

# ENVIRONMENTAL MANAGEMENT SYSTEM PLANNING AND IMPLEMENTATION

Case Eritoimi Oy

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Abstract <p>The thesis was about planning and implementing an environmental management system for Eritoimi Oy. The assignment from the company was based on two relevant issues: how important environmental management is to the company partners and would they require public reporting about it, and on the other hand what kind of benefits would waste management have.</p> <p>Research was made on the requirements and relevance of environmental management systems, SME's resources to maintain such a system and committing personnel into the system. The primary research methods were action research and interviews, but from quantitative methods a survey was used to map the environmental attitudes of the company partners.</p> <p>The results from the survey confirmed the notion from the supporting literature: Eritoimi partners have a positive attitude towards environmental management and they think that it has a positive effect on the public image of the company. Almost half of the respondents thought that their company will require public reporting about environmental management from their partners in the future. Environmental management system was implemented for Eritoimi based on the ISO14001 standard and it had direct effects: waste handling fees were reduced by recycling and the company facilities had a better chance to stay clean and safe when different wastes had a proper method for discharge. The ISO standard does not define any absolute values for the level of environmental management, so also a small company can implement an EMS as long as its personnel, including the top management, are committed to the system.</p> <p>Results from the thesis can be considered as an example of the positive effects that environmental management systems have economically and ecologically for a company, and the thesis also provides a compilation of sources from relevant literature to support the development of environmental management in companies.</p>		
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Tiivistelmä <p>Opinnäytetyön tarkoituksena oli suunnitella ja toteuttaa ympäristönhallintajärjestelmä Eritoimi Oy:lle. Samalla yritys halusi saada tietoa siitä, kuinka tärkeää ympäristöasioiden hallinta on yrityksen yhteistyökumppaneille ja vaaditaanko ympäristöasioista tiedottamista tulevaisuudessa. Jätteiden kierrätyksellä mahdollisesti saatava taloudellinen etu tuli myös kartoittaa.</p> <p>Tutkimus kohdistui ympäristöjärjestelmän vaatimuksiin sekä sen merkitykseen, järjestelmän toteuttamiseen PK-yritysten resursseilla ja henkilöstön sitouttamiseen järjestelmään. Tutkimusmenetelmänä käytettiin ensisijaisesti toimintatutkimusta sekä haastatteluja, mutta kvantitatiivisista metodeista käytössä oli myös kysely, jolla kartoitettiin yrityksen yhteistyökumppaneiden suhtautumista ympäristöasioiden hallintaan.</p> <p>Kyselytutkimuksen tulokset vahvistivat myös Eritoimen osalta alan kirjallisuudessa esiin tullutta päätelmää: yrityksen yhteistyökumppanit suhtautuvat erittäin positiivisesti ympäristöjärjestelmän perustamiseen, ja näiden tahojen mielestä järjestelmällinen ympäristöasioiden hallinta vaikuttaa positiivisesti yritystoiminnan arvoon ja julkisuuskuvaan. Lähes puolet vastanneista ilmoitti vaativansa lähitulevaisuudessa yhteistyökumppaneiltaan julkilausumaa ympäristöasioiden hoidosta. Opinnäytetyön tuloksena perustetulla ISO 14001 –standardin mukaisella ympäristöjärjestelmällä oli suoria vaikutuksia: jätehuollon kustannukset pienentyivät kierrätystä tehostamalla, ja yrityksen toimitiloilla olisi paremmat edellytykset pysyä siisteinä ja turvallisina. Järjestelmä voitiin toteuttaa standardin pohjalta myös pienen yrityksen resursseilla, mutta se vaati myös henkilöstöltä ehdotonta sitoutumista ylintä johtoa myöten.</p> <p>Opinnäytetyön tuloksia voidaan pitää yhtenä esimerkkinä ympäristöjärjestelmän perustamisen positiivisista vaikutuksista taloudellisesti ja ekologisesti, ja työhön koottu tutkimus taustoittaa laajasti ympäristöjärjestelmän perustamiseen vaikuttavia tekijöitä.</p>		
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## 1 INTRODUCTION

The target company in this thesis is Eritoimi Oy, a member company in Intolog group that provides products and services in warehouse and production technology. The company has two branches in Finland: in Jyväskylä and Kuopio. These branches work in cooperation to support each other in the provision of services and products for internal logistics.

At the time of the thesis assignment the company had no recorded processes for waste management or the tools to follow their environmental performance, and this had affected the company facilities so that waste was piled up and not taken away until the piles started to really be a problem. There were also no processes for handling dangerous waste or what to do in a case of emergency. The company management had started to think what kind of effect these issues might have in the eyes of suppliers and customers.

In order to secure the ability to answer to customers' and stakeholders' potential requirements concerning environmental issues and to increase the transparency of the company operations an Environmental Management System (later "EMS") was developed for Eritoimi Oy. The ultimate objective was to have the readiness within the company to prove sound environmental performance and when in the future it is required either by the Intolog chain or the customers.

## 1.1 COMPANY INTRODUCTION

Eritoimi Oy has retail locations with warehouses in Jyväskylä and Kuopio. The location in Kuopio has been founded already in the 1980's and it provides logistics products and services for most of the Eastern Finland area. The location in Jyväskylä was founded in 2004 and the business concentrates mostly on the Jyväskylä area and its surroundings.

As global markets have decreased the prices for materials, Eritoimi tries to stand out from the competitors by providing good service and high-quality products accessible through the Intolog chain instead of bargaining for prices. (Savolainen, 2012)

The company operates mostly in business-to-business markets, but the locations offer products to consumers, too. Main customers are in the manufacturing business and include some of the biggest manufacturers in Central Finland area. For downstream businesses Eritoimi has started to increase the effort to provide more immaterial services in internal logistics solutions to compensate the low margins in the highly competed product markets.

The main tool for product marketing is the Intolog chain catalogue, which is sent annually to all active customers in the company database. This catalogue includes most of the product range offered through the chain and directs the customers to contact the nearest location with their requests.

The products that are available through the Intolog chain come from several different suppliers mostly in Finland, Sweden and Estonia. Eritoimi Oy has contracts with the most important suppliers in Finland to enable consistent pricing and lead times for all of the main products in the product range of over 10 000 items.

The products sold include i.e. warehouse furniture, work station solutions, forklift trucks, industrial cabinets and a variety of accessories related to them. Two thirds of the company turnover comes from the shelving products provided by Constructor Finland. These products include truck pallet shelves, small item shelving and archive shelving.

Most of the larger orders are made as straight deliveries from the supplier to the customer locations, but small deliveries are made daily also from the Jyväskylä warehouse. By keeping stock in Jyväskylä better service level can be achieved when smaller, random orders can be fulfilled instantly. The idea for Intolog marketing is illustrated below in Figure 1.

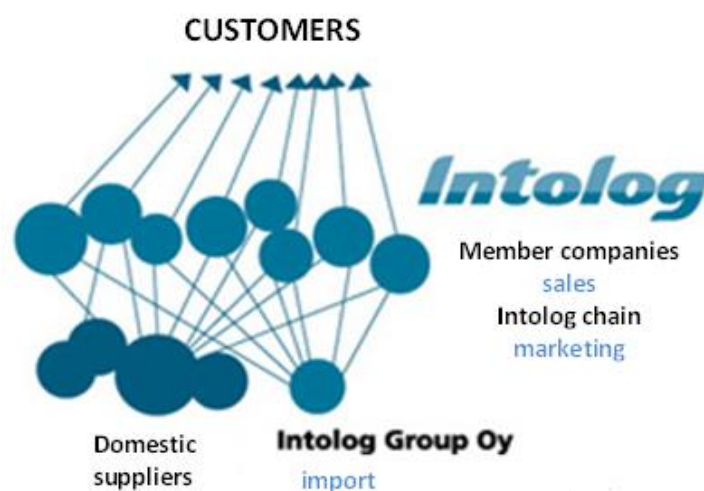


Figure 1: Intolog and member cooperation (Intolog.fi)



## 1.2 REQUIREMENTS FOR CHANGE

*Man has been endowed with reason, with the power to create, so that he can add to what he's been given. But up to now he hasn't been a creator, only a destroyer. Forests keep disappearing, rivers dry up, wild life's become extinct, the climate's ruined and the land grows poorer and uglier every day. (Chekhov 1897.)*

Since the beginning of the 21<sup>st</sup> century, public discourse has started to raise financially, ecologically and socially responsible practices by companies as the center of attention. As an extension to globalization, sustainable development is seen as evaluating the long-term effects of these practices in the companies so that they can be developed towards the well-being of the people, society and the environment while aiming for financial growth. (Rohweder 2004, 3.) Aaltonen and Junkkari (2000, 37) explain this as a change of the paradigm in the society towards post-materialistic values. These values are different from the time when industrialization began in western countries in a way that instead of efficiency people are more concerned about the long-term impacts of company operations. Finnish people have become more worried about the state of nature since the 1980's and seven people out of ten think that the continuous strive for financial growth will eventually destroy the nature and the human race itself. (Erilaisuusien Suomi 2010, 28.) Also Valkonen (2013) has recognized that the environmental reporting of companies has increased in the past 10 years and more companies are aware of their responsibility to their environment.

Green, Morton and New (1996, 2) recognized early that companies that work proactively on environmental issues can gain strategic advantage in seeing problems and opportunities better in their supply chains. Already then it was expected that eventually more and more customers pressurized by the laws and regulations and influences from stakeholders are requiring well-maintained environmental policies from their suppliers. According to Welford (1998, 5) in order to realize this competitive advantage companies must develop proactive and honest management strategies to improve their environmental performance and answer to the internal and external demands of increasing environmental concern.

