Aalto University
School of Economics

Environmental Quality Management in Hospitality Industry - Case Hotel K5 Levi

Logistics

Master's thesis

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ENVIRONMENTAL QUALITY MANAGEMENT IN HOSPITALITY INDUSTRY

Case Hotel K5 Levi

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Jenni Vähätiitto
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ABSTRACT

The object of this thesis is to find out what ways there exist for non-affiliated hotel in Finnish Lapland to manage environmental aspects of the business and improve environmental quality. The current status of how environmental issues are dealt in the hospitality business is reviewed in the beginning of this thesis and also concept of environmental quality is defined. The theories and concepts that were chosen to be reviewed were Total Quality Environmental Management (TQEM), formal Environmental Management Systems (EMS) such as ISO 14001 and European Union's Environmental Management and Audit Scheme (EMAS) and certified eco-label schemes, mainly the Nordic eco-label Swan. All of the approaches were reviewed in general and then more specified in the scope of hospitality industry. In addition to these environmental management theories also environmental cost and the way to manage, classify, estimate and compare them were considered.

Based on the theories a model was created for building an environmental management for Hotel K5 Levi located in skiing centre Levi in Finnish Lapland. The model consists of three parts that together form the environmental quality of a company, or in this case, a hotel. "Physical parameters" part of the model is about having proper data on energy, water, waste and chemicals consumption at hotel. The following parameters were chosen because Nordic eco-label Swan offers corresponding limit values, which makes comparison easy. These limit values among other indicators form the "Performance indicators" part of model in which each parameter is translated to an indicator that tells the current status of the parameters consumption in comparison to some measure, mostly hotel ground surface in m2 or number of guest nights. Third part of the model, "Operating scheme", describes the qualitative and strategic aspects of environmental quality management that should be considered.

In empirical research the model was used for analysing the current status of hotel K5 Levi's environmental management and environmental quality. The analyses revealed that Hotel K5 Levi is actually quite environmental friendly hotel already in the extent of energy and water consumption. However, for the analysis of environmental impact of waste management and use of chemicals some measurement systems should still be developed. In the case study some guidance was also given how to further develop environmental management on strategic level at the hotel. As conclusion can be said that none of the reviewed environmental quality and management theories offer ready solution for a hotel to start managing environmental quality. The Nordic eco-label scheme seems to be most comprehensive yet it does not consider environmental costs. Therefore creating an own model was the answer to the research objective on what ways there exist for a hotel to have proper environmental management system.

Keywords: EMS, TQEM, hospitality industry, environmental quality
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Liiketoiminnan teknologian laitos
Logistiikan ja palvelutalouden pro gradu -tutkielma
Jenni Vähätiitto

Ympäristölaadun hallinta hotelli- ja majoitusalalla
Case Hotelli K5 Levi

TIIVISTELMÄ

Tämän tutkielman tavoitteena on selvittää, mitä eri keinoja suomalaisella yksityisomisteisella hotellilla on kehittää ja hallita toimintaan liittyviä ympäristöasioita- ja laatua. Tutkielmassa käsitellyt teoriat ovat teoria kokonaisvaltaisesta ympäristölaadusta (Total Quality Environmental Management), teoriat eri sertifioiduista ympäristöjärjestelmistä (Environemntal Management Systems), erityisesti ISO 14000-standardi ja Euroopan Unionin ympäristöjärjestelmä EMAS. Näiden teorioiden lisäksi myös Pohjoismaisen ympäristömerkin eli Joutsenmerkin kriteeristöä on tutkittu eräänlaisena ympäristöjärjestelmänä. Jokainen teoria on käsitelty ensin yleisellä tasolla ja sitten erityisesti hotelli- ja majoitusalan näkökulmasta. Ympäristöjärjestelmäteorioiden lisäksi myös ympäristöasioihin liittyviä kustannuksia ja niiden hallintaa, luokittelua, arviointia ja vertailua on käsitelty omana kokonaisuutenaan.

Edellä esiteltyjen teorioiden pohjalta rakennettiin uusi malli ympäristöasioiden hallintaan tutkielman case-yritykselle, hotelli K5 Leville, joka sijaitsee Kittilän kunnassa Levin laskettelukeskuksessa. Malli koostuu kolmesta osasta, jotka yhdessä muodostavat yrityksen ympäristölaadun. Mitattavat ominaisuudet (physical parameters) osa mallista kerää yhteen eri osa-alueet, jotka vaikuttavat konkreettisesti yrityksen ympäristöystävällisyyteen. Tässä tapauksessa ominaisuuksiksi valittiin energiankulutus, vedenkulutus, jätteiden määrä ja käytettyjen kemikaalien määrä. Tunnusluvut (perfromance indicators) osa mallista sisältää erilaisia mittareita em. ominaisuuksille. Tutkielmassa esitellyt ominaisuudet ja mittarit valittiin, koska samat ovat käytössä Joutsenmerkkikriteeristössä. Täten ominaisuuksille saadaan pätevät vertailukohdat. Mallin kolmas osa kuvaa toimintaympäristöä (operating scheme), jossa kuvataan laadulliset ja strategiset edellytykset onnistuneelle ympäristölaadun hallinnalle.

Tutkielman empiirisessä osassa mallia käytettiin hotelli K5 Levin ympäristöasioiden laadun ja hallinnan nykytilan analysointiin. Tuloksena voidaan todeta hotelli K5 Levin olevan energian- ja vedenkulutuksen osilta varsin ympäristöystävällinen hotelli, mutta esimerkiksi jätteiden ja kemikaalien käyttömääriä tulisi tietää tarkemmin. Tämän varten tulisi rakentaa seurantajärjestelmiä. Empiirisessä osassa annettiin myös yksityiskohtaista ohjeistusta mitä ympäristöasioiden hallinnassa tulisi strategisella tasolla ottaa huomioon. Lopputuloksena voidaan todeta, että mikään tutkielmassa käsitellyistä ympäristöjärjestelmiin liittyvistä teorioista ei sellaisenaan ole täysin toimiva tai riittävä ympäristöasioiden hallintaan. Pohjoismainen Joutsenmerkki olisi soveltuvin, mutta ympäristölaatuun liittyviä kustannuksia ei siinä erikseen huomioida. Tämän vuoksi teorioiden pohjalta kehitettiin erillinen malli ympäristöasioiden- ja laadun kehittämiseen sekä hallintaan.

Avainsanat: ympäristölaatu, ympäristöjärjestelmät, hotelli- ja majoitusala

Sivujen lukumäärä (liitteineen): 82

ENVIRONMENTAL QUALITY MANAGEMENT IN HOSPITALITY INDUSTRY
Case Hotel K5 Levi

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1. Introduction

Development of economic activities has for over more than a century emitted greenhouse gases and other harmful emissions and used natural resources now resulting in a situation that the entire planetary climate system is changing. This has led companies to develop new climate responsible strategies by which competitive advantage is achieved through reducing company's contribution to climate change. These strategies can also create new opportunities for making profit. (Rohweder 2008, 4, 11, 18) Considering the changes caused by climate change in corporate world, the overall objective of this thesis is to find out whether focusing on environmental issues in a company can be defined as an investment in environmental quality. The overall objective can be divided to sub-objectives of defining environmental quality, how it can be implemented and managed and how the resulting environmental performance should be measured.

Travel and tourism industry is one of the forces pushing global warming forward. Ten years ago it was claimed that travel and tourism is now the world's largest industry and is set to double its size over the next decade. This means that more and more people have had, and probably will have in the future as well, the possibility to travel and see the world, which naturally impacts the areas and environments where they travel. (Synergy 2000, 1) Today travel and tourism industry is comprised of diverse and interdependent sectors and represents 10 % of global GDP (US$ 5 800 billion in 2008) and 8 % of employment (230 million jobs worldwide) (WTTC 2009, 5-6). It is estimated that all leisure-related human activities have a contribution of 3,2 % and 5,3 % to global energy use and to global CO2 –equivalent emissions, respectively (Gössling 2002, 298).

While tourism is a broad category the scope of this research is narrowed down to accommodation (also called hospitality or lodging) industry and mainly to hotels. Tourist accommodation service is defined as "the provision of sheltered overnight stay in accommodation with properly equipped rooms, including at least a bed, offered as a main service to tourist travellers and lodgers for a fee". Within this definition is also included the other activities related to the service, such as reception, administration, staff and common rooms. (APAT 2002, 2)

1.1 Definition of Environmental Quality

Quality of a product or service can be defined from different perspectives. Evans and Lindsay (2008) present the following perspectives: judgemental where quality is synonymous to superiority or excellence; product-based where quality is a function of specific measurable variable; user-based where quality is determined by what customer wants; value-based where quality is the relationship of usefulness or satisfaction to price and manufacturing-based where quality is conformance to specifications. In addition to these quality can also be customer-driven, which then means exceeding the customer expectations. (Evans & Lindsay, 2008, 13-17) In user-based and value-based quality environmental impact during and after use should be included (Klassen & McLaughlin 1993, 15). Environmental quality is rather case sensitive and can be defined by all of the perspectives mentioned above. According to Affisco et al (1996) quality standards tend to be more customer-focused where as environmental standards address the needs of more varied group of stakeholders. Still, features of quality and environmental standards are rather similar, which indicates that the can be integrated. (Affisco et al 1996, 15, 18) This supports the main idea of this thesis that environmental issues are also quality issues.

Environmental quality, or just quality, cannot be inspected at the end in the end-product, it needs to be designed beforehand for the whole process (Chadrashekar 1999, 129). According to Metters et al (2006), environmental strategies for service operations can be either process focused or product focused. Environmental quality can be thus be defined as the level of how environmental aspects are dealt in a company, either on product or process level. Improving quality means in other words eliminating inferior quality, which can result in savings and higher revenues (Drury 2004, 957). Eliminating inferior environmental quality will likely have the same result. One simple example of this would e.g. better insulation of windows. When less cold air is coming in through windows the room need less heating and therefore results in saving in energy costs. Environmental quality is greatly related to use of energy but it has also a role in operations and in production of services.

The common definition of quality refers also to meeting the customer requirements. The same sentence has been expressed in varied ways by many “quality gurus” such as Juran, Deming, Feigenbaum and Crosby (Oakland 1995, 4-5). Quality is affecting the company’s customer’s beliefs and the more the customer thinks of the overall quality level of the company, the more it will affect his behaviour towards the company. This is why companies that are interested in

implementing quality initiatives must take into consideration the customer perceptions of quality. (Boulding et al 1999, 464) The same applies to environmental quality. Improving environmental quality needs also defining the customer perspective. The customer, or the general public, might demand for less waste and thus better environmental performance. To answer this demand, many domestic and international environmental standards and standardized environmental management systems have been forming in the past decade and despite their differences in action the main principle is always the same: improving environmental performance. (Chandrashekar 1999, 124-126)

To sum up, the definition for environmental quality in this research is:

"Environmental quality is the level of how environmental issues are taken care of within an organization's products and processes with a regard to internal and external customer's needs and perceptions".

This means that the intensity of effort put on measuring, analyzing and handling of environmental concerns (e.g. energy consumption) sets the level of environmental quality; the more time and effort invested in, the higher the quality. It also necessitates that employees, customers and other stakeholders are taken into account with e.g. proper communication and guidance. Hence, the focus should not only be on certain figures (energy consumption) but in the process as a whole.

1.2 Environmental Quality Management

Quality management has been a widely researched field of study. Managing quality usually relates to improving quality and quality can be improved in various aspects. Different quality frameworks developed propose that investing in quality within a company gives competitive advantage and even improvement in financial performance in the long run. Today when climate change concerns are widely recognized companies have started to make investments in environmental quality. This can be translated e.g. to terms of improving environmental effectiveness or performance, investing in sustainable actions, improving energy efficiency, creating environmental cost management schemes, creating environmental management systems etc. Despite the differences in their terms and features they all tend to reach the same goal: to improve environmental quality. In addition to being useful for the environment and climate, the organizations investing in environmental quality might also gain cost savings and other benefits in their operations. Most successful examples of environmental management

have been in the area of energy management where financial savings act as a clear motivator (Kirk, 1995).

Having environmental quality in a company thus requires a proper environmental quality management system or smaller subsystems to interpret it to internal or external stakeholders. Different environmental management system and sub-system schemes exist, depending on the size of the company, on the formalness of the approach and on the industry. From these various schemes three separate approaches were chosen to be researched in this study and these are Total Quality Environmental Management (TQEM), standardized formal Environmental Management Systems (here ISO 14000 and European Union's Eco-Management and Audit Scheme EMAS) and product or service eco-labelling schemes.

As similar to quality improvements, environmental quality improvement requires a thorough understanding of cost and the process involved. A basic understanding of the environmental cost is the first step to process improvement. (Chandrashekar 1999, 126, 129). The level of the costs depends on whether investments to quality have been made prior to actual quality failures or after they have been detected. In environmental quality the need for prior investments is more crucial since the climate and environmental consciousness is growing. On the other hand, companies might not recognize the need for environmental quality before someone is actually demanding for it. This applies especially to those industries where investments in environmental quality are not yet mandatory. The accommodation and tourism service industry is one of those. Naturally the option of not investing in environmental quality has its cost e.g. due to growing energy costs.

1.3 Environmental Quality and Motivations in Hospitality Industry

Hospitality industry due to its function, operating characteristics and provided services is to great extent in charge of the environmental impacts of the whole tourism industry while it consumes great amounts of energy, water, food, wood, plastics and other non-durable products that require disposal (Bohdanowicz 2006, 663; Erdogan & Baris 2007, 604, Kirk 1995). Hospitality services are responsible for 4 % of the total greenhouse gas emissions of the tourism industry, while transport is emitting 94 % of the emissions (Gössling 2002, 298). The hotel industry is already becoming increasingly environmentally responsible and taking activities towards environmental issues for the sake of the environment itself, for economic reasons or for building a positive image (Erdogan & Baris 2007, 610; Chan 2008, 187).

Hospitality industry has thus many opportunities to reduce its environmental impact by e.g. creating environmental management systems, reducing energy use, reducing the use of materials and by recycling and being aware of the supply chains environmental impacts (WTTC 2009, 22). Implementation of environmental practices also gives a chance for cost-benefits and product differentiation in the hotel industry (Molina-Azorin et al 2009, 517). To work on a large extent the environmental practices need be incorporated into the whole hotel industry. This should be done by delivering information about best practices and the findings from cost-benefit analyses. Also developing new and less expensive technologies for environmental practices would be an asset. (Bohdanowicz 2006, 679) The benefits of environmental quality investments in hospitality industry are thus both financial and non-tangible. Investing in environmental quality asks for better environmental management practices and measurement tools and the use can result in operating cost reduction, increased revenue and increased profitability. Pro-active environmental management practices can result in increased financial savings and increased profits in the whole industry. However, many hotel operators are still unaware of the savings opportunities. (Scanlon 2007, 721)

1.3.1 Current Situation

According to a study of Bohdanowicz (2006), initiatives for better environmental quality are becoming more popular among hoteliers worldwide and these initiatives are mainly related to energy and water consumption, waste generation and disposal and treatment of wastewater (Bohdanowicz 2006, 666). Simultaneously there exists a lack of application of business valuation practices in the area of environmental management. An unexpected lack of formal and systematic measurement and documentation of energy and other commodities consumptions rates and costs also exists in individual accommodation businesses. (Scanlon 2007, 715) It can be seen that the will and motivation for improving environmental quality exists in hospitality industry but the tools for getting the most out of it are either misunderstood, not found or not yet existing.

Many studies have been conducted on the environmental practices of hotels but the majority of them have focused on large hotels in mass tourism seashores and popular touristic areas (Erdogan & Baris 2007, 605) but yet still the majority (97 %) of travel and tourism industry comprises of SME's (Synergy 2000, 38). Heavy environmental management systems may end up being too costly for smaller companies and push the cost of environmental management to service prices. This can be a huge obstacle for companies, at least in those resorts where

competition is high because of season-dependency (e.g. Lapland). In a study done in Spain, standardised EMS's have shown to be more popular in the hotel sector than certified eco-labels. Still only a small fraction of hotels possess a certification for standardised EMS (1,5 %). The main incentives for implementing an environmental quality approach, according to the study, are financial gain, ethical stance, response to customer demand, improved hotel image ("green image") and marketing image. The obstacles against implementation are too high costs, lack of time and knowledge, jeopardising customer satisfaction, difficulties of involving staff and beliefs that hotels are not responsible for the environmental impact. (Ayuso 2007, 145-146) Therefore there is a need for proper practical environmental tools and practices that are easy and light to implement in order to make it easy for hospitality SME's to take environmental management seriously and to monitor and report the efforts of mitigating climate change. (Kirk, 1995; WTTC 2009, 19)

1.3.2 Geographical and Consumer Aspects

Sun-holiday sites full of tourists are thus not the only places where investing in environmental quality is needed, the Finnish Lapland has its own characteristics and needs for environmental preservation as well. The cold climate necessitates using great amounts of energy and thus the need for energy-saving practices and other environmental improvement exists. Travel and tourism in Lapland has also been growing steadily over the past decade (Statistics Finland 2010) and is likely to keep on growing.

It is not only for internal reasons why hotel industry should focus more on environmental issues. Tourists and customers have become more demanding with their preferences of the product and they will demand greater respect towards the environment (Molina-Azorin et al 2009, 517). Consumers are a strong market force and their increasing "green" consumption is a strong signal for companies to pursue corporate greening (Rohweder 2008, 15). But it can work the other way around also. Environmental concerns are driving customer choices in Western and Northern Europe but this is not as common in Central and Eastern Europe. Therefore hotels should also actively advertise their environmental commitment and invite customers to participate in environmental actions. Some customers might even be willing to pay extra for having a chance to stay over-night "green" which proposes that environmentally responsible operation might be a good business decision. (Bohdanowicz 2006, 679) Then again, a newer study claims that few tourists or any choose their hotels based on

environmental practices or certificates or at least it does not show in the occupancy rate per room (Molina-Azorin et al 2009, 522).

1.3.3 Scandic's Example

One example of an affiliated hotel chain that has focused on environmental quality and performance for many years is Scandic. The chain's Swedish hotels mentioned frequently in articles of Bohdanowicz (2006) and Bohdanowicz and Martinac (2007). In Scandic's webpage's it is claimed that they have started the pro-active work for environmental issues already back in 1994 and are really a pioneer in the environmental quality issues in hotel industry (http://www.scandichotels.com/About-Us/Responsible-living/Environmental/). Figure 1-1 presents the percentage distribution of Swan eco-labelled hotels in the Nordic countries by hotel operators in February 2010. Scandic hotel chain is clearly leading while over third of all the Swan eco-labels issued in the Nordic countries belong to Scandic. In November 2009 the Scandic figure was 41 % and the figure for "other" was 25,5 %. It can be thus concluded that non-affiliated hotels and smaller hotel chains are becoming more active in getting certified with the Swan eco-label.

