

Has environmental management system always a cost reducing benefit for the adopting firm?

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Abstract – The aim of this paper is to present a case study of the application of EMS in a medical establishment. It may have importance because the effect of ISO 14001 certification on the environmental and financial performance of a medial-touristic facility has been not examined yet. Hévíz Thermal Lake and St Andrew's Rheumatism Hospital uses the biggest natural thermal lake of the world. It is located in a Nature Reserve Area and the thermal lake is considered as a national treasure of Hungary. Hazardous waste generation and its economical viewpoint were analyzed. It can be concluded that hazardous waste generation as an environmental factor was improved, but the costs of the transport, neutralization and disposal of hazardous waste increased in consequence of the rapid fuel cost rise of the past years. Reduced waste quantity had the economical benefit just of lower increment of costs than without reduction. It can be not always directly and clearly proved that realizing environmental goals and maintenance of EMS has cost reducing effects on the economy of the adopting firm.

Keywords: environmental management system / ISO 14001 standard / medical institute / Hungary

1. INTRODUCTION

1.1. Environmental Management System (EMS)

Recently demonstrating environmental commitment is of high importance for the enterprises. There are several tools for improving environmental performance of a firm and communicate it. These are mostly voluntary approaches. One of these voluntary actions for firms to demonstrate environmental commitment is to introduce an environmental management system (EMS). EMS helps the firms to reduce their negative impacts on the environment while improving their economic efficiency (GOMEZ - RODRIGUEZ 2011). The most widespread environmental management system is the ISO 14001 standard. According to the latest survey of the International Organization for Standardization (ISO 2009) until the end of 2009, at least 223.149 ISO 14001:2004 certificates had been issued in 159 countries and economies.

Several literatures that deal with EMS in details can be found (BALZAROVA - CASTKA 2008; NISHITANI 2009; MARAZZA et al. 2010; MORROW - RONDINELLI 2002; ZIEGLER - NOGAREDA 2009; ARIMURA et al. 2011; BARLA 2007; HERAS - ARANA 2010). For instance ARIMURA et al. (2008) estimated the effects of adoption of ISO14001 and publication of environmental reports on environmental performance of the firms. HERAS-SAZARBITORIA et al. (2011) analyzed the ISO14001 certified firms' financial performance in Spain before and after the adoption of EMS. NISHITANI (2009) examined the motivation of ISO 14001 adoption in Japan and found that between 1996 and 2004 stakeholders' environmental preferences and

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firms' financial flexibility determined this decision. NISHITANI (2010) analyzes the role of customers in this process. ZENG et al. (2005) investigated the motivation of the EMS application in China. They concluded that the major motivation for certifying ISO 14001 was to seek entrance to the international market. JOHNSTONE - LABONNE (2009) investigated the motivation of ISO 14001 certification in seven OECD countries. BALZAROVA - CASTKA (2008) examined the underlying mechanism of the maintenance of ISO 14001 environmental management system in manufacturing organizations.

ISO 14001 international standard can be adopted in various economical sectors, e.g. in construction industry (SAKR et al. 2010; LAM et al. 2011), but mainly it is certified in manufacturing sector (ARIMURA et al. 2008; NISHITANI 2009; ZIEGLER - NOGAREDA 2008; BARLA 2007; FRANCHETTI 2011; HERAS- SAIZARBITORIA et al. 2011; JOHNSTONE - LABONNE, 2009) and less in services and commerce (LAGOMIDOS et al. 2007). CARY - ROBERTS (2011) gives an overview of EMS adaptation in the Australian agriculture.

Introducing EMS has several benefits for the organizations (BARZALOVA - CASTKA 2008), e.g. adopting EMS firms may reduce costs and increase revenues (AMBEC - LANOIE 2008) and it can accelerate the adoption of cleaner technologies (RADONJIC - TOMIC 2007). Advocates of ISO 14001 claim substantial operational, managerial, and competitive benefits for the organizations that adopt the international standard (RONDINELLI - VASTAG 2000). DARNALL et al. (2008) provided empirical evidence of the potential business value created by adopting a comprehensive EMS. Besides financial benefits environmental improvement may be of greater importance. For example ISO 14001 is effective in reducing solid waste generation and natural resource use according to the estimation of ARIMURA et al. (2008). FRANCHETTI (2011) examined the effect of ISO 14001 certification on solid waste generation in US industrial organizations and found that solid waste generation rates are significantly reduced by certification of EMS.

Our case study may have importance because the effect of ISO14001 certification on the environmental and financial performance of a medial-touristic establishment has been not examined yet. Hévíz Thermal Lake and St Andrew's Rheumatism Hospital uses the biggest natural thermal lake of the world of water surface area of 4.4 ha and surrounded by a protecting forest of 27 ha. All this territory is located in a Nature Reserve Area and the thermal lake is considered as a national treasure of Hungary and it is nominated to be part of UNESCO's World Heritage (<http://www.spaheviz.hu/en/>).

1.2. Short overview of ISO 14001

The ISO 14000 standards give the components and characteristics of an effective system for managing the firm's environmental impacts (TIBOR - FELDMAN 1996 cit. RONDINELLI - VASTAG 2000). These components are developing an environmental policy, identifying environmental aspects, defining objectives and targets, implementing a program to attain a firm's goals, monitoring and measuring effectiveness, correcting deficiencies and problems, and reviewing management systems to promote continuous improvement (RONDINELLI - VASTAG, 2000). The ISO 14001 standard follows the Deming cycle /PDCA cycle: Plan-Do-Check-Act/ for developing environmental performance.