## **2 CHANGE AS A FOUNDATION FOR RESEARCH**

### **2.1 RESEARCH SCOPE**

The CEO of Eritoimi had noticed that the prices of raw materials have had a significant increase in recent years, so the task for this research on behalf of the company was to find out if environmental management would increase the value of the business in the eyes of partners. Another aspect to study was how waste management could be financially beneficial: not only by saving costs but also how new markets could be made to achieve new sources of profits.

#### **2.1.1 Research questions**

The research problems were set so that the following questions would be answered:

1. What is required from an Environmental Management System?
2. is the system relevant?
3. Do SME's have resources for such a system?
4. How to commit personnel to the system?

### **2.1.2 Research limitations**

The research is not a general research but a case study for one company. This is why the purpose of this research is not to answer to the research questions at a general level but to assist the company to make decisions that are relevant to the target company itself.

Early on in the research it was noticed that the waste generation of the company is so random and small-scale, that the exploration of new markets for taking advantage of waste was left out of the research, and effort was concentrated on ways of cutting costs by increasing the environmental performance of the company.

## **2.2 STRATEGY AND METHODS**

Research always has a meaning or a certain task, and these guide what kind of strategies are taken in terms of the research. Hirsjärvi et. al (2009, 135-135) present the three traditional research strategies: experimental research, quantitative survey research and strategies that have qualitative properties, such as case studies or field work. Despite quantitative research is based on measurable amounts and qualitative on the nature of the research object, these methods should not be considered mutually exclusive. Instead, they can be seen as approaches that fulfill each other whether they are used simultaneously or one after another.

Quantitative research is widely used in social sciences, and its characteristics include the use of existing theories, concept definitions, hypothesis presentation and collecting research data that is suitable for numerical measuring. Qualitative research, on the other hand, tries to focus on the research target as thoroughly as possible, taking also non-measurable properties (qualities) into account, and it has several different approaches and the research setup is human-based and conducted in natural circumstances. (Hirsjärvi et. al 2009, 139-164.)

This research is about building a system into a real, existing environment that people have to work in and reflecting on the results to achieve continuous improvement on the subject. The results should be convenient and purposeful and take into consideration the issues that can be grasped in the company on a practical level. In that sense the research strategy to approach the research questions is qualitative. The research methods, however, will include quantitative approaches such as a survey as an assisting tool to be able to get the answers to the research questions.

### **2.3 RELIABILITY AND VALIDITY**

There are many arguments about whether reliability has relevance in qualitative research, since it concerns measurements. The term is still used in different areas of research. Reliability is a feature of a research instrument, and is most often defined as the repeatability of the results of a study, how consistent the results are over time and how well the results describe the entire population of the study. Validity, on the other hand, determines whether a study actually measures that which it is supposed to measure, in other words it describes the truthfulness of the research. As qualitative research is not measurable, validity in qualitative research has a broad range of descriptions from actual quality of the research to trustworthiness or rigor. The connection between reliability and validity in qualitative research then sums up as reliability is a result from the validity of a study and that the results help to understand the studied situation. (Golafshani 2003, 598-602.)

Ihantola & Kihn (2011, 39-40) argue that internal validity of a study is about the logic between a theory and the research: threats to internal validity can occur in any phase of the research from the selection of research instruments to data interpretation. They also argue that external validity is crucial in qualitative research, and that it determines whether the research results can be generalized to other settings or time periods, and if one can draw more conclusions from the research model and gathered data.

### 3 ACTION RESEARCH

Action research is one of the tools in the area of qualitative research. E.g. McNiff (2000, 198) traces the origins of action research to the ideas of Kurt Lewin, a social scientist. According to Cohen & Manion (2007, 297) action research is a small-scale intervention in a real-world setting and that it is made to understand and reform practice. Somekh (2006, 1) continues that action research can be used as a methodology in changing situations and that it helps to overcome the limitations of traditional scientific research methods.

Action research is understood as a learning process combined to actions so that there is no clear boundary between the research and the action. Learning from practice and reflecting to the gathered data and theory form the components for action research. (Whitehead & McNiff 2006, 112.)

Denzin & Lincoln (2005, 566-568) introduce Kemmis' & McTaggart's (2000) thoughts about "participatory action research", which describes the social process where people join together and change the practices through which they interact. In addition to it being an improvement process to changing something and learning from the changes action research involves the following features:

- It is a social process exploring how individuals reflect to the social setting
- It engages people, so it has a participatory nature
- It induces collaboration while being practical
- It is emancipatory, so it helps people release themselves from unsatisfying social structures
- It is critical, so it helps people to reconstitute irrational ways of interpreting their world
- It is reflexive, so it aims for people to investigate and change their practices through self-reflection and critique

- These aspects result in action research as a systematic learning process through a spiral cycle of planning, observing and reflecting.

### **3.1 IMPLEMENTATION**

Action research as a research method describes the implementation of an environmental management system, because the action research characteristics are present in the implementation process. According to Denzin & Lincoln (2005, 569) these characteristics are:

- There is an intervention into a defined practical situation: the company operations regarding the environment
- It is a change process that involves an individual within a group: Conforming to the ISO standard is a change process because there were no processes defined for environmental operations before this project. The company employees are involved in the process because implementing the standard changes some actions taken by each employee, and the main responsibility is with one person.
- The setting of problems is both scientific and practical, because environmental issues need a practical solution that is more often based on legislation or the rules in the ISO standard.

### **3.2 RESULTS AND CRITIQUE**

Metsämuuronen (2006, 105) lists reasons why action research has gained lots of critique like other qualitative methods: The research object is often specific with a limited population so the results cannot be considered very representative. The methods and targets for action research are also often poorly defined, and the theory and practice have not been properly connected when the researcher has done research and the other participants have taken care of the implementation and practical applications.

When considering this EMS implementation project, these arguments can be defended: In order for the EMS to be practical and purposeful, the research object *has* to be strictly limited so that the results will show in operational efficiency. Also, for example results from a wide study of organizations' environmental management experiences in the service industry would not necessarily be very useful in this project because every company have their specific operations so that each only represent a small margin of the company population. In a small company the employees also must be involved in the change process so that the purposefulness of the system will remain according to the project objectives, at a good level.

#### **4 SURVEY**

According to e.g. Fink et al. (1998, 1) "A survey is a method of collecting information directly from people about their ideas, feelings, health, plans, beliefs, and social, educational, and financial background." Thus a survey can be used as a tool in many different situations – just that the design between them is different.

Cohen et al. (2007, 207) set preliminary considerations for a survey: First, the exact purpose of the survey needs to be specified, the target group (sample) that it focuses on needs to be clear together with what kind of resources are available to arrange the inquiry.

A common purpose for a survey is to produce statistics about the study population so that their answers produce the data to be analyzed. (Fowler Jr. 2002, 1.)

The design of conducting a survey consists of the following elements (Fink & Kosecoff 1998, 3-6; Fowler Jr. 2002, 4-8.):

1. questions
2. instructions
3. sampling and design
4. data processing and analysis
5. pilot testing
6. response rate

## 7. reporting results.

The questions in the survey can be either forced-choice items or open ended questions. The questions should be carefully selected to serve the meaning of the survey, and careful thought should be put into the selection, ordering and wording of the questions. They should be complete questions one at a time so that the respondent can not misunderstand the question. (Fink & Kosecoff 1998, 4)

Instructions can include guidance in which questions to answer, are all questions mandatory or not or how many answers to select, and is there a time limit. A clear definition of the used terms is also required, because people can understand the meanings of words differently in different contexts. In sampling the responding population is determined, because it can have an effect on the design of the survey. The sample should also be selected so that it actually represents the population that the researcher wants to research at and draw conclusions from. (Op. cit. p. 4-5.)

Access to the survey should be considered: if the survey is done by e-mail, will every respondent have the same opportunities to use e-mail so that the sample does not already limit out a certain part of the population?

Data analysis should already be thought of ahead of the survey (op. cit. p. 5). How will one analyze the data and what kind of statistics will be formed from it? Does the researcher want to represent some data in relation to different characteristics of the respondent?

To measure the actual usability of the survey, pilot testing is needed. This testing will reveal if the respondents have to chance to answer the questions and if they understand them. At this point corrections can still be made according to the feedback of the test respondents. Poorly designed survey can reduce the response rate and make forming statistics more difficult. There might not be a desired response rate because statistically it depends on the population, but a rule of thumb could be "higher is better".



## 5 COMPANY STRATEGY AS A GUIDE

### 5.1 BUSINESS STRATEGY

Welford (1998, 22) argues that companies have recently started to see environmental management as a tool in their strategy to gain competitive advantage. He mentions Rushton (1993) suggesting that usually the environmental strategy is linked with the overall business strategy.

### 5.2 SERVICE AS A DIFFERENTIATION FACTOR

Porter (1998, 35) has defined the classical three generic strategies for outperforming other companies in an industry: overall cost leadership, differentiation and focus. He defines differentiation as "...creating something that is perceived *industry wide* as being unique." As mentioned earlier, Eritoimi has somewhat adopted this differentiation strategy by not bargaining with the prices as Porter's cost leadership strategy suggests, but offering a comprehensive range of services supporting the sales of their products: from early involvement and consultation in construction projects to scheduled checks and maintenance. Böckerman (2000, 7) describes how already Schumpeter (1987) writes that the capitalistic system is not in a static, but in a dynamic state, an evolution that opens up new markets constantly.

Kim and Mauborgne (2005, 21) suggest recreating market boundaries, because competing in the traditional, congested markets will limit the profits and possibilities for growth. They encourage finding new demand, "blue oceans", by six methods:

1. Reconstruct market boundaries
2. Focus on the big picture, not the numbers
3. Reach beyond existing demand
4. Get the strategic sequence right
5. Overcome key organizational hurdles
6. Build execution into strategy.

