

The Natural Step Environmental
Management System
Performance:
An evaluation of eight organisations
in Canterbury, New Zealand

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Lincoln
University
Te Whare Wānaka o Aoraki

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Contents

Contents	i
List of Tables	ii
List of Figures	ii
Acknowledgements	iii
Executive Summary	iv
Chapter 1 Introduction	1
Chapter 2 Characteristics of EMS and the Natural Step	3
2.1 The Funnel	3
2.2 System Conditions	3
2.3 Implementation Methodology	4
Chapter 3 Organisation Profiles	5
Chapter 4 Methodology	7
Chapter 5 Processing and Analysis of Data	9
Chapter 6 Results	11
6.1 Goals	11
6.2 Implementation	13
6.2.1 Training	13
6.2.2 Organisational adjustments	13
6.2.3 Monitoring	15
6.2.4 Documentation	15
6.3 Performance	16
6.3.1 Initial situation and changes	16
6.3.2 Efficiency and Effectiveness	17
6.3.3 Benefits and Costs / Challenges	17
6.3.4 Outcomes	18
6.3.5 Future	19
6.4 General	19
Chapter 7 Analysis	21
7.1 Costs and Benefits	21
7.2 Management	21
7.3 Sustainability	21
7.4 Training and Communication	22
7.5 Framework and Structure	22
Chapter 8 Conclusion	25
Chapter 9 Recommendations	27

References.....	29
Appendix 1 Evaluation Framework (Questionnaire).....	31
Appendix 2 Results Table - Large Organisations.....	33
Appendix 3 Results Table - Small Organisations.....	41

List of Tables

Table 1	Summary of organisations’ key characteristics	5
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List of Figures

Figure 1	The ABCD framework used for The Natural Step	4
Figure 2	Figure 6.1.1: Main drivers for TNS implementation	12
Figure 3	Main change areas at the inception of TNS.	14
Figure 4	Challenging areas during the implementation of TNS.....	15
Figure 5	Environmental problems and/or gaps found prior to the implementation of TNS.....	17
Figure 6	Cost for the implementation of TNS.....	18

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Executive Summary

A qualitative evaluation of the performance of The Natural Step (TNS) implemented by eight Canterbury based organisations was undertaken. An evaluative framework containing a series of questions was formulated to facilitate an analysis of the goals, implementation and performance of TNS in the participant organisations.

The research identified that TNS is an effective 'ems' that provides the framework for improved sustainability performance. It was found to be flexible, adaptable to a variety of organisational structures, however not without limitations in terms of documentation and auditing.

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.

The Natural Step (TNS) is a principle-based approach that provides a conceptual framework for achieving a sustainable society, which has applicability at all levels, from the individual to the community and government scale. Although it is not a 'formal' EMS with an explicit set of criteria to comply with or a marketable label, as for example ISO 14001, it can be used to critique an organisation's sustainability performance and subsequently define actions for addressing those issues.

TNS is currently an international sustainability organisation with offices in twelve countries; each country one with its own board. TNS came to New Zealand in 1995.

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 TNS. In particular, the evaluation of TNS 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 TNS across a range of industries and present recommendations to enhance the overall performance of TNS.

This is the third study in a series of research articles evaluating goal and process focussed 'EMS', undertaken within the Environment, Society and Design Division at Lincoln University.

Chapter 2

Characteristics of EMS and the Natural Step

The Natural Step framework provides a strategic planning tool for sustainability and is based around systems thinking, sound science and practical business decision making. It has been developed to complement and give direction to other environmental management systems such as ISO 14001, Enviro-Mark, and Cleaner Production. The methodology works by understanding the broader system, providing design criteria based on principles for success within that system and developing solutions for environmental, economic and social issues. The Framework has three main components for its vision of sustainability. These are The Funnel, System Conditions and Implementation Methodology.

2.1 The Funnel

A metaphor of a funnel is used to help visualise and bring together the economic, social and environmental pressures.

