised form
 5 May 2009
 Accepted 6 May 2009
 Available online 18 May 2009

Keywords:

ISO 14001
 Environmental supply chain management
 Environmental practices
 Environmental audit
 Environmental management systems

ABSTRACT

This paper focuses on the role of ISO 14001 in environmental supply management practices in Swedish companies. It discusses the existing and potential role of ISO 14001 for three key operational tasks of environmental supply chain management: to communicate the requirements to the supplier, to motivate and enable the supplier, and to verify that the supplier follows the requirements. The study used three different research methods: interviews with environmental managers, focus group discussions and a survey of two multinational companies and their operating units in several countries.

It concludes that cooperation between the purchasing and environmental functions within a company is frequently not sufficiently achieved in implementation of ISO 14001; this makes the communication of customer requirements to suppliers less efficient. Building close relationships with suppliers is important to overcome initial difficulties, but this often conflicts with having a large supplier base. For the supplier to have an ISO 14001 certificate is seldom an absolute requirement, however, preference is often given to such suppliers. The value of the ISO 14001 certificate, as a proof of environmental performance, is a combination of the supplier's environmental ambitions, the advancement of supply chain practices of the customer and the ambitions of the certification bodies. Supplier audits are not commonly used as they are resource-consuming. Monitoring and verification approaches need further development.

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1. Introduction

The general level of environmental awareness is increasing and as a result of this, there is a growing interest in the environmental performance of industrial companies. The environmental challenges do not stop at the gates of the companies. Many companies operate on a global arena and competition motivates them to seek economically preferable manufacturing alternatives. This often results in outsourcing of manufacturing to low-cost countries and sourcing of materials, components and services from a range of suppliers. Recognizing that the environmental footprint of the product is not limited to the final manufacturing phase, increasingly more attention is being given to the overall environmental aspects not only related directly to operations of one company, but increasingly to the entire supply chains (e.g. see Refs. [1,2]).

This puts pressure on companies to address environmental issues and manufacture products with an environmental profile that satisfies the customer requirements, but also to inform about the environmental impacts of the production processes and of the products during their entire life cycle. To meet the increasing

market pressures and to comply with more demanding environmental legislation, many companies invest in voluntary environmental management and communication tools, for example, standardized environmental management systems (in particular ISO 14001), life cycle assessments, environmental labeling of products, carbon disclosure projects, and sustainability reporting schemes.

2. ISO 14001 as a management tool

The International Organization for Standardization (ISO) is continuously developing management standards that address environmental issues in organizations; consequently, the growing ISO 14000 family now includes, among others: environmental management systems, environmental performance indicators, life cycle assessments, eco-labels, and product design (see www.iso.org for more details).

One of the most widely utilized standards is the environmental management system (EMS) standard ISO 14001, which was introduced in 1996 and updated in 2004 [3]. According to Potoski and Prakash [4], the promise of ISO 14001 is that if a participating organization adheres to the requirements of the standard, it will increase the chance to reduce its environmental impacts relative to non-participating organizations.

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The aims to comply with legal requirements and to create a systematic management system have been reported as important driving forces for companies to implement ISO 14001 [5,6]. Also for companies that are not directly affected by environmental legislation, the ISO 14001 certificate can be a way to comply with customers' environmental requirements [7]. The business opportunities of ISO 14001 can be illustrated by a study of Swedish companies where the implementation of the standard was motivated by the potential gains, such as improved corporate image, market advantages and satisfying customer requirements [8]. Public pressure is another example of an important driving force for the implementation of ISO 14001 in companies [9]. In this respect consumers are a large and powerful group that affects the overall environmental management strategies of companies and encourages the implementation of ISO 14001 [10]. Bansal and Bogner found that ISO 14001 provided credibility and helps to increase the confidence of customers of retailing companies [11].

From the societal point of view the emphasis on environmental quality improvements are essential, but ISO 14001 is also connected to more immediate benefits for the certified companies. According to Hillary, the implementation of ISO 14001 can be associated with organizational benefits, financial benefits and people benefits [7]. Organizational benefits are usually connected to legal compliance, since regulatory authorities can offer possible control relief for environmental front-runners, such as less frequent inspections and more flexible enforcement [12,4]. Introducing a structure for managing environmental issues and assigning internal importance to the environmental issues was reported as an important benefit by Giménez Leal et al. [13]. Financial benefits can originate due to a reduction in resource use, waste reduction, or improvements in operational efficiency [14,6,15]. The human-related benefits are usually the increased awareness and a positive change in the behavior of employees [9].