### **5.3 COMBINING THE TWO STRATEGIES**

Unlike in cost leadership where economics of scale encourages large product volumes (Porter 1998, 37), differentiation as a strategy is more concentrated on the quality and customer loyalty by offering something unique to the market. Thus, differentiation as a business strategy is highly compatible with the goals in reducing harmful environmental effects, because immaterial products such as consultation and planning bring income to the company and do not harm the environment, but rather vice versa: the principles of why planning is made is that it prevents harmful and wasteful activities. (Robbins 2005, 159.) This encourages the differentiation strategy also in a financial sense: more services are sold and by increasing customer loyalty, sustainable profits can also be achieved.

This does not, however, totally exclude the companies aiming for cost leadership from performing soundly in environmental issues: there are a number of cost reduction strategies available that may improve environmental performance, but these strategies should go under further research. (Welford 1998, 27.)

## **6 STANDARDS OF (ENVIRONMENTAL) MANAGEMENT SYSTEMS**

### **6.1 STANDARDISATION**

“A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose.” (ISO, 2012.)

Standards can be prepared by national, regional or international standards bodies. The first national standards body was the British Standards Institution (BSI). The international organization for standardization (ISO) is based in Geneva, Switzerland and it was founded in 1947 to achieve a higher level of standardization across national boundaries.

### **6.2 ENVIRONMENTAL MANAGEMENT SYSTEMS**

Environmental Management Systems (EMS) have started to emerge since the 1990's with the first edition of ISO 14001 published in 1996. Before this the BSI published the world's first environmental management system standard, BS 7750 already in 1992. The European Commission drafted its Eco-Audit Scheme according to the BS 7750, which was the only available EMS standard available at that time, and after a mandatory period of company participation it was revised for open company participation in 1993. (Welford, 1998.)

The standards have been developed to achieve sound environmental performance within organizations. This development has been guided by the increased will in organizations to prove this performance by controlling the environmental impact of their activities, products and services in terms of increasingly stringent legislation, economic development and the increased concern expressed by the stakeholders about sustainable development and environmental issues. (SFS EN-ISO 14001, 2004.)

### 6.2.1 ISO 140001 STANDARD

ISO 14001:2004 is the current version of the environmental management system standard and it is part of the ISO 14000 series of standards. This standard has been under revision since 2012, but at the moment of this thesis the version in use is from 2004. The ISO 14000 series is built around the ISO 14001 standard, but supplementary standards offer more tools for building an EMS in a systematic way. The series includes standards such as:

- ISO 14001 and ISO 14004: Environmental management systems and general guidelines for principles and supporting methods
- ISO 14005 and ISO 14006: Instructions to a step-by-step implementation of EMS and including ecologic design into the system
- ISO 14021 and ISO 14025: Environmental labels and declarations
- ISO 14031: Environmental Management: environmental performance
- ISO 14040 and ISO 14044: Life cycle assessment
- ISO 14051: Material flow cost analysis
- ISO 14063: Environmental communication
- ISO 19011: Quality management systems auditing.

The ISO 14001 standard is a tool for management that defines the guidelines for the system. It requires the organization to recognize the environmental impacts of its operations, set goals and programs to limit these impacts and create documented methods to achieve these goals. In this process the organization should commit into obeying the legal requirements regarding the issues and the continuous improvement of the system. The system can be used for certification or registration or self-declaration of an organization's EMS. The system can be certified by an accredited company, and in Finland these companies are accredited, i.e. proven valid by FINAS, the Finnish Accreditation Service.

## 6.2.2 EMAS, EMASEASY AND ECOSTART

The European Community Eco-Management and Audit Scheme (EMAS) is a voluntary EMS, and it is based on a regulation by the European Union. It is another tool for environmental management, and it consists of an environmental system that is based on ISO 14001:2004, but it includes also the requirement for a public environmental statement, whereas in ISO 14001 this report is voluntary. The validity of the system is confirmed by an external audit. The steps for EMAS registration in relation to ISO 14001 are presented below in Figure 2.



Figure 2: Steps to EMAS (Finland's environmental administration 2012, [www.ymparisto.fi](http://www.ymparisto.fi))

According to the ISO 14001 standard the EMS in an organization does not need a certificate to be valid as long as it is implemented according to the legislative and operational requirements. By internal audits the company can self-declare or self-determine that it conforms to the standard.

Auditing is a business for the accredited companies, so there is a cost for external auditing and receiving the certificate for an approved implementation and maintenance of a standard. As a proof the certified company can use a certification symbol in its publications.

For small businesses, a program called EMASeasy has been also created, but it is available to commercial use by certified consultants only, and the target is to comply with either EMAS or ISO14001 standards. (EMASeasy, 2013)

The Finnish regional Centers for Economic Development, Transport and the Environment (“ELY-keskus”) provide a consultation service called EcoStart that is targeted to small and medium-sized enterprises. This service is also provided through certified consultants and has the same principles as the other systems. It offers a lightweight solution that is based on the environmental programs created by the target company. (EcoStart, 2013)

While in Spain and Italy, for example, both EMAS and ISO14001 implementations have increased significantly, in most of the other European countries the amounts of EMAS registrations have declined while ISO14001 registrations have increased at the same time. In Finland there were 39 EMAS registrations and 1128 ISO14001 registrations in 2003, and in 2010 18 EMAS and 1122 ISO14001 registrations respectively. (Eurostat, 2013; EU Commission, 2013.)

### **6.3 SCALABILITY AND REQUIREMENTS**

There is no detailed model for an EMS. The ISO standard gives only the main principles of the system which to conform to. The standard gives the organization the freedom to define the scope of its EMS according to the nature of its activities, products or services and the conditions it operates in so that the system will be useful and purposeful. It also does not define any absolute requirements for the level of environmental protection or performance, so the organization can define its own level of performance and objectives in terms of its financial, human and technological resources. (ISO 14001, 2004.)

The EMS is also not a stand-alone product. The standard gives the freedom to modify its already existing management systems to fill the requirements of ISO 14001, and also align or integrate its parts into those of other management systems.

Welford (1995, 52) has listed three requirements for an effective EMS:

1. The system needs to be comprehensive and cover every activity in the organization and every person must identify his part in the system
2. The procedures need to be understandable to everyone who is involved
3. The system must be open to review and everyone needs to commit into continuous improvement of the system.

The first part can be misleading: Welford states that the system should have a wide scope and cover *all* of the company operations. However, in order to be truly effective the standard suggests, especially in SME's, to define the scope of the EMS so that the system is purposeful and useful. The second requirement involves the proper training, education and distribution of information about the implementation of the EMS. It is also a prerequisite for the third part: by proper communication the employees can understand the necessary changes in the organization and this way be better prepared to cope with the change.

#### **6.4 STRUCTURE AND USAGE**

The ISO 14001 structure is divided into five segments:

1. Environmental policy
2. Planning
3. Implementation & Operation
4. Checking and corrective action
5. Management review.

In its environmental policy the organization must state the principles for its level of environmental protection. It must also commit to complying into the relevant environmental legislation and the prevention of pollution by setting a framework for objectives and how to reach them. This information should be publicly available and properly communicated. Planning starts by mapping all of the elements in the organizations operations, products or services that have an effect on the environment. By using appropriate tools the organization can then define which of these elements are significant and how much the organization can affect these significant aspects by its actions, and what is the relevant legislation. The ISO 14001 standard does not define a method for defining these aspects, but some of the tools are discussed in chapter 7.

After the plans are set, the organization must create a structure and define responsibilities and authorities for the people involved in the system. Management should also reserve the required financial and human resources for the system. The people that are working according to the system should be subject to adequate training and communication. An important part of the operation is establishing a way to create and handle the documents required by the ISO 14001. The operation of the system must also be ensured in potential emergencies and accidents, and proper procedures in these situations should be defined and documented. The planned objectives and targets should be measured, documented and regularly checked. A documented procedure to evaluating compliance with the relevant regulations and laws should also be implemented. If the targets are not met, there should be a documented procedure to review these cases. Management reviews must be taken in order to compare audit results with the targets, goals and the environmental policies set by the organization. Committing to continuous improvement forces the organization to redefine these targets if they are met or the circumstances need to be re-evaluated. (Starkey 1998, 45-51; ISO 14001:2004.) The ISO 14001 structure is illustrated below in Figure 3.



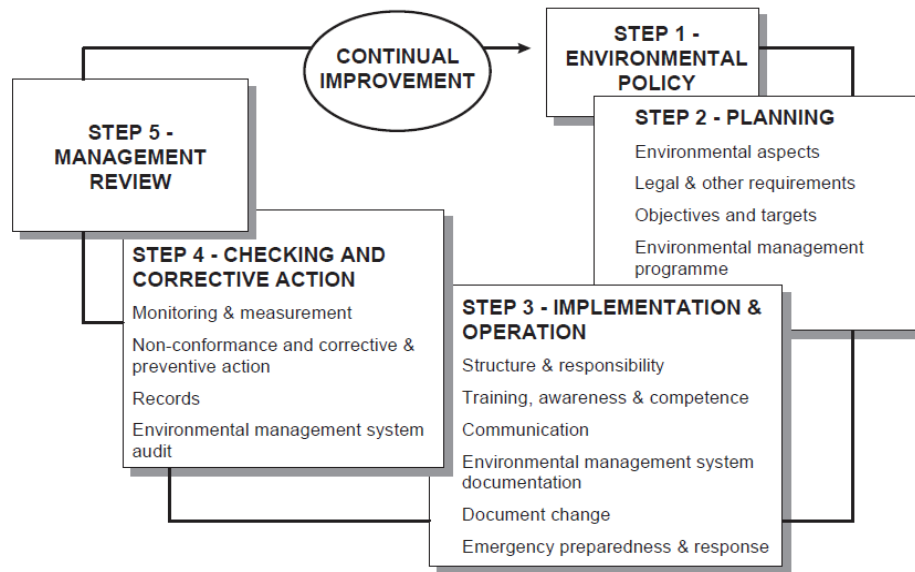


Figure 3: ISO14001 structure (Starkey 1999, 44)

The standard is based on the “Plan-Do-Check-Act” (PDCA) cycle, and the ISO 14001 standard (2004, 9) describes the elements as follows:

- Plan: establish the objectives and processes necessary to reach the goals in the environmental policy
- Do: implement the processes
- Check: monitor and measure the processes
- Act: take actions to continually improve performance of the EMS.