According to PÖDER (2006) the methodological framework set by standards ISO 14001 and ISO 14004 gives only general principles for environmental aspects assessment, which is regarded as one of the most critical stages of implementing environmental management system. Voluntary self-regulatory initiatives such as the ISO 14001 standard seek to provide all businesses with the means to develop systematic approaches to improve environmental performance (HILLARY 2004).

Usually firms officially certify their EMSs through a registered external auditor (RONDINELLI - VASTAG 2000). According to the analysis of MELNYK et al. (2003) firms having gone through EMS certification experience a greater impact on performance than do firms that have not certified their EMS. NISHITANI (2009, 2010) gives a detailed overview of ISO 14001 international standard.

2. THE EMS OF HÉVÍZ THERMAL LAKE AND ST ANDREW'S RHEUMATISM HOSPITAL

2.1. Motivation of the adoption of ISO 14001

The Hévíz Thermal Lake and St Andrew's Rheumatism Hospital is functioning on the territory of a Natural Reserve Area and its work attract attention not only locally but also at country level. The integrated Quality Management System and Environmental Management System were adopted in 2001 according to the decision of the leader management. The management intended to demonstrate its environmental commitment by certifying EMS and wanted to communicate that not only uses the thermal lake as a natural resource, but also protects this resource in the interest of its sustainable possession. From the viewpoint of the senior management it was also an important parameter that adopting EMS can develop the image of the institution and can make more attractive for the clients coming mostly from Western Europe since it is not just a hospital but also a wellness center with hotel.

2.2. Specialties of the sector

The latest certifying audit was carried out by SGS Hungary in 2011. The procedure of the audit is similar to that of a manufacturing enterprise. In case of this institute the product is not only the medical service, but also health provision in the hospital, operating covered swimming pools and Lake Bath, operating of a hotel and wellness services. During the audit all of these parts should be considered and audited as a complex system. From this viewpoint the audit process gets special characteristics. In purpose of supplying the multifold activity the Rheumatism Hospital has several establishments that are unusual in a conventional medical institute (e.g. maintenance division, technical division, painting room, joiner's workshop, store-room of pesticides for maintain the park surrounding the institute, store-room of chemicals for maintenance of the pools, etc). The Hévíz Thermal Lake and St Andrew's Rheumatism Hospital has an own store-room of fuel for the machines that are used to maintain the park and the protected forest surrounding the lake and the establishment. As special fact of the audit it can be mentioned that the institute is operating on the territory of a Natural Reserve Area of 60 ha with a protected forest of 27 ha and a thermal lake of 4.4 ha. During the audit in case of the survey of legal surroundings and the control of legal compliance much more rules should be taken in consideration than in case of a conventional public health institution. The Hospital must meet the requirements of health-, natural reserve- and environmental law, respectively among other regulations.

3. ENVIRONMENTAL AND FINANCIAL PERFORMANCE OF THE ISO 14001 CERTIFIED FIRM USING HAZARDOUS WASTE GENERATION AS AN EXAMPLE

One of the environmental purposes of the Hospital in 2008 was the reduction of hazardous waste generation. In 2009 the acquisition of a digital X-Ray served the long term improvement of the environmental indicators and decreased the quantity of the hazardous waste generated eliminating the waste of the traditional X-Ray process. Table 1 shows that in the categories of „Water-based developer and activator solutions” and „Fixer solutions” the quantity of hazardous waste generation decreased in 2009 due to the acquisition of digital X-Ray and in 2010 such types of waste was not produced on the territory of the Hospital.

The quantity of the hazardous waste generation in the year of the investment (2009) compared to 2008 declined by 9.5%, and in 2010 by 35%, respectively. Despite the decrease in hazardous waste generation the transport- and disposal cost increased by 13.5% in 2009 and by 4.5% in 2010, respectively compared to the costs in 2008.

Table 1. Hazardous waste generation of the Hévíz Thermal Lake and St Andrew's Rheumatism Hospital (2008-2010)

<i>Type of the hazardous waste</i>	<i>European Waste Code</i>	<i>Quantity (kg)</i>		
		<i>2008</i>	<i>2009</i>	<i>2010</i>
Water-based developer and activator solutions	090101	480	175	-
Fixer solutions	090104	495	213	-
Fluorescent tubes and other mercury-containing waste	200121	102	77	117
Wastes whose collection and disposal is subject to special requirements in order to prevent infection	180103	1030	1254	1206
Solid wastes containing dangerous substances	070513	3	-	8
Chemicals consisting of or containing dangerous substances	180106	78	163	60
Packaging containing residues of or contaminated by dangerous substances	150110	16	45	47
Waste printing toner containing dangerous substances	080317	-	70	-
Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	150202	8	6	-
Total quantity of the hazardous wastes:		2212	2003	1438

The increase of the costs can be explained by the increased transport fees. The quantity of the carried hazardous waste declined and due to this in the costs of the transport- and disposal of the waste the partial charge of disposal decreased. However in consequence of the intensive increment of fuel prices the transport charge rose remarkably. In case the fee of transport and disposal of 2008 per hazardous waste unit should be applied for the quantities of 2009 and 2010, the cost of waste management would decrease the same as the quantities and the charges related to hazardous waste generation declined. Due to the market properties in Hungary (especially fuel costs) that are external factors for the organization, development in environmental indices did not lead to decrease of costs, at least helped to avoid a drastic increase. The increment of the price of transport and disposal of hazardous wastes was 25.4%

in 2009 and 61.5% in 2010, respectively. At the end, progress achieved in environmental factors preserved the Hospital from radical rise of costs. Although cost saving did not realize, this had a favourable effect on the economy of the institute.

As a conclusion it can be established that applying EMS and realizing environmental goals had positive effect on the economy of Hévíz Thermal Lake and St Andrew's Rheumatism Hospital and served also the interests of the environment.

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