2.2 System Conditions

The four System Conditions are the core of The Natural Step's sustainability framework and define the conditions that must be met to achieve a sustainable society and an understanding of how the Earth functions. These conditions provide the framework within which assessment and monitoring can take place. The four interdisciplinary conditions¹, as outlined below, are based on the underlying scientific principles of thermodynamics and natural cycles:

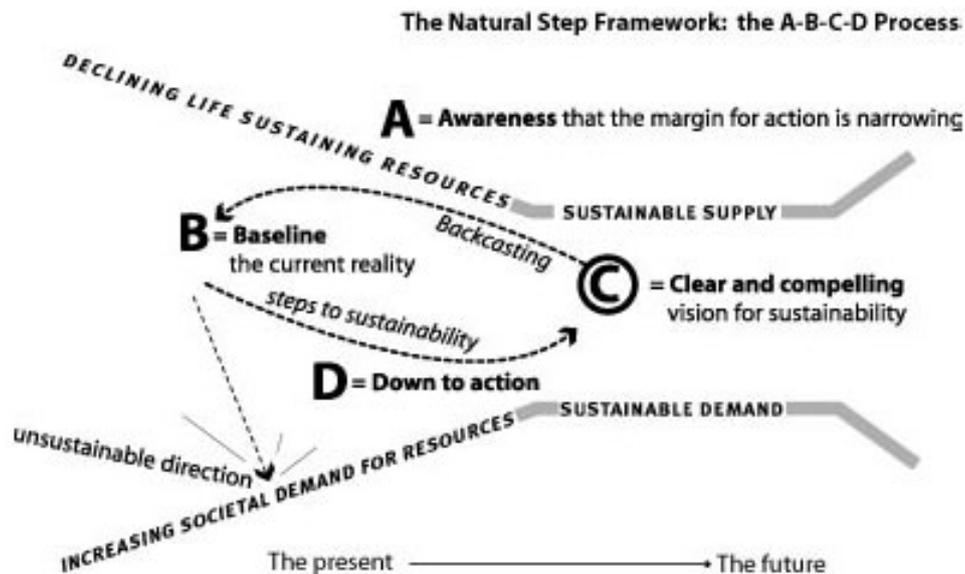
The Four System Conditions...	... Reworded as The Four Principles of Sustainability
In a sustainable society, nature is not subject to systematically increasing:	To become a sustainable society we must...
1. concentrations of substances extracted from the earth's crust	1. eliminate our contribution to the progressive buildup of substances extracted from the Earth's crust (for example, heavy metals and fossil fuels)
2. concentrations of substances produced by society	2. eliminate our contribution to the progressive buildup of chemicals and compounds produced by society (for example, dioxins, PCBs, and DDT)
3. degradation by physical means	3. eliminate our contribution to the progressive physical degradation and destruction of nature and natural processes (for example, over harvesting forests and paving over critical wildlife habitat); and
4. and, in that society, people are not subject to conditions that systemically undermine their capacity to meet their needs	4. eliminate our contribution to conditions that undermine people's capacity to meet their basic human needs (for example, unsafe working conditions and not enough pay to live on).

¹ Retrieved from <http://www.naturalstep.org/the-system-conditions> 10th October 2009

2.3 Implementation Methodology

The Natural Step has been developed for implementation into organisations using an ABCD approach (Figure 1) to help incorporate sustainability into their planning and decision-making processes.

Figure 1
The ABCD framework used for The Natural Step
 (Source: www.naturalstep.org.nz, retrieved on 12.05.2009)



- A. (Awareness) Gaining a common understanding of sustainability and why it is important to the organisation. Understanding the funnel and the four system conditions of the earth's ecological, social and economic trends.
- B. (Baseline Mapping) This involves 'Sustainability gap analysis' to identify where the organisation is now relative to the four system conditions.
- C. (Creating a Vision) Assessing what the organisation would look like when it is sustainable. From this vision, organisations develop a strategy and action plan for moving towards sustainability.
- D. (Down to Action) Action planning and setting priorities to progress towards sustainability. Initiatives, techniques and tools for implementation.