The PDCA cycle, also known as the Stewhart cycle is based on the scientific method and it is widely used in processes that require continuous improvement. (Madu 2007, 95.)

## 6.5 INTERNAL AUDITS

The levels of commitment to the environmental objectives and continuous improvement have to be monitored. This is done by organizing internal audits for the system. The frequency of the audits can be freely determined, but they should be organized so that the further development of the system is possible. The audits are based on an auditing program that defines the frequency and the targets of the audits. The audits should cover the entire system in its defined magnitude. In the audit program the targets can be distributed evenly over time if the organization has many locations or functions to audit. Definition parameters for the audit program can also depend on the current environmental aspects and specific needs at certain moment and the program can be redefined over time according to current state and problematic issues in the organization.

## 6.6 EFFECTS

Welford (1998, 84-87) lists at least three benefits for an organization that successfully implements an environmental management system. Firstly, because of a systematic approach to environmental issues many companies have gained cost reductions, because the companies can define their environmental targets to benefit both themselves and the environment. Second, a proper EMS ensures that the company is aware of its legislative compliance. Lastly, he suggests that organizations can improve their public image and access to new markets by the show of their target-oriented environmental performance.

Watson et al. (2004, 627) found three important issues regarding the financial aspects of implementing an EMS by interpret their research data on the subject:

1. the cost of reducing environmental impact does not impair a company's profitability
2. the benefits may not be fully realized by current accounting practices; and

3. companies with an EMS have not taken full advantage of their competitive situation.

This means that while the direct cost advantages from the implementation of an EMS may be difficult to substantiate, there are no significant cost factors that would occur from the system. In other words, there is no reason why not to implement an EMS, since the positive results have revealed better levels of recycling.

Welford (1998, 85) points out that an EMS is actually forcing a company follow the legislation because it involves a comprehensive study of all of the processes or functions in the organization and the related demands that need to be fulfilled.

Leppävuori (2012) supports the view of improved company image by presenting a fact based on a research made by Sita Finland, a waste management company: two thirds of Finnish companies believe that their company image can be improved by recycling more.

Kuisma et al. (2001, 34) have recognized in their research that the most noticeable change in the companies that have implemented an EMS is the improvement in their waste management. This could also be affected by increased waste handling fees and more strict legislative demands. Regardless, EMS implementation can directly reduce waste handling costs in a company, which is then a direct, short-term benefit. This was noticed in another company in the Intolog chain, when they ordered a waste management plan from a waste management company in 2012. The waste management costs were reduced over 50% by just mapping the waste that the company produced and organizing recycling bins for different waste types. (Savolainen, 2012)

The potential long term benefits from EMS implementation can include better preparation for accidents or other unforeseen situations when data is available from previous company operations. The system also helps new employees adopting the proper processes because training material and other supporting materials already exist and the processes have been under continuous improvement.

Together with complying with the plausible future demands from the partners of Eritoimi, improving the business image of the company can be considered to be one of the initial motivators for the Eritoimi to implement its own EMS.

## 7 PLANNING

*The organization should identify the environmental aspects within the scope of its environmental management system, taking into account the inputs and outputs (both intended and unintended) associated with its current and relevant-past activities, products and services, planned or new developments, or new or modified activities, products and services. --. They may select categories or activities, products and services to identify their environmental aspects. (ISO14001:2004 Annex A.3.1)*

### 7.1 ENVIRONMENTAL ASPECTS

The foundation for an EMS comes from mapping the environmental aspects of the organization and defining the significant aspects. An environmental aspect is a part of the organizations' product or a service that interacts with the environment, and significant aspects are those that might have a profound environmental impact.

These environmental impacts are defined as any changes to the environment that result from the organization's environmental aspects. (SFS EN-ISO 14001, 2004, 13)

Pesonen and others (2005, 21) state that the environmental aspects and the impacts can be recognized only after the nature of the processes in the organization have gone under a profound study.

In addition to the normal processes in the organization, risk analysis about accidental pollution should also be made, because unexpected events might have one-time, profound financial, human and environmental effects. Accidents might have also effects that violate legislation and thus might endanger even the entire operations of a company.

### 7.2 TOOLS FOR RECOGNITION

There are many tools available for recognizing the environmental aspects in an organization. The suitable method or a combination of several methods can be decided in the organization, because the ISO 14001 standard does not define any specific details on the methods.

Pesonen et al. (2005, 21) suggest the use of simple process charts and descriptions to find out the main and supporting processes in the organization. The division between different processes can be based on previous process descriptions, as long as the inputs, like materials and energy, and the outputs (waste and pollution) can be tracked accurately into a specific function or a process.

Pesonen et al. (2005, 21-23) also introduce a balance sheet method to define the material and energy flows. In this “eco balance sheet” all of the output and input materials and energy flows are defined based on the relevant information from the company documentation. Even if the exact amounts of flows are not available, all of the flows should be included in order to properly recognize the environmental aspects.

As a framework in defining the environmental aspects by the selected method, ISO 14001 standard suggests considering, for example, the following factors (ISO EN-SFS 14001, 2004, 29.):

- emissions to air
- releases to water
- releases to land
- use of raw materials and natural resources
- use of energy
- energy emitted, e.g. heat, radiation, vibration
- waste and by-products, and
- physical attributes, e.g. size, shape, color, appearance.

After the environmental aspects are defined, there should be a way to determine the aspects that have the biggest effect, in other words the significant aspects. This can be done simply by a scorecard: the parameters for evaluation are defined, for example the seriousness, probability and the consequences of an aspect with a scale from 1-5, latter being more serious. When multiplying these scores the most significant aspects can be found by bigger scores. Other parameters for scoring the significance can be for example how well the organization can affect the aspect, are some actions required by law and what are the financial impacts of either reducing the seriousness of the effects or not acting upon the aspect at all. Recognizing the environmental impacts is not a one-time task, but in the spirit of the PDCA-cycle and continuous improvement the impacts should be revised and updated because of a dynamic operational environment. The method itself can be modified to be purposeful for the company, but the company has to be able to explain how the aspects are defined. (Pesonen et al. 2005, 24-25.)

### **7.3 ASPECTS INTO POLICIES, OBJECTIVES, TARGETS AND PROGRAMME(S)**

Before implementing any procedures, the company can already have some process definitions or instructions regarding the environmental aspects. These aspects can be taken into account by performing a preliminary review. It is not required by the ISO14001 standard like in EMAS, but it is still recommended to check what the conditions of environmental management are in companies that do not have an EMS to begin with.

Company should create its environmental policy based on the significant factors and its corporate strategy. The policy describes what the company does, how its operations affect the environment and what will the company achieve with its environmental management. The ISO 14001 standard requires that the policy mentions complying with the relevant legislation, preventing the deterioration of the environment by the methods of continuous improvement. Moreover, the commitment from the top management is required, so that when it is committed to the policy it is expected that they will also ensure that the required resources for environmental management are available. Environmental objectives and targets are then based on the environmental policy and significant aspects. The objects might be long-term and general, but the targets are conducted from the objectives and are more precise and measurable. The targets should include the required level and a schedule to reach that level and revise the targets and objectives again. (Pesonen et al. 2005, 45-49)

## **8 CHANGE MANAGEMENT**

### **8.1 CHANGE AS A PROCESS**

Implementing an environmental management system is a change process. It changes some of the daily actions taken by the employees, but as a learning process it should also change the way of thinking and acting in the company. In order to make the system functional and purposeful, the entire company from top management to every employee has to be committed into the process and aware of the implications.

Change is a challenge that happens all the time in organizations, but with different magnitudes. The people in organizations perceive the effects of change in different ways. Change always means letting something go and adapting to something new. Change as a process can be divided into three phases (Kreitner & Kinicki 2002, 545; Ponteva 2010, 24):



1. Phase preceding the change: planning and preparing, unfreezing the situation
2. Feeling the threat: implementation (change itself)
3. Resistance: freezing the situation.

According to Ponteva (2010, 24) there is also a fourth phase from the perspective of the employees: after the situation has been refrozen, there is a stage for approval and looking forward.

People tend to feel anxiousness in the first phase, because of uncertainty about the future: people do not know what to expect and what will the future be like after the change, which is seen as a threat because people feel that they are losing something. After this starts the phase of resistance: people start to mourn the situation and looking back to how things used to be. This is the most concrete phase of change resistance. The last phase is acceptance, through which people start to see their possibilities and cope with the change and create a new organizational identity. (Ponteva 2010, 25.)

Kotter (1996, 66) has described a more profound and elaborate process for major organizational change, but in order to make change happen he suggests that a powerful guiding coalition needs to be established by doing the following:

- Finding the right people: leadership, positional power, expertise and credibility are needed
- Creating trust: Careful planning and lots of communication are essential
- Developing a common goal that is sensible and appealing.

This implies that that handling the people in the change process is the most important part, no matter how big or small the organization or the change itself is. Juuti & Virtanen (2009, 140) also remind about Kotter's (2002) idea that the basis for a successful change leadership is in the success of managing people. They continue that there is no certain method for leading change, because the organization dynamics and attitudes for change are dependable on the already existing leadership culture.

## **8.2 RESISTANCE TO CHANGE**

Resistance to change can be defined as emotional or behavioral response to real or imagined work change (Kreitner & Kinicki 2002, 552). Managing change always includes resistance to change, and handling it is critical when aiming for good results. The resistance can occur as ignoring the change, not identifying with the change, having uncertainty about the direction and disappointment. This can result in people not committing, looking back to old habits, wondering, asking why and also anger and denial. (Ponteva 2010, 24.)