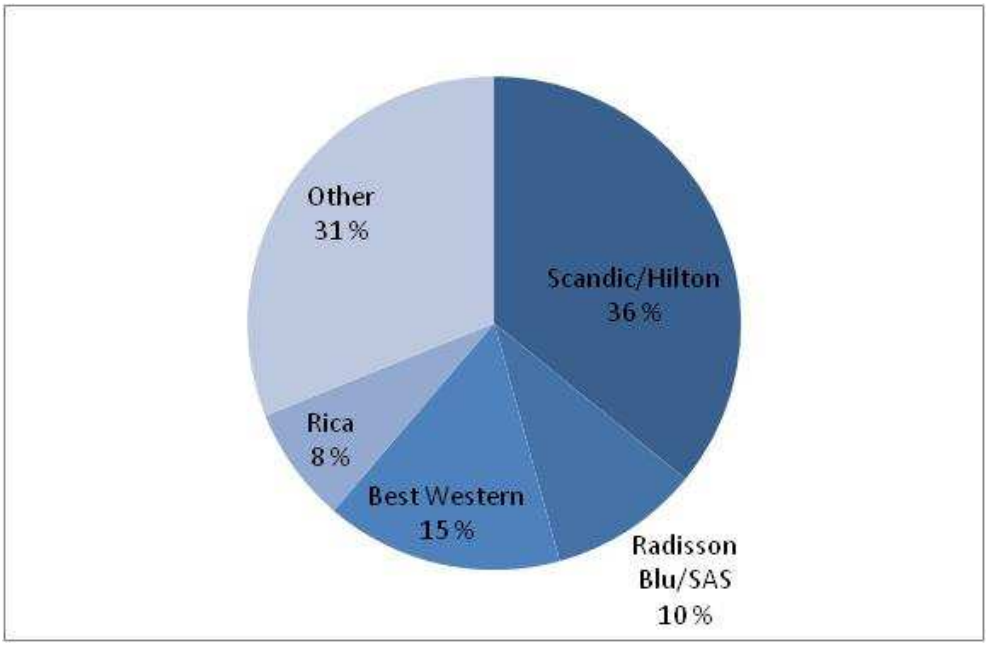

Figure 1-1 Swan eco-labelled hotels in the Nordic countries by hotel operators

(Data sources http://www.ymparistomerkki.fi/tuotteet?jta=search&pg=72, http://www.svanen.nu/SISMABDesktopDefault.aspx?tabName=ProduktLista&pgr=72, http://www.ecolabel.no/cgi-bin/svanen/imaker?id=272&method=lisenser, http://www.ecolabel.dk/licenser/produktliste?maerke=Svanen&produktgruppe=72, retrieved on 23.2.2010)

It is difficult to tell whether implementing environmental quality is easier in affiliated hotel chains or in privately owned hotels. In privately owned hotels the managers usually have stronger power and can thus more easily implement environmental quality initiatives. Again in hotel chains the implementation of environmental quality programs become easier after every implementation because of repetition and can also yield in economies of scale. In Bohdanowicz (2006), in Poland the privately owned hotels seemed to be more concerned about environmental issues than hotel chains. The exactly opposite situation was in Sweden but this can be explained by the large proportion of Scandic hotels in Sweden. Hotel chains also benefit the good corporate image achieved by environmental programs. (Bohdanowicz 2006, 670, 676) Some studies support the fact that strongest environmental commitment is seen in holiday-oriented hotels. This can be explained by the fact that holiday-oriented hotels mostly receive their customers through tour-operators, who have a bargaining position and can demand greater environmental responsibility from the hotels they work with. (Molina-Azorin et al 2009, 522)

1.4 Objectives and Structure of the Research

Currently there exist huge amount of different ways how to control the environmental quality and manage the environmental issues overall. Some of them are more comprehensive by their scale and size, others again more specified to certain industries and for certain size of companies. The case company in question was facing the question of which of the approaches would suit their operations best in order to manage and improve environmental quality. Solving this dilemma means defining the general elements of environmental quality from previous environmental quality literature, solving how these elements can be managed and assessing which of them are most necessary for an SME operating in accommodation service industry. Thus, the overall objective of this research is:

"How a framework for managing environmental quality in an SME could be built and how it would be used specifically in accommodation service industry"

The overall objective can be divided to five sub-objectives, according to the structure of the study

- *Defining environmental quality and analyzing environmental quality items in hospitality industry (Chapter 1)*

- *Reviewing environmental management approaches and their principles, analyzing the value and suitability for an SME in hospitality industry (Chapter 3)*

- *Analyzing costs and benefits of improving environmental quality (Chapter 3)*

- *Building a framework for managing environmental quality in domestic non-affiliated hotel (Chapter 4)*

- *Testing the model for the case company (Case Study, Chapter 5)*

The empirical objective of the study is thus to create a system for managing environmental aspects and quality for the hotel, based on lessons learned from theory. The base for the framework is derived from theory by comparing what models there exists for hotels to better manage their service and operations to be more environmental-friendly and what are general definitions of environmental quality. As an economical research, an important focus area is also the economical aspects of environmental quality, such as cost of quality, environmental cost and management accounting. While the case company is an SME, the specific features related to company size in the theory part are included when necessary. At the end the created framework is described in depth with the help of the case company. While the framework as such is built based in general theories and not only hospitality industry specific ones, the framework could as well in theory, be used by SME's in other industries.

1.5 Research Methodology and Limitations

The topic of this research, environmental quality, or quality in general, is something that can be researched from various perspectives (see chapter 1.1). This means that environmental quality can be assessed both qualitatively and quantitatively. However, due to the same reason, it is natural to do the research of topic both qualitatively and quantitatively in order to maximise the usefulness of the study results. This means that the study should be a rather comprehensive one. Therefore, a case study will be a suitable research method.

As a study method, case study research offers greater opportunity than other study methods to gain a holistic view of the study, enables to study different aspects and their relations to each other and also to view the process within its total environment. (Gummesson, 2000, 86) Research questions starting with "how" as like the research question in this thesis refer to explanatory research and likely leads to the use of case study as a preferred research strategy. Case studies can also be based on mix of quantitative and qualitative evidence. A single-case

study can represent a testing of a theory that has a set of different propositions. The single-case thus tests whether the theory's propositions are correct or whether some alternative or better propositions exist. (Yin 1994, 6, 14) Hence, a single-case study offers a comprehensive view for the study and gives the possibility to test whether the theoretical framework is accurate and sufficient and therefore a case study is chosen to be the main research methodology of this thesis.

The case organization of this study is a hotel in the Levi skiing centre in Finnish Lapland. The scope of the research is thus narrowed down to tourism industry and especially to hospitality services. While the hotel in question is not part of a larger hotel chain, the viewpoint of an SME is carried along in the study. While the research methodology limits the study to one single case and the empirical part of the research is based mostly on one company's internal factors, consumer viewpoint of environmental quality has been left on smaller notice in this study. While it is generally recognized that people are becoming more aware in environmental sense, improving environmental performance (or internal environmental quality) it will likely result in answering better the customer's needs. However, analyzing the consumer viewpoint would necessitate a larger study related to several hotel operators in order to have reliable results. Therefore it is not coherent to include it to this research.

2. Environmental Quality Management – Literature Review

2.1 Total Quality Environmental Management (TQEM)

The first approach in managing environmental quality is Total Quality Environmental Management (TQEM). It has its roots in Total Quality Management (TQM), which is a widely recognized and researched quality system already from the 1980's. By its definition TQM means improving the competitiveness, effectiveness and flexibility of the whole organization, in other words managing the overall quality within an organization. (Oakland 1995, 20) TQM is a quality management system which may have an impact on firm performance in both manufacturing and service organisations (Claver-Cortes et al 2007, 228). TQEM is an extension of TQM taking in consideration costs and environmental issues (Miles & Russell 1997, 159) and can thus be seen as a non-standardized environmental (quality) management system (EMS) that may have an impact on environmental performance. There is no single way to implement TQEM so comparing TQEM processes in different companies and the results gained from the programs can be quite difficult. To avoid this, TQEM, such as TQM, can be certified by third-party organization which makes the process more standardised and comparable. For TQM the certification is quality standard ISO 9000 and for TQEM environment standard ISO 14000 (Miles & Russell 1997, 159).

TQM system is based on a theory that when quality improves, less costs and wastes exist and it is a system where quality is dealt at every stage of the production process (Welford 1995, 54). According to Evans & Lindsay (2008), TQM in general is based on three fundamental principles. Firstly, it has a strong focus on customers and stakeholders; the customer is the principal judge of quality. Secondly, everyone in the organization should participate to "quality production" and work in teams. Lastly, quality should be seen as a process rather than a static state and it should be supported by continuous improvement and learning. (Evans & Lindsay 2008, 19) One essential feature in total quality thinking is that defect-free work is possible to achieve most of the time and quality management is actually all about prevention of failures (Bank 1992, 23). This supports the claim that total quality management should be thought as process and that preventive work should be done continuously. Most of the problems with total quality management indeed occur when it gets stuck in its theoretical area, then it becomes a program and the process-focus is lost (Baldacchino 1995, 70).

2.1.1 Features of TQEM

TQEM was first initiated when the Global Environmental Management Initiative (GEMI) included environmental issues to Total Quality Management. Or in the other way around, they set up the rules how TQM can be applied to corporate environmental issues. (GEMI 1993) TQEM has very similar features in comparison to TQM. It requires a systems-based approach and provides a process by which a company can carry out organization-wide program to eliminate pollution and improve environmental performance. Its main goal is to reduce pollution (in TQM reduce defects) and increase stakeholder satisfaction by transforming existing management practices (in TQM focusing on the customer satisfaction) Central aspects are also employee involvement, participation and training. (Bhat 1998, 10; Welford 1995, 54) The view that pollution is a defect in the production process has driven companies to implement TQEM which enables them to progressively eliminate waste and increase efficiency (Harrington et al 2008, 2996).

According to Bhat (1998) there are four major elements of TQEM. Firstly, TQEM has a strong stakeholder focus where internal customers are involved in the production of the service or product and external customers are the end-users of the product. Secondly, a strong focus is on continuous improvement. “Zero waste is the name of the game in TQEM” and identifying causes of environmental deterioration and preventing them in the first place are essential features. Thirdly, in order to be successful environmental projects need team work so people co-operation is one element of TQEM. Lastly, in successful TQEM processes managers must set environmental organization goals, show commitment to them and monitor the process of the implementation of TQEM continuously (Bhat 1998, 10-11, 32-33)

GEMI (1993) also defines four basic elements of TQEM. Firstly, strong customer focus and identifying the customers is essential. Secondly, continuous improvement is a systematic and ongoing effort to improve business processes and it is a progress along the continuum. Thirdly, the job should be done right the first time. This means that environmental problems should be recognized and prevented before they occur. Lastly, with TQEM each part of environmental management should be seen as a system and this means working across organizational boundaries in teams and involving all the needed functions to the system. (GEMI 1993, 3-4)

TQEM processes have thus four main characters as presented above

1. Strong stakeholder and customer focus
2. Focus on continuous improvement
3. Stress on team work and doing things right
4. Goal-oriented approach of setting objectives, measuring the progression of environmental quality investments and continuous monitoring of the whole process.

GEMI (1993) and Bhat (1998) both mention that TQEM's continuous improvement is based on the plan-do-check-act (P-D-C-A) cycle which is also known as the Deming Cycle of continuous improvement (Juran & Gryna 1993, 101; Oakland 1993,174). Figure 2-1 presents the P-D-C-A cycle for TQEM.

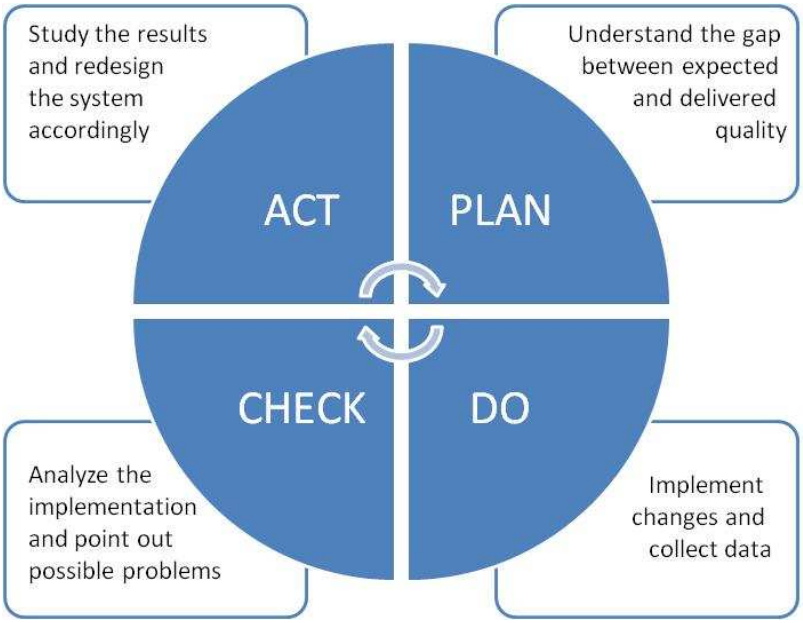

Figure 2-1 The P-D-C-A Cycle for TQEM adapted from GEMI (1993, 7)

2.1.2 TQEM Approach in Hospitality Industry

TQEM as such has not seemed to be that popular in academic research. TQM was a topic in the beginning of the 1990's but does not seem to be that popular anymore. However, some studies claim organizations in hospitality industry that have implemented TQM systems are more interested in and have better capabilities to implement environmental management practices (Claver-Cortes et al 2007, 239). Therefore TQEM approach in hotel and tourism industry can be rather seen as an informal EMS that needs development by the organizations than a "ready" package for environmental management per se. An informal EMS would in this case mean an approach to environmental quality that each company can make and create by themselves without the need for third-party verification or certification. It can be developed with the help of general TQEM/TQM theory and stress first the environmental aspects that are most easy to implement within a company. This way it would also be a great starting point for future implementation of formal EMS or certified eco-label scheme. The benefits of implementing and informal, non-certified EMS is that the organization has more flexibility in the degree of how environmental management is integrated in the organizations and the avoidance of certification costs (Darnall & Edwards 2006, 303).

The strong stakeholder- and customer-focus of TQEM might result as a weakness in the end. As like in one TQM case in hospitality industry, commitment of employees cannot be managed simply by forcing the new corporate philosophy down the throat but the employees should be able to associate themselves with the corporate vision (Baldacchino 1995, 76). This is most likely to apply to TQEM as well. In addition, many consumers might also perceive their satisfaction as a customer to be related to something else than "sustainable". High material standards of living and over-consumption of customers are somewhat conflicting with the principles of TQEM. (Welford 1995, 55) These conflicts apply also to other environmental quality approaches than just TQEM. However, today it can be expected that consumers might be more aware of environmental consequences of their actions and hospitality industry can be one of the forces pushing this thinking forward. It is thus necessary to keep in mind that customers who are paying a lot for a stay in a fancy hotel may not be looking forward to e.g. waste recycling as their first task as customers.

The tools used in hospitality industry can also well be applied to TQEM or the other way around, TQEM can be built of these tools. Examples of these tools are codes of conduct, benchmarking, best environmental practices and environmental performance indicators.

Codes of conduct are public statements that aim to show commitment to basic principles of environmentally sound company performance. Usually codes of conduct only address the strategic commitment of a hotel towards environmental quality but lack mechanisms to ensure real implementation of it. Adoption of a code does not usually involve any cost, although the resulting implementation measures can have a variable budget. (Ayuso 2007, 147-148, 154) Benchmarking applies in hospitality industry in the same as in general: benchmarking as a business process provides a standard to which an activity or process can be compared to (Scanlon 2007, 713). Still, corporate benchmarking is not necessarily an effective format to measure current utility consumption performance and to establish future performance objectives. Due to differences in distribution and in service requirements of different hotel modules (guestrooms, catering outlets, conference centres etc.), absolute benchmark values for the whole hotel facility might appear as being too simplistic. (Scanlon 2007, 721; Bohdanowicz & Martinac 2007, 93)

Best environmental practices and environmental performance indicators are action measures and tools for improving, assessing and communicating the environmental performance of the company. Best environmental practices are the practical measures taken for increasing environmental quality and environmental performance indicators are thus the key figures for monitoring the development. They do not however offer any direct environmental quality planning mechanisms or straightforward ways of improving environmental performance. (Ayuso 2007, 148-150, 152-154) Figure 2-2 presents how the tools that hospitality industry uses are linked to TQEM.

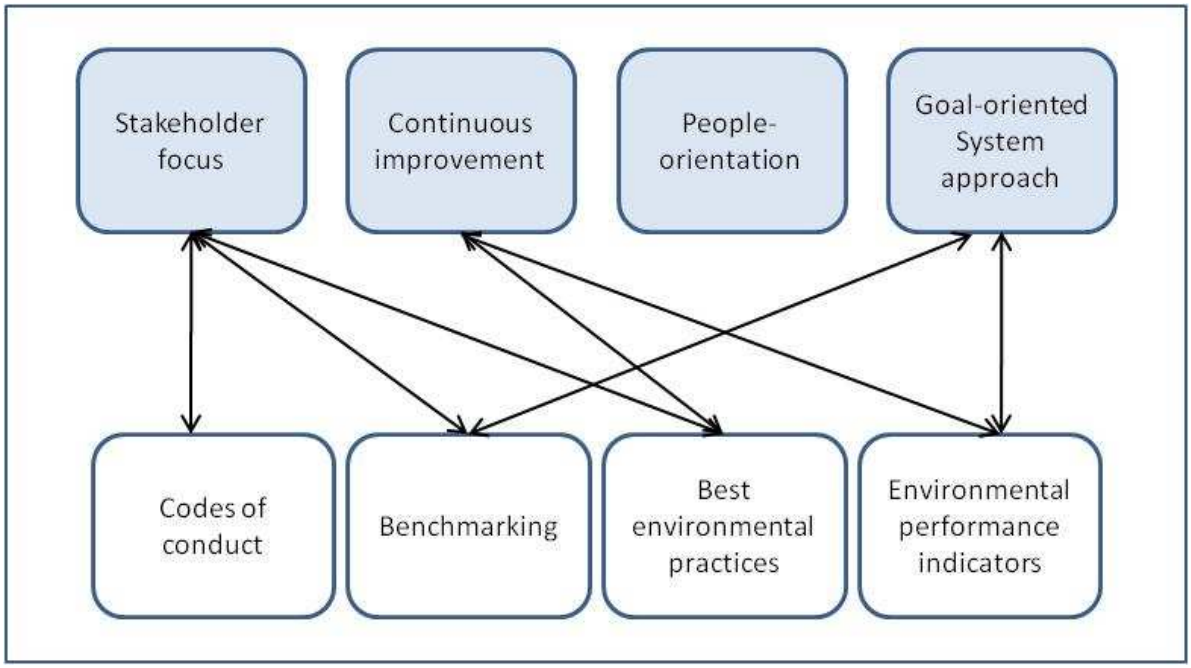

Figure 2-2 TQEM and tools used in hospitality industry

The tools presented above can be used as help in almost all TQEM principles but none of them necessarily answers directly to the principle's features. For example codes of conduct would probably not be enough to take care of all the stakeholder focus that is needed by TQEM so some extra work would be needed. None of the tools neither correspond to people-orientation principle of TQEM. If TQEM or informal EMS approach would be implemented in a hotel, a lot of work would need to be done in addition to those tools already available.

2.2 Formal Environmental Management Systems (EMS)

Another overall approach to environmental quality within a company is Environmental Management System (EMS). In comparison to TQEM, EMS does not itself include the word "quality" in its term. EMSs are in many ways more standardized approaches than TQEM frameworks and in many organizations they have evolved because of regulatory requirements or community pressures (Bhat 1998, 8-10).

Two of the most known standards for environmental management systems are ISO 14000 and EU Eco-Auditing and Management Scheme EMAS (Morrow & Rondinelli 2002, 162). Both of them offer a structured approach of how a company can improve its environmental quality and performance. ISO 14000 and EMAS have also protected EMS's state as a official management system (Chan 2006, 482). ISO 14000 was published in 1996 (Morrow & Rondinelli 2002, 159) and EMAS in 1993 (Welford 1995, 72). EMAS was thus a predecessor

to ISO 14000 together with British Standard's Institution (BSI) national standard on environmental management systems, BS7750, published for the first time in 1992 (Welford 1995, 63). Due to its national character concerning namely Great Britain, BS7750 has been left out of this study.

