ISO 14001: THE DRIVERS FOR INSTALLATION AND MAINTENANCE

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The drivers, installation, and maintenance of the ISO 14001 environmental management system standard among Australian and New Zealand organisations

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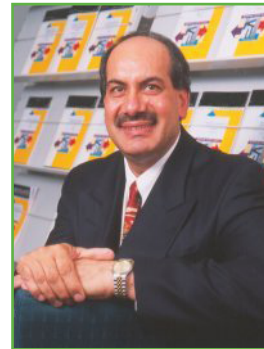
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1. EXECUTIVE SUMMARY

1.1 Introduction

This study was conducted by Monash University's Department of Management in the Faculty of Business and Economics, in collaboration with Joint Accreditation System of Australia and New Zealand (JAS-ANZ). The aim of this study was to investigate the perceptions of Australian and New Zealand businesses with respect to the drivers for the adoption of the ISO 9000 quality system standard and its installation and maintenance. Data for this study was collected by means of a questionnaire survey with 300 responses received from Australian businesses and 239 from New Zealand businesses.

1.2 Summary of Major Findings

The key findings from this study are as follows:

(1)   The most important driver for both Australian and New Zealand companies to implement ISO 14001 is improving environmental performance.

(2)   The Australian government is reported as putting more pressure on companies to adopt ISO 14001 than the New Zealand government.

(3)   The most effective stakeholders influencing an organisation's decision to certify to ISO 14001 are their customers and shareholders.

(4)   ISO 14001 improves production and manufacturing more than other operational areas.

(5)   Both Australian and New Zealand companies are very satisfied with implementing ISO 14001.

2. INTRODUCTION

2.1 Background

ISO 14001 refers to the series of environmental management systems (EMS) standards that were introduced in 1996 and revised in 2004 by the International Standard Organisation (ISO). The intent of ISO 14001 is not to address specific environmental issues. Instead, its purpose is to provide organisations guidance as to how they can identify and control the environmental impact of their activities, products or services; systematically set and work toward environmental objectives and targets; and continually improve their environmental performance (www.iso.org). Companies that become ISO 14001 certified must develop, document and implement an extensive list of internal operational procedures regarding issues such as emergency preparedness, industry/government regulations and agency approvals, training, contract control, and monitoring and measurement. ISO14001 is explicitly aimed at a broad range of audiences, including private and public organisations, national and state governments, communities, nongovernmental organizations (NGOs), and others.

ISO 14001 is rapidly becoming the national and international accepted environmental standard. The five requirements of ISO 14001 are: (i) formation of a corporate environmental policy and commitment to an EMS, (ii) development of a plan for implementation, (iii) implementation and operation of the EMS, (iv) monitoring and possible corrective action, and (v) top management review and continuous improvement (Lally 1998). Basically, the corporation must say what it is going to do, how it is going to do it, who is going to do it, and by when it is going to do it (Curkovic 2005).

ISO 14001 EMS standards are process, not performance, standards. In other words, these standards do not tell organizations what environmental performance they must achieve. Instead, the standards describe a system that will help an organization to achieve its own objectives. An EMS standard itself will not improve environmental performance. It must be understood in the overall context in which it is implemented (Poksinska 2003).

In designing the ISO 14001 specifications for an EMS, the intent was to create a generic model that could be applied by any type and size of organization throughout the world. The standards can be implemented within the whole organization or only in specific parts; they are not industry or sector specific. However, it must be emphasized that the implementation of a system alone cannot guarantee environmental excellence or even compliance (Curkovic 2005).

2.2 This study

The amount of research related to the ISO 14001 series has been limited since being a relatively new standard. Furthermore, few ISO 14001 studies have been conducted in the Australian/New Zealand context.

The overall objective of this study is to identify the motivations or drivers for implementing ISO 14001 and the installation and maintenance processes adopted by organisations. Also, in this study we identify the difficulties that organisations encounter during certification and measure the overall satisfaction with implementing ISO 14001. In meeting the objectives stated above, the research team collecting and analysed data from a large sample of Australian and New Zealand organisations. The next section presents the details of the research methodology.

3. METHODOLOGY

3.1 Organisation selection criteria

Organisations were selected for participation in this study from a JAS-ANZ database, which lists all companies that are certified to ISO 14001. Of a total of over 1,500 Australian and New Zealand organisations included in the JAS-ANZ database, 1,000 were randomly selected in Australia and 219 in New Zealand on the condition that their listing in the database included complete information regarding the organisation's name, postal address as well as the contact person complete with name, phone number and email address. Upon selection, each company was sent a questionnaire, via the named contact person. If this individual was not the person in charge of environmental management system (EMS), they were requested to forward the questionnaire to the most appropriate person within their organisation. The survey resulted in 169 responses received from Australian organisations and 42 from New Zealand organisations.

3.2 Questionnaire

The questionnaire content was built upon the key issues surrounding the implementation of ISO 14001, including the motives for adoption of the standard, the implementation and maintenance processes involved, and the perceived benefits of EMS. The key issues covered in this study are those which scholars and practitioners commonly perceive as being relevant to the installation and maintenance of international system standards.

3.3. Respondents

Table 1 indicated the position of the respondents in their organisation. As can be seen, almost 40% of the respondents in Australia and 45% in New Zealand hold the position of Environmental Manager. In addition, around 20% of the respondents in both countries hold the position of Production/Operations Manager or Quality Manager. This provides an appropriate sample for this study.

