

ISO 14001 Environmental
Management System
Performance:
An evaluation of ten organisations
in Canterbury, New Zealand

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Preface

This research project was undertaken by a group of six postgraduate students at Lincoln University. The six students were all enrolled in the course ERST 620 – Advanced Environmental Management Systems. This course has a major emphasis on practical and applied approaches to learning about business and the environment. The authors of the report are the six students and the course examiner, Ken Hughey.

Executive Summary

The aim of our research was to undertake a qualitative evaluation of the performance of ISO 14001 in ten Canterbury based organisations. An evaluation framework was developed consisting of twenty-two questions based on the ISO 14001 auditable elements. This framework formed the basis for qualitative interviews with representatives from each organisation. Our research indicates that ISO 14001 is an effective Environmental Management System (EMS) that led to improvements in environmental performance, however not without some limitations.

Chapter 1

Introduction

The development of Environmental Management Systems (EMS) was designed to provide a framework for organisations trying to incorporate environmental objectives into their decision-making. EMSs provide a methodical approach to managing the impacts of organisations on the environment. Furthermore, an EMS formalises an organisation's environmental effort into a systematic approach, based on the 'plan-do-check-act' cycle.

Certification standards for EMS have become increasingly common in recent years. In September 1996, the International Organisation for Standardisation (ISO) published a voluntary and international standard for EMS. The international standard and its guidelines are known as the ISO 14000 series. The specification standard of the series is ISO 14001.

ISO 14001 provides guidelines by which organisations design and implement an EMS that identifies the organisation's environmental policy, the environmental aspects of its operations, legal and other requirements, a set of clearly defined objectives and targets for environmental improvement, and a set of environmental management programs.

As more and more organisations adopt EMS, it is important to determine if implementation leads to improvements in the environmental performance of an organisation. As such, the focus of this report is to evaluate the overall performance of ISO 14001. In particular, the evaluation of ISO 14001 was based on the areas of motivation, implementation, operational and environmental performance. It was important to ascertain from the results and analysis whether any conclusions can be drawn about the performance of ISO 14001 across a range of industries and present recommendations to enhance the overall performance of ISO 14001.

Chapter 2

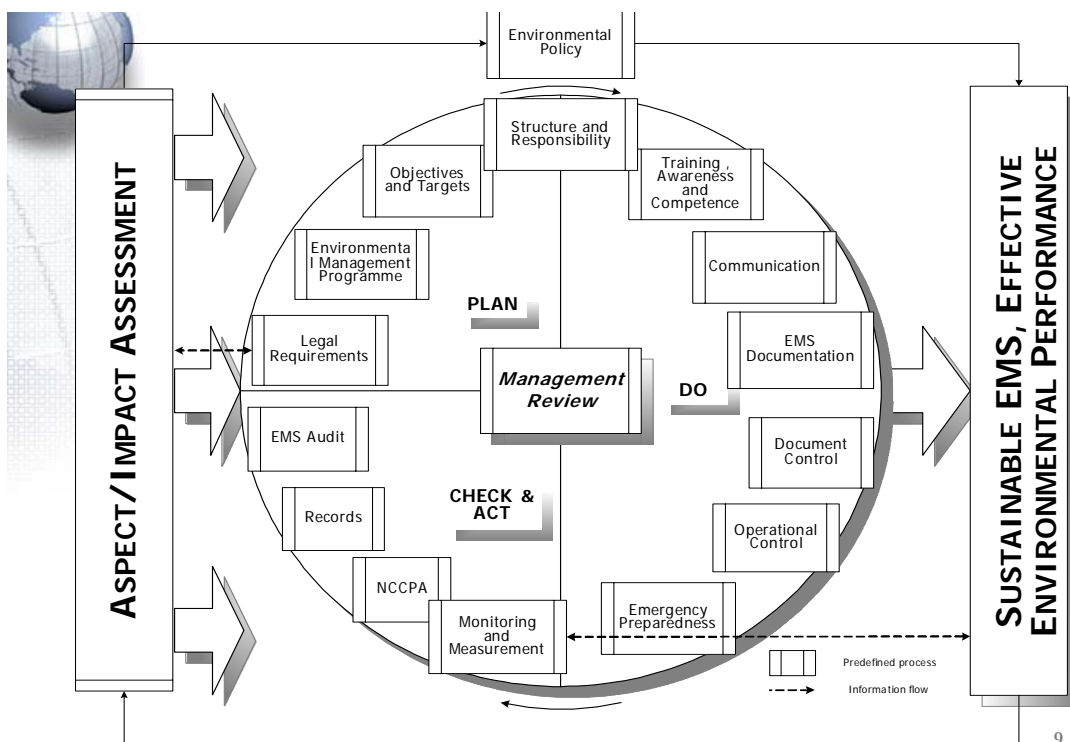
Characteristics of EMS and ISO 14001

Organisations are increasingly becoming more aware of the environmental impacts caused by their activities. Many organisations are adopting EMS to try to minimise their level of environmental impacts. An EMS can be defined as a voluntary management system within an organisation that aims to manage and continually improve the environmental aspects (social, economic and biophysical environments) related to its activities, products, and services; and environmental performance (Perotto, Canziani, Marchesi & Butelli, 2008).

ISO 14001 is an internationally renowned EMS that is process-based and ‘designed primarily to improve management’ (Morrow & Rondinelli, 2002. p162). It is a flexible system that can be implemented by almost any type of organisation in any country (Morrow & Rondinelli, 2002). It is also a process-based EMS that helps an organisation achieve its own environmental objectives rather than having an expected level of environmental performance (Melnyk, Sroufe & Calantone, 2002).