Chapter 3 Organisation Profiles

For this study, eight organisations implementing TNS were chosen. All organisations are Christchurch based and range from small service organisations to large public organisations. Table 3.1 summarises key characteristics of each organisation that participated in the study. This list represents the vast majority of TNS organisations in the area.

Table 1
Summary of organisations' key characteristics

Organisation Size	Organisation	Type of Business	Drivers for using TNS	Other EMS systems	Reason For Choosing TNS
Large	A	Electronic Supplier	Marketing Social side of sustainability Ideology	ISO 14001 ISO 9000	Best available
	B	Educational Institution	sustainability framework	Considering Enviro-Mark	Best available, most rigorous framework
	C	Research Centre	Sustainability Marketing Ideology	ISO 14001	Unable to answer – lack of institutional knowledge as key respondent not employed at the time
	D	Government Institution	Ideology Sustainability	No	Champion who decided to use it
Small	E	Restaurant	Ideology Marketing	No	Suitable for the organisation Initiated and paid for by the city
	F	Graphic Design	Ideology	EBEX 21	Suitable for the organisation
Small	G	Food Processing	Sustainability Marketing	Agri-quality	Availability Initiated and paid for by the city
	H	Architect	Ideology Sustainability Marketing	No	Suitable for the organisation

Chapter 4

Methodology

Due to the relatively small sample size, a qualitative study method was used in evaluating TNS performance in businesses and institutions based in Christchurch area. The sampling frame included nine organisations out of which one declined participation because it is not using TNS anymore. The participating businesses and institutions were identified as falling into two categories in terms of size as determined by the number of employees. That is, organisations with less than 50 employees were considered small-sized while those with more than 50 referred to as large-sized. For the purpose of collecting qualitative information, the sample size was deemed adequate. It has been observed that the larger the sample size, the less likely it is that the researcher would fail to discover a perception. The objective of designing qualitative research is to reduce the chances of discovery failure, as opposed to reducing (quantitative) estimation error (DePaulo, 2000).

The evaluation framework, employed during the interviews, was developed from TNS documentation (e.g., the ABCD Framework) and from group discussions. The evaluation framework was divided into four sections: implementation, performance, outcomes and future (see Appendix 1).

The businesses and institutions chosen for the study were listed on the TNS New Zealand website and contacted on that basis. Others were identified by discussion with former TNS staff (L. Roberts, pers. comm. to K Hughey). For the sake of interviewing suitable respondents, the businesses and institutions were first approached by email and/or a phone call. The email contents offered detailed explanation on the study's intention and also assured the respondents on the measures put in place to ensure confidentiality of the data collected.

Appointments were made for face to face interviews. The face to face interview method was preferred because it minimizes the incidence of incompleteness, misunderstanding, and inappropriateness in responses compared to the alternatives such as postal and email surveys (Lavrakas, 1993). By using face to face interviews, one is fully able to employ visual aids and hence gather information that genuinely reflects the respondent's views. The interview method entailed use of qualitative open-ended questions. According to Patten (2002), open-ended questions are those without fixed limit therefore allowing respondents to answer on their own approach. They are intended to encourage continued discussion in order to provide a richer source of information as compared with closed ended questions.

The interviews were conducted by different pairs of the research group, where one acted as the main facilitator and the other as the recorder. However, both of the interviewers paid attention the to interview process and complemented each other to ensure maximum data acquisition. The research group consisted of eleven students.

Chapter 5

Processing and Analysis of Data

The data analysis process involved understanding data, focusing the analysis, categorizing the information, identifying patterns within and between connections, and interpretation (Taylor-Powell and Renner, 2003).