Table 1 Sample breakdown in terms of respondents' position within the company

Position of the respondents	Australia (%)	New Zealand (%)
Environmental Manager	39	45
Production / Operations Manager	4	10
Quality Manager	17	10
General Manager / Managing Director	6	5
Owner	2	5
Others	31	26
Total	100	100

3.4 Industry sectors

As indicated in , the sample represented a number of industry sectors under the Australian New Zealand Standard Industry Classification (ANZIC) code with manufacturing dominating the sample in New Zealand accounting for almost one-half of the respondents (40% in Australia). In addition, 14% of the New Zealand sample is represented by organisations from the Agriculture, Forestry and Fishing sector whereas there are no organisations included from this sector in the Australian sample. However, one-fifth of the Australian sample is represented by organisations from the construction sector compared with only 2.4% in the New Zealand sample. These results indicate that ISO 14001 is still primarily adopted by organisations involved in production and the services sector is yet to appreciate the benefits of EMS.

Table 2 Sample breakdown by industry sectors

Industry sectors	New Zealand (%)	Australia (%)
Agriculture, Forestry and Fishing	14.3	-
Mining	4.8	7.1
Manufacturing	47.6	39.6
Electricity, Gas, Water and Waste Services	-	4.1
Construction	2.4	20.7
Wholesale Trade	-	0.6
Transport, Postal and Warehousing	9.5	2.4
Information Media and Telecommunications	2.4	6.5
Rental, Hiring and Real Estate Services	-	.6
Professional, Scientific and Technical Services	2.4	4.1
Public Administration and Safety	2.4	4.1
Education and Training	-	.6
Health Care and Social Assistance	2.4	2.4
Arts and Recreation Services	2.4	-
Other Services	2.4	1.2
Missing	7.1	5.9
Total	100.0	100.0
Total	100.0	100.0

3.5 Organisational Size

In terms of organisational size (see Table 3), 39% of the Australian sample and 47% of the New Zealand sample have less than 100 employees whilst 39% of the Australian sample and 43% of the New Zealand sample have between 100 and 499 employees. Almost one-quarter (22%) of the Australian sample is made up of large organisations employing more than 500 employees whereas only 9% of the New Zealand sample is made up of organisations employing more than 500 people.

Table 3 Organisational size based on number of employees

Organisational size	New Zealand (%)	Australia (%)
Less than 19	14	7
20 to 49	14	16
50 to 99	19	16
100 to 199	12	21
200 to 499	31	18
500 to 999	2	6
1000 or more	7	16
Total	100	100
Total	100	100

4. KEY FINDINGS

The following sub-sections present the results of the current study. All results are presented graphically, with each graph depicting group means.

4.1. Years organisations have ISO 14001 certification

As shown in Figure 1, 56% of Australian companies and 45% of New Zealand companies have had ISO 14001 certification for five years or less whilst 37% of Australian companies and 36% of their New Zealand counterparts have been certified to this standard for between 6 and 10 years. Overall, the results indicate that New Zealand organisations have been certified to this standard for a longer period of time than their Australian counterparts - 7% of Australian and 18% of New Zealand firms have been certified for more than 10 years.

Around one-fifth of organisations in both countries had obtained certification to ISO 14001 and ISO 9001 (the Quality Management System) within the same year. However, as expected because the ISO 9001 standard was introduced a decade earlier, two-thirds of sampled organisations had been certified to ISO 9000 first (see Table 4).
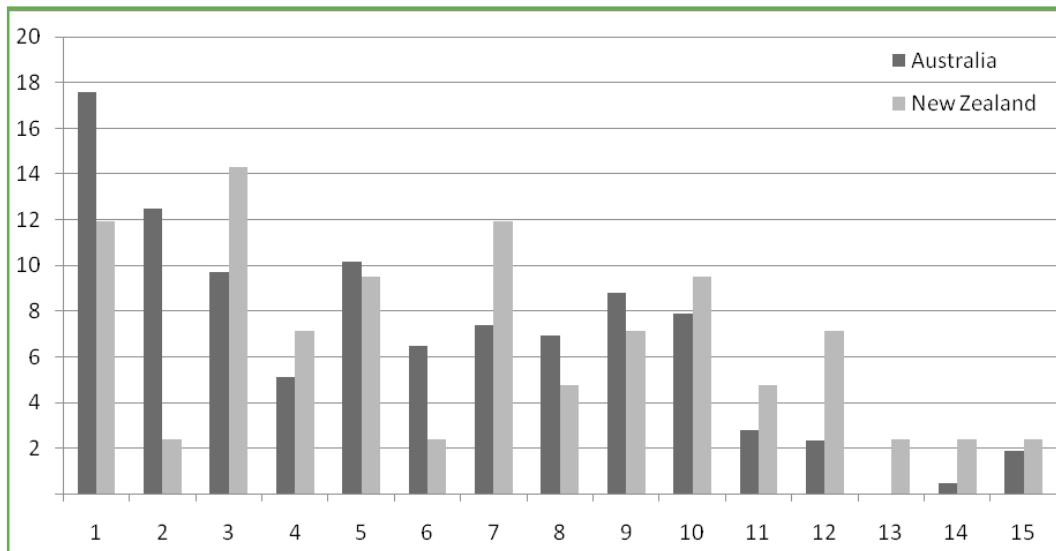

Figure 1 Years organisations have been certified to ISO 14001

Sequence of certification	Australia (%)	New Zealand (%)
Certified to ISO 9001 first	67	67
Certified to ISO 9001 and ISO 14001 at the same year	20	17
Certified to ISO 14001 first	8	-