2.2.1 Features of Formal Environmental Management Systems

An environmental management system is usually defined as a part of the overall management system with main elements focusing on personnel and organizational structure, operating processes and procedures, planning activities, reporting systems, good documentation and auditing processes in order to achieve and improve environmental performance and to obey the environmental regulations (Goetsch & Davis 2001, 97; Bhat 1998, 8-10). EMS's are likewise based on Deming's continuous improvement model (P-D-C-A cycle) and they assist enterprises to examine their internal operations and increase the knowledge level, engage employees in environmental issues and continually monitor progress (Darnall & Edwards 2006, 302-303). Most important feature of an EMS is thus its circular and all-embracing form and environmental auditing is a key element in EMS (Roberts 1995, 161). Figure 2-3 presents the steps of developing an EMS.

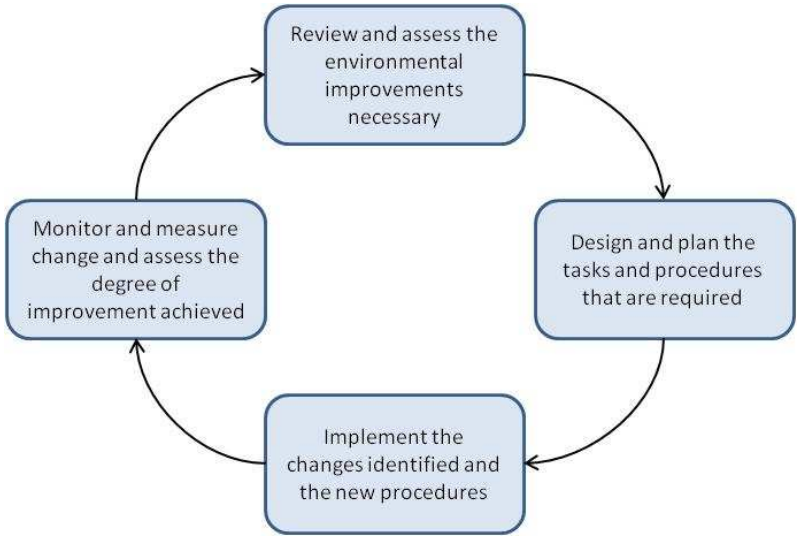

Figure 2-3 EMS developing process (Roberts 1995, 163)

As such, EMS is still not a standardized system. Environmental management systems can be divided to formal and informal EMSs, depending on whether it is an actual accredited environmental management system audited by some third-party authority or just an internal

system of the company to focus on environmental issues. According to McKeiver & Gadenne (2005), a large number of businesses can be engaging in environmental activities such as waste management, recycling and energy efficiency without having a formal EMS. According to their study of EMS implementation in SME's on minority of the companies had implemented a formal EMS despite the positive environmental attitudes and implementing a formal EMS seems to be lowest in service sector. (McKeiver & Gadenne 2005, 514; 529-530) This reflects the same as mentioned earlier in this thesis that SME's are less likely to implement a full TQEM process. An EMS should thus fit the requirements of the company and be capable to function with the overall organization (Roberts 1995, 164).

Purpose of EMS standards is to describe the elements of an effective EMS, which usually deal with environmental policy, goals, objectives, targets, procedures, documentation systems, environmental metrics and measuring, monitoring and reviewing environmental performance. Similar to TQEM, also EMSs are expected to focus more on process of actual and continuous doing, rather than just measuring the performance. One essential feature of EMS standards is that they differentiate the formal EMSs from informal ones and other informal environmental quality approaches, such as TQEM. The certificate issued by third-party authority gives credibility to the EMS and provide stakeholder reliable proof of that everything needed is done to comply with environmental regulations. (Bhat 1998, 8-10) An EMS standard also requires identifying the environmental aspects of the company's products, services and activities (Miles & Russell 1997, 162). The benefits gained from implementing a standardized EMS are mostly related to management improvement, employee awareness, systematic and integrated documentation and environmental performance improvements (Morrow & Rondinelli 2002, 170).

2.2.1 ISO 14000

ISO 14000 is one the most common international standards developed for environmental management systems. It is about standardizing the approach organizations take to managing their environmental aspects and impacts and helps them to transform their environmental excellence to reality. (Goetsch & Davis 2001, 97; Bhat 1998, 8-10) ISO 14000 can also be seen as comprehensive TQEM where components of environmental marketing (environmental labelling, life-cycle assessment, environmental design) are integrated with TQM (Miles & Russell 1997, 165). ISO 14000 was first introduced in 1996 as a result of the Rio Summit of Environment held in 1992. The standard was later on revised and a new

version of it was published in 2004. The ISO 14000 is actually a series of standards and out them the ISO 14001 is the environmental management system standard. (Chan 2008, 543) The EMS Standard ISO 14001 has the greatest global level impact with more than 129 000 certifications (Bhat 1998, 83; Bernardo et al 2008, 742). It is noted that main trigger for seeking an ISO 14001 certification is the interest of stakeholders (Chan 2006, 484), even if it does not require any public disclosure of environmental information (Nawrocka & Parker 2008, 606).

The ISO 14001 standard as well as the whole ISO 14000 series, similarly to TQEM approach, proposes the Deming's "Plan-Do-Check-Act" (P-D-C-A) model for the EMS (ISO, 2009). The P-D-C-A cycle for ISO 14000 is presented in figure 2-4.

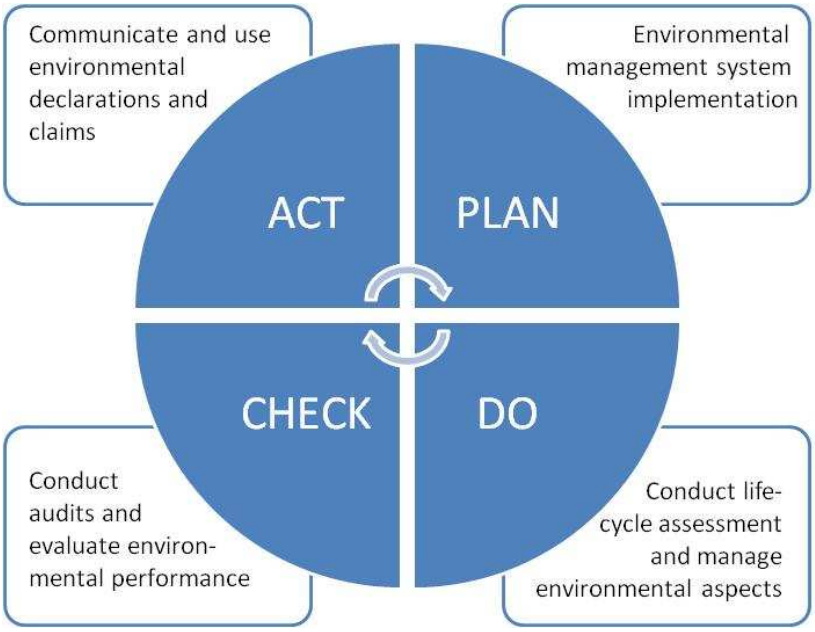

Figure 2-4 The P-D-C-A cycle for ISO 14000 (ISO, 2009)

The management system requirements are classified as general requirements and five other phases. (Bernardo et al 2008, 742) The needed elements of an EMS to conform with ISO 14001 are management commitment, planning environmental actions and creating environmental policy, communicating the environmental message internally and externally and creating awareness through training, controlling and documenting the operations related to environmental issues, keeping record, auditing and reviewing as a means for corrective and

preventive action and continuous improvement (Goetsch & Davis 2001, 101). The environmental management system model of ISO 14001 is presented in main phases which are environmental policy, planning, implementation and operation, checking and corrective action and management review (Bhat 1998, 87). The structure of the model is presented in figure 2-5.

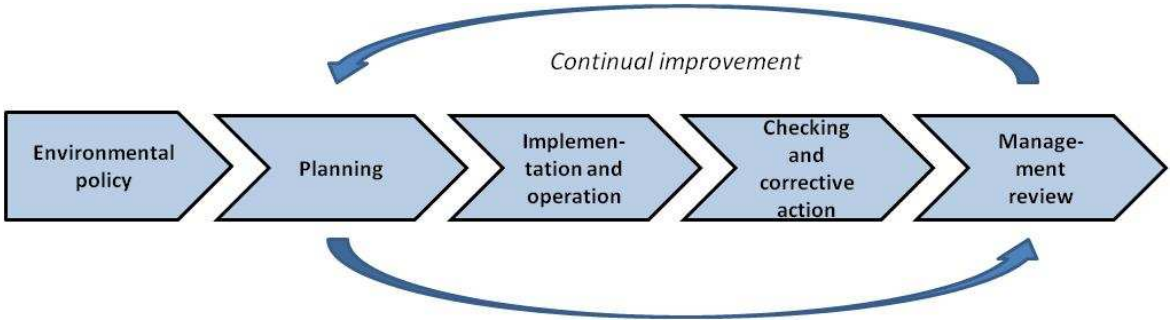

Figure 2-5 ISO 14001 Environmental Management System model (Bhat 1998, 87)

Even though ISO 14000 standardized EMS applies to environmental aspects that organizations can control and over which it can have influence, it does not itself state a specific environmental performance criteria (Goetsch & Davis 2001, 7). This basically means that companies that have implemented ISO 14001 EMS still cannot be compared to each other based on environmental performance. Since ISO 14000 only gives guidance for the form of EMS it does not really tell, whether some company has better environmental than some other company with informal EMS. It just tells, that the ISO 14000 certified company has a standardized environmental management system. Unlike TQEM's, ISO 14001standardized EMS can be compared as *system*, but still not in terms of environmental quality results or environmental performance.

2.2.2 European Union's Eco-Management and Audit Scheme

Another standardized environmental management system is the European Union's Eco-Management and Audit Scheme, EMAS. It is based on regulation (EC) 761/2001 and it is a tool for companies situated in the EU to embrace environmental management into their operations and report the environmental achievements to public (Erkko et al 2004, 801). It also requires a formal audited EMS in place reporting of independently audited environmental performance. In contrast to ISO 14000, EMAS calls for an extensive review of the

environmental impacts of the company's operations before environmental policies are developed. Another unique feature of EMAS in comparison to ISO 14000 is also that it requires maintaining a register of environmental effects such as emissions on atmosphere, discharges to water, use of natural resources and discharge of energy or noise. In general, environmental policy, program and audits of EMAS should deal with evaluation and reduction of environmental impacts, energy savings, raw material savings, waste prevention, noise reduction, new processes and process changes, product planning, environmental performance of contractors and suppliers, prevention of environmental accidents, emergency preparedness and environmental reporting. (Bhat 1998, 93-94) EMAS certified organizations need to produce an environmental statement and allow more information available to public, which enhances the organizations transparency (Morrow & Rondinelli 2002, 162). Figure 2-6 presents the structure of EU Eco-Management and Audit Scheme.

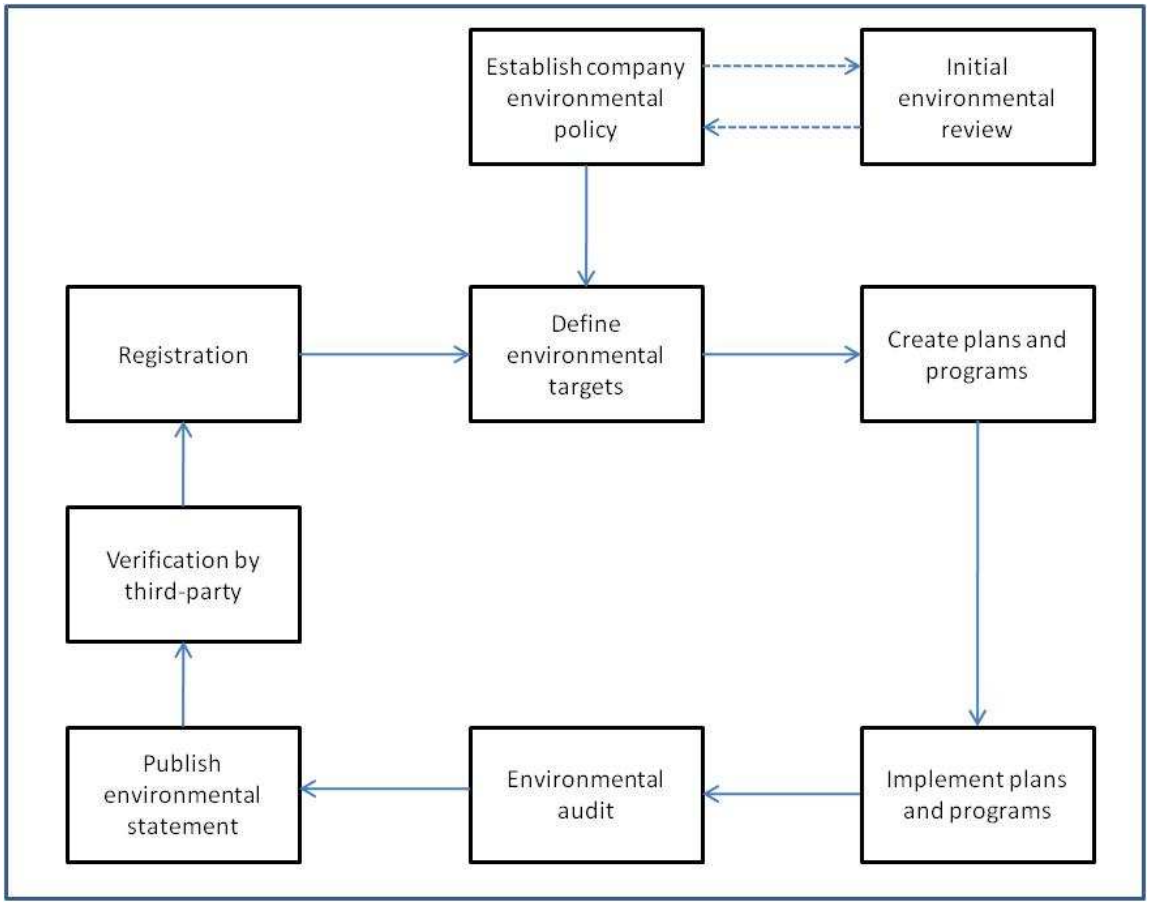

Figure 2-6 EMAS scheme (Roberts 1995, 145)

According to Iraldo et al, despite of the growing force of voluntary-based standardized EMS implementation such as ISO 14000 and EMAS, many have not yet achieved the maturity in

their implementation and they are not that fully integrated in other corporate management functions such R&D and supply chain management. The research is claiming that with greater implementation of the EMS e.g. to supply chain management the company could better show the certification towards the market and stakeholders and it would be more integrated with operational tools and instruments. It also seems that EMSs seem to be implemented in a more comprehensive and effective way by EMAS-registered organizations. (Iraldo et al 2009, 1451) One limitation mentioned on the certified standards is that they are designed to certify appropriate environmental management systems, not efficient environmental management (Welford 1995, 75).

As being rather similar, ISO 14001 and EMAS certifications have some differences. Where ISO 14001 has been primarily designed to improve management and it can be implemented in almost any type organization anywhere, EMAS is more focused on bringing changes in environmental performance and is aimed only for the EU region (Morrow & Rondinelli 2002, 162). These differences in the characteristics of certified EMS's can also affect the way how environmental performance is defined. Environmental performance, or its improvement, can also be seen rather differently inside the company compared to how the general public sees it and also differ between different companies. Nawrocka & Parker (2008) found in their study of previous EMS studies that definition of environmental performance differs in each study but the definitions could be categorized to two different groups. First group expresses environmental performance as use of operational performance indicators such as waste generation or water consumption. Second group definitions view environmental performance as the various environmental benefits perceived. (Nawrocka & Parker 2008, 602, 604)

The real value of any auditing system is still realised only if the overall philosophy of an environmental management system is adopted (Roberts 1995, 160). Implementing a certified EMS does not also mean that the environmental performance of the company would be measured. In their study of Finnish EMAS-certified companies, Erkko et al (2002) find that using eco-efficiency indicators as a mean to measure environmental performance, especially in financial terms, is still rather rare. Of the benefits of an standardized EMS, documenting of cost savings, increased competitive advantage and operational improvements have been the more difficult ones to notice, both in MNC's and SME's (Morrow & Rondinelli 2002, 170).

2.2.3 Formal EMS Approaches in Hospitality Industry

Formal EMS's have been increasingly applied by hotel companies since the 1990's, while they give the recognition of "doing the things in the right way". In a study done in Spain, relatively large number of Spanish hotels have implemented the EMAS-style EMS, mainly due by being promoted in public funding programs (Ayuso 2007, 151). Chan and Wong (2006) focus on hotel industry and re-arrange eight motivational factors determined in previous studies to adopt a formal EMS. The motivational factors in hotel industry to adopt a formal EMS are (in order) corporate governance, ISO benefits, top management, legislation, market trend, trade barriers, customers and competitors. The motivation for the adoption is thus determined more by internal forces than external ones. This is mainly because hotel industry has not been perceived as destroyer of the environment (compared to e.g. manufacturing industry) and therefore is less influenced by stakeholders' interest in environmental performance. Still, and ISO 14001 standard is a very good way to comply with environmental protection legislation and the adoption of it would rise if encouraged or required by the government (study was done in Hong Kong). (Chan and Wong 2006, 489-490) The customers growing interest towards environmental friendliness may change the order of motivational factors in some point of time and set the focus from internal to external forces. Then the importance of an accredited EMS as marketing advantage may also grow.

A formal EMS is still not a must for hotels. According to Chan (2008) many hotels have implemented energy and water saving best practices but do not have a formal EMS in place. From the interviewed hotels only 10,6 % had a formal EMS (ISO 14001) in place. Internal barriers for implementing a formal EMS are more obvious for the lower class and medium sized hotels than for four- and five-star hotels that are also bigger in size and capacity. (Chan 2008, 188, 195) This study is again made in the Asian region so it does not include any numbers from Europe or Americas. Because of EMAS and ISO 14001 systems are usually more feasible to larger companies and do not suit small businesses needs, the tourism and hotel industry has usually preferred to work with its own and softer systems. This is because tourism industry companies are mainly comprised of small and medium –sized businesses (97 %). (Synergy 2000, 38)

In Chan (2008) the greatest barriers of implementing a formal EMS for upper class hotels in Hong Kong were implementation and maintenance costs, lack of professional advice, lack of knowledge, skills and resources and certification and verification investments. Hotels found it

difficult to access or interpreting the information of ISO 14001 standard and that they did not have experienced consultants to assist them in developing the environmental management system. Also the fact of not actually knowing what an EMS is or what are the ISO environmental statements cause a barrier for implementing one. Traditionally hotels focus on quality service to guests and gaining better profits through yield management and not that much on environmental issues. Hotels found it also hard to find resources for the rising environmental thoughts since the demand from the greatest stakeholders, customers, is not necessarily that strong yet. In order to maintain competitive the hotels cannot just hire a new manager responsible for environmental issues. The top management should also show commitment and offer the resources. Lastly, the barrier of certification and verification means that hotels should make a commitment to invest money, time and people to meet the required standards of ISO 14001. In addition to all these investments the verification costs can be relatively high. If the value of a certified EMS is not crystal clear for the company at this point it creates uncertainty and hinders again the adoption process of a formal EMS. Again, the smaller the hotel and lower class, the bigger the barriers become since implementing and EMS increases costs initially. Active support from stakeholders such as the government or the local actors (hotel association, holiday resort) is again needed for breaking down the barriers. (Chan 2008, 192-195)

In Ayuso (2007) study done in Spain the factors of hindering (or proceeding) the implementation of a formal EMS (in this case EMAS), were involvement of hotel management and staff, collaboration with existing organisations and cooperation with consultants and external auditors. If the personnel of the hotel is not aware of the effort needed for changing the current systems to be more environmental-friendly, it may result in barrier while the staff do not feel motivated to do needed work for it. If the existing organisations around the hotel do not offer the supporting services for increasing environmental quality, such as proper waste management or sustainable products, it might hinder the hotel's ability and willingness to implement a formal EMS. Thus, EMS in hotel industry is a tool that requires the biggest effort in terms of changing the practices of hotel managers and employees and also requires support from all relevant stakeholders. Last but not least the costs of certification and verification may be quite high for some hotels. First certification cost of EMAS is 3500 – 7500 € and after it comes the annual certification audit costs of 1500-2500 €. These high costs were recognized as an important obstacle in the study. (Ayuso 2007, 151-152, 156)

2.3 Eco-labels

In addition to organization-wide formal or informal EMS's, such as TQEM approach, ISO 14001 EMS or EMAS, less heavy methods for reaching environmental quality within an organization are available. On the contrary to EMS's where the scope of the approach is rather high, eco-labels offer solutions that are usually targeted for single service or product. Still, they raise the awareness towards environmental issues within an organization and offer a signal to customer's and consumer's of the environment-friendliness of the product.