Taking cognisance of the fact that having data does not constitute quality data, the interviewees reviewed the information they had collected. This was to ensure that it made sense; sometimes information collected does not add value because it may have been collected in a biased way, Taylor-Powell and Renner (2003). Grounded theory (GT), first described by Glaser and Strauss in 1967 was utilized to develop theory from the data. GT makes qualitative research a “good science”, Strauss and Corbin [1990:27] as quoted by Roelien Goede (n.d). This is because of its potential to meet all requirements of “good science”: significance, theory- observation, compatibility, generalisability, reproducibility, precision, rigor, and verification.

After reviewing and understanding the data, interviewers discussed the emerging issues. Positive and negative aspects found by the organisations using TNS were identified. These were noted down then matched to the businesses and institutions in order to establish trends. The analysis was then focused by questions where responses for each question were compared across the groups of small organisations and large organisations separately. The aim was to identify consistencies and differences.

These comparison outcomes were then analysed under several categories namely: Costs and Benefits, Management, Sustainability, Training and Communication and Framework and Structure. The study findings were presented by means of figures, numbers and text.

Chapter 6

Results

Results are presented following the order of the questions employed to assess TNS within the different organisations, according to the four main areas of the evaluation framework. This order was established considering the steps that the organisations had to go through when they decided to start utilising TNS.

6.1 Goals

Why did you choose TNS?

TNS was chosen because it provides an affordable and accessible framework that helps provide structure to thoughts and ideas about sustainability in organisations. Six of the organisations researched chose TNS because it was the best available program at the time. This was particularly relevant to the small ones. Three small organisations stated that it was the best fit for them. Two of these organisations also chose TNS because it was funded by Christchurch City Council. Two of the organisations chose TNS because it enjoyed the support of a ‘champion’ commitment within the organisations.

What other options were considered?

One organisation tried EBEX 21 as a tool offered by Landcare Research, but it did not suit their requirements. One organisation considered Enviro-Mark but chose to implement TNS. One organisation was unable to comment due to loss of institutional knowledge. No other EMS was considered by the remaining organisations.

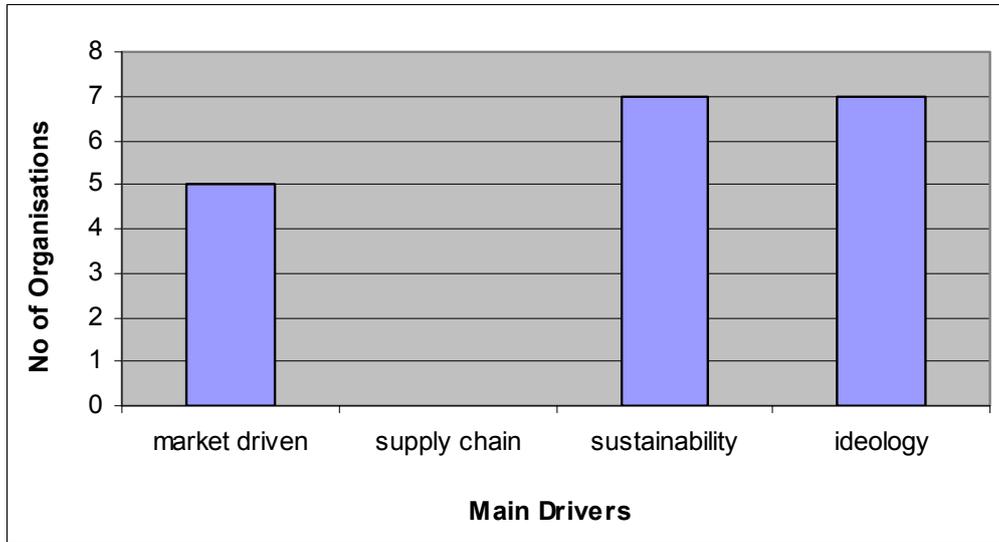
Did you envisage that TNS would interface with other EMS in your organisation, assuming you have or are planning to have other EMS?