4.2 Reasons for implementing ISO 14001

The questionnaire listed nine potential reasons/motivations for implementing ISO 14001 and respondents were asked to rate their strength of agreement along a five-point scale where 1= 'strongly disagree', 3= 'neutral' and 5= 'strongly agree'. The results are presented in Figure 2 below.
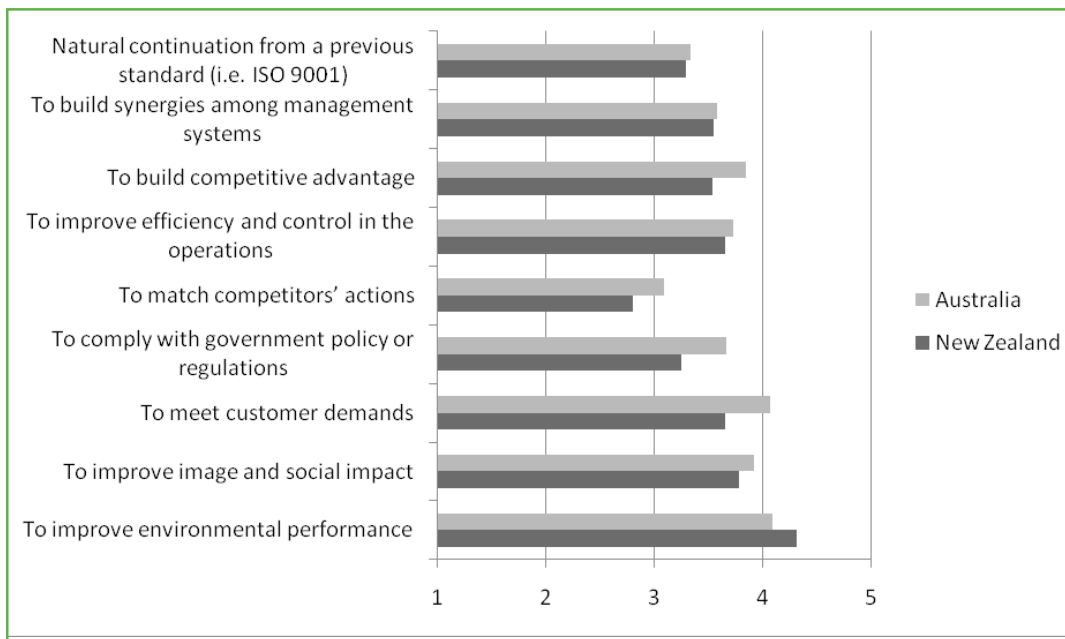

Figure 2 Primary motives for implementing ISO 14001

Improving environmental performance is the most important driver for both Australian and New Zealand companies to implement ISO 14001. Overall, Australian organisations seem to have stronger motivations to adopt ISO 14001 than their New Zealand counterparts. This is particularly the case with reference to building competitive advantage, meeting customer demands and complying with government policy and regulations.

They report that the Australian government put more pressure on companies to implement ISO 14001, but also, Australian firms are more willing to draw on ISO 14001 to meet their customers' demands and to help build competitive advantage for their firm.

Improving efficiency and control in the operations, building synergies among management systems, enhancing image and social impact, and continuing from a previous standard (i.e. ISO 9001) are other motivations to implement ISO 14001 and it was evident that all of these factors have a stronger impact reported by Australian firms than by New Zealand firms.

Matching competitors' actions is identified as the lowest driver for companies in both countries, indicating perhaps that EMS still provides a differentiation advantage rather than being the "norm" of business. Overall, the findings show a balance between internal and external motivations to implement the ISO 14001 standard.

4.3 Stakeholders

Stakeholders like customers, communities, and shareholders will gradually perceive the implementation of ISO 14000 as a "must-be" business practice and, on the other hand, organisations implement ISO 14001 as a way to improve relationships with their stakeholders (Pokinska 2003). In this section respondents were asked to indicate to what extent their stakeholders influenced their decisions to adopt ISO 14001, where 1=Not at all, 3=Neutral and 5=very large extent. The result is presented in Figure 3.

The most important stakeholder for both Australian and New Zealand companies influencing their decision to adopt ISO 14001 are their customers. The adoption of the Emission Trading Scheme (ETS) will have certainly impacted on the decision of Australian firms to embark on environmental management and carbon reduction strategies. On the other hand, shareholders have a stronger influence on New Zealand companies' decisions to achieve ISO 14001 certification. Social groups, NGOs and media have apparently had minimal impact on decisions to certify to ISO14001 in both Australia and New Zealand (all items score less than 3).
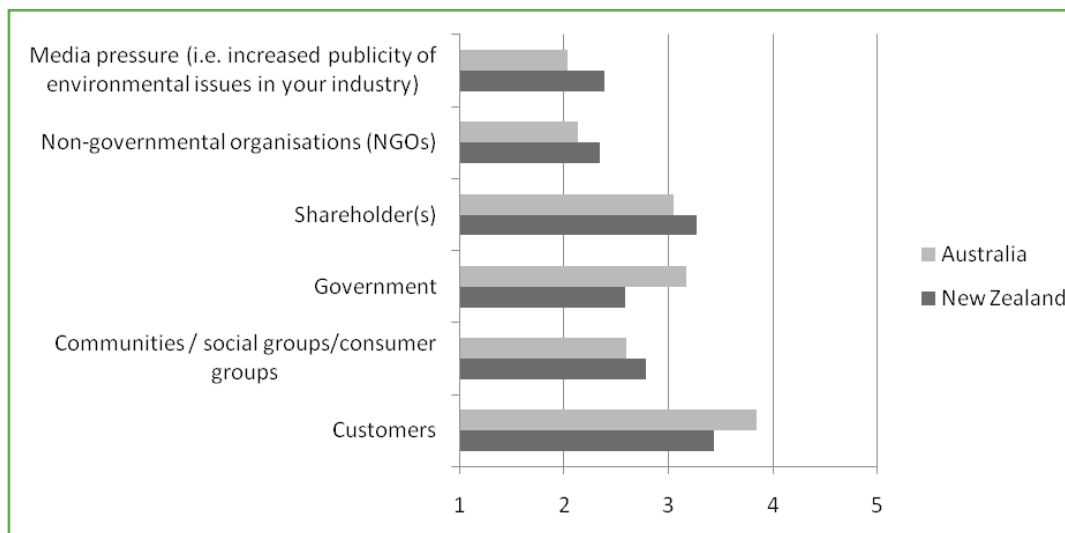

Figure 3 Stakeholders' Influence on ISO 9901 Certification

4.4 Approaches to ISO 14001 installation

Statements relating to six key practices in implementing ISO 14001 were listed in the questionnaire and respondents were asked to record the extent to which each applied to their company's implementation process. A score of one indicated strong disagreement (the practice was not involved in the process), three indicated neutrality and five indicated strong agreement. The results are presented in Figure 4.