Resistance to change appears most strongly at the individual level, but also in the formal and informal groups within organizations. Individuals reflect to new things brought by change according to their previous life experience. New situations that people encounter are interpreted within the definitions from our cultural and social perspective. This perspective is still seen as objective, so it leads to errors in attribution and people experiencing things differently, usually negatively. (Juuti & Virtanen 2002, 110.)

The reactions to change at group level are mostly based on the perceptions of individuals. Cultures in different informal groups, however, are still relatively strong and exist through “legends”, people who may be long gone from the group. The culture and power in the group is thus relatively enduring and changes slowly even if the individuals in the group change, because social pressure homogenizes the behaviors of people. Still social and professional hierarchies exist within groups, and the groups try to defend these positions. The resistance to change within groups then especially depends on how the change threatens the power of these groups and their dominant norms and how the change is explained by information and models that are not perceived legit by the groups. (Hokkanen & Strömberg 2003, 81.)

It is generally difficult and takes effort for people to try new ways of doing things. Because of this most people do not want changes in their workplace. Ten of the most significant reasons for resistance according to Kreitner & Kinicki (2002, 552-553) are:

1. Individual’s predisposition toward change: depends on personal traits
2. Surprise and fear of the unknown: fed by rumors and lack of information
3. Climate of mistrust: lack of honesty in communication
4. Fear of failure: employees doubt their capabilities
5. Loss of status or job security because of corporate restructuring
6. Peer pressure: protecting the interests of companions
7. Changes in cultural and group dynamics
8. Personality conflicts
9. Poor timing
10. Lack of rewarding systems for more job effort due to the change.

### 8.3 OVERCOMING RESISTANCE TO CHANGE

In order to overcome the obstacles that these issues create, Kreitner & Kinicki (2002, 556) put lots of emphasis on communication. They suggest providing as much information as possible to the employees while explaining why the change is significant and what the rationales are for it. They suggest hearing the employees about the changes and the effect to employees' jobs through meetings and opportunities to discuss. They also present Kotter's (1979) classic six strategies to overcome change. They are illustrated below in Table 1.

Table 1: Six strategies to overcome resistance to change

Strategy	Advantages	Disadvantages
<b>Education &amp; Communication</b>	If successful, people will help with the change implementation.	Time consuming, requires lots of effort.
<b>Participation &amp; Involvement</b>	Increases commitment to change and mutual learning possibilities.	Consumes time if the design is focused on irrelevant aspects.
<b>Facilitation &amp; Support</b>	Best solution for adjustment problems.	Can be time consuming, expensive and still fail.
<b>Negotiation &amp; Agreement</b>	Relatively easy.	Expensive to negotiate compliance, might create inequality.
<b>Manipulation &amp; Co-optation</b>	Quick and inexpensive.	Might lead to mistrust and problems with relationships.
<b>Explicit &amp; Implicit coercion</b>	Fast and versatile solution.	Might create anger towards the management.

These strategies are not mutually exclusive, but should be used after strict consideration. The faster strategies might give good short-term results but lead to difficult situations in work motivation and the employees' attitudes towards the initiators.

This is why Hokkanen & Strömberg (2003, 83) recommend "hurrying slowly" in order to save expenses and effort by first building the basis for change. Some preliminary arrangements should be done to diminish the resistance right at the beginning of the change process. These arrangements include the definition of resources, plans and actions that are needed for the change.

Second, a diagnosis of the change should define whether the change is reoccurring or not and what kind of changes it requires and who it affects. This diagnosis should also include behavior analysis, which defines the people who might be against the change and what kind of resistance is expected and why.

Third, an environment that supports the change should be established: emphasis on the positive effects of the change should be communicated at an individual level and neutrality should be achieved among the employees. Next, positive reinforcement should be used towards the groups that support the change in order for the positive effect to transfer to the resisting individuals or groups. Finally leadership skills should be used to ensure the sufficient use of power and resources to implement the change. (Op. cit. p. 83-85.)

### **8.3.1 Leadership**

Kotter (1996, 25) defines leadership as "a set of processes that creates organizations in the first place or adapts them to significantly changing circumstances." In short, management deals with complexity and leadership deals with change while setting a direction, aligning people and inspiring and motivating them.

According also to Juuti & Virtanen (2009, 140), the basis for a successful change is in leading the people that are involved in the change. Therefore there is no certain pattern or a "recipe" to implement a change, but everything depends on the culture of leadership and what kind of environment for development there is.

### **8.3.2 Communication**

Juuti & Virtanen (2009, 151) put a lot of emphasis on the communicational part in change: the success of a change depends mainly on the quality and quantity of communication. It is important to be honest about the upcoming events especially if the leader does not know what is going to happen. Honesty creates credibility, but what needs to be remembered is that there is also a need-to-know basis for things, so that not everything classified can be told to the employees. The leader can still convey one's own opinions about the matters to keep a good communicational spirit.

One of the elements of communication is training, and with training and education the people involved in the change can have the necessary information and skills for the change to be successful.

Most important role in education and training is with the top management, because their task is to create the framework for environmental management that the entire staff has to work with. This commitment is a message to the employees that the matters are important, and with proper education the employees will understand the importance and therefore will commit to the change easier. (Pesonen et al. 2005, 55.)

## **9 EMS PLANNING AND IMPLEMENTATION IN ERITOIMI OY**

The research for a theoretical basis was started with a literature review and desk study in January 2013 in order to gather some theoretical knowledge that is involved with the process in terms of its defined breadth. The mapping of the required resources was already started in summer 2012 and plans for the process implementation for spring 2013 were also made beforehand.

Interviews were conducted in summer 2012 and January 2013 to gain access to information about Eritoimi Oy operations and goals and also with Vapo Oy environmental management to have some practical information about working with an environmental system.

Before implementing the EMS for Eritoimi Oy, the environmental attitudes of the stakeholders and relevant partners were mapped by conducting an online survey, and the questions are listed in appendix 1. The survey was based on a survey made by the European Union about personal environmental attitudes, but questions were also placed in order to ask directly how the implementation of an EMS will affect the company image in the eyes of the partners.

All of this knowledge was then combined to and reflected on in the EMS planning and implementation process that took place in spring 2013.

### **9.1 SURVEY MAPS THE ENVIRONMENTAL ATTITUDES OF PARTNERS**

The online survey (see Appendix 1) was conducted in February 2013. An e-mail advertisement with the link to the survey conducted in Finnish was sent to 950 representatives of domestic suppliers and customers. Eritoimi was able to order an appealing digital advertisement poster (see Appendix 2) from a designer that was already in cooperation with Intolog chain and had experience from the color schemes and themes that the chain has used. Eritoimi also purchased prizes which announced to be raffled among the respondents leaving their contact information after the survey.

### **9.1.1 Survey planning and distribution**

The survey was created using Digium Enterprise online survey platform. The first part of the survey was about respondents' personal opinions and actions over environmental protection and management. The questions were applied from a questionnaire that EU had made to its citizens, and the purpose of these questions was to set the framework of environmental issues to the respondents in this survey. The main idea of the survey was, however, to get affirmation from the company stakeholders that implementing an EMS is important and people see it as an improvement to company image. At the same time by two questions the future possibility for companies actually requiring an EMS from their partners was mapped.

Eritoimi had a mailing list with customer e-mail addresses, and this mailing list was used as a target group for the survey. In addition to the customers, approximately 50 representatives were selected from the domestic suppliers to be included in the survey target group.

Before sending out the survey it was tested with two teachers from JAMK, one Eritoimi employee, one customer representative and one member from the Intolog chain. According to the comments from the testers the wording of the survey was tweaked to make it more understandable for people that do not have earlier experience from the concepts of environmental management.

### **9.1.2 Response rate**

From the 950 targets the survey received 97 answers within the first week. 108 targets were not present, had gone to another company or did not want to be on the mailing list of the company. These names were then removed from the customer mailing list of Eritoimi but also from the name list that was subject to a reminder after a week from starting the survey.



For the first week we get a response rate:

$$RR = \frac{\text{responses}}{\text{number of people in the sample} \text{ (all targets - invalid targets)}} \times 100 \% = \frac{97}{950-108} \times 100 \% = 11,5 \%$$

After the reminder and ending the survey there were altogether 156 responses. The survey was open for two days after the reminder, but all the rest of the answers came on the day or the following day from the reminder, which gives us the final response rate:

$$RR = \frac{156}{950 - 108} = \mathbf{18,5 \%}$$

Thus, the reminder was an effective tool to improve the response rate, because it increased the total response rate by approximately 60 %, or 7,0 %-units to 18,5 per cent.

### 9.1.3 Survey results reaffirm the need for an EMS

The survey results were encouraging: 56 % of the respondents thought that the companies that they work in will require environmental management from their partners, 53 % of those seeing it happen within the next two years (2013-2015). Moreover, 85 % found that having an EMS is either somewhat significant or very significant in terms of a positive company image, while only two respondents suggested that it has no significance at all.

These results revealed that at least as representatives of their respective companies people see environmental management as an important factor in current and future business. This supports the views from the literature that was reviewed for this paper and the survey gives a valid reason to really put effort into environmental management in the company.

## **9.2 EMS SELECTION**

Because of the requirement for public environmental statement in the EMAS system, Eritoimi decided to comply with the simpler ISO 14001 standard, because it already includes the definition of the company's environmental policy. This policy together with the possible changes in it were decided to be communicated to the company stakeholders, and this was considered to be a sufficient enough of a public statement. The company did not want the system to be certified, because a statement that the company is complying with the standard was considered to be enough. Still, maintaining the processes that are included in the ISO14001 standard could give the opportunity in the future to apply for a certificate if and when it was required by the company partners. In that case the monetary input for the certificate would be more justified.