Two organisations currently complement TNS with ISO14001. One also uses ISO 9000, while another also uses Agri-quality but has seen no interface between it and TNS. Another organisation saw the potential for complementary use of Enviro-Mark but is not currently considering using it. Three of the small organisations did not see TNS interfacing with other EMS within their organisations.

What were the principal drivers for you undertaking TNS?

The respondents were asked about the importance of market driven, supply chain, sustainability and ideology, as the main drivers for using TNS (Figure 2). The ideology behind the principles of TNS was seen as a major driver in implementation, with seven out of eight organisations stating that this was a principal driver. Sustainability and market driven issues were noted by the majority of organisations as significant reasons of implementation of TNS. There were no organisations that implemented TNS because of supply chain requirements.

Figure 2
Main drivers for TNS implementation



How did you envisage that TNS might impact on your organisation’s operation or performance?

Improved resource use efficiency alongside positive environmental outcomes were seen as the key impacts liked to the implementation of TNS. Other expected impacts included an improved image or profile of the organisation and a clearer structure of thoughts and ideas that would be of use in the organisation profile.

What were/are your organisation’s perceived areas of environmental challenges?

The respondents were asked to identify the organisation’s environmental challenging areas, regarding regulation (e.g. resource consent), competitiveness (e.g. clean & green) and non regulatory aspects (e.g. ideology, vision of sustainability).

Compliance with regulatory requirements was cited by four organisations as an environmental challenge.

A need to be competitive and convey an image and vision of sustainability was seen as an important factor for the majority of organisations. One organisation identified social responsibility as a challenge, to enable them to keep New Zealanders in employment and stay competitive.

Challenges of a strong commitment to sustainability coincided with a need for the organisations to carry out their core functions, was also stated by most of the organisations.

Did you carry out initial benchmarking of environmental challenges? (starting point)

Half the organisations surveyed did not carry out initial benchmarking of their environmental challenges. Two organisations did carry out initial benchmarking with the remaining two citing a loss of institutional knowledge for not being able to respond.

Do you require your suppliers to have an accredited EMS?

The majority of organisations stated that they do not require their suppliers to have an accredited EMS programme. However two of the surveyed organisations consider the sustainability policies of new suppliers. Two of the small organisations require their suppliers to have an accredited EMS.

How do you see sustainability from your organisation's perspective and from a conceptual perspective?

Sustainability was a priority for all organisations surveyed and a variety of responses were given, including being generally aware of sustainability throughout the organisation and the importance of sustainability for the organisation and clients. One organisation noted that sustainability was “crucial for brand and reputation as this is wrapped around sustainability”.

Social, economic and environmental sustainability ideals of the *Triple Bottom Line* were highlighted as being significant for six organisations and that there is still a lot to do to raise awareness. Of these six however, only one small organisation mentioned the *Triple Bottom Line* explicitly. In addition, out of these six, another small company stated that sustainability should be part of everyday life.

6.2 Implementation

6.2.1 Training

Who offered training?

Both large and small organisations received training from TNS NZ. In the case of small organisations, three out of four were sponsored by Christchurch City Council and/or Target Zero.

What levels of training did any of your employees undergo?

Key staff of all organisations and, in the case of large organisation, also the representatives of the departments received initial training. Follow up training consisting of workshops and individual training were attended by key staff from two organisations.

Were the training sessions mandatory or voluntary?

For all large organisations the training was voluntary while for one of the small organisations the training was mandatory but flexible, since the few key staff had also to take care of the production.

How many employees have been trained?

An average of 13 persons per organisation were trained in the case of large organisations, while the small organisations trained an average of 2 persons. One of the large organisations trained staff members from three departments.