Assigning a particular staff member (or department), involving senior management, documenting quality policy and procedures show the highest relative scores in both Australian and New Zealand companies.

The leadership role of senior management also received a high score; once again, consistently demonstrating the importance of top management involvement for the success of the implementation process.

The experience in implementing other standards and integrating ISO 14001 with other standards, like ISO 9001, seems to be helpful for organisations in installing EMS.

Providing sufficient resources, drawing on experienceof implementing other standards, and training quality management concepts to all employees are other practicesadopted by firms in both countries receiving a mean above 3.5.

Overall, all processes except the involvement of senior management received a higher mean score among New Zealand firms in comparison to their Australian counterparts. The findings show that both Australian and New Zealand firms have demonstrated strong commitment in implementing ISO 14001 EMS.
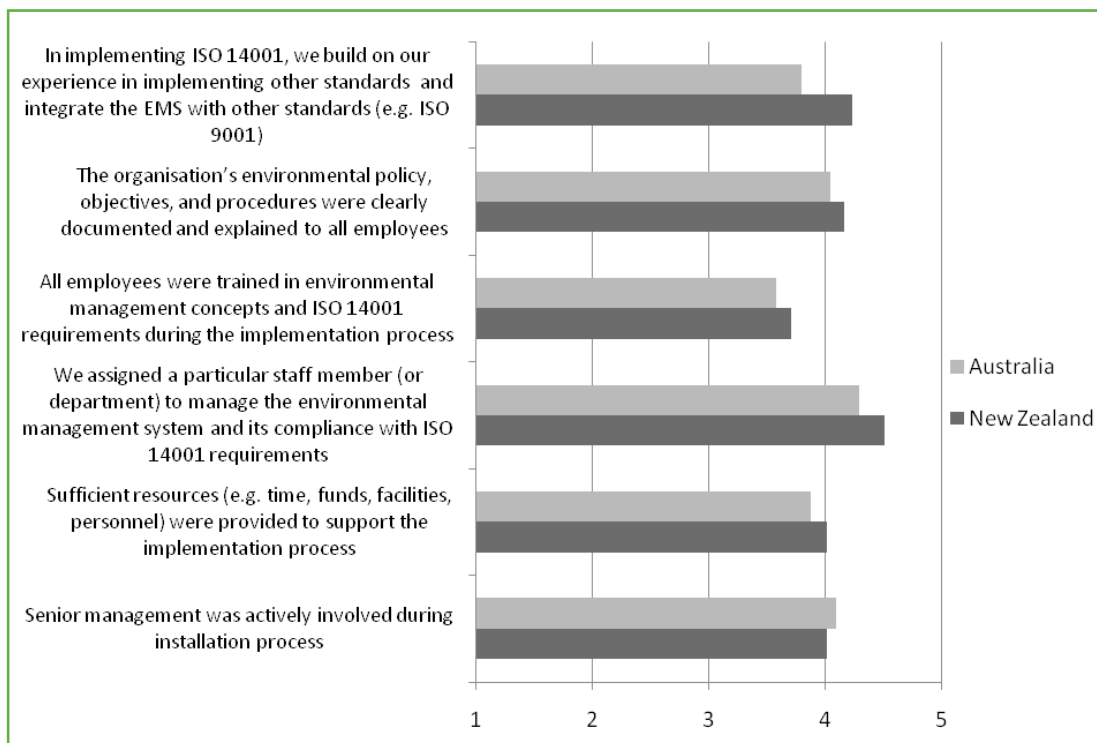

Figure 4 Approaches to implementing ISO 14001

4.5 Maintenance of ISO 14001 certification

The ISO 14001 procedures and documentations should be reviewed every three years to maintain certification.Seven different approaches to maintaining certification were assessed in this study. These were presented as statements and respondents were asked to indicate to what extent they agreed with each statement where 1=strongly disagree, 3=neutral and 5=strongly agree. The result is presented in Figure 5.

Approaches adopted to maintain ISO 14001 are very similar in Australia and New Zealand. Companies in both countries have procedures to maintain ISO 14001 to a large extent (all averages are more than 4), including: regular use of internal audits and use of results to improve the processes, document quality policy and procedures. Furthermore, firms in both countries update their policies and procedures continuously, maintaining daily practices based on ISO 14001 requirements, capturing and measuring environmental performance and monitoring environmental information.