2.3.1 Features of Eco-labels

In addition organization-wide environmental quality approaches as ISO 14000 and EMS there exist also more product or industry based certificates that are still applicable for processes. Eco-labels are usually certificates that are admitted by a third-party authority and can be called also green labels. They are voluntary instruments for implementation of high environmental performance and for aiming to reduce consumption, reduce environmental impacts of goods and services and gain market visibility (APAT 2002, 2). Eco-labels can thus be seen as tools that ensure environmental performance (Ayuso 2007, 150).

Eco-labels are rather consumer-oriented and the purpose of them is to steer consumers toward green products and encourage producers to develop environmental friendly products and services. They also provide information to consumers and communicate the less environmentally harmful nature of the product or service within its category. Having an eco-label can also improve sales and thus give competitive advantage. (Ayuso 2007, 150; Bhat 1998, 142) However it is not necessarily enough just to have an eco-label. A good eco-label should be recognized by the public and it should also mean something more than the substitute service or product, at least in the case when the eco-labelled product has a higher price. (Buckley 2002, 189)

While there are some synergies within the application of EMAS or ISO 14001 systems (APAT 2002, 3), eco-labels tend to be more product-oriented by nature and also more common in domestic or regional than in international use. Where the standardized EMSs and TQEM approach can be thought as quite generic approaches, eco-label programs can differ widely in different countries and regions and are thus less recognizable especially for the international public. While eco-labels should be applied internationally, they only need the regional recognition from the target market to gain maximum effectiveness (Buckley 2002,

191). An eco-label is also a mean to differentiate in the market and some observations indicate that the main motivation for applying an eco-label is the official recognition of it (Ayuso 2007, 151). An eco-label can thus also work as marketing tool in the company's target market.

2.3.2 Certified Eco-label Approach in Hospitality Industry

Tourists' decision making is only marginally influenced by eco-labels even that they have existed for more than 10 years. Tourists usually feel time pressure when choosing their tourism-related products and thus may not pay attention to the "information overload" caused by eco-labels. This is actually the question of whether tourists actually are able to fit in the environmental concerns to already demanding decision-making process. (Reiser & Simmons 2005, 590, 610) An eco-label is thus unlikely to be a significant factor in consumer choice if hardly any products bare that label or vice versa if almost everyone has it. When more tourists choose to buy a not eco-labelled product, it might higher the price of the eco-labelled product and thus results in barrier of buying, if the purchase of an eco-labelled product requires altruistic attitudes. (Buckley 2002, 198, 202)

While it has been noted in previous sections that standardised EMS systems such as EMAS or ISO do not suit smaller companies needs, an EMS aligned eco-label scheme solves the problem for smaller companies in this sense. In Ayuso (2007) it is noted that the hotels applying for an eco-label already have a record of environmental practices in place and do not need to make a big effort for fulfilling the criteria. The applied eco-label is still only an official acknowledgement of current environmental practice and is not likely necessary for business operations to run well, especially when the eco-label is not too known. The certification of an eco-label has also its own cost and this can be seen as one barrier for applying the label. (Ayuso 2007, 150-151)

There are over 100 eco-labels for tourism, hospitality and ecotourism and many of them are overlapping in sector and geographical scope (Font 2002, 197). The greatest proliferation of tourism eco-labels is in Europe and especially around Germany. Also one global eco-label for tourism is started by the World Travel and Tourism Council. A single global tourism eco-label scheme would have the advantages in recognisability but in order to be effective it should be highly customized to different countries, ecosystems and tourism activities. Thus, for an eco-label scheme to be affective it would need global brand recognition and audit procedures, different detailed criteria for various types of tourism accommodation, transport,

tours and activities. Transparent criteria and at least two levels of labelling as backup information are needed for the labels when given out to the public. (Buckley 2002, 184, 186, 192) What is also needed are standards aimed for different tourism sub-sectors but which simultaneously allow site-specific differences. If standards are ought to be measurable, benchmarks are needed for supporting the standards. These benchmarks should be context-specific and need external updating. (Font 2002, 201)

Since eco-label schemes in tourism are quite diverse and clearly it is very difficult to build a single eco-label to suit all the tourism needs, the focus from this point on is in eco-labels for tourism accommodation. It is noted that eco-labels are valuable tools but they will most likely be at their best when used along with other environmental management tools (Buckley 2002, 199). While eco-labels ensure compliance with fixed environmental performance criteria and help in communicating this to consumers, an EMS is helpful in assessing and planning the continuous improvement of environmental quality and performance (Ayuso 2007, 154). For these reasons, there are an increasing number of eco-labels that take into account also the management system and process approach of environmental quality creation. This means in practice that the company commits to make an improvement according to their own plans and resources but without necessarily committing to a certain threshold level (Font 2002, 202). They can apply for the eco-label when they have reached the needed thresholds but the help of the criteria can also be used as an informal EMS base.

Such eco-label criteria are e.g. Green Globe 21 (global) and Nordic Eco-labelling of Hotels “Swan” (the Nordic countries). Despite its international coverage and being the largest network in the field, Green Globe 21 hast still only a little market penetration (in the year 2002) (Font 2002, 198). Also the EU Flower fits into this scheme while it is relatively similar to the Nordic Swan and used widely in other Europe. These three approaches are presented below and their logos in figure 2-7.

Figure 2-7 Eco-labels

EU Flower and Nordic Swan

Nordic eco-label "Swan" and EU flower are general eco-label schemes for different product groups. For the product group hotels and accommodation the criteria includes requirements for areas of energy, water, waste management and chemicals and purchasing. They also require certain organizational and management aspects. According to Synergy (2000) Nordic eco-label for hotels has a generic management system approach combined with performance benchmarks and specific criteria. It encourages for creating comprehensive EMS with performance targets and supports investing in economic and environmental value technologies. It does not embrace the social and economic aspects that are part of the area of sustainability. (Synergy 2000, 19)

The detailed requirements for the Nordic Swan eco-label scheme are listed as appendix 1. Swan and EU Flower and relatively similar and due to this the Nordic Swan is common standard in the Nordic countries. It is only also applicable in the Nordic countries. From figures 4-4 and 4-5 it can be seen that Nordic Eco-label and EU Flower are most common in Sweden and Italy respectively. Nordic Eco-labels have been issued totally 315 (February 2010) and EU Flowers total 372 (November 2009). Nordic Eco-label was the first truly multinational eco-label for tourism services and in the year 2000 only three companies had been awarded with it (Hamele 2001, 181-128). So in ten years the Nordic eco-label for tourism has gained a remarkable popularity. Figure 2-8 presents the number of Nordic Swan eco-labelled hotels in the Nordic countries and figure 2-9 presents the number of EU Flower eco-labelled hotels by country.

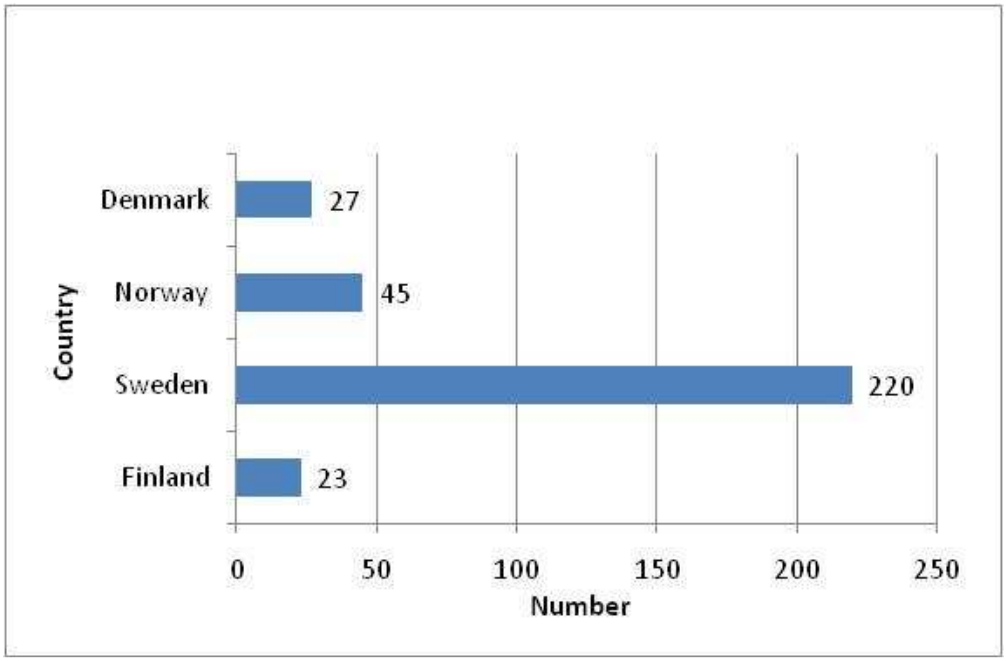

Figure 2-8 Swan eco-labelled hotels in the Nordic countries

(Data sources http://www.ymparistomerkki.fi/tuotteet?jta=search&pg=72, http://www.svanen.nu/SISMABDesktopDefault.aspx?tabName=ProduktLista&pgr=72, http://www.ecolabel.no/cgi-bin/svanen/imaker?id=272&method=lisenser, http://www.ecolabel.dk/licenser/produktliste?maerke=Svanen&produktgruppe=72, retrieved on 15.11.2009)

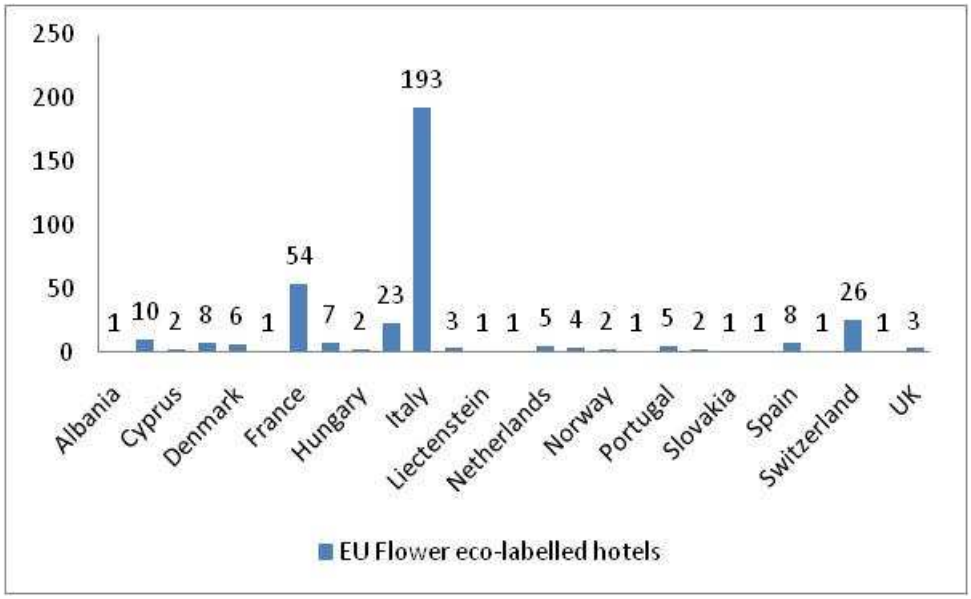

Figure 2-9 EU Flower eco-labelled hotels by country

(Data source www.eco-label.com, retrieved on 15.11.2009)

Green Globe 21

Green Globe 21 is one of the rare or even only eco-label schemes targeted for the whole world. It has three geographic focus regions that are the Americas, Africa-Europe and Asia-Pacific. Green Globe 21 eco-label offers guidelines and manuals that are helping the company in getting accredited. These manuals, however, are not formally incorporated in the accreditation criteria. This and the fact that Green Globe 21 does not have any baseline threshold criteria for accreditation makes it different from other eco-label schemes and also rather weaker since it is not as transparent to consumers and regulators as some other eco-labels can be. The accreditation criterion of Green Globe 21 is defined purely in terms of continuous improvement in areas such as energy and water consumption and waste management. (Buckley 2002, 192-193, 202) While the Green Globe 21 eco-label seems to be rather weak when compared to Nordic Swan and EU Flower and it does not have the recognisability in Europe or in the Nordic Countries it will be left out at this point from the scope of this research.

2.4 Measuring the Performance of Environmental Quality

Determining environmental quality costs is essential in order to see how and where the investments for improving environmental quality are. According to Emblemsvåg and Bras (2001), both the economic and environmental impacts of products and processes should be first assessed in order to be improved. To be able to reduce the overall environmental impact i.e. improve environmental quality, resource use should be investigated from the product perspective, process perspective and organizational perspective. (Emblemsvåg & Bras 2001, 8) Environmental costs and improvements can be managed and measured with the help of different environmental cost accounting and activity-based costing concepts.

In general managing and measuring environmental costs should lead to a better financial performance in the end. The idea is similar as Klassen & McLaughlin (1996) model of the linkage between strategy, environmental management and form performance presented in figure 2-10. Environmental management should work together with the corporate strategy of the company and with other functional strategies. Strong environmental management will lead to environmental performance which will thus lead to financial performance. (Klassen & McLaughlin 1996, 1199-1200)

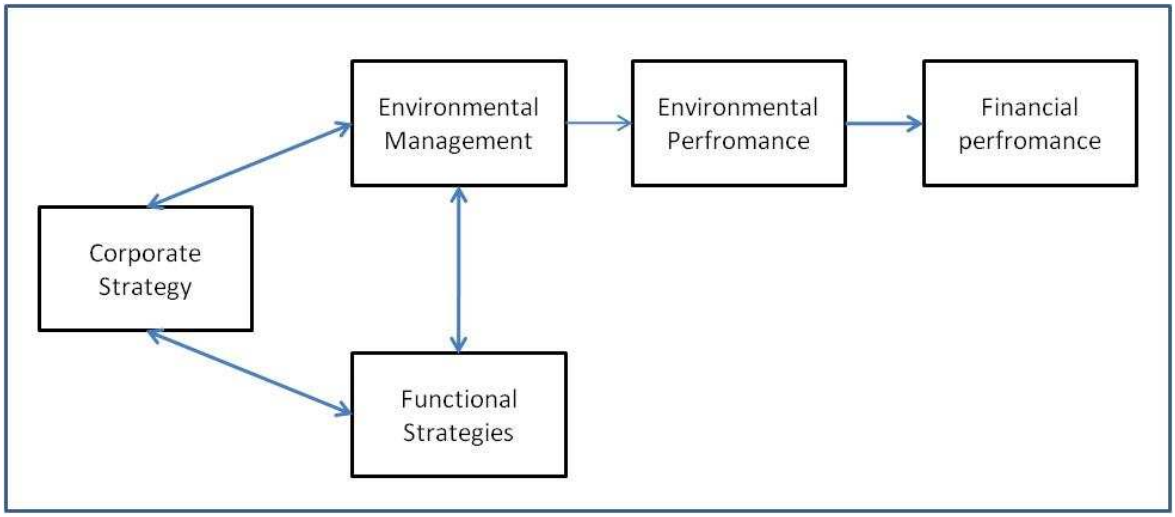

Figure 2-10 Linkage between strategy, environmental management and firm performance (Klassen & McLaughlin, 1996)

2.4.1 Cost of Quality

Cost of quality, frankly cost of poor quality, is a cost that is resulted from avoiding poor quality or occur as a result of poor quality of a product or a service. (Evans & Lindsay, 2008, 408) In environmental sense, cost of quality is the cost of generating wastes that do not add any value to the product or may even reduce the existing value (GEMI 1993, 4). Klassen and McLaughlin separate cost of quality similarly furthermore into two classes: the cost of creating quality and the cost of not seeking quality. The cost of creating quality divides into cost categories which are *prevention costs* and *appraisal costs*. The cost of not seeking quality divides into *internal* and *external failure costs*, respectively. (Klassen & McLaughlin 1993, 17)

Following the same logic, Drury (2004) reports four cost categories of environmental costs, which are environmental prevention costs, environmental appraisal costs, environmental internal failure costs and environmental external failure costs. (Drury 2004, 966) These categories of environmental quality costs do not differ remarkably from the general quality cost categories. In services, quality related costs are usually process-related costs and usually appear in contact with the customer. This means that the quality costs in services in general are highly labour-dependent. This and fact that services are intangible make the quality cost assessment more difficult. (Evans & Lindsay, 2008, 412) In theory the costs of quality do not differ from other costs and they can be budgeted, measured and analyzed like the costs from maintenance or operations (Oakland 1993, 184).

Examples of environmental prevention costs are training employees, recycling products and obtaining certifications to meet national or international standards. Environmental appraisal cost would be e.g. inspecting processes to ensure regulatory compliance and auditing environmental activities. (Drury 2004, 966) According to a study of different companies and environmental quality, it is suggested that an increase in prevention costs of investing in environmental quality does not only lead to a decrease in other environmental costs but also to a decrease in the total cost of environmental conformity (Chandrashekar 1999, 129). Environmental internal and external failure costs are for example costs of disposing toxic materials and costs of cleaning contaminated soil (Drury 2004, 966). This environmental cost classification is thus in a way classifying costs based on when they happen.

According to Alberti (2000) the costs of environmental quality can be classified in three categories. Firstly, the implementation costs covering internal and external human resources and the acquisition of new technology, production resources and tools. Secondly, certification and audit costs paid to an accredited organization (if such official environmental quality approach has been chosen). Lastly are the system maintenance costs. (Alberti 2000, 4456) This cost classification again tells where the environmental costs take place.

Some studies claim that it is not even necessary to separate costs of quality between prevention and appraisal costs of those from internal or external failure. The main thing is that investment in quality improvement should result in overall cost avoidance that offsets the initial investment. Therefore, the expenses of quality should not exceed the investments in quality and this is where the focus should stay at. (Laszlo 1997, 411-413) It can be concluded that investing in environmental quality will result as a cost as but also not investing in it may result as a cost. It is thus clear that environmental quality certainly has a cost, and the therefore in order to master the costs environmental quality cost management is needed.

2.4.2 Environmental Quality Cost Management and Activity-Based Costing

In general, usually the measurement of environmental quality cost is a mechanism for controlling progress and monitoring the key performance indicators in terms of money. The main thing in analyzing and reducing environmental quality cost is thus to describe the process and find out where the environmental cost come from.. To better manage these costs, the environmental cost drivers should be understood. (Epstein 1996, 12-13) Environmental costs are not however a separate type of costs but rather a part of an integrated system of materials, energy and money flows going through the company (Jasch 2005, 1196).