The ISO 14001 system is based around the Plan / Do / Check / Act cycle, as modelled in Figure 1. Organisations wishing to be certified as ISO 14001 must go through an assessment process in which they are audited to see if they are compliant with the ISO 14001 Standards. Each box around the circumference of the circle as well as the Environmental Policy box in Figure 1 represents an auditable element of ISO 14001 standards.

Figure 1
Plan/Do/Act/Check Cycle of ISO 14001



Source: Balzarova, Sharp & Castka (2003)

Once organisations have gained certification, they must conduct an annual internal review to ensure compliance with ISO 14001 standards and every three years are externally audited for recertification. ISO 14001 has many potential benefits for an organisation such as improved efficiency of operations and processes, cost reduction, reduced pollution and assured legal compliance (Hillary, 2004; Korul, 2005).

Chapter 3

Methods and Analytical Approach

ISO 14001 certified organisations located within the Canterbury (mainly Christchurch) area were approached, with the intention of working with these organisations to gather data concerning their interactions and experience with this environmental management system. Of the organisations contacted 10, ranging in size, industry and structure (branch or head office), were willing to participate in the research. These represent the majority of ISO 14001 certified organisations in the Christchurch area. The organisations' names were deliberately not included in the results and analysis section rather references are made to the nature of the industry. This relative anonymity was based on ethical reasons and to avoid possible conflicts arising from the research findings.

The data were collected by conducting qualitative, semi-formal interviews, undertaken by various pairs of the research team, with a representative familiar with ISO 14001 at each of the contacted organisations. This style of qualitative research was preferred over a quantitative approach as it allowed the researchers to gain a deeper understanding of the 'meanings' (both on paper and how they interact with the system), behind each organisation's understanding of ISO 14001. Additionally, it was expected that a 'face to face' approach would give a clearer insight towards the organisation's motivation or lack thereof, for improving social, environmental and economic performance through ISO 14001.

The evaluation framework, consisting of criteria and performance measures, employed during the interviews, were developed from ISO 14001 clauses and from group discussion. The criteria developed related to: Planning, Implementation and Operation, Checking and Corrective Action, Management Review and Outcomes (See Appendix 2).

The data collected from the interviews was processed and analysed by the research group. Notably, each organisation's response was compared with; responses from other surveyed organisations, ISO 14001 criteria, and their environmental policy. From these results and this analysis information designed to reflect the usefulness of ISO 14001 was created.

After conducting the interviews and reviewing the fieldwork data it was determined that the research categories needed to be redefined in order to undertake an effective analysis. In particular, it was necessary to re-group the initial questions around the crucial points we wanted to evaluate. Furthermore, there was often an overlap between the questions and answers provided. The following categories for the purposes of the analysis were therefore evaluated: Motivation, Benefits, Implementation, Operational and Environmental performance.

Chapter 4 Organisation Profiles

Ten ISO 14001 certified organisations in the Canterbury (mainly Christchurch City) area were used in this study – only around 14 exist in the area so this is a high participation rate. Manufacturing and service industries were the predominant industries followed by energy and processing industries. Eighty percent of the organisations surveyed had greater than 100 employees and had multiple sites located nationally and/or internationally. Three of the ten organisations use other EMSs in conjunction with ISO 14001 to achieve the desired level of environmental performance (see Table 1). Note that the organisations have been allocated a letter of the alphabet for future reference – this was done to maintain a level of anonymity.

All organisations had an Environmental Policy that is publicly available. These policies were later examined. The findings show that all organisations were compliant with the policy criteria requirements set in ISO 14001 Clause 4.2 (See Appendix 1).

**Table 1
Summary of Organisations' Key Characteristics**

	Industry	Size*	Single/ Multiple Sites	Branch/ Head Office	Environmental Policy	Other EMS systems
A	Service	Large	Multiple Sites	Head Office	Yes	Carbon Zero, Enviro Mark, Enviro Smart
B	Manufacturing	Large	Multiple Sites	Head Office	Yes	No
C	Service	Large	Multiple Sites	Head Office	Yes	Clinton Global Initiative (CGI)
D	Manufacturing	Medium	Single	Head Office	Yes	No
E	Manufacturing	Large	Multiple Sites	Head Office	Yes	No
F	Process/ Manufacturing	Medium	Single	Head Office	Yes	Green Choice
G	Processing	Large	Multiple Sites	Branch	Yes	No
H	Service	Large	Multiple Sites	Head Office	Yes	No
I	Process/ Manufacturing	Large	Multiple Sites	Branch	Yes	No
J	Energy	Large	Multiple Sites	Head Office	Yes	No

* Size (Employee numbers): Small <10, Medium 10-100, Large >100

The ISO 14001 standard does not require the organisation to make environmental performance reports accessible for external viewing. Half of the organisations interviewed

chose to publicly disclose their environmental performance reports. Of the organisations that opted to publicly disclose, four had ISO 14001 operated within Senior Management, compared with one that chose not to publicly disclose.