Also, Australian companies are relatively more successful in integrating and synergising the environmental management system (EMS) with the quality management system (QMS). Finally, developing a linkage between EMS and supply chain partners has the lowest score. This suggests that in maintaining EMS, firms are still primarily focused on their internal operations and have yet to extend it to their supply chain network.
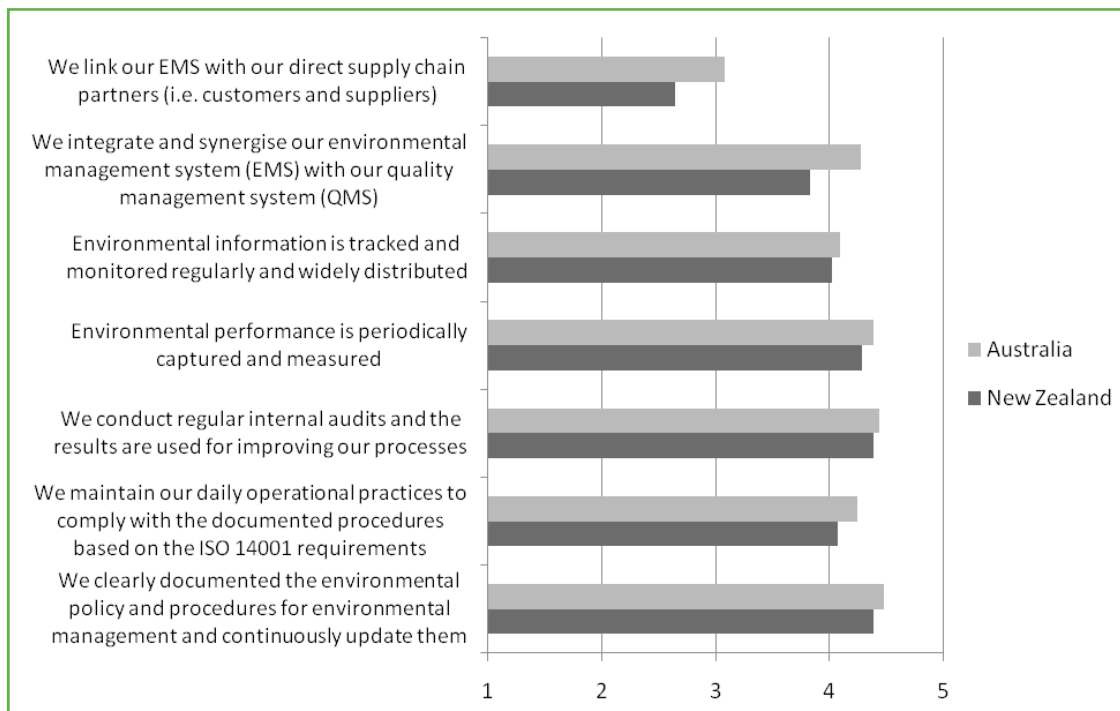

Figure 5 Approaches to maintaining ISO 14001 certification

4.6 Difficulties Encountered in Implementing ISO 14001

To assess the difficulties encountered by firms in implementing ISO 14001, respondents were asked to rate the level of difficulty they experienced in relation to ten different aspects. Their responses were recorded on a five-point scale, where 1= minimal, 3= moderate, and 5= major. The result is presented in Figure 6. Lack of human resources is identified as the most serious difficulty. This perhaps relates to the fact that environmental management is still a relatively new area and many firms have not yet acquired sufficient knowledge and experience. The other reported difficulties are relatively low (below mid-point of 3). This result could be linked to the fact that most of the respondent firms are already certified to ISO 9001, and, therefore, well placed to transfer knowledge of certification to ISO 14001 implementation.
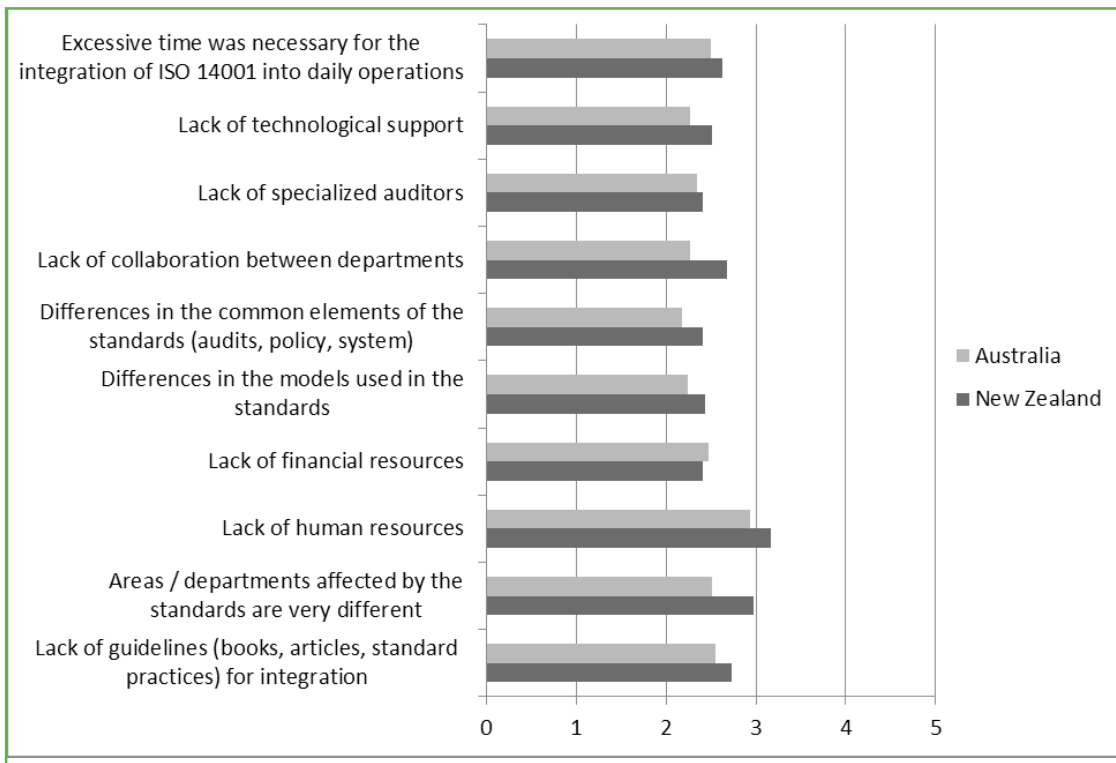

Figure 6 Difficulties experienced in implementing ISO 14001

Overall, firms in both countries reported few difficulties being faced in implementing ISO 14001 EMS. This situation is significantly different to that related to the adoption of ISO 9001 some years earlier, again indicating that firms are transferring earlier knowledge/experience to implementing ISO 14001.