Cost accounting systems are often very weak with regard to environmental and material flow issues (Jasch 2005, 1210) and in many management accounting systems the environmental costs are still defined as overhead costs and are not allocated to cost objects (Drury 2004, 966). This spreading of costs to overhead accounts makes it difficult to see to what actually caused the cost and most companies do not even know their environmental costs. This makes effective environmental management almost impossible. (Epstein 1996, 12) While there is a growing trend to include information on environmental performance in the financial statements, companies willing to improve their environmental quality and performance measuring could implement environmental management accounting (EMA). EMA is management accounting (MA) with a focus on physical information on the flow of energy, water, products and materials and on monetary information on environmental costs and revenues. SME's might not have an independent MA system in place but they rather use the data from bookkeeping for reporting and internal decision-making. EMA is still applicable to SME's as well while it is not a parallel system from MA but simply doing better MA. (Jasch 2005, 1194-1195)

For an EMA to be successful, process-costing and activity-based costing (ABC) are recommended (Jasch 2005, 1194). Activity-based costing allocates overhead costs to products and services that use them by activity and resource drivers. Activity-based costing and activity-based management (ABM) are thus often used together with Total Quality Management (TQM) approaches. (Evans & Lindsay 2008, 413; Emblemsvåg & Bras 2001, 89) ABC necessitates that environmental quality costs should thus be separated to cost pools, analysed by appropriate categories and then traced to products or processes that caused them. ABC-systems have emerged only in the late 1980's and their aim is to use only cause and effect cost allocations in assigning indirect costs to cost objects. The environmental quality costs should be reported so that each or the four environmental cost categories (prevention, appraisal, internal failure, external failure) are expressed as a percentage of sales revenues or operating costs. This shows which categories have the greatest cost reduction potential and makes the comparison of previous periods possible. (Drury 2004, 58, 372, 966)

The beauty of activity-based costing lies in the handling of overhead costs. With ABC overhead costs (that environmental costs usually represent) are equally divided to the products or services based on how the products use activities that use resources. The tracing of the costs from resources to activities and further on to objects are done with resource and activity

drivers. A resource driver is a measure of the quantity of the resources consumed by an activity (e.g. the amount of electricity) and an activity driver is a measure of the consumption of another activity or the cost object itself (e.g. amount of labour or number of products). All activity and resource drivers have a numerical quantity associated with them, but it does not necessarily need to be a monetary term. A resource can have a multi-value cost measured e.g. in terms of $, kWh or kg. This makes ABC suitable method also for environmental management. Two generally used environmental dimensions in ABC are energy consumption and waste generation and they can also be used as environmental performance indicators. (Emblemsvåg & Bras 2001, 64, 68, 97,99)

2.4.3 Eco-efficiency Indicators

Motivations for companies to measure their environmental performance with eco-efficiency indicators are e.g. tracking performance and progress, identifying opportunities, cost-savings and benefits for improvement of eco-efficiency. It might also be helpful for consumers to understand the environmental performance of products. For example km / l of fuel used is widely recognized eco-efficiency indicator ratio. (WBCSD 2000, 8-9) When an organization is eco-efficient it uses fewer resources and thus causes fewer emissions while producing the same output as competitors. This is likely to lead in higher operating margin due to lower costs and to higher sales due to improved public image. The term “environmental performance” should me made clear by its definition. For example ISO defines it to be “the result of organization’s management of its environmental aspects” and thus means that environmental performance could be measured against organization’s policy objectives and targets. Müller & Sturm (2001) define environmental performance to be something that has no reference to an economic figure (eco-efficiency has). (Müller & Sturm 2001, 9, 11, 14) So it can be concluded that the term “environmental performance” does not necessarily need to relate to monetary terms.

According to Müller & Sturm, an eco-efficiency indicator is the ratio between environmental and financial variable and in order to be consistent, environmental items should be calculated on the same basis as financial items. Eco-efficiency indicators can thus be used for forecasting the impact of environmental issues in future financial performance. These indicators should be globally recognized and comparable within an organization and also between them. They can be either generic or industry specific. (Müller & Sturm 2001, 8, 10, 11) The equation of Müller & Sturms eco-efficiency indicator is the following:

Eco-efficiency by Müller & Sturm (2001) =
Environmental performance / Financial performance

In the equation the environmental item is an absolute figure of environmental performance. Five different items have been selected, which are *energy purchased (MJ), water use (kg), global warming emission (kg), ozone depleting substances (ODS) (kg) and solid and liquid waste (kg*) (36). The financial item is measured in monetary units and is recommended to be either *sales* or *value added*, which means the sales minus costs of goods and services purchased.

According to World Business Council of Sustainable Development (WBCSD), eco-efficiency is a tool for measuring the relationship between environmental progress with more efficient use of resources and lower emissions and economic prosperity. Eco-efficiency indicators should be e.g. relevant and meaningful, recognize the diversity of business, be based on overall assessment of the company and recognize the relevant upstream and downstream issues of the supply chain. The equation for it however different from Müller & Sturm's, but WBCSD recommends it because in this form and increasing efficiency ratio reflects a positive performance improvement. (WBCSD 2000, 2, 6, 9, 11)

Eco-efficiency by WBCSD (2000) =
Product or service value / Environmental influence

Like Müller & Sturm, WBCSD uses almost the same items with the exception that value added is replaced with volume of goods and services. WBCSD also stresses that eco-efficiency information should internally be part of routine management system and externally interpreted in environmental and financial reports. They do not recommend publishing a stand-alone report for eco-efficiency but rather included in the mentioned reports as eco-efficiency profile, which includes all the relevant used for calculating eco-efficiency indicators. (WBCSD 2000, 4, 26)

3. Managing Environmental Quality in Hospitality Industry

In this chapter the most reasonable features of theoretical approaches presented in chapter 2 are combined to a separate framework for managing environmental quality in hospitality industry. The framework is built so that it supports the definition of environmental quality in this thesis as much as possible (see chapter 1.1).

3.1 Environmental Quality Management System – a Model

When keeping in mind the focus area of this thesis, hotel and hospitality business, three separate theoretical approaches that fit the given topic were chosen. Figure 3-1 shows the different perspectives to environmental quality within this research, how they differ in the level of standardization and what is the scope of the approach in respect to the organization. The theoretic approaches to environmental quality studied in the literature review were Total Quality Environmental Management (TQEM) representing a base for informal environmental management system, standardized Environmental Management Systems (EMS) and certified third-party eco-labels. All of these methods enhance organizations work towards greater sustainability and in this chapter the essential features of each method are studied and based on them a model for managing environmental quality is created.

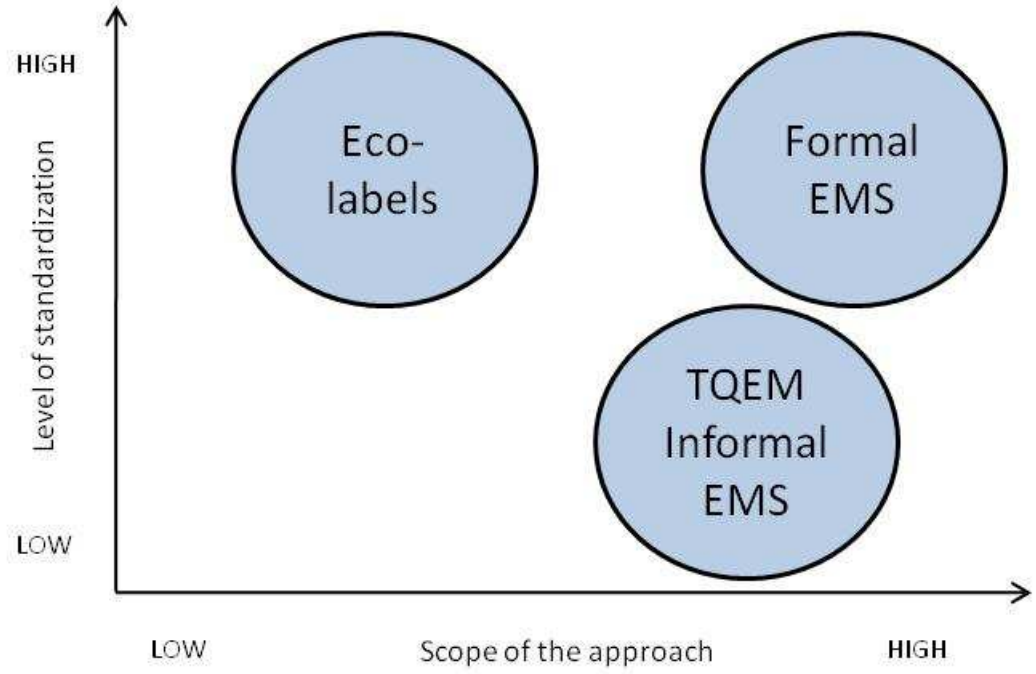

Figure 3-1 Differences of the approaches to environmental quality

It can be clearly seen that with TQEM environmental issues can be applied to total quality management of a company. As both of the frameworks (TQEM and TQM) focus on similar features, environmental quality can be seen as aligned to "general" quality. TQEM still seems to be quite generic tool for environmental quality management and might need extra help hired when implementing it. Implementing such a system as TQEM is without a doubt a big process and it might result greater benefits in larger companies rather than in the small and medium sized ones. It has been studied that larger firms, probably because of their greater experience, access to resources and cost bearing ability, larger companies are more likely to adopt TQEM programs (Harrington et al 2008, 3005). SME's most scarce resource is management time while managers are busy with daily activities and have less time for other projects. Due to this planning processes are usually informal and take place in individual minds and also the extent of training and staff development are limited. However, if aim is to successfully implement a quality improvement project, management and staff devotement is a necessity. (Ghobadian 1995, 88, 90)

An accredited EMS gives a hotel the status of doing things right and it most probably also improves and streamlines the hotel's operations in longer run. Many barriers still exist for implementing a formal system, mainly the investments needed for it and the "formalness" of the system, i.e. the yearly audit costs need to be paid whether you have customers or not or whatever the economic situation might be. Thus, hotels implementing a formal EMS need support from many stakeholders, and also prove, that the certification is worth receiving for the environmental quality improvements, i.e. how the customers perceive it and how it affects the company's financial operation. It seems that the a formal environmental management system is not yet a best practice of the industry and may not ever be for the majority of the companies in hotel and tourism industry, mainly due to their relatively small size.

According to Ayuso (2007) eco-labels and EMSs are the only instruments that can guarantee improvement in company's environmental performance. Eco-labels tend to set a fixed criterion that ensures minimum performance level and EMSs target several functions of business management. An EMS seems thus to be most comprehensive while it combines written environmental policy, best practices to implement the environmental strategy and performance indicators for monitoring the progress (in other words it has strategy, action, communication and assessment). (Ayuso 2007, 154-156) From here we can see a sign of overlapping terms. Ayuso (2007) defends EMSs as being the most complete tools but for

example the eco-label Nordic Swan has all the same instruments. Also it can be seen that formal EMS's as such do not guarantee improvement in environmental performance, at least not in financial terms while no measurement tools exists ready.

Since eco-label schemes are more unique they tend to have more specific requirements that are easier for small companies to implement (e.g. Nordic eco-label Swan). Where the organization-wide environmental systems can be too heavy for a smaller organization, eco-labelling programs can give them easier and cheaper tools and ways to focus on environmental issues and thus the environmental quality of the company. By adjusting company's processes to fit the certification criteria also creates a more qualified service supply since the processes have to be thought through again. It can thus be concluded that having an eco-label means that a company has improved its environmental quality in order to receive such a label or just been already environmental friendly enough.

The overlapping definitions also raises a question whether for example Nordic Swan is an eco-label scheme or EMS or a combination of certified eco-label and non-formal EMS or can it seen even as certified EMS, even if it is not certified by ISO or EMAS. Nordic Swan is clearly more performance-based than an EMS while in the same time being also process-based. In this case the Nordic swan eco-label would be more suitable than the EU Flower while it is more recognized in the market in Finland. Eco-labels as such offer ready performance indicators that can be easily transformed to monetary eco-efficiency indicators with small calculations. Nordic Swan also has the benefits of having a ready-made tool aimed directly for hospitality industry and it is relatively easy to implement due to comprehensive manuals. Even if the case company would not be aiming for getting the actual eco-label, the Nordic Swan criteria offers a good starting point for improving environmental quality.

The presented environmental quality approaches are in many extent overlapping and the benefits gained from certified systems are more or less non-tangible in economical sense. They all have their good sides and useful elements but it is clear that none of the approaches is "a clearest winner" in all terms. All of them highlight management support and that environmental quality should be incorporated as a mind-set of the company. When it comes to finding out the answer for the fourth research question "Is some of the approaches suitable by itself or is there are a need for creating a new model or approach?" the answer is no. Therefore in the scope of this research it is better to create a new model for managing environmental quality in the case company based on a combination of the presented

approaches. The model created for the case company is a mixture of the approaches presented before and of the environmental quality framework presented next.

3.2 Environmental Quality Framework

Figure 3-2 presents Environmental Quality Framework that illustrates the approach towards overall environmental quality in hospitality industry in this research. The features are viewed later in chapter 4 forming the case company's point of view. Physical parameters and performance measures, while still being separate units, should mainly relate to environmental quality through operating scheme. This means that operating scheme is the cornerstone of the model and the strategic approach to environmental quality. Of course physical parameters and measuring performance affect directly to environmental quality but essentially they should "serve" the operating scheme part first.

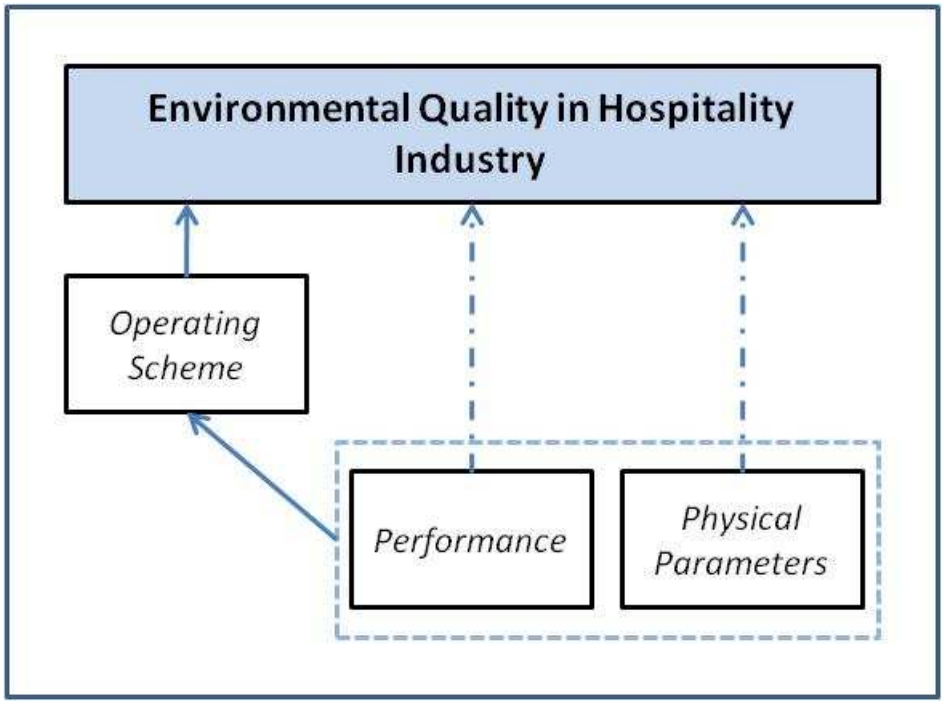

Figure 3-2 Environmental quality framework

3.2.1 Operating Scheme

Operating scheme means the "how and where" of the hotel: where it is located and how this affects physical parameters, how environmental issues or general quality issues have been dealt previously in the hotel and what is the management's mindset towards environmental issues. If quality issues are already important in the hotel, the staff and management are motivated for improving also the environmental quality and some measurement systems are

already in place then the prerequisites of environmental quality are quite good. If again the management does not really see the reason why to invest time and efforts to environmental quality, the environmental quality as such is probably lower in the first place and it will take more and greater efforts if the environmental quality is to be improved. Operating scheme and its effect on environmental quality is thus more on the non-tangible side and is highly case sensitive.

Both TQEM and standardized EMSs are more or less similar by basics (process-based) with the distinction that standardized EMSs require more public communication in the form of environmental policy than TQEM. This is basically the price for having a certified system to deal with environmental issues within a company. The real value of a certified EMS as a supply chain –wide management system still seems to be arguable. Also the non-common best practices for integrating environmental and economical aspects in the form of eco-efficiency or cost analysis do not seem to exist, neither in standardized EMS nor TQEM.

It thus seems that in EMS's and TQEM environmental performance is a subjective term and there is no standardized and commonly accepted way to measure it. This means that some performance measurements and indicators should anyhow be added. The certification may still as such quite well give competitive advantage. Theory seems to support the fact that EMS's and TQEM are more suitable for larger companies and may in this case be too heavy for the hotel in case. Because the case company is an SME and the manager's time is limited, the operating scheme phase of the model should clear, precise and comprehensive. It needs to be easy to implement and it actually represents a guideline to change the whole organization's mindset towards more environmental thinking.

Operating scheme part of the model is based on theories of TQEM, EMS and certified eco-label approaches. All of them support the proper planning and operation-wide approach of environmental management, although from formal EMS's ISO 14000 features seems to be more suitable for hospitality industry than EMAS. The best practices of each of these approaches are gathered as one combination that should be executed in order to ensure environmental friendly actions within the organization. The main common features that all the systems include are defining environmental policy and setting targets, creating environmental strategy, internal communication and external communication.

Defining environmental policy and setting targets (goal-oriented approach and continuous improvement)

Eco-label schemes Swan and EU Flower and standardized EMS's include forming an environmental policy presenting the general attitude towards environmental within the company and goals and objectives for the future. Also reporting and documentation and yearly reviews are included here. This in a way represents the continuous improvement aspect of TQEM where mapping and preventing causes of environmental problems is an essential feature. The environmental policy works also as a message to customers and other stakeholders and shows the management commitment. Environmental policy should also include the decided environmental targets which are reviewed each year, as stated in TQEM definitions by Bhat (1998).

Creating environmental strategy

Creating environmental strategy means, by TQEM, systematic and ongoing effort in order to improve business processes. It also means that jobs should be done right by the first time and environmental problems should be recognized and prevented before they occur. EMS's and especially ISO defines this planning environmental actions and implementing them to operating processes and procedures. A necessity for being able to create an environmental strategy is to know the processes of the hotel operation. This is described later in chapter 4.

Internal communication: learning, training and guidelines (stress on team work)

In TQEM involving the internal customers to production of quality service and stressing teamwork are essential features, while TQEM should be seen as a system and work should be done across organizational boundaries. In TQEM the job should done right at the first time, which also sets importance on proper training of employees in how to deal with environmental quality and giving opportunities for them to learn with proper guidelines. ISO 14001 brings up features of communicating the environmental message internally and creating awareness through training.

External communication: marketing and guidelines for customers (strong customer and stakeholder focus)

TQEM has a strong focus on external customers, i.e. the end-users of the product and they should be clearly identified. ISO 14001 stresses that the environmental message of company's

actions towards environmental issues should be communicated also externally to customers and other stakeholders. The external communication means thus proper marketing for customers and guidelines for employees.