## **9.3 PREREQUISITES, RESOURCES AND A STRUCTURE FOR THE SYSTEM**

ISO 14001 standard states that the commitment to the system has to be present in all levels of the organization, and that it should start at the highest levels of management. Before starting the project it was made sure that the owner and CEO of the company were committed to the process and that they would support the process in their communication to other employees and stakeholders and that they would also provide instructional guidelines to help the progress and development of the system. The monetary resources within reasonable limits were agreed to be available for any necessary equipment or supporting functions in order to achieve good results. I was the primary resource for the system implementation, and it was stated in my employment contract that in addition to my normal work in sales I could use a certain part of my working hours for the project tasks and reporting. Later on we agreed that there can be a training session for the staff about the procedures that the management system would cause.

One of the concrete goals of the process was to build an environmental handbook for the company of the system. The document structure of the system is not defined in the ISO standard. To maintain scalability and adoptability for the system within the Intolog chain, the documentation was built under the ISO14001 standard headings in order to avoid cross-references and confusion if the EMS is later implemented in other locations of the chain. This means that even if the functions on the other locations have different emphasis or environmental effects, the same foundation can be used for building the EMS and preparing the documentation. Furthermore, this will allow for reallocation of internal auditing and document updating responsibilities within the chain, because the system is similar everywhere. Because no other handbook or a quality management system had not been used in the company, creating a new entity for the appropriate files was the simplest solution.

The documentation was built from the beginning into separate documents to the company intranet under a Windows folder. Once the drafts became final versions they were converted into pdf-files so that nobody could modify them accidentally.

#### **9.4 DETERMINING ENVIRONMENTAL ASPECTS**

Environmental aspects are the basis for any environmental management system, so after the resources for the project were clear we started to map the effects that the company has on its environment. The effects were divided by a functional approach (illustrated in Appendix 3) into Eritoimi facilities, transportation and maintenance vehicle processes. Together with the CEO of the company we mapped the effects that each of these processes have and made a scorecard based on the quantity, probability of an accident and the effect of the aspects. By giving a value from 1 to 5 and multiplying the figures from each column we got a risk number for each aspect. The valuation seen in Appendix 4 was based on quantitative data from different sorts of documentation but also empirical estimation. We also considered if we can affect the aspect by our own actions and whether there is a legal requirement that has something to do with the aspect. Combining these valuations we were able to find the significant environmental aspects. The most significant aspects from the company operations that the company itself could affect directly were:

1. Facility energy consumption
2. Waste disposal and recycling, regarding especially dangerous wastes
3. Usage of the maintenance vehicles (cars)

Determining these aspects also helped the company management to reform the company environmental policy, because after that the company management had a justifiable documentation about which things were the significant effects from the company operations. Earlier there was no clear statement about the overall company strategy, so now it was possible to combine the environmental policy into it and make a new declaration.

## **9.5 COMPANY STRATEGY AND ENVIRONMENTAL POLICIES**

Eritoimi did not have a clear, outspoken strategy or business policy at the time of the EMS implementation. Together with the owner and CEO of the company the core competences of the company were mapped. At the same time conversations were held in order to find out how the environmental performance of the company affects these factors at least in two ways: First, training and education for the employees increase staff competence and know-how while reducing the risk for accidents and minimizing the time for unproductive work.

Second, sorting and recycling wastes and also second-hand products helps to elongate the life cycle of the products and save waste management costs. By keeping control of the second-hand shelving markets, for example, value for the products can be maintained in the market better when most of the products go through Eritoimi rather than private owners that might not have any idea on the value and pricing of the products. The commitment to a cycle of continuous improvement will leave also the company strategy open to review should the situation in the market change.

Eritoimi environmental policy is a part of the Environmental Handbook in Appendix 8.

## 9.6 PRELIMINARY REVIEW

A preliminary review concerning the state of environmental management at Eritoimi was conducted by interviewing the management and staff in the company. The review was based on the previously determined environmental aspects and it also took legislative issues under closer study. Very soon it was clear that environmental issues were not managed and that recycling was random and done only if there was a direct monetary benefit from it – in practice “a guy” took out scrap metal every once in a while and paid a small amount of money for it. There were separate bins for mixed wastes and cardboard, but there was no control over what was put into the bins or when the bins were emptied, nor was there anyone responsible for these things. Wood waste was freely taken away by any employee in the facility that would need some firewood. Photos taken of the waste bins before the EMS implementation are in Appendix 6. In here all waste types are mixed to the same bin, even small parts of wood even though there is an unofficial pile for wood next to the bin.

The management of the company was not aware of the legislative requirements concerning environmental management, except that they knew that sorting wastes is mandatory and they considered it being handled “somewhat OK.”

Interviewing the property owner revealed that the property energy consumption was managed by a timer controlling the inside temperature, so that the temperature was lowered outside of business hours. As this was one of the most significant environmental aspects also in Eritoimi operations, the property owner suggested that the usage of the lifting doors should be taken under investigation, because the doors had no insulation and let through lots of heat energy.

By a quick calculation from a waste management company consultant it was estimated that just by changing the company waste bin types into energy-to-waste bins there would be a chance to decrease the waste handling costs by at least 30 %.

## **9.7 LEGISLATORY REQUIREMENTS**

Keeping a record of the legislative requirements concerning any company operations is an enormous task, because a legislation registry for any relevant requirements should not only be collected, but also kept up-to-date. As there were not enough resources or skills to build such a registry, it was decided that a legislation registry will be acquired as a service from a consultant who will help maintain a registry that includes relevant legislative issues concerning not only the Eritoimi EMS but also the operation of other companies of the owner.

## **9.8 COPING WITH CHANGE**

Already before starting the process a notification was sent by e-mail to Eritoimi employees describing the process of implementing the environmental management system into the company and what kind of responsibilities it might bring in the future. A positive image was given about how important the change is and how it would clarify responsibilities and improve some of the processes in the company. It was meant to be made clear that the system is implemented in order to make things simpler instead of complicating them.

Spring 2013 was also a time for other changes in the company, because the office in Jyväskylä was about to move to a new location, and there was also a project going on regarding the usage of the ERP system in the company that was aiming for improvements in purchasing and inventory management. The staff was informed that the implementation project of the EMS has nothing to do with the other projects, is silently going on in the background and most of the work regarding the EMS is done by the student. This was because there was already lots of resistance among the employees towards the change in the processes regarding the ERP system, so to alleviate the pressure felt by the staff the purpose was to keep their minds off of another project, the EMS implementation. The purpose was also to reassure the mechanics of the company that in the future handling the waste that their work generates is in the end not their responsibility, because they only need to comply with the processes regarding different wastes, and if taking care of a waste type or an oil spill, for example, do not have process descriptions and solutions, it is because of a deficiency in the system.

## **9.9 WASTE MANAGEMENT**

As discussed in chapter 6.6, effective waste management is one of the most noticeable results after implementing an EMS. Implementing waste management at Eritoimi was rather straightforward after the material flows and environmental aspects had been mapped. The preliminary review revealed that there was no documentational evidence that packaging waste including plastic and cardboard were the biggest waste types generated at Eritoimi facilities, but after every employee evaluated this to be the situation, it was comfortable to take it as a fact. On this basis it seemed clear that plastic wrappings and cardboard should be sorted out from other mixed waste instead of putting all waste types into the same bin for mixed waste. This is because mixed waste is one of the most expensive waste types to handle, as can be seen in an example of the pricing list of Mustankorkea waste management facility in appendix 5. During the time of the preliminary review cardboard and plastic were the biggest waste types, and after they had been piled up to a mixed waste with other trash, all of the waste taken out to recycling was charged according to the most expensive waste type!



A plan for the new waste bin setup is illustrated in Appendix 7. In here packaging waste other than cardboard is collected to energy-to-waste bin, because it is cheaper to take for recycling than mixed waste. Cardboard, scrap metal and paper have their own, separate bins, because waste management companies take these types free of charge. Possibility for the collection of mixed waste should still exist so that mixed wastes would not accidentally contaminate the separately collected waste types.

Initial setup for waste handling was made according to the plan, and in this system the waste-to-energy would be stored until the proper waste bins were received.

The correct placement for each waste type is included in the training agenda for the employees, and proper sorting is ensured by having these waste bins for Eritoimi only instead of letting other companies in the facilities to use them. This is because if the bins were free to use by anyone in the premises, proper usage could not be ensured even if there were guiding signs for how to sort different wastes. In here wood waste is an exception, so that Eritoimi collects its wood waste and empties it to a bigger pallet mutually used by other companies in the same building. The wood waste is then free for anyone to take home to burn. In case of the pallet being filled up, it would then be collected by a waste management company and replaced by an empty pallet.

### 9.10 EMS IMPROVEMENT

In order to complete the implementation of the system and to keep it running, there were still issues to be solved at the time of the thesis was published. These issues with the propositions to solve them are presented below in Table 2.

Table 2: Issues still to be developed in the EMS

Issue	Intended solution
Incomplete training	Arrange training for both locations at the same time with a meeting regarding other company processes
Waste bins are homemade	Change the current mixed waste bins

Rescue plan is misplaced	into energy-to-waste bins Create digital, up-to-date version of the rescue plan
No clear targets for the environmental programs	Gather waste amount and cost data for until the end of 2013 so that targets can be set further, use more simple objectives until then
No plan for outbound communication	Set up rules with CEO for how the EMS is shown to customers and partners

## **10 CONCLUSIONS**

### **10.1 RESEARCH RESULTS**

Research questions presented in chapter 2 created a solid base for the research. The online survey together with the supporting literature revealed in case of Eritoimi Oy that there is a demand for an EMS and that it is relevant for successful business operations in the present situation at Eritoimi and possibly even more in the future. The system will not only increase the company's environmental performance, but can also save money in time savings and recycling costs. When properly executed, the system will also enable that the company will follow the mandatory legislative requirements, which is essential in any company operations. Proper processes for waste management will also increase the tidiness in the facilities, which is also an improvement for employee health and safety. As the facilities also function as an office and exhibition for consumer visitors, a better public image will be presented to the visiting customers and more value is created for the business in that sense, too.