4.7 Areas impacted by ISO 14001 certification

This section assessed the extent to which implementation of ISO 14001 impacted seven key company areas, namely, operations or production, procurement/purchasing, sales/marketing, logistics/distribution, R&D/Design, human resources/personal management, and information systems. Respondents were asked to record to what degree the environmental management system had affected a number of key elements within each area. The degree of impact was measured along a five-point scale, where 1 = 'Not at All", 3 = 'To some extent' and 5 = 'To a very large extent'. The result is presented in Figure 7.
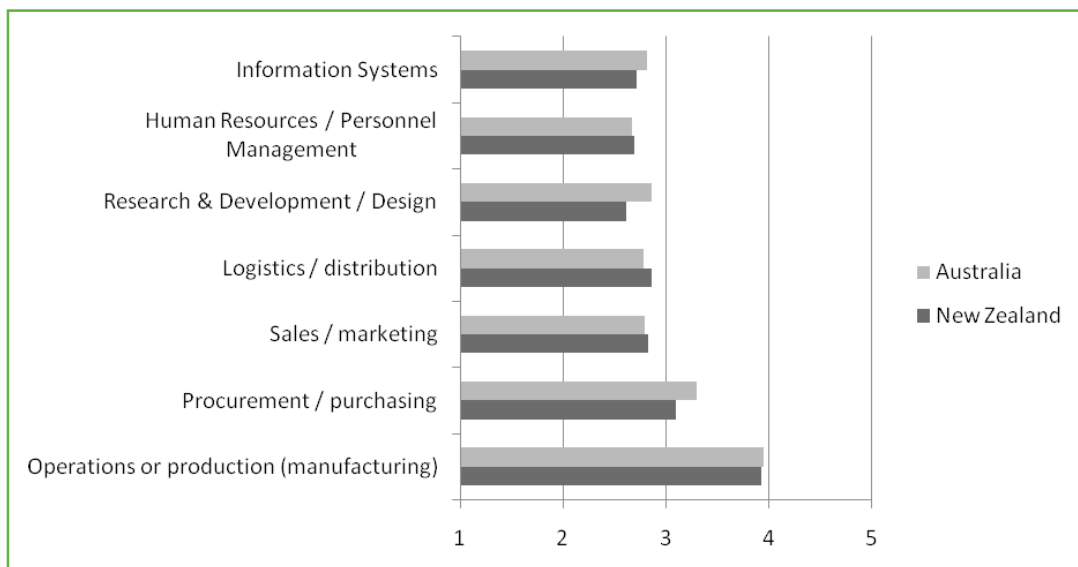

Figure 7 Functions affected by ISO 14001

Operation or production is most affected function by ISO 14001 in both Australia and New Zealand (mean is close to 4). The second area that respondents believe most affected by ISO 14001 is procurement/purchasing. Five other areas in both countries are not affected greatly by ISO 14001, with all elements scoring less than 3. Overall, firms appear to confine the EMS implementation on the internal scope of the firms and have yet to reach the network / supply chain areas, such as sales/marketing and logistics/distribution.. Also, the focus seems to be heavily placed on production (manufacturing) processes rather than on design. This does not necessarily mean that firms do not place attention on "green" design. They may do this as a separate activity rather than as an integral part of their EMS.

4.8 Alignment of environmental system and organisation strategies

To assess the degree to which ISO 14001 and organisational strategies are aligned in Australian and New Zealand companies, respondents were asked to indicate their agreement to five different statement listed in the questionnaire where 1=Strongly disagree, 3=Neutral and 5=Strongly agree.

As is presented in Figure 8, both Australian and New Zealand companies perceive that their environmental policy is well aligned with their organisational policies, with a mean score of 4. New Zealand firms indicated that the environment is one of the most important aspects of their organisation strategies compared with their Australian counterparts. The findings also shows that senior management in both countries have an active role in managing the environmental systems that highlights the increasing importance of environmental issues, which can be linked to the previous finding which shows the commitment of senior management during the installation process.
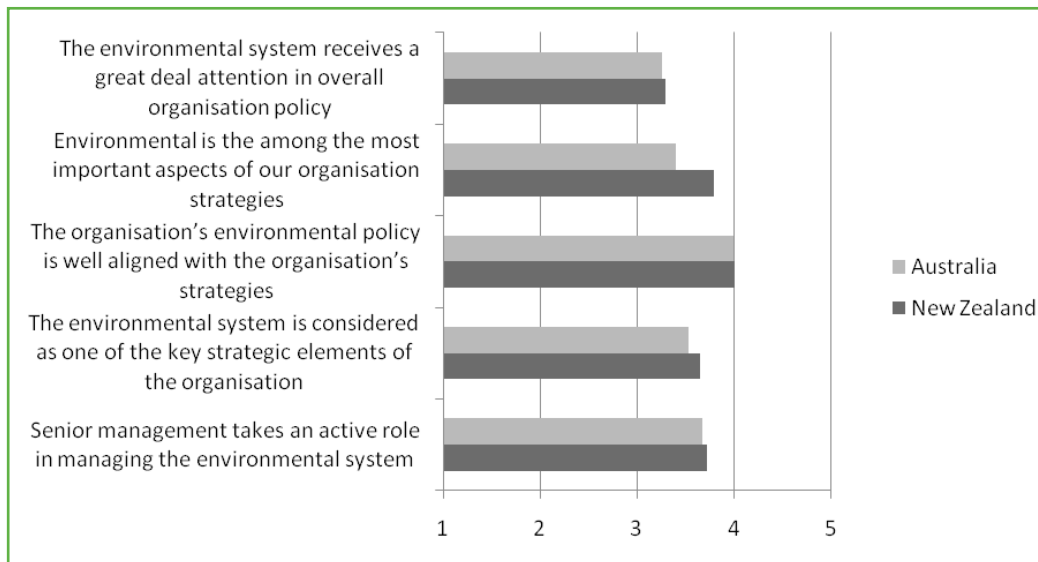

Figure 8 Alignment of environmental system and business strategy

Overall, the results indicate that firms have begun to integrate their EMS into their overall business strategy. In Australia, in particular, with the carbon emissions tax in place, it could be expected that there would be increasing attention to environmental issues that would boost further alignment between environmental management and business strategy.