3.2.2 Physical Parameters

Physical parameters part of the model is the base that actually enables calculating the Performance part of the model and it is mainly collecting data of the different parameters. Therefore physical parameters part of the model is a must in order to actually be able to see the current state of environmental management, improve or create it from the bottom. Physical parameters affecting environmental quality are those tangible factors which clearly affect the environmental capability of the hotel premises and the service operations done in the hotel and thus affect the environmental quality of the hotel. Physical parameters form the manufacturing-based quality of environmental quality in hospitality industry, where quality is conformance to specifications, as defined in quality perspectives of Evans and Lindsey (2008).

Energy use, water use, waste management and purchasing are usually seen as the most relevant physical parameters (APAT 2002; Bohdanowicz 2006; Erdogan & Baris 2007; Gössling 2002; Kirk 1995; Nordic Eco-labelling 2007). These four focus points are forming the base for approaching environmental quality in hotels. Improving the quality in these four factors will most likely increase the environmental quality of the hotel and its services. Other approaches to general quality also mentioned are quality of indoor air, indoor noise level and participating in environmental protection programs (Bohdanowicz 2006; Bohdanowicz and Martinac 2007; Scanlon 2007; Molina-Azorin et al 2009; Nordic Eco-labelling 2007). These however are not that tangible physical parameters and are not that much affecting the environmental quality of a hotel in the sense of prohibiting the global warming. The four chosen physical parameters are thus energy, water, waste and purchasing

Energy

Energy use of a hotel is mostly affected by the physical parameters of the building. These are for example size, structure and design of the building, age of the facility, geographical and climatic location, installed energy and water systems and their operation and maintenance schemes and energy and water resources available. Other issues affecting the energy consumption are the hotel operations such as catering outlets, laundries, swimming pools and

spas and recreational and conference/business facilities. Naturally the occupancy rate is also one of the major factors affecting the energy consumption at a certain moment. It is also worth noting that mid-market hotels seem to have lower energy consumption than the upscale ones. (Bohdanowicz & Martinac 2007, 83, 85)

Energy used is mostly comprised of electricity and heating or air conditioning, depending on the geographical location. Direct electricity heating is used in some hotels according to Bohdanowicz and Martinac (2007) but usually the electricity is used mainly for operating appliances, such as cooking, cooling, illumination and cleaning and other appliances such as computers and televisions (Gössling 2002, 290). The forms of used energy affect the environmental effects of energy and also to the prices of energy consumed. The utilisation of renewable energies is typically limited to purchase of "green" electricity. In their study, only few hotel facilities in the Mediterranean area use solar energy for hot water generation. (Bohdanowicz and Martinac 2007, 85) In Finland central district heating is often used as heating energy, which lowers the direct electricity consumption but does not necessarily cut down emissions or the price of the energy bills (results from the empirical analysis).

Management and measuring of energy use is a part of overall environmental management in hotels and it is also a factor in competitiveness (Erdogan & Baris 2007, 612). Energy consumption in hotels is mainly measured in two ways, kWh/m^2 or kWh/guest night (GN) (Nordic Eco-Labelling, 2007). In Sweden the average energy consumption of hotels varies between 198-379 kWh/m^2, depending on the geographical location. The acceptable upper limits of the Nordic Swan Eco-label are 235-469 kWh/m^2 (Bohdanowicz 2006, 665). It can thus be seen that Swedish hotels, despite the country's northern location, are quite energy effective. Still, climatic conditions are strong determinants for the final energy consumption (Bohdanowicz and Martinac 2007, 90).

Another term for guest night is bed night (BN). Energy use per GN or BN means the daily energy use of a tourist in the certain accommodation premise (Gössling 2002, 288). However, comparing figures of energy consumption of different years needs a fixed base. The amount of sold GN's differ from year to year and are not therefore a valid measure in estimating yearly energy consumption (unless a yearly average of kWh/GN is calculated each year based on actual energy consumption). Thus, the calculation kWh/m^2 seems more reasonable calculation method in management of energy use. It also ignores better the fact that in

Lapland both outside air temperature and the amount of tourists vary greatly between different seasons.

Water

Usage of water causes environmental impacts, mostly in areas where water resources are already scarce and tourism tends to increase water demand in those areas (Gössling 2002, 297). Water use follow-up does not seem to be that popular among hoteliers, at least in Europe, since no collective data for water use in European hotels exist (Bohdanowicz 2006, 665). It is still used in many instances such as bathroom facilities, heating, cleaning, in the hotel kitchen and naturally in swimming pools. Managing water, i.e. follow-up of water use and saving, would reduce the environmental impacts of water. (APAT 2002, 33) Water use always also necessitates the treatment of wastewater, which can also be a serious environmental risk when left undone.

At least in the Nordic countries and in most parts of Europe these things are taken care of properly. Saving water is still a good thing for hotels to do, since if not benefiting the environment, it at least decreases the operating cost of the hotel. According to Bohdanowicz and Martinac (2007), constantly rising prices of energy and also water necessitates water and energy conservation actions in hotels. For these actions to be successful the main prerequisite is to gather data of the water and energy and consumption in order to see in which level the consumption is. (Bohdanowicz and Martinac 2007, 83) The limit value for water usage in hotels is 200-300 liters/GN (Nordic Eco-labelling, 2007). However, tourists tend to spend more water when staying in hotels than at home. Water consumption per tourist ranges between 100 and 2000 liters/GN (Gössling 2002, 298), from which the latter figure is highly over limit values mentioned above.

Waste

Waste management normally includes sorting of waste, avoiding the use of single packages and relations with municipal waste management and recycling firms. Generation of wastes is probably the greatest visible impact hotel industry has for the environment. Waste categories include normally plastic, metal, glass, paper and food and according to study of Erdogan & Baris (2007) hotels produce mostly paper and food waste. (Erdogan & Baris 2007, 608, 612) Essential part of waste management is to understanding the hierarchy of waste minimization. Most favourable is to minimize the amount waste, followed with reusing and recycling the

product. Less favourable and more harmful for the environment is the disposal of waste either by incinerating or as landfill, which is the most damaging for the environment (Kirk 1995).

In Bohdanowicz's (2006) study in Sweden, responsible waste management seemed to attract most attention, while responsible waste management has been highly promoted in the Nordic countries in the past 15 years (Bohdanowicz 2006, 670) This responsible waste management orientation can thus be seen also in hotelier's actions and as a socio-cultural aspect. The limit value for un-sorted waste per guest night is 0,45-1,35 kg/GN by Nordic Eco-label criteria.

Purchasing and chemicals

Focus for purchasing means buying products that are sustainable and safe, using local products in order to decrease the transportation distances and aiming for bulk deliveries. A proper purchasing policy emphasizes recyclable products, energy-saving equipments and reduced use of detergents. (Erdogan & Baris 2007, 609) Hoteliers should also involve and courage the suppliers to supply products with lower environmental impacts or eco-certify their products and services (Bohdanowicz 2006, 675). Other often purchased items in hotels are chemicals used for cleaning, which have an impact on water quality, soil protection and biodiversity (APAT 2002, 33). Environmentally sensitive purchasing policy should apply as well to these products. A Nordic Eco-labelling criterion has set limit values for chemical product use as 25-35 g/GN.

3.2.3 Performance

Environmental quality initiatives have also a price tag and thus the when considering environmental quality economical aspects should also be taken into consideration. These include cost of quality, environmental quality cost management and ways to measure environmental improvement. In order to ensure the profitability of the investments in environmental quality, some monetary measurements should be included to cost and perfromance analysis of environmental quality.

Performance part of the model deals with environmental and economical performance indicators. As stated by Klassen & McLaughlin (1997) in chapter 2, strong environmental management and performance will lead to financial performance. If the performance indicators are not known, estimating the cost of environmental quality is also rather difficult. There exist huge amounts of different performance indicators and usually they even created

internally based on the needs of the company in question. Some performance indicators may not directly be monetary, such as energy use kWh/m^2, but it still works as an indicator of costs while the common understanding is that the price of energy is not going to fall, at least not remarkably. Therefore the rise in kWh/m^2 ratio will probably result as in a rise in energy costs as well.

For the model here the performance indicators chosen economical aspects part of the model are energy use kWh/m^2 and €/m^2, water use in liters/GN, liters/m^2, €/GN and €/m^2, waste production in kg/m^2 and €/m^2 (also per GN), chemicals use g/m^2, g/GN, €/m^2, €/GN and finally also energy use per sales (kWh/€). Eco-efficiency indicators presented by WBCSD (2000) and Müller & Sturm (2001) seem to offer almost the same information as the performance indicators in the model and are thus not presented here. Eco-efficiency indicators seem also to be more profitable for bigger companies working rather in heavy industry are maybe not that valuable for a small SME working in accommodation industry.

The environmental performance indicators presented in the model represents closest the theory of Activity-Based Costing because here the resources are separated and they have a multi-value cost measure. When these resource indicators are linked to activities, e.g. to different services in accommodation processes, we are starting to be really close of Activity-based Environmental Management and be able allocate actual environmental costs to real cost objects instead of having all the environmental costs (energy, water etc.) as overhead costs.

3.3 The Extended Model and Positioning Towards Other Theories

The developed framework for managing environmental quality in the case company is presented as a whole in figure 3-3.

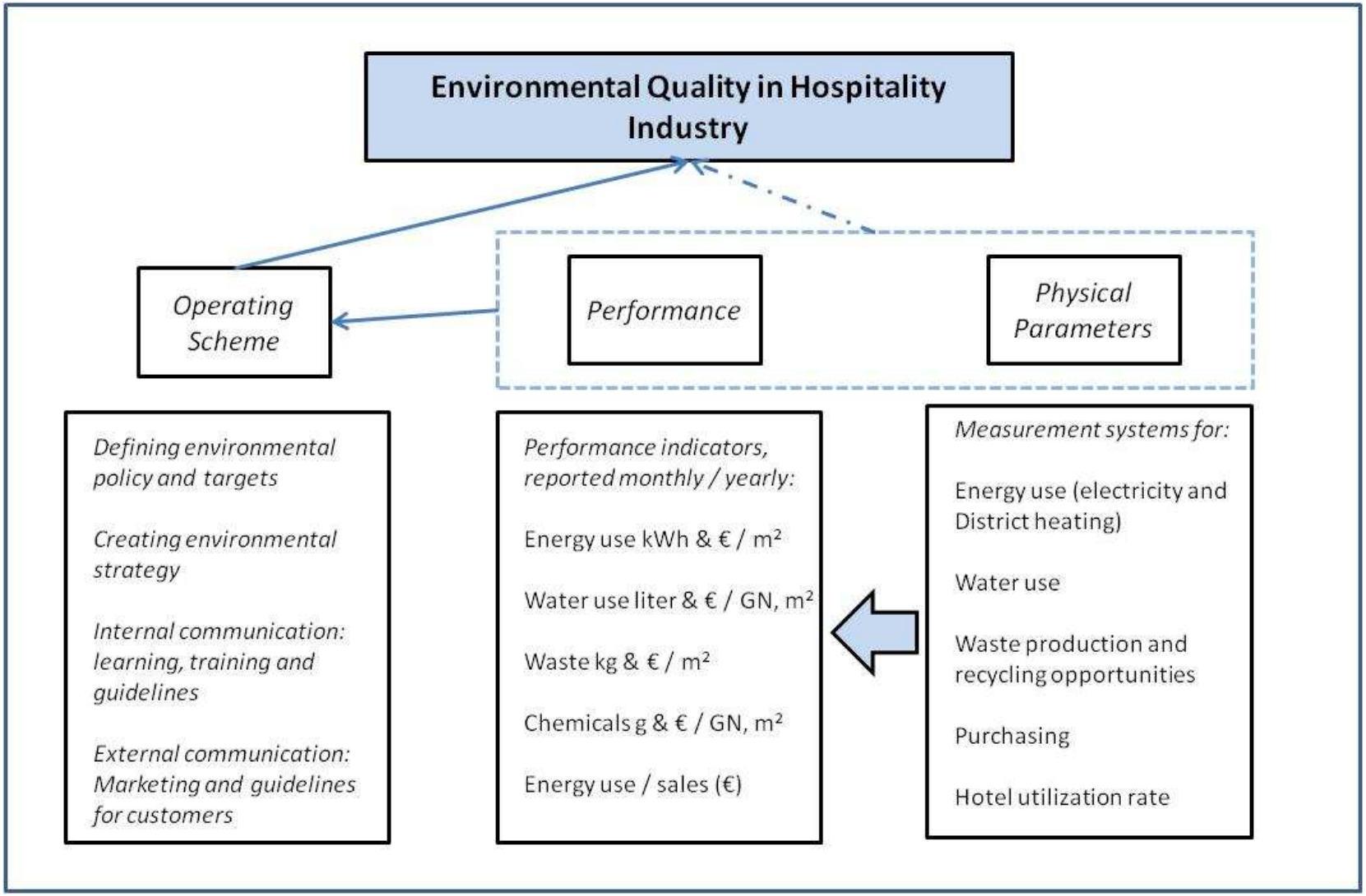

Figure 3-3 Environmental Quality in Hospitality Industry

In figure 3-4 we can see how the created framework positions in relation to other environmental quality approaches. The created frmework thus fills in the empty spot in the field by offering a low-scope approach (aimed for one industry at a time) and low level of standardization, that also increases the flexibility of the framework. Therefore it is suitable especially for SME's needs.

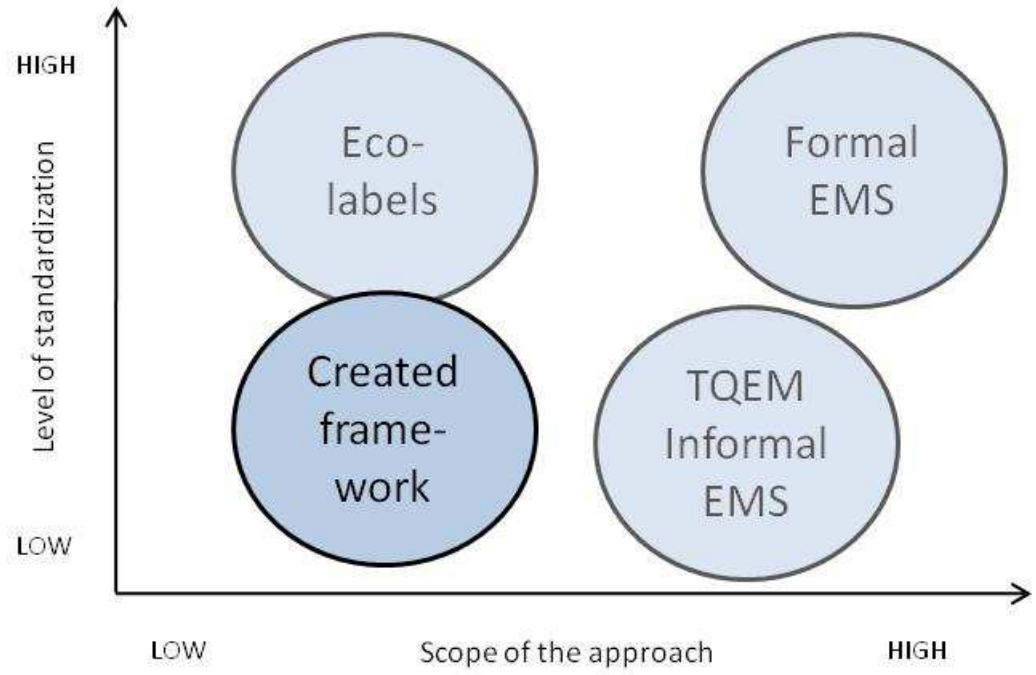

Figure 3-4 Created framework in relation to other environmental quality approaches

The created framework in this thesis is designed for hospitality industry but in theory it might work also for SME's in other industries. The things that differ between industries are the most commonly physical parameters, which are also the cornerstones of the model. Therefore by changing the physical parameters and by re-determining the performance indicators the model would work in other industries as well. As such it is almost suitable for any kind of business that has something to do with facilities or real-estates, while the most important environmental quality features will result in the area of energy and water consumption, despite the location or industry of the business.

4. Case study - Building an Environmental Management System for Hotel K5 Levi

The aim of the case study is to create an environmental management system for Hotel K5 Levi with the model presented in chapter 3. The logic of case study is following: first the basic information of the hotel is presented and also service processes are described. After this the features of the model are described with the facts and figures from the hotel in case. First the physical parameters and performance are dealt and based on this information the features operating scheme part of the model are determined for the hotel.

4.1 Presentation of the Hotel

The quantitative data for the presentation of the hotel were gathered mainly from invoices and information systems. Some informal interviews were also made in November 2009 at the site of the hotel, in order to have a common picture of the state of the environmental quality at the hotel.

4.1.1 General Information

Hotel K5 Levi was opened in August 2002 and it is situated in the Levi skiing centre in Kittilä, Finland. The hotel has 35 rooms, which are presented below in table 4-1.

Table 4-1 Hotel K5 Levi room types

Room type	Number of rooms	GN capacity	Room size in m^2	Equipped with
Double room (2 pax)	15	30	32	Sauna (in three rooms jacuzzi bathtub), glass-walled balcony, Internet-connection, television, telephone, DVD player, ironing equipment, clothes-drying cupboard, hair dryer
Room for four persons (4 pax)	15	60	45-50	Sauna, glass-walled balcony, Internet-connection, television, telephone, DVD player, ironing equipment, clothes-drying cupboard, hair dryer
Suites (2 pax)	5	10	31,39	Jacuzzi bathtub, glass-walled balcony, Internet-connection, television, telephone, DVD player, ironing equipment, clothes-drying cupboard, hair dryer
Total	**35**	**100**		

Given that the total capacity of the hotel is 100 beds per night, we can assume that the yearly guest night capacity is 100 * 365 nights, which totals to 36 500 guest nights / per year with full capacity. Below in table 4-2 the occupancy rates from previous four financial years are presented. It should be noted that the relatively lower occupancy rate in financial year 2009-2010 is due to global recession that started in fall 2008. However, the average occupation rate over previous four years is closer to 60 %.

Table 4-2 Occupancy rates 2006-2010

Financial Year	Occupancy Rate
2006-2007	55 %
2007-2008	61 %
2008-2009	65 %
2009-2010	48 %
Average	57 %

Based on the total capacity of guest nights per year (36 500) and the average occupancy rate (57 %) from previous four years, the average amount of guest nights (GN) per year is approximately 20 860. Hotel K5 Levi also has 16 separate high-class apartments at the same lot, sizing from 70 m^2 to 242 m^2. These apartments have, however, left out from this research while they represent a somewhat different service type than hotel rooms. The heated surface area of the hotel is 4 362 m^2 and 7 327 m^2 when the apartments are calculated with. Since the data gathering of the physical parameters in this study is done by calculating data from invoices both surface area figures are needed to be used because of the differences in invoicing methods. Electricity and district heating invoices include the consumption for the whole real estate (hotel and apartments) but e.g. water consumption invoices separate the water consumption between the apartments and hotel (each have separate water consumption gauges). Due to data gathering method also the time span of the study is limited to last four years, starting from financial year 2006-2007 (the financial year of the company is 1.5.-30.4.)

4.1.2 Service and Accommodation Processes and Cost Allocation

In order to be able to create an environmental management system for accommodation service provider the basic process of the service needs to be described. APAT (2002; 18, 21, 24) separates accommodation services to class A and class B services. Class A services comprise of the components that can be divided by the following physical boundaries presented in table 4-3.

Table 4-3 APAT Class A Services

A 1 Room premises	A 2	A 3 Common rooms
A-1-1 Bedroom area A-1-2 Private Bathroom etc.	Reception / administration area	A-3-1 Corridors A-3-2 Lounges etc.

Class B services again are linked to tourist accommodation according to following categories presented in table 4-4.