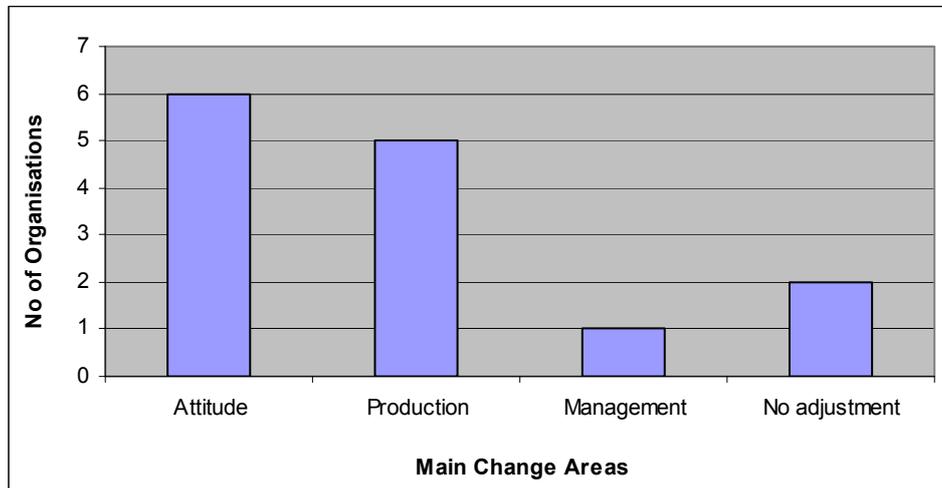
6.2.2 Organisational adjustments

What did you have to change at the inception of TNS?

Most changes introduced in the organisations' operations with the introduction of TNS fall within three main categories (Figure 3). Changes in production included modification in

packaging, recycling and waste minimization. One organisation initiated no operational change but attitudinal because the system was considered already green. In another organisation, TNS is not applied to the whole organisation, and therefore, no adjustments were needed.

Figure 3
Main change areas at the inception of TNS.



What are you yet to change?

The responses concerning changes that are yet to be implemented for the organisations to comply with the TNS principles were diverse but sometimes not specific. However, the following areas were mentioned: minimisation of carbon emissions, reduction of resource consumption, change in resource supply, modification of the community and staff attitude and initiating more training to the staff members.

What might not change?

Four organisations reported that there was nothing specific to change. Conversely, three organisations specified that air travel, use of cars and corrosives might not change. In addition, one organisation stated that the attitude of long term employees might be difficult to change.

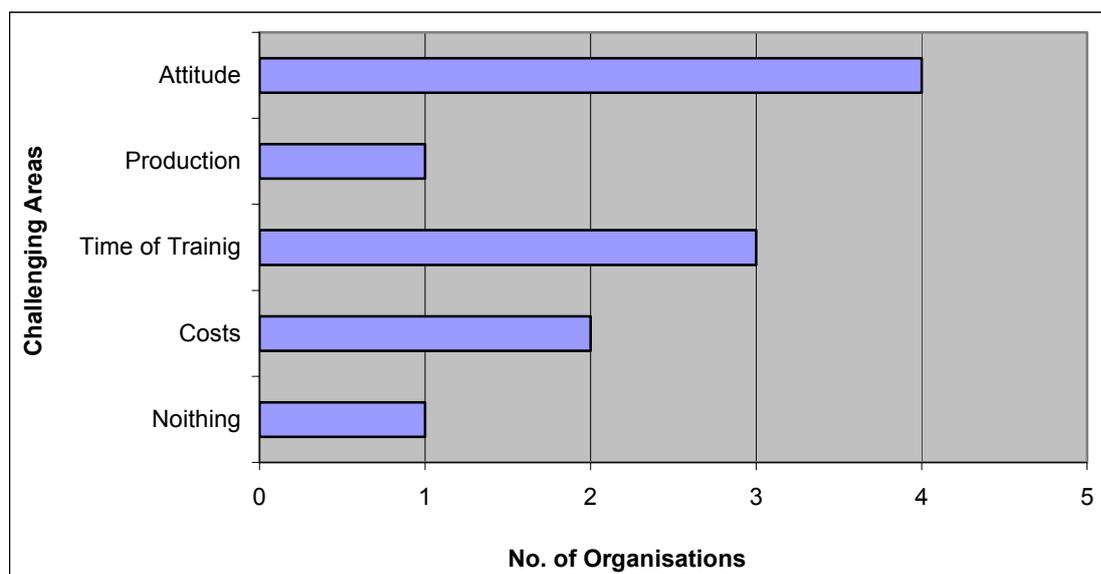
Did you have to establish a new department office or employ an expert?