4.9 Operational benefits of ISO 14001 implementation

Potential benefits for ISO 14001 users such as reduced pollution, reduced material and energy consumption, improved waste management, and improved environmental performance were examined in this study. Respondents scored the extent to which they agreed that each benefit applied to their organisation where 1=Strongly disagree, 3=Neutral and 5=Strongly agree. The result is presented in Figure 9

Implementing ISO 14001 enhance operational performances to some extent (all means are above 3) without significant differences identified in two countries. The most important improvements are reducing environmental hazards, improving environmental performance and waste management. On the other hand, the least improvements reported are in reducing operating cost and reducing costs for waste treatment.
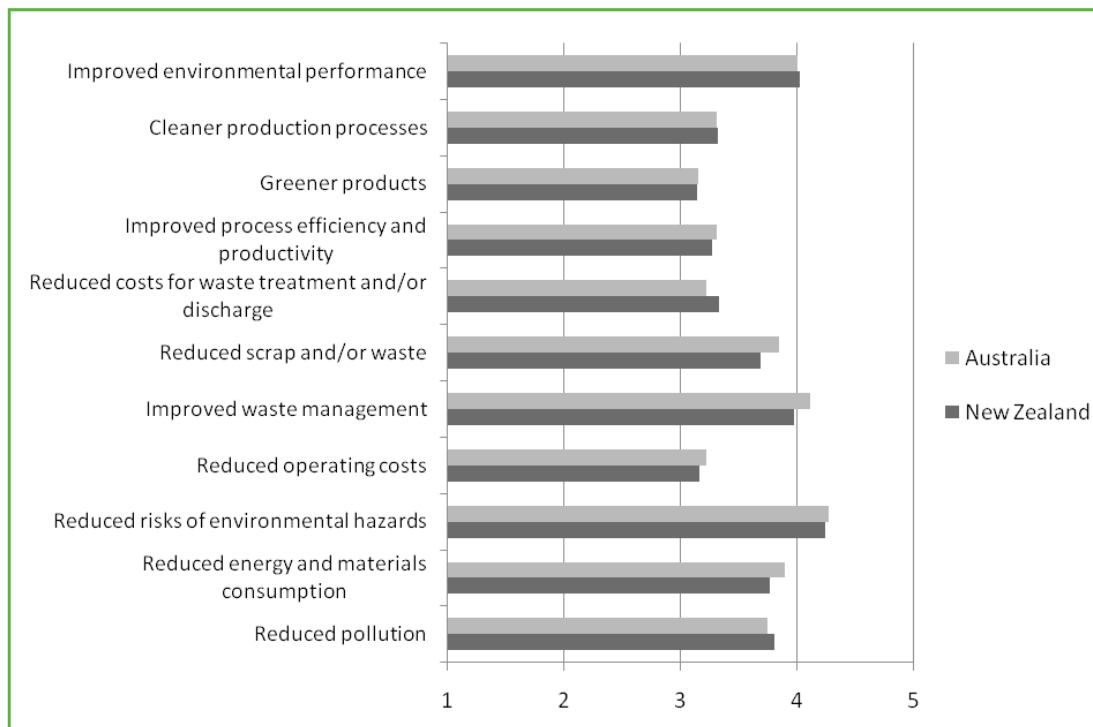

Figure 9 Impact of ISO 14001 on operational benefits

Overall, the effectiveness of EMS has been reflected in several key areas in environmental management, including reducing risks of environmental hazards and improved waste improved management. As firms grow in maturity with their EMS, we could expect wider benefits which also impact on improved business performance.

4.10 Strategic benefits of ISO 14001 implementation

In this section respondents were asked to indicate the extent to which their firm achieved "strategic benefits" from implementing ISO 14001. Responses were provided on a 5-point scale where 1=Strongly disagree, 3=Neutral and 5=Strongly agree. The result is presented in Figure 10.

Australian firms experienced more improvements in almost all strategic aspects in comparison to New Zealand firms. Both Australian and New Zealand companies strongly agree that ISO 14001 improves environmental awareness. Other improvements that Australian and New Zealand firms have experienced after implementing ISO 14001 include improving legal compliance, market opportunities, customer satisfaction, relations with stakeholders and public image.

On the other hand, neither Australian nor New Zealand companies believe that implementing ISO 14001 has significantly enhanced their profit and sales performance. Similarly, they perceive that the certification has relatively little impact on improving staff relationships.

Figure 10 Impact of ISO 14001 on strategic benefits

The general impression is that firms still see the effect of EMS from internal perspectives (environmental awareness and legal compliance). Firms have yet to see external effect from their EMS implementation, and this perhaps reflects the lack of awareness from markets in terms of public image, market opportunities, and sales. Again, we would expect that these areas would be enhanced in the future as markets begin to increase their demand for environmental friendly products or services.

4.11 Business environment

In this section the number of suppliers, customers and competitors who are certified to ISO 14001 were assessed for each organisation. Respondents indicated to what extent their suppliers, customers, and competitors were certified to ISO 14001 where 1=Very few, 3=Some and 5=Almost all. The result is presented in Figure 11.