Chapter 5

Results and Analysis

5.1 Motivation

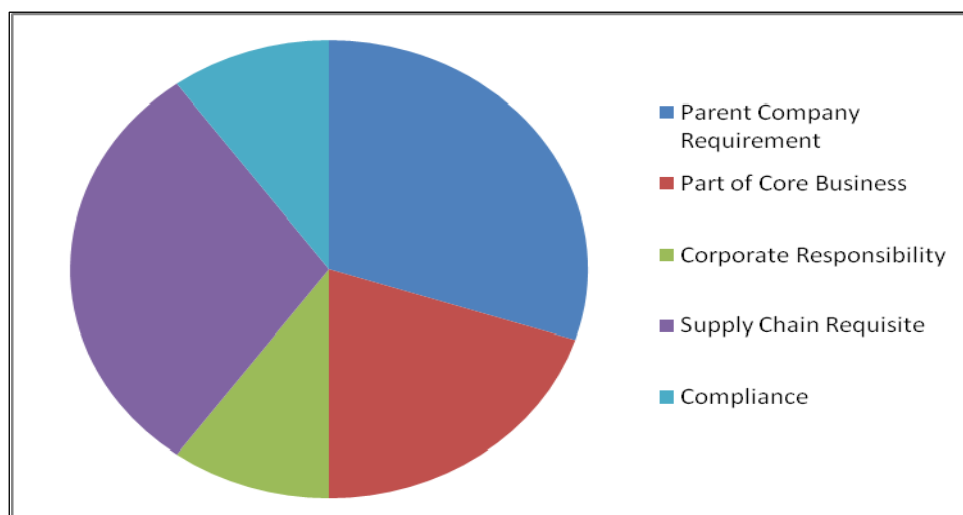
The following questions were asked about motivation for adopting ISO 14001:

- *What was your overall intention in introducing ISO 14001 into your organisation?*
- *What benefits did you expect to make in environmental performance?*

(a) *What benefits did you expect to make in economic performance?*

There was a diverse range of responses from the ten organisations surveyed when questioned about their initial motivations for introducing the ISO14001 environmental management system (see Figure 2).

Figure 2
Motivations of the 10 Organisations Surveyed for Introducing ISO 14001



It is important to note the organisations surveyed are from a broad range of industry backgrounds and vary considerably in size. Of the ten organisations surveyed, three identified a parent company requirement as the primary motive behind introducing ISO 14001 into their business framework. A further three organisations indicated that being ISO 14001 accredited was a supply chain requisite. In addition two organisations cited the ISO 14001 EMS as being a core part of their business, and therefore the introduction of ISO 14001 was considered a necessary component of their day-to-day operations. The culture of the latter organisations is very much inline with sustainable practices and implementation of ISO 14001 is just one aspect of this mentality. As for the remaining two organisations, one cited corporate responsibility as the primary motive for implementing ISO 14001, while the other mentioned their primary motive as being a means of complying with statutory regulations.

5.2 Benefits

When questioned about the expected benefits of introducing ISO 14001 in regards to environmental and economic performance it was surprising that three of the ten organisations indicated that there were no initial environmental or economic benefits. Furthermore, three organisations cited that an expected benefit of being ISO 14001 certified is that it can improve economic performance. As for the remaining four organisations; three indicated that they expected ISO 14001 would result in reductions in resource use and a further one stated that they expected improvements in energy efficiency.

Interestingly, none of the organisations surveyed explicitly identified a commitment to the environment as a primary reason for establishing ISO 14001. The majority were instead driven by economic factors such as, the potential of using accreditation as a marketing tool or to reduce resource use and its associated costs. Many of the organisations surveyed found it hard to pin-point the exact benefits resulting from being ISO 14001 accredited. However, only one organisation reported that no economic or financial benefits arose from introducing the ISO 14001 framework into their organisations.

In terms of how useful ISO 14001 has been to the organisations surveyed a common response was that ISO 14001 had helped their organisation become more ‘focused’ on environmental performance, others alluded to the financial benefits associated with accreditation such as, becoming more competitive in European and Asian markets and reducing energy and resource costs.

It seemed there was no one dominant benefit to ISO 14001 certification rather; it has the potential to be beneficial in a variety of ways depending on the nature and structure of the given organisation. However, the consensus was that ISO 14001 is generally a beneficial aspect of their organisation even though it may not lead to direct increases in profits.

5.3 Implementation

The following questions were asked about motivation for adopting ISO 14001:

(a) Do you have someone responsible for the overall operation of ISO 14001?

All organisations appointed an employee who had overall responsibility for managing and overseeing the operation of ISO 14001. However, this person’s position within the corporate structure differed between the organisations.

Where this person sat in the corporate structure varied greatly between organisations from the senior to middle management. Research suggests that for ISO 14001 to operate successfully in an organisation the top managers must show commitment to ‘walking the talk’ (Chattopadhyay, 2001). An interesting observation is that the organisation that chose this position to sit within middle management in the corporate structure did not initially get staff support for ISO 14001.

(b) How do you communicate and train staff with ISO 14001 standards?

One of the ISO 14001 standards for implementation and operation is for the training of employees in areas related to environmental awareness. As such, environmental training,

awareness, and communication are key tools organisations can use in achieving improved environmental performance.

All ten organisations communicate and train their staff on the statutory and internal requirements of ISO 14001. Three of the organisations communicate to staff on regulation and process changes through regular meetings (daily or monthly). Two of the organisations rely on employees using the organisation's intranet where the ISO 14001 manual or updates from standards NZ are available. One organisation has conducted an environment week showcasing environmental DVDs, holding competitions and creating posters outlining ways in which to reduce, reuse and recycle.

Training has been undertaken by all organisations at the initial implementation stage, with existing employees and new employees gaining training during their induction. Two of the organisations vary the level and content of their training based on the skill level of their workforce. One organisation conducted road shows that travelled around their various sites. Four of the organisations made reference to ongoing training whereas one organisation implied training was used only in the initial implementation stage.

(c) How did employees respond?

The reaction from staff towards the organisation adopting ISO 14001 was mixed. Fifty percent of organisations surveyed indicated they experienced support from employees at the initial implementation stage while the remainder did not. Two of these latter organisations suggested this was due to the mindset and attitudes of the staff whilst the remaining three organisations indicated that given the nature of their industry, the majority of their employees are unskilled consequently, the level of understanding of ISO 14001 was minimal. An observation noted was that the two organisations that did not receive initial staff support for ISO 14001 due to their staff's mindsets and attitudes now have staff support. The organisations where the workforce was too unskilled or did not understand ISO 14001 continue to not have staff support.