Seven out of eight organisations did not need to employ an expert or create a new section/department, but three of them consulted experts periodically. Only one organisation established an Environmental Coordinator and a manager within the Senior Executive Team.

What challenges did your organisation face implementing the TNS?

Most of the organisations found change in staff attitude as a main challenge in implementing TNS (Figure 4). Cost was a concern in two areas, identified as training and purchase of (eco-friendly) products/supplies.

Figure 4
Challenging areas during the implementation of TNS



6.2.3 Monitoring

Do you have any processes in place to ensure continued adherence to TNS principles? Please explain if you do.

Five organisations do not have a system in place to ensure adherence, while three have. Of these three organisations, two are also ISO14001 certified. One of the small companies stated that there is no need for such a system because TNS is applied in day-to-day decision making.

How are the non-compliant cases reported / treated?

Only two organisations reported non-compliance cases. The others, especially the small organisations do not have any system to report non-compliance. One organisation stated that they do not have a system because compliance is not required by TNS, so compliance does not apply in this case. Another organisation responded that as soon as a problem is noted, corrections are made.

6.2.4 Documentation

Do you have any system for documenting compliance with the TNS principles?

Only two organisations, namely those that have ISO 14001, have a documentation system.

Who is responsible for overseeing it? What is his/her position in the organisation?

All the large organisations stated that they have responsible persons for documentation, in positions of: Departmental Manager, Sustainability Advisor, Environment Coordinator and Principal Advisor of Sustainability. One of the small organisations reported that the Managing Director looks after general information about TNS, but they do not have any particular documentation system.

How is the information about TNS communicated to the employees?

In the large organisations, training is the key method of passing information about TNS to the employees. On the other hand, small organisations employ informal use of charts and sharing of information amongst the employees. One of them stated that employees are normally encouraged to read the organisation's website as a source of information about TNS.

6.3 Performance

6.3.1 Initial situation and changes

Was there an initial assessment of environmental performance?

Six out of eight organisations carried out an initial assessment of their environmental performance.

What was assessed?

Three organisations carried out an assessment over the whole system.

The remaining organisations focused their assessments on energy and waste reduction. One organisation, due to institutional knowledge loss, could not identify the changes made.

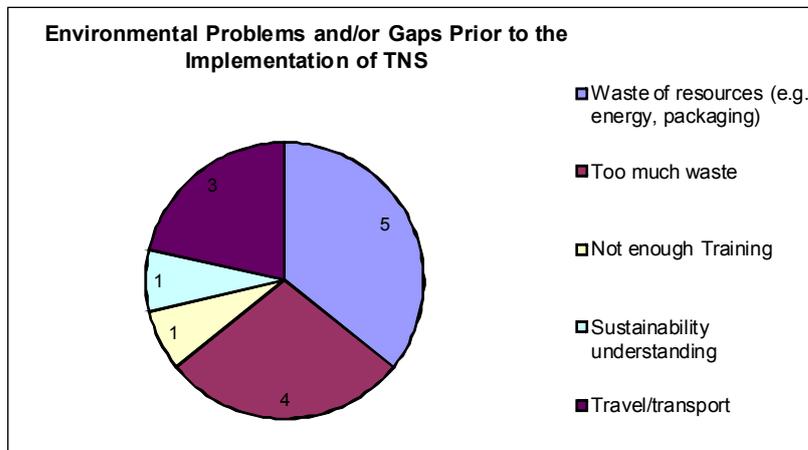
Is there a report?