In general, ISO 14001 certification has yet to permeate widely across both countries. However, Australian firms are relatively more exposed to ISO 14001 compared to their New Zealand counterparts. There are more Australian suppliers, customers, and competitors that have been certified to this standard.
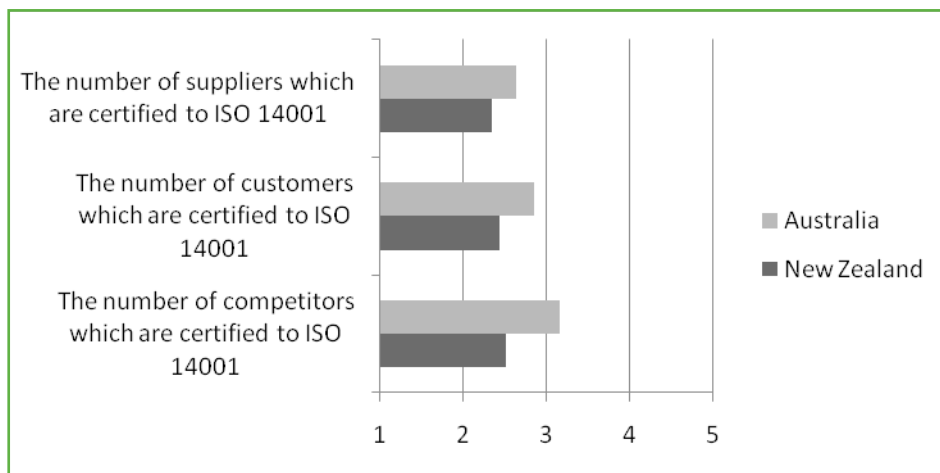

Figure 11 Number of suppliers, customers and competitors certified to ISO 14001

4.12 Satisfaction with ISO 14001 certification

Respondents were asked to indicate the extent to which their organisation is satisfied with ISO 14001 certification. Five statements were listed in the questionnaire and respondents were asked to provide their response on a 5-point scale where 1=Strongly disagree, 3=Neutral and 5=Strongly agree. The result is presented in Figure 12

Companies in both countries strongly believe that ISO 14001 is important for their organisations and they indicated that they will continue to maintain the system even where there is no external pressure to do so. Also, they believe that the significant benefits that they receive from implementing ISO 14001 are worth the cost and time involved. Australian companies are relatively express a higher degree of satisfaction with ISO 14001 compared to their New Zealand counterparts.
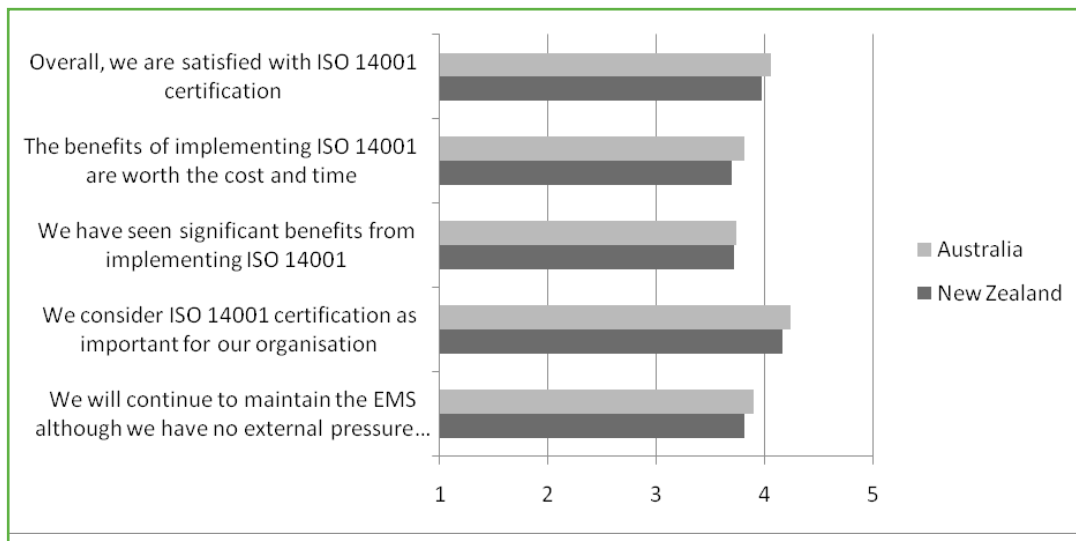

Figure 12 Overall satisfaction with ISO 14001 certification

The finding suggests that most firms will retain ISO 14001 and with more firms being expected to follow suit, we would see a higher number of certified firms in the coming years.

5. SUMMARY AND CONCLUSIONS

In summary, five major conclusions can be drawn from the above findings.

(1) Improving environmental performance, enhancing social image, and meeting customer (market) demands are the primary motives for firms in adopting ISO 14001; customer demands for ISO 14001 are relatively stronger in Australia than in New Zealand. Furthermore, customers also appear to be the primary stakeholders who have interest in the ISO 14001 certification.

(2) In implementing ISO 14001 EMS, firms commonly assign particular staff or department to manage the EMS. Interestingly, at the same time, lack of human resource is the greatest challenge being faced in implementing the standard. Past experience from implementing ISO 9001 appears to be fairly significant.

(3) In maintaining the ISO 14001 certification, firms take basic approaches, just as they commonly do with ISO 9001 certification, by maintaining the documented practices, ensuring that operational practices comply with documentation, and conducting regular internal audits. Firms also appear to understand the importance of aligning their EMS with their business strategies.

(4) The implementation of ISO 14001 has impacted primarily the operations / production area. As such, firms have seen some major environmental benefits at the operational level, including reduced risk of environmental hazard, reduced pollution, reduced energy and materials consumption, reduced waste, and improved waste management. At the strategic level, improved environmental awareness and improved legal compliance have been perceived as the greatest benefits. They are followed by several other benefits, including market opportunities and public image. However, these benefits have yet to be translated into improved sales and profit. It is noteworthy that Australian firms perceive greater strategic benefits than their New Zealand counterparts.

(5) Finally, overall firms expressed their satisfaction with ISO 14001 certification and consider the certification is an important part of the organisation.

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