(d) What did you take into account when establishing your environmental policy? Please can you describe the process?

Social responsibility had a prevailing role for around half of the organisations whilst establishing their environmental policy. The reduction of environmental impacts was another key component that six organisations paid high consideration towards. The development of the environmental policy was most commonly achieved by organisations simply following the ISO 14001 requirements. Three organisations simply borrowed material or re-wrote their environmental policy by closely following the structure of existing policies from parent companies. For one organisation the environmental policy was created from the feedback received from the initial audit in conjunction with the ISO 14001 certification process.

The ISO 14001 manual is designed so that organisations can establish an environmental policy without external help. The vast majority of the study organisations created their policies 'in house' or with the additional guidance from parent companies. Only two organisations required an external consultant in preparing their environmental policy. This process was performed by the creation of a draft plan which incorporated ISO 14001 standards as well as other organisations' best practices. The draft plan was then passed to higher management for approval and changes were made at their discretion.

5.4 Operational

The following questions were asked about motivation for adopting ISO 14001:

(a) How do you ensure compliance with relevant legislation?

A broad range of approaches were used by the organisations to ensure compliance with legislation. These approaches included: in-house and external lawyers, quality and environmental audits, resource consent applications, websites, consultants and alternative legislative bodies, such as Brookers. The most popular option to ensuring compliance was to acquire the aid of lawyers (both in-house and external), as five organisations applied this approach.

Auditing had secondary importance as far as compliance with relevant legislation was concerned. Advice received by the organisation after external auditing was used by three organisations to further ensure compliance, while one organisation placed even higher importance on this and used a combination of auditing schemes. Organisations that required resource consents for their activities ensured compliance by conforming to plans and policies set out by local authorities. This method was emphasised by three of the organisations, one of which passed data concerning their activities that required resource consent directly to the Regional Council for review and feedback. Consultation via the internet was given priority by one organisation only, although it was used as an additional method by others as well.

(b) Identify the most significant environmental aspect arising from your organisation's activities?

The significant environmental aspects most commonly identified by the organisations were discharges to land, water or air. Discharges to land tended to be most evident in the manufacturing sector as many of their processes involve the use of heavy metals, hazardous substances and oils that are easily transported into the ecosystem through runoff. Aspects that were air related tended not to be industry specific as they were identified regardless of industry type. Discharges to air came in a variety of forms: emissions from smoke stacks were common from the manufacturing organisations, while emissions from cars and airplanes during travel plagued the service organisations. Lastly, discharges to water were a concern amongst all the organisations studied, generally arising from runoff and waste.

(c) How did you determine what the most significant environmental aspects were?

Determination of significant environmental aspects was mainly achieved by ranking and scoring aspects, which were perceived as causing the greatest detrimental impact on the environment. Activities that required resource consent tended to highlight for the organisations, those aspects that were likely to create significant environmental impacts. Additionally, organisations paid particular attention to the importance of continual management and re-evaluation. One organisation had the benefit of staff that had previously undertaken training courses that dealt with identifying aspects through risk assessment. While two organisations concluded they did not need to pay attention to determining the significance of their aspects because all of their activities were considered to result in only very minor environmental impacts. Instead, creating awareness of environmental issues was perceived as a higher priority. Surprisingly, none of the organisations referred to the ISO 14001 manual for assistance while determining their environmental aspects.

(d) How did you then set your objectives and targets?

Six of the organisations developed their objectives and targets through utilising either: weekly checklists, monitoring, benchmarking or scoring. Measured usage of current performance, such as electricity and water use were particularly important because they determined what to reduce and to what extent. Generally, firms attempted to set their objectives and targets in accordance to what is considered best practice in their industry, while moving the organisation towards a direction perceived as desirable to the organisation both economically and environmentally. Two organisations emphasised the need to set realistic and easily achievable objectives and targets that would contribute to improving their environmental performance. For one organisation, maintaining resource consent compliance became their prime target. Another organisation targeted maintaining the status quo, in other words preventing environmental performance from declining.

(e) What happens if targets are not met?

The organisations employed a broad range of methods to react to missed targets. Commonly, this involved evaluating why targets were not met and if necessary adjusting targets to make them more obtainable. Alternatively, one organisation applied an action plan followed by corrective action to bring the organisation's operations closer in line with targets. For eight of the organisations, missing targets was of real concern as it put their current certification with ISO 14001 in jeopardy and they were looked upon unfavourably by auditors. In contrast, two organisations expressed little concern over missing targets since targets were always met.

(f) Do you document in relation to planning, operating, and controlling your significant environmental aspects?

i. If no, why?

ii. If yes, how?

iii. What are your procedures for controlling documentation?

All the organisations had some form of documentation in relation to planning, operating and controlling their significant environmental aspects. For the majority of organisations the quality and form of documentation was dictated by what is considered by local authorities as necessary for the organisation to maintain current resource consents. However the creation of the documentation was often aided by applying the specific rules and standards from the ISO 14001 framework, and through using environmental plans, management manuals and quality standards to provide guidance.

The methods employed towards controlling and managing the documentation varied considerably between organisations. Approximately half of the surveyed organisations opted to store documentation in both hard and digital formats. This was done to create an extensive paper trail that could be later used to support resource consents and audits. Employees were also encouraged to record environmental concerns raised during the organisations' operations, and document any adjustments made. Risk analysis was another tool used by management, ensuring that unnecessary discharges and impacts on the environment and communities are minimised.