Table 4-4 APAT Class B Services

B 1 Food services	Kitchen, restaurant, bar
B 2 Wellness and recreation	Swimming pool, sauna, sports facilities, solarium etc.
B 3 Conference services	Conference area, sanitary facilities, administration, common rooms etc.
B 4 Green area	Garden, park, fields etc.
B 5 Parking area	Indoor and outdoor parking, transport means
B 6 Shopping services	Supermarket, other shops
B 7 Other	

Jones et al (2003) again describe accommodation processes by identifying socio-technical systems in hospitality operations presented in table 4-5.

Table 4-5 Accommodation processes (Jones et al, 2003)

Operational systems (operation-wide)	Procurement and control, stores, maintenance and engineering, environment and waste
Accommodation services	Front office, housekeeping
Food production systems	Food preparation and production
Food and drink service systems	Foodservice and dining, cleaning and dishwashing, bars

None of the classifications as such is not enough suitable for analyzing accommodation processes while they are somewhat simplistic as such. However, when combining these accommodation process classifications to a single framework case company's accommodation processes can be properly described. The frameworks are combined in a way that each system or service is allocated to certain area of the hotel. The areas are described with physical boundaries, here rooms, common facilities and restaurants, which are derived mainly from the APAT model. Systems and services allocated to each physical boundary are again taken from Jones et al model.

Hotel K 5 Levi has in addition to hotel room premises also common lounge with a bar, fine dining restaurant and kitchen, conference facilities, gym, play room for children, self-laundry facilities for guests, some office premises and a parking garage. Table 4-6 presents the services and accommodation processes of hotel K5 Levi.

Table 4-6 Hotel K 5 Levi services and accommodation processes

	Rooms	**Common facilities**	**Restaurants**
Physical boundaries (objects)	Rooms and suites	Conference facilities, gym, self-laundry, parking garage, common lounge, play room for children, office premises	Fine-dining restaurant, bar
Systems/ services (activities)	Front office, Housekeeping, Maintenance and engineering	Housekeeping, Maintenance and engineering	Food preparation and production, Foodservice and dining, clearing and dishwashing, bars

The main focus of this research is to study accommodation services comprehensively and the "Restaurants" main group is limited out. In the case study, restaurants premises are simply incorporated to the whole hotel as system and area as such and not handled as a separate unit with unique functions. Creating an environmental management system for restaurants is a wide scope and basically gives background for another thesis.

Describing the service and accommodation processes also helps in the allocation and classification of environmental costs. While the case company was not in the time of writing this thesis able to change their management accounting system, the environmental management accounting and cost allocation is presented here quite shortly and basically only

described how it could, or should, be done in principle. Having an environmental management accounting system aside with general management accounting is still something that the case company is highly considering.

Physical boundaries can be considered as objects and systems and services as activities and this way the Activity-based Costing method can be used for allocating costs to different cost objectives, as mentioned in chapter 2.4.2. As an example could be calculated how much energy or chemicals are used by housekeeping activities per room per year or how much waste is collected by housekeeping or maintenance from hotel rooms or common facilities. This kind of system would need a lot of time and effort to set up and it was not possible to test in the time span of this thesis. It would also offer possibilities for calculating certain performance parameters that are not yet possible to calculate, as seen later in chapter 4.3. Further on after figuring out the environmental costs with the help of ABC-costing, the costs could be allocated to each environmental quality cost category (prevention cost, appraisal cost, internal failure cost and external failure cost) and then proportion them to operating costs or sales, whatever figure suits better.

In ABC, most commonly used resources are energy and waste and the system lies on the fact that each object is responsible for consumption or resources. It is not always necessary to separate environmental costs to different cost pools while some of the environmental costs may actually be costs from improving environmental quality. It is thus wiser to separate actual environmental costs (e.g. use of energy) from the cost of the initiatives that are aimed for improving environmental quality. Basically the cost separation can be done also with the help of the model developed for this thesis. Costs deriving from physical parameters use can be thought as actual environmental costs and costs resulting from actions in the operating scheme part of the model are the costs of improving environmental quality. Hence, activity-based costing should be used together with physical parameters part and environmental cost categories mentioned above, or Alberti's environmental cost classification of implementation costs, certification costs and system maintenance costs, should be used more with operating scheme part of the model. Alberti's system maintenance costs can though also be thought to represent costs in physical parameters part in the model.

4.2 Physical Parameters and Performance Indicators

Physical parameters form the base for deriving economical and environmental performance, i.e. the key numbers for analyzing the level of environmental quality within the hotel. This is why both of the topics are dealt in this same chapter. Main actors in both physical parameters and economical aspects are energy use, water use, waste production and use of chemicals. In addition the hotel utilization rate is also needed in order to be able to calculate some of these performance indicators. Carbon footprints of the categories can also be calculated when the emission factors of each category are known.

The Nordic eco-label Swan determines limit values for the categories mentioned above. Limit values of Nordic eco-label Swan are divided into classes A, B and C presented below in table 4-7. The class division is mainly based on restaurant turnover in comparison to total turnover or lodging occupancy rate. (Nordic Ecolabelling of Hotels and Youth Hostels, 2007) Hotel K5 Levi occupancy rate over the last four years has been 57, 17 % , so it belongs to class B. Energy consumption in addition takes into account the geographical location of the hotel, hence the following energy consumption limit value apply for geographical location of Levi.

Table 4-7 Nordic Eco-label Swan limit values

	Class A	Class B	Class C
Energy kWh/m^2	415	385	370
Energy kWh/GN	65	70	70
Water l / GN	300	250	200
Used chemicals g / GN	35	30	25
Unsorted waste kg / GN	1,35	0,9	0,45

Physical parameters are mentioned in many of theories but it is more of an assumption that the needed variables are actually measured. Physical parameters are dealt mostly in eco-label theory but most of the time the calculation of performance indicators (economical aspects) are required.

4.2.1 Energy Use (Electricity and District Heating)

Energy use is usually mentioned always first in theories so it can be concluded that energy consumption is one of the most important factor of environmental quality. The more energy is consumed, the less environmentally qualified hotel. Hotel K5 Levi as being rather new hotel has the technical side of real estate management in good shape. The heating systems, insulation and technical systems are up to date, which guarantees good energy-efficiency. As mentioned also in Bohdanowicz and Martinac (2007), hotel K5 Levi also uses district heating for heating and direct electricity only for operating appliances. Hotel K5 Levi however joined the district heating network only at the end of 2007 and until that the whole building was heated with electricity. Therefore in the total energy use we have comparable data only from the years of 2008 and 2009.

Energy use of hotel K5 Levi was calculated simply by gathering consumption data from energy invoices. The data was then collected to a spreadsheet and analyzed accordingly. So far hotel K5 Levi is not using any more systemized approach for gathering energy consumption data, such as electronic maintenance books that are commonly used in real-estate business. Tables 4-8, 4-9, and 4-10 below show the electricity consumption, district heating consumption and total energy consumption, respectively, from the last four years. Table 4-11 shows the consumption in monetary terms. Note that these years are “actual” years and not the same as financial years.

The tables show that both electricity consumption and district heating energy consumption have fallen in the year 2009, which can be explained as well with the global recession and the lower occupancy rate followed by it. It is thus notable that in 2008 when the hotel joined district heating network, the use of electricity dropped almost in to a half. This is an asset for the future, while the cost of electricity seems to be a lot higher than the cost of district heating energy (0,11 €/kWh vs. 0,07 €/kWh). If hotel K5 Levi would have continued with direct electricity heating, the average heating energy cost between 2006 and 2010 would have been 0,10 €/kWh. Now when using both energy forms the average cost 0,09 €/kWh, which is less than with only electricity. Therefore it can be assumed that joining district heating was a wise decision economically as well as ecologically.

Table 4-8 Electricity consumption 2006-2009

	2006	2007	2008	2009	Average
Total € /a	183 874	177 787	153 402	141 069	164 033
Average €/month	15 323	14 816	12 783	11 756	13 669
Growth- %	25,6 %	-3,3 %	-13,7 %	-8,0 %	
Consumption kWh/a	2 075 526	2 284 629	1 350 095	1 265 344	1 743 899
Average kWh/month	172 961	190 386	112 508	105 445	145 325
kWh/m^2	283	312	184	173	238
€ / kWh	0,09	0,08	0,11	0,11	0,10

Table 4-9 District heating 2008-2009

	2008	2009
Total €/a	71 709	70 173
Average €/month	5 976	5 848
Consumption kWh/a	1 177 475	1 056 090
Average kWh/month	98 123	88 008
kWh/m^2	161	144
€/kWh	0,07	0,07

Table 4-10 Energy consumption in total 2006-2009

	2006	2007	2008	2009	Average
Total €/a	183 874	177 787	225 111	211 242	199 503
Average €/month	15 323	14 816	18 759	17 603	16 625
Consumption kWh/a	2 075 526	2 284 629	2 527 570	2 321 434	2 302 290
Average kWh/month	172 961	190 386	210 631	193 453	191 857
kWh/m^2	283	312	345	317	314
€/kWh	0,09	0,08	0,09	0,09	0,09

Table 4-11 Energy consumption €/m^2 2006-2009

	2006	2007	2008	2009	Average
Total €/a	183 874	177 787	225 111	211 242	199 503
€/m^2	25	24	31	29	27

From the tables above it can be seen that the average figure for energy consumption has been 314 kWh/m^2 during the past four years. Energy consumption per guest night can thus be calculated by dividing the yearly consumption in kWh with the yearly number of guest nights (20 860). Energy consumption (kWh/GN) would thus total in 2 302 289/20 860 = 110 kWh/GN. While the energy consumption figures concern the whole real estate and not only

the hotel, it is wiser to use the kWh/m^2 rate. This is due to the fact that the number of guest nights concerns only the hotel but not the guest night from apartments and therefore is figure is relatively higher than the corresponding figure e.g. in the Nordic eco-label Swan limit values.

Energy consumption determined in €/m^2 presents an environmental performance indicator mentioned e.g. by Emblemsvåg and Bras (2001). The figure can be used as well as internal benchmark with kWh/m^2 figure. Energy cost in € /m^2 also show the increases in energy prices and therefore it can already be a merit in trying to keep this indicator in the same level as in previous years. Of course other eco-efficiency indicators could be used here, e.g. the ones mentioned by WBCSD (2000) or Müller & Stürm (2001). While these calculations call for more internal figures (sales, value added services), the case company decided that these calculations will only be calculated internally.

4.2.2 Water Consumption

Below in table 4-12 is presented the water consumption in hotel K5 Levi. As mentioned earlier, the water consumption data is accurate to concern only the hotel, so the guest night figure can be used for calculating environmental performance measures. Data for water use was only possible to get from 2007 on, which makes the results less comparable than e.g. energy consumption. However, it can be seen that figures, liters/GN and liters/m^2, have fallen constantly. It is yet worth noticing that the lower occupancy rate in 2009-2010 has not apparently had that great of an effect to water consumption of the hotel guests. Therefore actions for reducing the water consumption would result economical benefits in the future.

Table 4-12 Water consumption 2007-2010

	19.3.2007-28.3.2008	28.3.2008-2.3.2009	3.3.2009-8.3.2010	Average
in m^3	3 902	3 460	3 366	3 576
in liters	3 902 000	3 460 000	3 366 000	3 576 000
liters/GN	187	166	161	171
liters/m^2	895	793	772	820

While the hotel real estate is relatively new, also the faucet equipments are relatively new and thus not spending too much water. However, an easy to cut down the water consumption in the hotel is to lower the water pressure in the pipelines. It would also be wise to give subtle

guidance to customers on how much to use water when taking a shower. With these kinds of guidance one must be careful while not all the customers are ready to reduce their consumption when staying at a hotel from which they are paying a high price. In most cases the situation is exactly on the contrary in guests tend to use more resources in hotels than when staying home.

4.2.3 Waste Production and Recycling Opportunities

Waste handling is one the clearest environmental problems at hotel K5 Levi. Yet this is not only due the hotel itself, the whole waste, and especially recycling, management in Levi area is somewhat in its early stages. Handling of organic waste has just started in the area and this should offer better recycling possibilities for K5 Levi also in the future.

At the moment hotel K5 Levi is recycling cardboard for which a cardboard press is used to pack it smaller and the organic waste from the restaurant is recycled as bio waste. Even paper is not recycled in the office premises due to the fact that no paper recycling for businesses exist in the area (only private consumers have the ability to self deliver their paper waste to paper refuse bins). Also no recycling possibilities exist in hotel rooms yet, but these are planned to take into use as soon as the recycling possibilities in the area are getting better. Empty beverage and wine bottles are naturally collected separately from other wastes.

One might suggest that the recycling and separation of wastes could already be started in hotel rooms, even if the actual recycling and separation is not in use yet. This would teach the customers how to recycle but again there are risks that customers would see that their recycling efforts are still useless if all the waste still end up in the same place. Then again without proper recycling training on cannot expect it to work perfectly when the actual recycling possibilities exist.

One problem also related to wastes is the measurement method concerning the amount of wastes. Nordic eco-label Swan limit values are determined based on waste kg/GN ratio but so far it is not possible in the Levi region to know how much waste is produced in kilograms. The waste handling is charged based on the amount and size of waste bins. Sizes of waste bins used at K5 Levi are 600 liters and the only information found from the invoices is how many times the bins are emptied during two months invoicing period. However, it is not possible to know how many of the bins are full when emptied. According to Helsinki Region Environmental Services Authority (HSY) waste management comparison experiment Petra a

full 600 liter bin of un-sorted waste weighs 50 kg and the average weigh is 35 kg (HSY 2010). HSY also has weight estimates for organic waste, paper, cardboard, glass and metal. However, firstly it should be estimated how full the bins are at hotel K5 Levi in order to calculate proper estimates with HSY's figures. We also need to remember that the hotel restaurant kitchen that is not noted in this study is a great producer of the total waste amount. The restaurant turnover is affecting the Nordic Ecolabel limit values and therefore in realistic estimation of waste amounts and its division restaurant operations should be included in the study.

Therefore the best way at the moment for following the amount of unsorted waste in accommodation processes would with some other ratio, e.g. waste charges in €/m^2 or per GN. This does not give the possibility to see whether it will fit the Nordic eco-label Swan limit values but at least it is measure. Also this figure does not really tell the development of the amount of un-separated waste while the local waste handling operator probably increases the prices on yearly basis. The only way for finding out this figure is to follow up the waste bins filling level and estimate the amount of waste in kg's and also take into account the amount of waste produced in the hotel restaurant. While this necessitates rather long surveillance period at the hotel, it was seen wiser to postpone it for the hotel employees to follow in the future and not include it in the thesis.

4.2.4 Use of Chemicals and Purchasing

Hotel K5 Levi does not have a follow-up system for the use of chemicals yet, so the amount and quality (environmental friendliness) of chemicals used is not possible to know. The greatest chemical substance use is naturally due to housekeeping and cleaning. Within this category laundry makes one greatest function where chemicals are used but this is something where hotel K5 Levi does not have a direct control of. Laundry of linen and towels is outsources at the hotel and therefore the only way to affect to the chemicals used in laundry washing is to lobby the laundry entrepreneur to use environmental friendly chemicals and not excessively. Yet the result of this lobbying is not predictable.

In Nordic eco-label Swan limit values the use chemicals is measured with g/GN ratio. This ratio is thus impossible at the moment to calculate. Therefore it is suggested to create some sort of a follow-up system for chemicals use. If it is not possible to know the actual amounts of chemicals used the second best option is to do the following same way as with wastes, i.e.

expenditure on chemicals €/m^2 or €/GN. This will give some measurement of much chemicals are used and offers possibility to follow-up the progress in the future.

Purchasing of environmental friendly and sustainable products is naturally most important the more often the products are sourced. At hotel K5 Levi this means mainly food and beverage products, which are left out of this research, as stated previously. However, also sourcing of products that are not fast moving consumer goods should be considered wisely and as environmental friendly. For example hotel room furniture when renewed is a possibility to favour locally produced and environmental friendly products. Also avoiding single packaging at hotel rooms is a good thing to start with. At the moment hotel K5 Levi does not offer any single packaged soaps etc. in hotel rooms but instead they are offered in fixed dosing machines.

4.3 Operating Scheme

Now that the physical parameters and performance indicators of hotel K5 Levi are solved we can continue to the operating scheme part of the model. In this part the qualitative actions towards environmental quality are described with model developed in chapter 3.

4.3.1 Defining Environmental Policy and Setting Targets

Environmental policy of the case company contains the management aims to become one of the most environmental friendly hotel in at least in Levi, but also be one of the leading environmental friendly hotels in the Finnish Lapland. Clear qualitative environmental objectives are defined for this purpose and they are the following:

- Objective 1: Continuously diminishing the amount of energy used per guest without harming the service level
- Objective 2: Aiming to continuously lower the amount of unsorted waste produced by customers and hotel employees
- Objective 3: Monitor and lower the usage of water
- Objective 4: Create measuring system for the use and purchasing of chemicals

As stated in the model, the environmental objectives should be clear and they should have measurable targets with which they can be followed. These targets should be reviewed on

yearly basis and do corrective actions if they are not achieved. Also proper systems for data gathering and monitoring should be created or acquired.

Suggested targets are the ones that are measured in performance part of the model, which are the table 4-13:

Table 4-13 Objective targets

	Performance indicator	Target measure	Reviewed on
Objective 1: Energy	kWh/m^2	Less than 310 kWh/m^2	Quarterly basis
Objective 2: Water	liter/GN	150 - 170 liters/GN	Twice a year
Objective 3: Unsorted waste	€/m^2 and €/GN (in kg's as soon as possible)	0,9 kg/GN	Yearly basis
Objective 4: Chemicals	g/GN	30 g/GN	Yearly basis

One target in addition to these is a certified environmental management system approach. It is recommended to set a target for acquiring the Nordic Eco-label Swan, while it has most comprehensive guidelines and it is most generally recognized in Finland. The additional plus would be the marketing value it the eco-label while so far not a single hotel in Finnish Lapland has Swan eco-label. With the current figures of energy and water consumption acquiring the certificate would not be a problem but it still necessitates follow-up systems for waste and used chemicals.

4.3.2 Creating Environmental Strategy

Creating environmental strategy in practice means thinking how environmental actions are done within the company in each of service and accommodation processes (see table 4-6). A proposition of the strategy is given in table 4 – 14. The actual environmental strategy should be created with a team consisting of employees from different apartments, such as management, maintenance, house-keeping and front-office staff. With the proposed strategy they should go through what of the actions are feasible to execute in the short run and which might call for longer time to initiate. Separate persons in charge should also be chosen to make sure that each physical boundary and system or service of the hotel's accommodation process is taken properly in consideration and that continuous improvement is happening all the time. These persons should also be in charge of collecting the data and monitoring the actual performance in environmental quality improvement.