3. Management of environmental issues in the supply chain

There is a growing set of requirements from regulatory, societal and market sources for companies to adopt environmental supply chain management practices [16]. One example of a coercive pressure is the legislative requirement to phase out certain hazardous substances in consumer products that is transferred to the supply chain [17]. To ensure compliance with external requirements, companies may have to transfer the requirements to their supply chain. This can be illustrated by the supply chain management approaches of companies such as Herman Miller, Sony Ericsson or IKEA. One approach that is used by many companies is to require that suppliers should implement ISO 14001. As a result of this, an increasing number of companies is implementing ISO 14001 [18], and also requires their own suppliers to implement the standard [19]. In addition to this, normative forces may influence companies. One example is the World Business Council for Sustainable Development (WBSD) that encourages its members to improve the environmental performance of their supply chains [16]. Another example is when consumers and NGOs require companies to address their supply chain related environmental problems.

The requirements of end-customers are increasingly important drivers for many companies to improve their supply chain environmental activities [20]. Companies that are close to the consumer market are often under greater pressure and scrutiny from stakeholders concerning the environmental aspects of their supply chains [21]. Consumers may request green products, or the implementation of environmentally friendly practices. Subsequently, manufacturers of consumer goods will influence their suppliers to improve their environmental performance [22,23]. However, suppliers that are positioned upstream in the supply

chain may perceive the environmental requirements to a lesser extent than the first tier of suppliers. Such upstream organizations can, in many cases, be characterized as small and medium sized enterprises (SMEs) and will frequently have limited resources and a weak position in the supply chains. As a result of this they may face more difficulties in influencing their own suppliers [24,25].

When external driving forces are present, companies are more likely to get involved in practices to manage risks and products performance in their supply chains [2]. However, to implement such practices, companies need to create a broad internal commitment. Bowen et al. have identified several internal management capabilities for working with supply chain related environmental issues [26]. The capabilities are related to the link between the purchasing function and other functions, purchasing procedures, partnership with suppliers, technical skills and environmental knowledge that have impact on the level of adoption of supply chain activities. Such environmental practices in supply chains normally fall into categories of supply process-oriented, product-oriented or advanced practices. Activities oriented at supply processes have the objective of gathering information on suppliers, and their environmental performance, while the product-oriented practices will be designed toward waste reduction and related practices, including packaging and transportation reduction. Advanced practices will require introducing environmental criteria into the evaluation of suppliers or creating partnerships with suppliers to address their environmental problems [26]. Unavoidably, the purchasing work will become more complicated by adding yet another dimension to supplier evaluations and decisions [27].

4. ISO 14001 certified companies in the supply chains

Companies that have implemented ISO 14001 need to address environmental aspects that apply not only to their internal operations but also throughout their supply chains [28]. Implementation of the EMS requires organizational structures, routines, and a knowledge base to manage the company's direct environmental aspects. Such managerial capabilities can also be utilized to manage the indirect environmental aspects that are associated with the activities of the company's suppliers. Handfield et al. [29] outlined a conceptual model for integrating environmental issues in purchasing considerations, and Chen [30] suggested that environmental considerations in purchasing can be managed using a structure similar to ISO 14001.

Despite the manner in which companies manage their purchasing functions, the symbiotic features of EMS and environmental supply chain management suggest, that ISO 14001 certified companies can be expected to be active in supply chains. Darnall et al. demonstrated that certified companies were more active in environmental supply chain activities compared to organizations that were not certified [31]. Similarly, Rao [32] has empirically shown that ISO 14001 certified companies in Asia also have introduced supply chain initiatives, being motivated mainly by economic considerations. Such initiatives resulted in increased competitiveness [33,34].

Given the diversity of ISO 14001 certified companies, and the differences in driving forces for the implementation of environmental supply chain activities, the question remains what role ISO 14001 has in fostering the corporate implementation of practices to improve their management of environmental aspects of the supply chain.

5. Purpose of this study

The role of ISO 14001 in supply chain management seems, from practice, literature and earlier studies [35,17] to be related to

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