Two organisations had in-house systems for documentation; TMS, a software tool that manages documentation and an Environmental Effect Register which lists risks and objectives.

- (g) *What monitoring/measurement tools do you have?*
i. *How do you use them?*

The purpose of this question mainly focuses on the details in checking and corrective action, which is one of the basic five-step systems model (Environmental policy → Planning → Implementation and Operation → Checking and corrective action → Management review) for ISO 14001 standards (Tibor & Feldman, 1997, p.26; Hortensius & Barthel, 1997, p.24).

Of the ten organisations, six monitored their activities and operations which are considered to cause notable adverse environmental effects through the use of indicators. Common aspects monitored by indicators on a frequent basis include: waste water discharges, energy use, and pH level. The monitoring information and assessments are then collected and utilised to compose a report by either experts within the organisation or external consultants. These reports are normally passed on to higher management for review or in the case of one organisation passed to the Regional Council for review and feedback.

One organisation emphasised its somewhat alternative approach to monitoring by using complaints received against the organisation as a tool to highlight areas where environmental improvements could be made, along with the information received from their monitoring program. Another organisation adopted a quality improvement database system, a formal electronic system where all corrective actions become entries. One organisation does not monitor until the monitoring is required during the implementation. The fourth organisation did not answer this question explicitly.

- (h) *How do you use auditing information?*

Most organisations believed that the feedback from auditing is necessary for the continual improvement of operations. Feedback information comes from auditors through reports that outline their performance. Other feedback mechanisms include the follow up of complaints from stakeholder and the general public.

Those who are in charge, such as site managers, and/or environmental auditors, use the auditing feedback information as a means for improvement (corrective action), and compile a list of issues and the possible ways they can be mitigated. A method of communicating and presenting the feedback could be through daily staff reviews, meetings, and providing an interactive format, such as an intranet to promote staff participation in problem solving and resolution.

One organisation uses a Quality Improvement Database System, by which recommendations (areas with corrective actions) are generated. However, not all the recommendations are worthwhile at this stage. An interesting point is that one organisation thought that their auditors (TELARC) were very strict towards their organisation, and asked the organisation to do auditing annually, nine-monthly (if bad) and six-monthly (if very bad). Another organisation insisted that the current corrective action system needs more recommendations so as the whole system can be improved.

- (i) *Do you have processes that deal with non-compliance with regards to ISO 14001 standards (including legislation)?*

Of the ten organisations, one organisation did not explicitly answer the question. For the remaining organisations, only one organisation answered this question with 'no'. All the

other organisations explained the processes and/or legislations dealing with the non-compliance with regards to ISO 14001.

One organisation stated that everything is reviewed, whilst another stated they conduct corrective action through an internal audit system, by which they could identify what went wrong and where. Also for each site they require a form of corrective action to be completed. This process keeps non-conformance in check. On a similar note with regards to specific fieldwork, the working procedures are very methodical and are reviewed by management.

Three organisations conducted the corrective actions by submission of any non-compliance to the Audit and Compliance Committee or to Board Members, and actions should be taken from there. The remaining three organisations use their databases as tools for setting up a tight timeframe to fix most of the non-compliance, such as risk databases and QUID system. The organisation using QUID system also has customer audits, by which the independent body could see if their supplier has environmental issues and/or any non-compliance.

- (j) *What feedback mechanisms do you have to evaluate the performance of ISO 14001?*
- i. *How do you work?*
 - ii. *Who is responsible?*

Two of the ten organisations did not answer the question explicitly. Three organisations relied on the annual management and corrective action reviews, by which any environmental or non-compliance issues could be forwarded and discussed during the environmental seminar.

For the remaining five organisations, two used various databases as tools for generating feedback forms and recording any indicators that can be monitored to see how well their performance rates and this process includes the intranet and management reviews as well. Another organisation receives feedback from customers, and also, conducts internal reviews and staff meetings, by which they pre-set objectives and targets that can be discussed and re-evaluated in due course. Another organisation felt that feedback mechanisms should only be required when there is an operational failure within the system.

One organisation explained this process in more detail, and stated information is passed verbally from the Board to Senior Management then to staff. There are also staff newsletters, staff intranet and road shows to keep concerned people up to date with feedback. This system was regarded as working well, especially with a staff culture that places a huge focus on sustainable practices.

5.5 Environmental Performance

Assessing environmental performance is a difficult and rather challenging topic, as ISO 14001 does not require public disclosure of environmental performance. ISO 14001 has been criticised by researchers as only measuring conformance to the system rather than environmental performance (Korul, 2005) and the lack of disclosure gives organisations the ability to conceal actual performance. Therefore, environmental reports providing documented evidence of environmental performance and continual improvement could not be analysed for the purpose of our investigation. Results effectively are only as accurate as the integrity of responses given.

The following questions were asked about motivation for adopting ISO 14001:

- (a) *What benefits did you expect to make in environmental performance?*
i. *What benefits did you expect to make in economic performance?*

All organisations anticipated environmental performance benefits. Six expected resources to be used more efficiently as well as reducing discharges into air, water and land therefore minimising their environmental impacts. Examples given covered a wide range of areas from electronic reports instead of hardcopies, reduction in the amount of waste, a healthier and safer environment for staff and improving relationships with the community (social environment). One organisation expected to “not make things worse” and “maintain status quo”, however whether this goal reflects commitment to environmental performance is debateable.

Economic benefits were also anticipated by each of the organisations. Three organisations relied on ISO 14001 to help sustain their products, brand and marketing as certification was a requirement in order to trade with some countries or organisations (Supply Chain). Organisations expected that compliance with ISO 14001 Standards would lead to a reduction in operational costs, due to better resource management, increased energy efficiency (especially outlined by two organisations), reduction in waste and risk management.