Table 4-14 Strategy proposition for linking environmental actions to service and accommodation processes in hotel K5 Levi

	Physical boundaries	Systems /services	Strategy
Rooms	Rooms and suites	Front office, Housekeeping, Maintenance and engineering, Environment and waste	Diminishing paper use in the front office, giving customers guidance on how to save resources during their stay (e.g. towel and linen reusing), giving customers guidance on shutting down all the electronic equipments while not staying in the room, giving guidance on using the sauna energy-efficiently, offer possibilities for waste recycling, using environmental-friendly chemicals in cleaning, making sure that radiators are adjusted properly in rooms and that room facilities work well
Common facilities	Conference facilities, gym, self-laundry, indoor parking space, common lounge	Housekeeping, Maintenance and engineering, Environment and waste	Have energy-saving light bulbs in common areas and motion sensors in rooms where light is not needed all the time, offer information on energy saving actions in the hotel, offer environment-friendly detergents in self-laundry, offer waste recycling possibilities
Restaurants	Fine-dining restaurant, bar	Food preparation and production, Foodservice and dining, clearing and dishwashing, bars	Offer organic food and food that is produced locally, use energy-saving equipments

4.3.3 Internal Communication: Learning, Training and Guidelines

In developing internal communication of environmental issues the case company should consider the current level of environmental expertise among employees. If employees are not familiar with the actions that should be done in order to increase the level of environmental quality or they do not see the benefits then management cannot expect them to act accordingly. All the strategy actions mentioned in the table above should be communicated clearly to all employees, not only one the ones responsible in each area. This improves the team working attitude and helps working across organizational boundaries towards common goal of improving environmental quality.

Every part of the organization, whether it is management, maintenance, housekeeping or front-office staff, should have their own separate guidelines on how to improve environmental quality in their own area of work and in addition to have common guidelines how environmental quality is going to be improved hotel-wide. This increases the transparency in the processes and makes it easier to improve it in other areas of work than just in each employee's own.

Separate training sessions should be held for the whole staff and also for the different departments by the persons in charge of each department. The training session structure could for example be two general training sessions and two specified training sessions for different department's employees. Considering the nature of the business, continuous training should also be done. For the peak season the hotel generally hires more extra staff and also this additional work force should be trained to act accordingly to environmental quality guidelines.

Proper training is supported with the fact that job should be done right at first time. Therefore it is wiser to train employees a bit too much than too less because otherwise the consequences may not be as positive as they could. The most important thing is that internal communication clearly presents the importance of improving environmental quality and how much it will affect the reputation of the hotel and result in cost savings and this way that also improve the employees working conditions.

4.3.4 External Communication: Marketing and Guidelines for Customers

In addition to training and delivering message of improving environmental quality to employees, also customers should be properly informed on environmental quality improvement in the hotel. The purpose of this communication is both to create awareness on environmental issues and also teach the customers how to act accordingly, i.e. to separate wastes and how to cut down energy and water consumption.

Customers, as like employees, should be trained both on general as well as more personal level. General level communication would in this case mean common marketing in the hotel premises of environmental friendliness. In the front desk there can be posters on what are the hotel's actions and possibly present the current performance indicators and aims. The bulletin board could include general information of how global warming could affect the local nature

and how this can be prevented, also as a hotel customer. And in general promote sustainable tourism and encouraging using local products.

More personal level communication would include same information in hotel rooms and more specific guidelines on what each customer can do by themselves (e.g. not having their sheets and towels changed every day, not leaving the lights or electric equipments on when leaving the room, heating up the sauna correctly etc.). Similar kind of info package as presented in the hotel lobby bulletin could be distributed to hotel rooms. This leaflet could contain information of the environmental-friendliness of the chemicals used in the hotel and for example promote the local products that are used in the hotel restaurant.

If the hotel would decide to apply for Nordic Swan eco-label, many of the marketing materials of improving the environmental image would be received from the organization. The benefit in this would be that the eco-label is widely recognized in Finland and it would be a good mean to differentiate in the local competition of consumers. However, with proper planning the actions of improving environmental quality can be communicated to customers as well as with the help of the eco-label.

4.4 Conclusions

To conclude the empirical study part of this thesis the main results are gathered in this chapter. Table 4-15 lists the limit values that were possible to count at hotel K5 Levi in comparison to Nordic eco-label Swan limit values.

Table 4-15 Comparison of Nordic Eco-label limit values to Hotel K5 Levi

	Class B limit value	Hotel K5 Levi	Fits the limits
Energy kWh/m^2	385	314	Yes
Energy kWh/GN	70	110	No
Water l/GN	250	171	Yes
Used chemicals g/GN	30	N/A	No (N/A)
Unsorted waste kg/GN	0,9	N/A	No (N/A)

Figure 4-1 presents the results of the empirical study in the framework created in chapter 3.

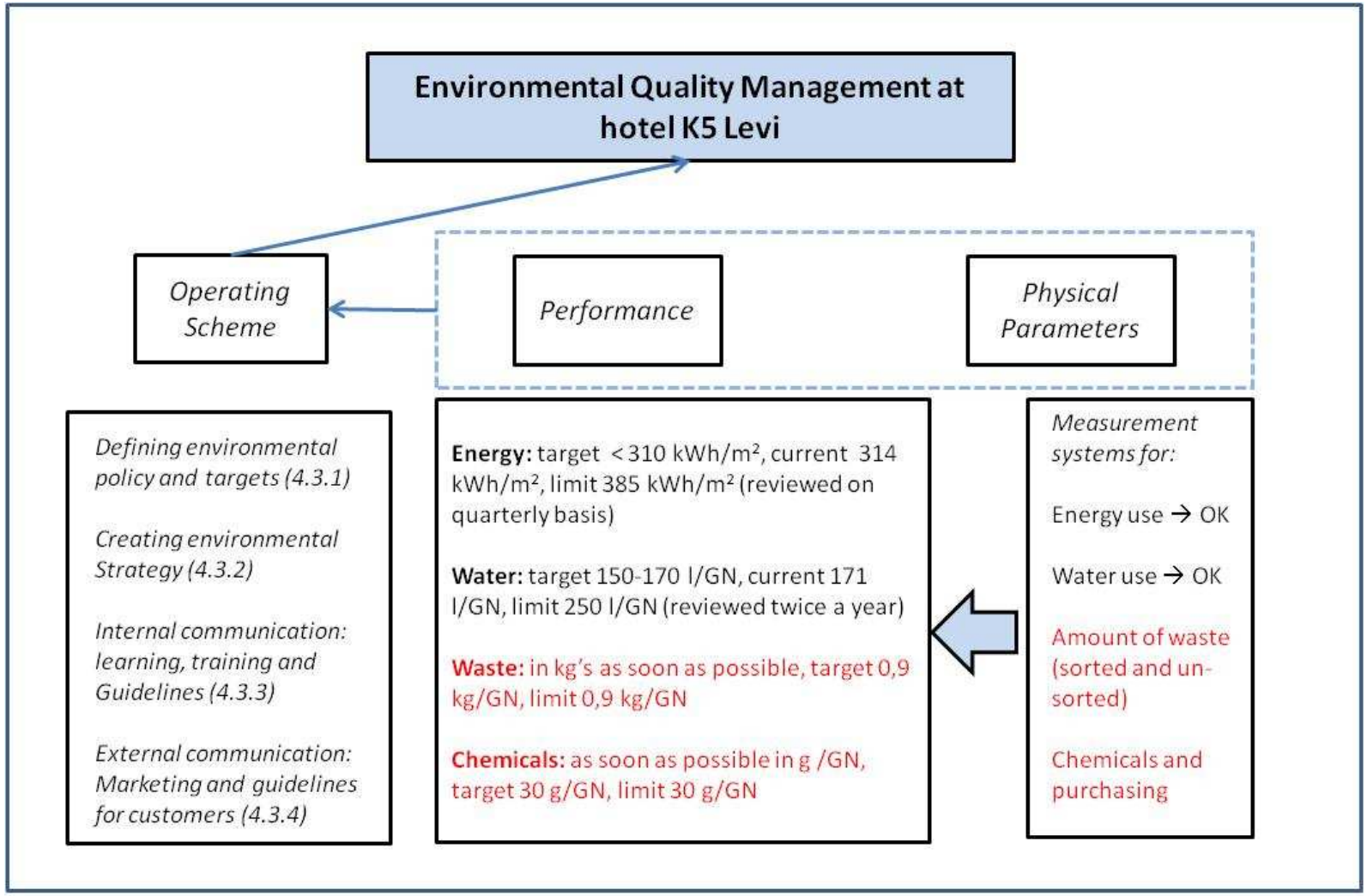

Figure 4-1 Environmental quality management framework for hotel K5 Levi

To sum up it can be concluded that physical parameters of energy and water are as environmentally friendly as possible at hotel K5 Levi. Energy and water consumption fit easily the limit values determined by Nordic eco-label Swan. Important is still trying to cut down energy consumption as much as possible and measure it with proper ratios, e.g. kWh/m^2.

Waste handling and recycling in the Levi region is something a single hotel does not have an effect on but some follow-up systems for the wastes produced at the hotel premises should be developed. The simplest method for this is to follow-up the costs of waste handling in comparison to hotel surface or guest nights. Waste recycling pilot projects would also be good to test, even if actual recycling is not yet possible. It is not only the customers who should be taught to recycle, but also the employees of the hotel. The same applies for chemicals. Proper follow-up system gives some sort of guidance of how much chemicals are consumed at the hotel. Following the consumption usually also gives a chance to follow the quality of the products, i.e. how environmental friendly they are.

The operating scheme part of the framework is still on guidance level. By the time this thesis has been written no strategized approach for managing the qualitative parts of the framework (operating scheme) exists. Therefore the operating scheme part of the framework described in chapter 4.3 works as guidance package for the future environmental quality actions.

5. Research Findings and Discussion

5.1 Theoretical Findings

This research revealed that environmental management is becoming more and more known topic in business life and also in the hospitality industry to which this thesis was focused. Focusing on environmental management can also be seen as an investment in environmental quality while it improves the manners how operations that have an effect on environment are dealt in companies. This supports the idea of generating environmental consciousness also in the Finnish Lapland, though it is not the first place to suffer from the consequences of global warming. However, the customer's interest for hotel's environmental practices is thus probably highly related to the general mindset of people towards environmental issues. No matter how the customers might perceive it, investing in environmental quality improvements and energy saving issues is very likely to be beneficial in the future, at least when the price of energy rises.

There exist different kinds of approaches for how environmental quality can be managed in companies. Many of them are also used or suitable for the industry in case in this research, the hospitality industry. However, the approaches in general are quite universal or generic and do not offer a ready- made approach. Thus, from the approaches presented in this thesis neither of them seems to offer a one and only perfect solution. Total Quality Environmental Management (TQEM) and formal Environmental Management Systems (EMS), mainly ISO 14000 and EMAS, or more of holistic approaches and do not take very specific or goal-oriented hold on improving environmental quality. They classify some general actions of what should be done but these suggestions can be understood in many ways. These approaches are also more suitable for bigger companies and do not serve small and medium sized businesses that well.

Certified eco-label approaches, especially the Nordic Eco-label Swan, seems to be most realistic environmental management scheme to be used as such. The European Union has a similar kind of eco-label directed to hospitality industry but in the case of Finland the Nordic Eco-label Swan is more commonly recognized and thus offers better opportunities. Nordic eco-label approach does not still consider environmental costs almost at all, even though some environmental performance indicators are used. Eco-labels tend to aim of fitting the hotel's operations into certain limit values and that is all that matters. In addition to this it should be

wise to consider also which costs actually are environmental costs, are they direct or indirect, what is causing them and how they can be classified or prevented.

It can be concluded that preventing quality failures tend to decrease most the overall quality cost and investments in quality pay themselves back quite rapidly. Analyzing and reducing the cost of environmental quality calls for process evaluation with different cost assessment methods, monitoring the progress with the help of these cost assessment and keeping in mind that investments in quality (cost of quality) should yield as overall better profits. Environmental costs are usually classified either as quality costs to prevention, appraisal, internal failure and external failure costs. This means basically classifying the costs based on when they happen. Another way of classifying them is to divide them to implementation costs, certification costs and system implementation costs. This division points out the environmental costs based on where they happen. Activity-based costing again can be used for allocating environmental costs to separate cost objectives and is thus most transparent method when defining environmental costs. All of the cost classification and allocation schemes are useful to use when determining and estimating environmental costs and costs from improving environmental quality.

The approach to environmental quality in a hotel depends thus on many aspects (nature of the business, geographic region, ownership structure) and also the local political and socio-cultural environment has its affects. Based on this it can be seen that the environmental quality approaches in accommodation and hotel industry are quite fragmented and no best practice exists yet. The main things in environmental quality improvements are: understanding the customer, understanding the costs of quality and using this knowledge with the right techniques in order to improve the environmental performance. The challenges are how reliable different environmental initiatives are, how reliable quality programs are in general and how easy they are to implement and how difficult it is to consider both indirect and direct production processes. Since none of the reviewed theories as such did not offer a ready-made solution for managing environmental quality in hospitality industry a new model was created for this purpose. Therefore, the theoretical objective of this thesis is reached. The created model is based on the theories presented in this thesis and it consists of three parts which are “Operating scheme”, “Performance” and “Physical parameters”. The environmental quality management for Hotel K5 Levi was built with the help of this model as case study.

5.2 Empirical Results

The empirical part of the thesis consisted of a case study where the framework created for managing environmental quality was used to design an environmental management system for Hotel K5 Levi located in Levi skiing centre in the Finnish Lapland. The aim of the empirical research was to test the usability of the created framework by solving out the current state of environmental quality in the hotel, mainly with the help of performance indicators calculated from physical parameters of energy, water, waste and use of chemicals. In addition to this, guidelines were created for the hotel to improve environmental quality in operations. The time span for the physical parameters data gathering was four years, from 2006 to 2010.

In the case study the service and accommodation processes of the hotel were described. With the help of this also the environmental costs were attempted to analyse. However, since the hotels management accounting system does not yet separate environmental costs as such at all, it was seen best at the scope of this thesis to give only general guidance on how the costs should be considered in the future when implementing the model of environmental management.

The analysis of physical parameters consumption revealed that Hotel K5 Levi is actually quite environmental friendly hotel already, at least when it comes to the technical structure of the building. The Nordic eco-label Swan limit values were used as reference for the hotel K5 Levi respective values and they revealed the hotel K5 Levi is way below the limit values at least in energy and water consumption. Based on this, hotel K5 Levi would have good possibilities for acquiring the Nordic eco-label Swan as first hotel in the Finnish Lapland.

However, the analysis also revealed that some of the physical parameters measurement systems were not adequate or they did not exist at all. Due to the fact that the amount of waste produced in the hotel is not weighed it is impossible to compare the amount of waste limit values between Hotel K5 Levi and Nordic eco-label Swan. Comparing the costs of waste collection can however give an estimate of how the development of waste production and separation is, but it is not that valid figure. The only reasonable way would be to estimate the filling level of waste bins and estimate weight of all the unsorted waste. This was seen to be too challenging task concerning the time span of the thesis but it is recommended for the case hotel to conduct in the future. No measurement system exists also not for chemicals that are used in the hotel so any comparative analysis could not be done for this physical parameter. A

measurement system for estimating the amount of chemicals used should thus also be developed. With proper measuring system Hotel K5 Levi could solve out whether they have possibilities for acquiring the Nordic eco-label Swan in these areas also.

In addition to analyzing physical parameters some guidelines for creating the strategic part of the model, i.e. operating scheme, were given. These guidelines were related to defining environmental policy and setting targets, creating environmental strategy, improving internal communication through learning and training and improving external communication with the help of marketing and guidelines to customers. In defining environmental policy four objectives related to the physical parameters were defined and target measured and review basis were proposed. In creating environmental strategy propositions were given in accordance to system and service processes of the hotel how environmental quality could be improved. In internal and external communication propositions for how the communicating of the message of improving environmental quality and environmental management in general should be done.

All in all the empirical results show that the framework can be applied for a hotel as an environmental management system. With proper monitoring of the targets and continuous improvement of environmental quality the model might actually result as being quite comprehensive management system. This would, however, require a longer research of several years in order to see the results.

5.2 Future Research

Most interesting topic for future research would be the implementation of the framework and its further development in action. It would also be interesting to see whether actual environmental quality improvements could be gained with the help of the model. Testing it also in different kinds of business environments and industries would be interesting.

Another interesting field of research would be to find out how consumers perceive environmental quality in hospitality industry or Nordic consumers perceive the Swan label in hospitality industry and how much in general they appreciate environmental standards in hotels? Also an important future research area would be studying the barriers in Finland for hotels or resorts to implement such systems and how much informal environmental management systems have been implemented in general and how well they consider environmental quality costs.

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Appendices

Appendix 1: General Requirements for Nordic Swan Eco-label

1.General descriptions	O1. Description of the hotel
2. Limit values	
2.1 Class division	
2.2 Energy consumption	
2.3 Water consumption	
2.4 Chemical products	
2.5 Waste management	
3. Environmental requirements	
3.1 Operation and maintenance	O2. Refrigerants
	O3. Outdoor lightning
	O4. Sauna
	P1. Energy analysis
	P2. Heat consumption
	P3. Electricity consumption
	P4. Refrigerants
	P5. Heat recovery
	P6. Control of ventilation and interior lightning
	P7. Low-energy lamps
	P8. Led lamps
	P9. Toilets
	P10. Toilets
	P11. Water-saving taps
3.2 Hotel's premises and purchased products	O5. Fitting and fixtures
	O6. New purchases of textiles
	O7. New purchases of low-energy lamps and fluorescent tubes
	O8. Kitchen rolls, paper towels and toilet paper
	P12. Toner cartridges
	P13. Office machines
	P14. Printed matter
	P15. Ecolabelled soap and shampoo
	P16. Dispensers for soap and shampoo
	P17. Drinking glasses and mugs
	P18. Returnable bottles or barrels/tanks
	P19. Work clothes
	P20. Working environment
	P21. Purchase of ecolabelled consumables
	P22. Ecolabelled durable goods/infrequently bought commodities
	P23. Ecolabelled services
	P24. Sale of soap/shampoo/detergents
3.3 Guest rooms	O9. Non-smoking rooms
	P25. Bed linen and towels
	P26. Lightning
	P27. Television sets
	P28. Minibars
	P29. Water-saving showers
	P30. Single-lever mixer taps
	P31. Disposable items
	P32. Waste sorting
	P33. Waste paper bin
	P34. Rooms adapted for the physically disabled or allergy sufferers

3.4 Kitchen and dining room	O10. Disposable items O11. Ecolabelled dishwashing chemicals O12. Non-ecolabelled dishwashing chemicals O13. Non-smoking dining area P35. Organic foodstuffs and beverages P36. Fairtrade products P37. Ecolabelled dishwashing chemicals P38. Dosage of dishwashing chemicals
3.5 Extra requirements for hotels with restaurants	P39. Nordic Ecolabelled restaurant P40. Regional foodstuff and beverages P41. Vegetarian food P42. Declaration of GMO content P43. Origin of main ingredients P44. Food with significant environmental impact P45. Energy and water saving actions
3.6 Cleaning and laundry	O14. Disinfectant O15. Ecolabelled laundry detergents O16. Non-ecolabelled laundry detergents O17. Ecolabelled cleaning products O18. Non-ecolabelled cleaning products P46. Cleaning without chemicals P47. Ecolabelled laundry products P48. Ecolabelled cleaning products P49. Bed linen and towels P50. Exact dosing P51. Concentrated products
3.7 Waste	O19. Hazardous waste O20. Waste sorting O21. Batteries P52. Further waste sorting P53. Returnable packaging P54. Organic waste
3.8 Transport and distribution	P55. Own vehicles P56. Public transport P57. Bicycles and horses
3.9 Extra points from the limit values	P58. Limit values P59. Energy consumption lower than limit value
3.10 Extra requirements for hotels with conference 3.11 Extra requirements for hotels with pool/hot springs 3.12 Extra requirements for hotels with garden 3.13 Extra requirements and adaptation for youth hostels	
3.14 Environmental management	O27. Organisation and responsibility O28. Actions to reduce environmental impact O29. Legislation and regulatory requirements O30. Information about the Swan for employees O31. Guest information O32. Continuous measurements O33. Documentation of Swan requirements O34. Energy-demanding equipment and service log O35. Handling of chemical products O36. Annual follow-up