The requirements for an effective EMS were presented in chapter 6.3 and finding the significant environmental aspects of Eritoimi operations will help to achieve good results from the system. ISO14001 standard also specifies the requirements for an EMS, and by following this standard the requirements should be properly met. Eritoimi has also released resources for the environmental organization so that the cycle of continuous improvement can be achieved. The scalability of the standard allows for every organization to define their own level of performance concerning environmental issues, so in that sense the system itself can be implemented in companies of all sizes to meet their specific criteria.

Committing people was dependable more on the personalities of the employees than the effort in leadership. Communication was started early, which alleviated some of the resistance, but there were differences in the behavior of individuals in their attitude towards change: some helped in the process but others did not see the small tasks included in the system building worthwhile. On the other hand, most of the communication was done by me instead of top management, which could be a chance for improvement.

## 10.2 RESEARCH CRITIQUE

### 10.2.1 Survey

The survey was done to map the environmental attitudes of the current company partners, who represented companies from all sizes and different positions and industries. This gave a good variation for the population, but by limiting the population to the existing partners there are threats to the validity of the study results and they are at the same time limited in two ways:

1. The respondents are already in cooperation with Eritoimi, so they already had formed an opinion about the company; this may cause a response bias so that the respondents answer in a way they think the questioner wants them to respond, or in a way they think is most socially desirable. (Paulhus 1991, 17.)
2. Some of the company representatives did not know about environmental systems and some had the systems already operating. This might have affected their answering even though the basics of environmental management were explained in the survey.

The questionnaire, however, is repeatable and as a tool for research it gave reliable information even though there were minor threats to its validity. The survey is repeatable and if it was repeated after a period of two years, the progress in the environmental attitudes of the partners could be compared to the results of this survey.

If there would have been a need for results for generalizing attitudes towards management systems, the survey should have been done by an unaffiliated party so that the threat to response bias would have been smaller. On the other hand, environmental values have emerged as more and more socially appealing, so the results for such a survey might have still been more or less biased in any case.

### **10.2.2 Research purpose**

Implementing management systems is not a new field of study and there are already many papers available of environmental management system implementations. In this paper, however, the requirements for an EMS and the connection between the EMS and successful company strategy with the effects on the company image are under closer study.

This paper is also missing studies on any arguments that would be against environmental management, because the research scope was set only to find the benefits.

The author's effort to ensure the company staff how small the effect of implementing the system in their daily work was going to be might have affected the attitudes towards disregarding the entire project. In this sense communicating more about the positive impacts for a small effort from the staff might have been a better strategy and lead to better commitment and assistance.

### **10.3 Reflections on the research**

I found the research work to be very rewarding, because the desk study and especially the survey revealed an actual need for the EMS implementation. This is why my motivation was rather high during the process. The project itself was not very rewarding in terms of creating something original because there was the standard to be followed, but still the ways to handle all of the required information had to be figured out by myself.

In hindsight, creating a proper project plan with the schedule, resources and responsibilities would have probably helped during the process and especially in the communication between myself and the company staff.

During the project I gained a lot of new information regarding environmental issues and in that sense increased my skill level. The project required persistence and increased my skills and motivation to take more responsibility, to do initiatives and to develop company processes towards consistency and cost-effectiveness.

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## Appendix 1: Online survey questions

### 1. Kun puhutaan "ympäristöstä", mikä seuraavista tulee mieleesi ensimmäisenä?

- kaupunkien saasteet
- ilmastonmuutos
- vihreä maisema
- luonnonsuojelu
- elämänlaatu
- ihmisen aiheuttamat teollisuusvahingot
- maanjäristykset, tulvat ja muut luonnonkatastrofit
- luonnonvarojen käyttö
- en osaa sanoa
- jokin muu, mikä \_\_\_\_\_

### 2. Valitse listasta kolme (3) ympäristöasiaa, jotka ovat mielestäsi merkittävimpiä.

- vesien saastuminen
- ilmansaasteet
- ihmisen aiheuttamat vahingot
- luonnonkatastrofit
- maanviljelyn saasteet (tuholaismyrkyt, lannoitteet yms.)
- kemikaalien yms. vaarallisten aineiden varastointi
- ilmastonmuutos
- melusaaste
- luonnonvarojen käyttö
- eri kuljetusmuotojen vaikutukset (lisää autoja, moottoreita ja lentokuljetuksia)

### 3. Kuinka tärkeää ympäristöstä huolehtiminen on sinulle henkilökohtaisesti?

- ei lainkaan tärkeää
- ei juurikaan tärkeää
- en osaa sanoa
- jokseenkin tärkeää
- erittäin tärkeää

-----

### 4. Vastaa seuraaviin väittämiin omasta näkökulmastasi, oletko täysin samaa mieltä, osittain samaa mieltä, osittain eri mieltä tai täysin eri mieltä.

#### 4.1 Ympäristöhaitoilla on suora vaikutus päivittäiseen elämääni

- täysin samaa mieltä
- osittain samaa mieltä
- en osaa sanoa
- osittain eri mieltä
- täysin eri mieltä

#### 4.2 Suurilla saastuttajilla, kuten esimerkiksi teollisuuden yrityksillä on päävastuu ympäristönsuojelusta

- täysin samaa mieltä
- osittain samaa mieltä
- en osaa sanoa
- osittain eri mieltä
- täysin eri mieltä

#### 4.3 Pystyn henkilökohtaisella panoksellani vaikuttamaan ympäristönsuojelun tasoon

- täysin samaa mieltä
- osittain samaa mieltä

- en osaa sanoa  
 osittain eri mieltä  
 täysin eri mieltä

-----

**5. Olen viimeisen kuukauden aikana tehnyt jotain seuraavista asioista ympäristösyistä (rasti niin monta kuin haluat)**

- käyttänyt autoani vähemmän  
 ostanut ympäristömerkittyjä tuotteita  
 suosinut lähiruokaa tai paikallisia tuotteita  
 vähentänyt kertakäyttötavaroiden kulutusta  
 lajitellut jätteeni kierrätykseen  
 vähentänyt veden kulutusta  
 suosinut ympäristöystävällisempää kulkumuotoa (kävely, pyöräily, julkiset kulkuneuvot)  
 vähentänyt kotini energiankulutusta  
 ei mikään näistä

**6. Mitkä seuraavista ovat kolme tärkeintä tapaa, joilla ihmiset voivat mielestäsi vaikuttaa ympäristönsä suojeluun? (valitse max. kolme (3))**

- lisäverojen maksaminen  
 ympäristöasioiden huomioiminen suurten ostosten yhteydessä (talonrakennus, auton hankinta, matkustaminen)  
 auton vaihtaminen ympäristöystävällisempään malliin  
 jätteiden lajittelu kierrätykseen  
 lähiruoan ja paikallisten tuotteiden suosiminen  
 kodin energiankulutuksen pienentäminen  
 ympäristömerkittyjen tuotteiden ostaminen  
 ei mikään näistä

**7. Yrityksenne koko?**

- mikroyritys (<10 työntekijää, liikevaihto < 2 milj. €)  
 pieni yritys (10-50 työntekijää, lv. < 10 milj. €)  
 keskisuuri yritys (50-250 työntekijää, lv. < 50 milj. €)  
 suuri yritys (>250 työntekijää)

**8. Yrityksessänne on käytössä ympäristö(nhallinta)järjestelmä.**

- kyllä  
 ei  
 en osaa sanoa

**9. Yrityksessänne ollaan tietoisia sen ympäristövaikutuksista.**

*(=Haitallisista tai hyödyllisistä yrityksen toiminnoista, tuotteista tai palveluista johtuvista muutoksista, jotka tapahtuvat ympäristössä. Ympäristöllä tarkoitetaan tässä toimintaolosuhteita, joihin sisältyvät ilma, vesi, maa, luonnonvarat, kasvi- ja eläinkunta sekä ihmiset ja näiden väliset vuorovaikutukset.)*

- kyllä  
 ei  
 en osaa sanoa

**10. Yrityksenne on saanut riittävästi tietoa ympäristöasioista (lainsäädäntö, käytänteet)**

- kyllä  
 ei  
 en osaa sanoa

**11. Kotimaiset yritykset keskittyvät jatkossa enemmän ympäristönsuojeluun.**

- täysin eri mieltä

- osittain eri mieltä
- en osaa sanoa
- osittain samaa meiltä
- osittain eri mieltä

**5. Yrityksenne saattaa vaatia tulevaisuudessa yhteistyökumppaneiltaan ympäristöasioidensa selvittämistä.**

- kyllä
- ei (siirry kysymykseen 14)
- en osaa sanoa

**6. Ympäristöasioiden selvittäminen on ajankohtaista (arvionne):**

- 0-2 vuoden kuluessa
- 2-5 vuoden kuluessa
- 5-10 vuoden kuluessa
- 10+ vuoden kuluttua

**7. Eritoimi Oy (Intolog Kuopio ja Jyväskylä) siirtyvät tänä keväänä ISO 14001 -standardin mukaiseen ympäristönhallintajärjestelmään.**

**Kuinka merkittävänä pidät järjestelmällistä ympäristöasioiden hallintaa yrityskuvan kannalta?**

- ei merkitystä
- vähäinen merkitys
- en osaa sanoa
- jokseenkin merkittävä
- erittäin merkittävä

**Voit halutessasi jättää yhteystietosi arvontaan osallistumista varten (nimi ja sähköpostiosoite riittää). Yhteystietojasi ei yhdistetä antamiisi vastauksiin, eikä niitä käytetä markkinointitarkoituksiin.**

**Nimi:** \_\_\_\_\_

**Sähköposti:** \_\_\_\_\_

## Appendix 2: Online survey advertisement and reminder picture links



**Kerro mielipiteesi ympäristöasioista**

**Kerro mielipiteesi ja voita!**

Toivomme apuasi. Eritoimen Jyväskylän toimipisteessä työskentelevä **Toni Myyryläinen** tekee JAMK:n opinnäytetyönä Eritoimelle ympäristöhallintajärjestelmää, jolla tähdätään ISO 14001 -ympäristöjärjestelmästandardin mukaiseen toimintaan. Tähän liittyen kartoitamme yhteistyökumppaneidemme mielipiteitä ympäristöasioista. Vastaaminen vie vain muutama minuutti.