- (b) *Have you met your commitments as set out in your Environmental Policy?*

Six of the 10 organisations were confident that all commitments set out in their Environmental Policy were achieved and even exceeded by some organisations. The four remaining organisations felt that most commitments had been achieved however, for varying reasons others were not. Some objectives were found to be unrealistically set and more difficult to achieve than others. For example one organisation prioritised air travel as their environmental aspect to reduce the level of pollution as set out in their Environmental Policy. However, air travel was an integral part of their organisation and for many occasions there was no viable alternative available without compromising their ability to effectively fulfil job requirements therefore this aspect proved difficult to reduce.

One organisation commented that some objectives set out in their Environmental Policy were long-term goals and therefore were not expected to have been achieved by now.

- (c) *How useful is ISO 14001?*

Most (90%) organisations stated ISO 14001 is a useful management tool. In particular, these organisations found it provided a framework to achieve the levels of environmental performance sought.

Four organisations indicated that ISO 14001 increased environmental awareness amongst employees and assisted the respective environmental managers to focus their activities. Increased awareness was recognised as a positive trend by these organisations. This is possibly due to the educational and training activities implemented as part of the overall environmental management process. Furthermore, three organisations stated ISO 14001 focuses on continual improvement, which is one of the important features of this management system.

Although confident about the usefulness of ISO 14001 three organisations indicated they could operate just as effectively without this system. One organisation (service industry) felt

that it was of very limited use to their business yet they know they are doing the right thing by utilising ISO 14001.

Two organisations alluded that the cost of implementing ISO 14001 vs the actual financial gains were minimal if any. One organisation stated that the main limitation of ISO 14001 is that it did not solve any environmental problems.

(d) Has ISO 14001 resulted in improvements in environmental performance?

Only 50% of organisations believe ISO 14001 has led to financial benefits. Two organisations indicated that being ISO 14001 certified allowed them to trade within the European and Asian markets. One organisation has experienced reduced costs associated in energy use and waste reduction.

Three organisations indicated that being ISO 14001 certified has resulted in minimal or no financial benefits to the organisation. In particular, these can be attributed to cost of certification and costs associated with waste removal. However, these three organisations indicated that although no financial gains have been made it has not been detrimental to their organisation.

(e) Will the organisation seek recertification? If no, why?

All the organisations surveyed stated that they wished to continue accreditation with ISO 14001 for the foreseeable future. The reasons given for recertification were largely along the lines of, 'it is an indicator for performance' and 'is part of the continual improvement process'. However, one organisation said it was investigating downsizing their certification to only one branch in Australasia, as they are still able to market themselves as working under an EMS. This highlights a potential weakness in ISO 14001, where an entire organisation can benefit from being marketed as ISO 14001 compliant, where in fact only selected branches or departments are.

(f) Have you encountered any difficulties as you implemented ISO 14001?

The difficulties in becoming ISO 14001 certified and maintaining that status were apparent throughout the responses of the ten organisations. When questioned whether they had encountered any difficulties the majority (80%) had encountered some problem or difficulty. A high proportion (40%) cited staff buy-in as a major hurdle in establishing ISO 14001 within their organisations. Other organisations identified problem areas such as communication, education, maintaining ISO 14001 as a priority, auditing issues and general operational difficulties. Of all the organisations surveyed only one was confident in saying they had encountered no difficulties with regards to ISO 14001 implementation or operation. That organisation did mention they felt success could be attributed to their organisation's culture; being very complimentary with the rationale behind the ISO 14001 system.

(g) What was your overall assessment of ISO 14001?

Organisations were asked to rank statements derived from research on the characteristics and benefits ISO 14001 on the following scale:

1 = Strongly Agree

2 = Agree

3 = Neither Agree or Disagree

4 = Disagree

5 = Strongly Disagree

The mean response for each statement was calculated by summing all the organisations responses for that statement and then dividing by the total number of organisations. Table 3 below summarises the results of the organisations’ responses to each statement.

Table 2
Organisations’ Overall Opinion of the Effectiveness of ISO 14001

ISO 14001 Statements	<i>Mean Response</i>
a) ISO 14001 is a flexible environmental tool	1.7
b) ISO 14001 suits our business needs	1.8
c) ISO 14001 accreditation has enhanced our company image/reputation	1.7
d) ISO has given out business a competitive advantage	2.6
e) ISO 14001 has required our organisation to reorganise our structure	3.9
f) ISO 14001 promotes continual improvement	1.4
g) ISO 14001 complements government regulation	2.5
h) ISO 14001 is good for us economically	2.4
i) ISO 14001 is good for the environment	1.3

Overall, organisations supported strongly the following statements about ISO 14001, i.e:

- It is good for the environment (Hillary, 2004)
- It promotes continual improvement (Chattopadyay, 2001)
- It is a flexible environmental tool (Morrow & Rondinelli, 2002)
- It suits our business needs
- Certification has enhanced our organisation’s image/reputation (Korul, 2005).

Organisations agreed to some extent that ISO 14001:

- is good for us economically (Chattopadyay, 2001)
- complements government regulation (Korul, 2005).

Overall, organisations had no opinion as to whether ISO 14001 was a competitive advantage (Morrow & Rondinelli, 2002) and disagreed that ISO 14001 required changes within their corporate structure.

Overall, results from these statements were consistent with responses made by organisations during interviews with the exception of ISO 14001 being good economically and not all organisations mentioned that it led to continual improvement.

Chapter 6 Evaluation

6.1 Benefits and Motivation

The motivations to obtain ISO 14001 certification varied amongst the organisations surveyed. There appeared to be no single dominant motive behind introducing ISO14001; according to Gavronski (2008); “the firm may have both (more than one) types of motivations, with different intensities. The intensity of these motivations is explained by their legal and internal motivations”. Similarly, our results indicated that the two primary motives for introducing ISO 14001 were: a) requirement from a parent company, and b) supply chain requisite, each cited by fifty percent of the organisations as their primary motivation. The initial motivations in establishing ISO 14001 appear to be linked to the perceived benefits. For example within our study, ‘Supply chains’ were a major motive in establishing ISO14001, a likely benefit would be increased sales or market share; although this connection was not explicitly stated in the organisations’ responses. When questioned as to whether ISO 14001 certification has lead to financial benefits the majority (80%) indicated they had either broken even or experienced financial benefits as a result of certification.

Interestingly, none of the organisations surveyed explicitly identified a commitment to the environment as a primary reason for establishing ISO14001, the majority were driven by economic factors such as the potential of using certification as a marketing tool or possibly as a means to reduce resource use and associated costs.

6.2 Implementation

According to ISO 14001 an organisation’s environmental policy should be directional and lead to the identification of environmental aspects. For the majority of the organisations their environmental policy conformed to this purpose, as reducing environmental impacts was considered a core component of the policy. Additionally, half of the organisations interviewed placed a high priority on ensuring their operations were not to the detriment of the outside community. Eight organisations were able to create their environmental policy without requiring external aide, thus it can be assumed that the ISO 14001 manual is relatively straight forward for organisations to follow. However, the fact that two organisations still sought guidance from external consultants may suggest that additional improvements could be made to the manual’s clarity. It is likely that the quality of environmental policies varied amongst the organisations. Two organisations stated they had borrowed material from other organisations rather than developing a policy from the criteria they considered important to them.

The most popular option (50%) for ensuring the organisational legal compliance was acquiring in house and external lawyers. This enabled staff with limited legal knowledge to remain constantly updated with changes in the legal field, allowing management to make appropriate changes to the organisation’s operations. Advice from external audits (3 organisations) was another common method to ensure compliance.

However, if used independently of other methods, it may place the organisation at risk of failing the audit if non-compliance is significant.

The significant environmental aspects identified by all the organisations comprised of discharges to the air, water or land. These aspects were predominantly determined by management ranking and scoring the impacts of the organisations activities and by any resource consents. These methods were favoured over applying the assistance of the ISO 14001 manual. The majority of organisations set targets that were challenging but achievable and moved the organisation towards improved economic and environmental performance, which lends itself to the goal of ISO 14001. However, one organisation in the processing sector stated that targets were fundamentally set “to maintain the status-quo”. This was somewhat alarming as it contradicts one of the core ISO 14001 principles, ‘continual improvement’.

Eight of the organisations found that targets on occasions were not met. The most typical reasoning behind failure was that the targets were unrealistic, requiring review of targets and if necessary made more easily attainable. Two of the organisations stated that their targets were always met. This suggests two things, either the organisation is highly motivated and proactive towards reaching targets or the organisation has set targets that are too easy to achieve. Because the organisations meeting all their targets included the same organisation that set targets of ‘maintain the status quo’, it unfortunately lends itself to the latter of the two reasons.

6.3 Operational

Awareness training is one of the most crucial strategies for the successful implementation of an EMS. Employee involvement is imperative in order for the EMS to work. If employees are convinced about the program, the program will succeed in meeting its objectives. However, if there is not a strong level of support, the program may not achieve its goals no matter how well other aspects have been adopted. The first step in ensuring employee involvement is to establish a training program. All organisations indicated training occurred within the organisations at the initial implementation stage and 90% indicated that ongoing training and awareness programmes occur. The key area of concern is that only 50% of organisations indicated they had staff buy in. This lack of support was generally associated with industries with an unskilled workforce. This level of support or lack of support may have an overall bearing on the level of environmental performance achieved.

With regard to the monitoring tools/measurements used for checking and corrective action for ISO 14001, only one organisation indicated they do not utilise any monitoring tools (however, they are currently being developed) and one organisation did not provide an answer. Most organisations (six organisations) chose the industry specific indicators as their measurement tools. Quite alarmingly, one organisation considered complaints from customers as a good monitoring tool. Generally, most organisations undertake some form of monitoring which is used as a tool to undertake the necessary corrective action.

All ten organisations use auditing information as a tool for achieving a state of continual improvement. As for the feedback mechanisms in place for evaluating the performance of ISO 14001, no matter which systems are adopted, each organisation has set in place procedures for communicating with management, employees and stakeholders.

The ISO 14001 standard requires only that an organisation's environmental policy be made public rather than their environmental performance. This is evident in that five organisations publicly disclose their environmental performance.

6.4 Environmental Performance

Our research indicates that ISO 14001 has played a positive role towards improving environmental performance within the organisations. It is a powerful management and educational tool although some experienced difficulties in implementing the initial framework. ISO 14001 provides a well-structured guideline that leads management easily through the overall process. ISO 14001 also helped employees focus on the most significant environmental aspects of their activities, to prioritise them and to mitigate the adverse effects.

Organisations expressed concern about resource use and emphasised the need to address the most adversely affected areas many of which are industry specific. All organisations demonstrated a commitment towards sustaining their market position and believed improving environmental performance was a necessary approach to do so.

ISO 14001 adoption had a positive impact through raising environmental awareness among organisations.

Chapter 7

Conclusions and Recommendations

Overall ISO 14001 led to improvements in the organisations' performance. The motivations for adopting ISO 14001 varied amongst organisations and the perceived benefits provided justification to implement the system. The guidelines provided by ISO 14001 were easily incorporated into the organisations framework with little external guidance. This led to the identification of significant environmental aspects, which were subsequently addressed.