Osallistu tutkimukseen tästä. Vastaathan viikon sisällä.

**Intolog**  
Suomalaista sisälogistiikkaa

**ERITOIMI OY**

**Kuopio**  
Ankkuritie 3  
Puh. (017) 364 8400

**Jyväskylä**  
Laukaantie 7  
Puh. (014) 449 9703

asiakaspalvelu@eritoimi.fi  
www.eritoimi.fi  
www.intolog.fi

Osoitelähde: Eritoimi Oy:n asiakasrekisteri



**Kerro mielipiteesi ympäristöasioista**

**Kerro mielipiteesi ja voita!**

Hyvä yhteistyökumppani!

Lähetimme Sinulle viime viikolla ympäristöasioihin liittyvän kyselyn. Mikäli et ole jo vastannut, toivomme, että Sinulla olisi vielä mahdollisuus vastata kyselyymme.

Osallistu tutkimukseen tästä. Vastaathan 15. helmikuuta mennessä!

**Intolog**  
Suomalaista sisälogistiikkaa

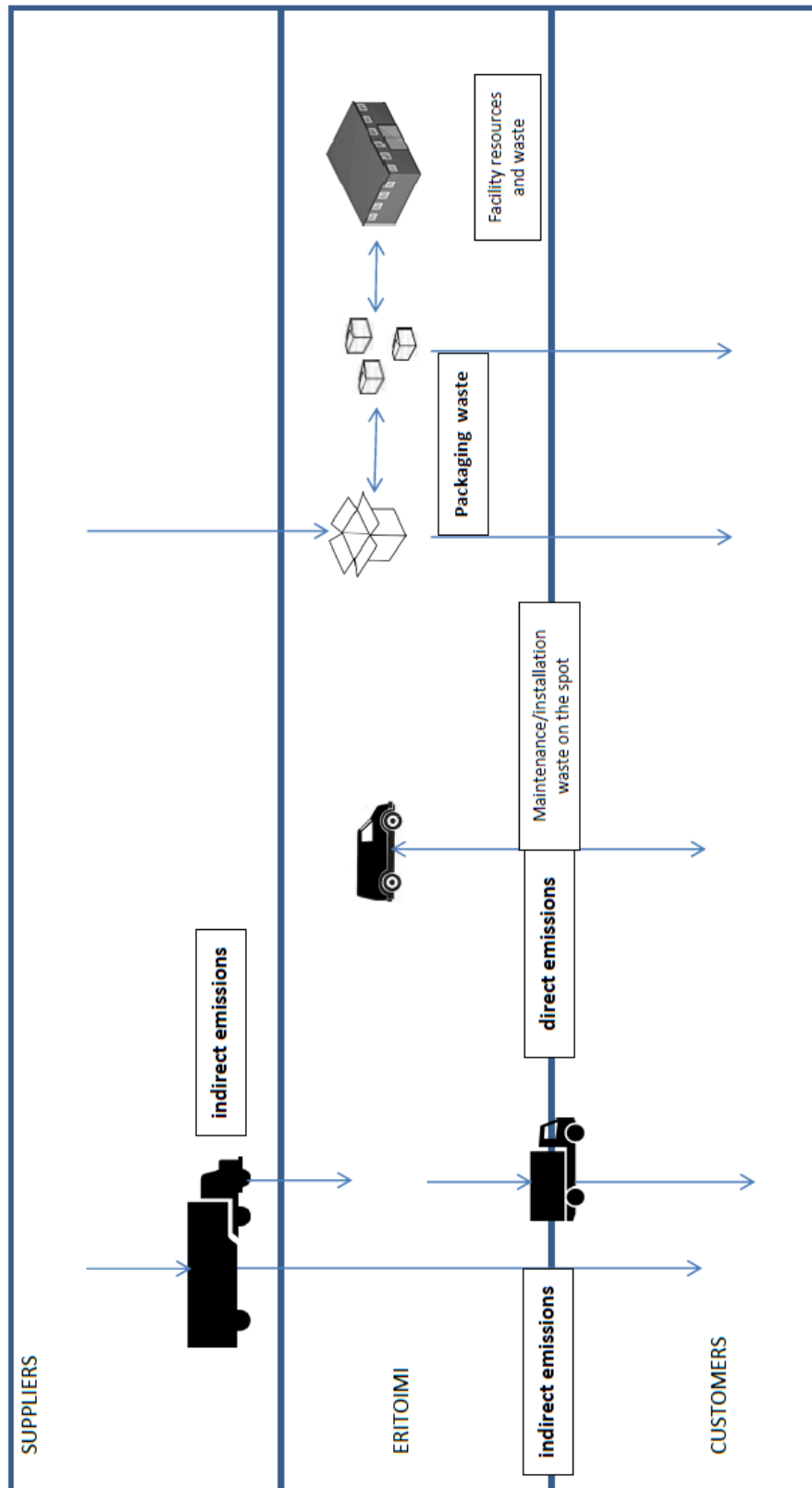
**ERITOIMI OY**

**Kuopio**  
Ankkuritie 3  
Puh. (017) 364 8400

**Jyväskylä**  
Laukaantie 7  
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www.intolog.fi

Osoitelähde: Eritoimi Oy:n asiakasrekisteri



TOIMINTO	NÄKÖKOHTA	VAIKUTUS	määrä (E-3)	Oirettomuuden todennäköisyys (E-3)	vaikutus (E-2)	ERM (todennäköisyys x vaikutus) (E-1,2,5)	Merkittävä?	Mahdollisuus kontrolloida?	TAVOITEHUJELMA	ULKOISET VAATIMUKSET	
KINTEISTÖ	YLLÄPITO	sähkön kulutus	4	2	3	24	k	k	Kulutusta ja tavoitteet.		
		veden kulutus	2	1	2	4	e	k	Kulutusta ja tavoitteet.		
		lämmitysenergia	4	1	2	8	e	k	Kiinteistökohtainen.		
		toimistopaperi	1	1	2	2	e	k	Kulutusta ja tavoitteet.		
	VAARALLISTEN AINEIDEN SÄILYTYS	JÄTTEET	öljyt	2	3	4	24	k	k	Selvitys Kuopion kanssa.	http://www.finlex.fi/fi/laki/ajantasa/1997/19970101
			jäteöljy	1	4	4	16	k	k	Kulutusta ja tavoitteet.	http://www.finlex.fi/fi/laki/ajantasa/2008/20080422
			akut	2	3	2	12	e	k	Kulutusta ja tavoitteet.	
			paristot	1	3	2	6	e	k	Kulutusta ja tavoitteet.	
			muovijäte	3	1	3	9	e	k	Kierätyks.	Pakkausjäte: http://www.finlex.fi/fi/laki/ajantasa/1997/19970962
			pahvijäte	3	1	2	6	e	k	Kierätyks.	
			puujäte	2	1	2	4	e	k	Kierätyks.	
			sekkijäte	4	1	2	8	e	k	Kierätyks.	
			paperijäte	1	1	2	2	e	k	Kierätyks.	http://www.finlex.fi/fi/laki/ajantasa/1998/19980883
			tupakkatumpit	2	1	2	4	e	k	Työhyhyvinvointi?	
HUOLTO/ASENNUS/ MYynti	SUORAT PÄÄSTÖT	sähkö/elekt. romu	1	0	0	0	e	k	Hankinnat.	http://www.finlex.fi/fi/laki/ajantasa/2004/20040852	
		metalliroomu	3	2	2	12	e	k	Kierätyks.		
TOIMITTAJAT & ASIAKKAAT	EPÄSUORAT PÄÄSTÖT	pakokaasut	4	3	4	48	k	k	Huoltoautojen käyttö.		
		asennusjätteet vieväde pois	2	3	3	18	k	e	Kierätyks ja myyntitiedot.		
SATUNNAISPÄÄSTÖT			2	1	2	4	e	e	Ketjun kanssa kommunikointi		

**JÄTTEENKÄSITTELYMAKSUT, Suuret kuormat / raskas liikenne**

Jätelaji	Hinta 2013		Huomioitavaa
	€/tonni alv 0%	€/tonni alv 24%	
<b>KÄSITELTÄVÄT JÄTTEET</b>			
Biojäte	76,12	94,39	
Biojäte II-laatu (pakkauksellinen biojäte)	83,59	103,65	(1,5
Karjanlanta	24,68	30,60	(5
Puhdistamoliete	Pyydä tarjous puhdistamolietteen käsittelystä.		
Ravintorasvat	24,68	30,60	
Energiajäte	75,91	94,13	(2
Keräyslasi	63,15	78,31	
Paperi	0,00	0,00	
Pahvi	0,00	0,00	
Keräysmetalli	0,00	0,00	
Risut ja oksat	16,75	20,77	nuppikuormahinta
Puutarhajäte	16,75	20,77	nuppikuormahinta
Tietosuojamateriaali	261,62	324,41	
Sekajäte, lajiteltava (sis. hyötyjätettä)	153,17	189,93	



**Appendix 6: Waste bin placement during preliminary review**