Key difficulties experienced by organisations included gaining staff buy-in, quality of auditors and achieving targets. Performance varied across organisations because of the quality of environmental policies, setting of objectives and targets and commitment of management. Improvements in environmental performance were allegedly experienced by all organisations, however this was difficult to quantify and did not correspond to direct economic benefits.

7.1 Recommendations

Based on our evaluation of ISO 14001, the following recommendations have been developed:

- Compulsory public disclosure of environmental performance reports - to improve accountability and broader level engagement.
- Standardised benchmarks for target setting across industries – this will assist with reporting and with public understanding.
- Standardised training of ISO 14001 for organisations – for improved performance.
- A Certification Body should audit the ISO 14001 auditors – to ensure consistency.
- Increase public awareness of the ISO 14001 label – to improve understanding and marketability.

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Appendix 1

Environmental Policy Criteria and Compliance

This table shows the assessment of the each organisation's Environmental Policy against the clauses set out in the ISO 14001 standards. A tick (✓) indicates compliance with the standards.

Table 3
Evaluation of Environmental Policy Criteria

Organisation	a	b	c	d	e	f	g
AW Fraser	✓	✓	✓	✓	✓	✓	✓
Colyer Mair	✓	✓	✓	✓	✓	✓	✓
Environment Canterbury	✓	✓	✓	✓	✓	✓	✓
Heinz Watties	✓	✓	✓	✓	✓	✓	✓
Holcim	✓	✓	✓	✓	✓	✓	✓
Landcare	✓	✓	✓	✓	✓	✓	✓
MainPower	✓	✓	✓	✓	✓	✓	✓
MWH	✓	✓	✓	✓	✓	✓	✓
Southern Pine	✓	✓	✓	✓	✓	✓	✓
Tait	✓	✓	✓	✓	✓	✓	✓

ISO 14001 requires organisations to define their environmental policy and specifies the requirements for establishing an environmental policy such that, an organisation's environmental policy must:

- (a) *be appropriate to the nature, scale and environmental impacts of its activities, products and services,*
- (b) *include a commitment to continual improvement and prevention of pollution,*
- (c) *include a commitment to comply with applicable legal requirements and with other requirements to which the organisation subscribes which relate to its environmental aspects,*
- (d) *provide the framework for setting and reviewing environmental objectives and targets,*
- (e) *be documented, implemented and maintained,*
- (f) *be communicated to all persons working for or on behalf of the organisation, and*
- (g) *be available to the public.*

Source: Hortensius & Barthel (1997).

Appendix 2

Evaluation Framework (Questionnaire)

Planning

1. What was your overall intention in introducing ISO 14001 into your organisation?
2. What benefits did you expect to make in environmental performance?
 - a. What benefits did you expect to make in economic performance?
3. Does your organisation use any other environmental management systems in conjunction with ISO 14001?
 - a. If yes, please specify.
 - b. What is your primary reason for using more than one EMS?
4. What did you take into account when establishing your environmental policy? Please can you describe the process?
(If we were unable to obtain policy publicly, why?)
5. Do you have someone responsible for the overall operation of ISO 14001? Where are they within the corporate structure?
6. How do you ensure compliance with relevant legislation?
7. Identify the most significant environmental aspect arising from your organisation's activities?
 - a. How did you determine what the most significant environmental aspect was?
 - b. How were these aspects addressed (prioritised)?
 - c. How did you then set your objectives and targets?
 - d. What happens if targets are not met?

Implementation and Operational

8. How do you communicate with staff regarding ISO 14001 standards (relating to e.g. statutory/internal requirements)?
9. How you train your staff with ISO 14001 standards (relating to e.g. statutory/internal requirements)?
 - a. Did they support it initially and now?

10. Do you document in relation to planning, operating, and controlling your significant environmental aspects?
 - a. If no, why?
 - b. If yes, how?
 - c. What are your procedures for controlling documentation?

Checking and Corrective Action

11. What monitoring/measurement tools do you have?
 - a. How do you use them?
12. How do you use auditing information?
13. Do you report on your environmental performance? Reports
14. Do you have processes that deal with non-compliance with regards to ISO 14001 standards (including legislation)?
 - a. Describe the processes and how they are reviewed?

Management Review

15. What feedback mechanisms do you have to evaluate the performance of ISO 14001?
 - a. How do they work?
 - b. Who is responsible?
16. Have you met your objectives as set out in your Environmental Policy?
 - a. If yes, how?
 - b. If no, why not?

Outcomes

17. How useful is ISO 14001?
18. Has the implementation of ISO 14001 led to financial benefits?
19. Has ISO 14001 resulted in improvements in environmental performance?
 - a. If so, please specify? (note: Try to link back to question relating to significant environmental aspects- Question 7)
 - b. If no, please specify?
20. Have you encountered difficulties as you implemented ISO 14001?
 - a. If so, what?

b. How have you overcome these?

21. Will you seek recertification? If no, why?

22. On the following scale please rate each of the following statements according to your experience of ISO 14001 (Note: Hand the interviewee a copy of this to write

(Strongly Agree=1)

(Agree=2)

(Neither Agree/Disagree=3)

(Disagree=4)

(Strongly Disagree=5)

- a. ISO 14001 is a flexible environmental management tool
- b. ISO 14001 suits our business needs
- c. ISO 14001 accreditation has enhanced our company image/reputation
- d. ISO 14001 has given our business a competitive advantage
- e. ISO 14001 has required our organisation to reorganise our structure
- f. ISO 14001 promotes continual improvement
- g. ISO 14001 complements government regulation
- h. ISO 14001 is good for us economically
- i. ISO 14001 is good for the environment