Five organisations compiled an initial report of the above mentioned assessment. Two organisations did not produce a report. Due to loss of institutional knowledge one organisation could not respond.

What environmental problems and/or gaps were found?

Resource utilisation, waste generation and transport could be identified as major environmental problems among the organisations surveyed. Training and sustainability understanding were also named as gaps between the organisation's current practices and their environmental goals. On the whole, most of the organisations found significant number areas for improvement including recycling, efficient resource use and sourcing raw material. Organisations could report more than one factor involving cost of implementation. These numbers are shown in Figure 5.

Figure 5
Environmental problems and/or gaps found prior to the implementation of TNS



What measures did you undertake to address the problems?

Organisations undertook a number of measures to address identified areas for improvement. Half of those sampled undertook measures to address general house keeping such as recycling, energy use, transport and waste reduction. Staff awareness was improved by training for two organisations; travel was reduced by utilising video conferencing also by two organisations. One organisation changed its manufacturing process.

6.3.2 Efficiency and Effectiveness

Were there measureable changes in the organisation’s environmental impact?

The respondents were asked to identify measurable changes in the amount of waste produced, as well as in water, electricity and other forms of energy consumption as a result of the implementation of TNS within the organisations.

Six organisations observed a reduction in electricity consumption, waste generation and other energy use. Interestingly none of the organisations considered their water use as an issue to be considered.

6.3.3 Benefits and Costs / Challenges

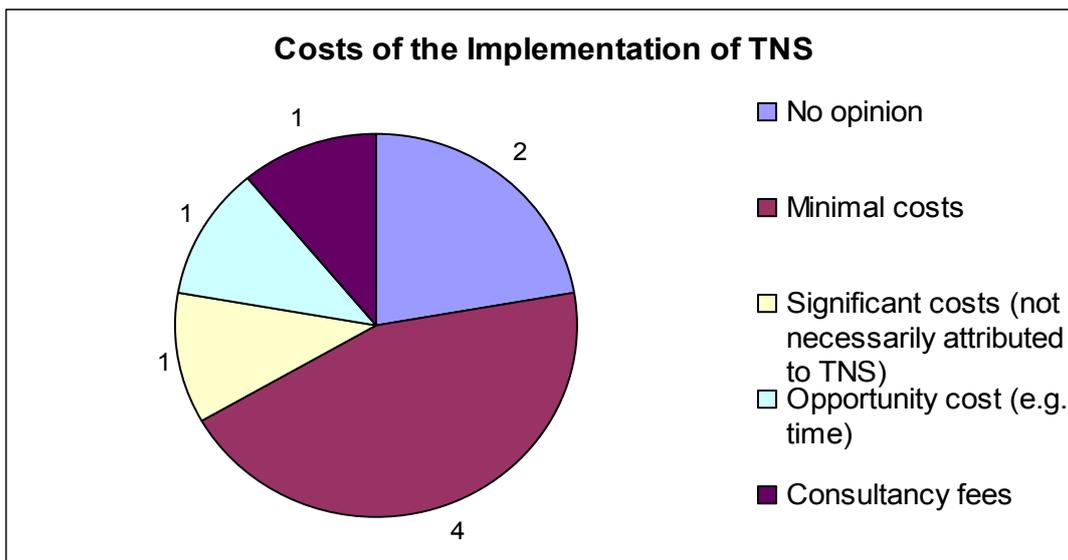
What benefits were you able to attribute to TNS?

Half of the organisations observed both financial and marketing advantages following TNS implementation. For three organisations TNS was helpful in structuring ideas and thoughts relating to sustainability. Two organisations reported more customers, a strategy to enhance quality and a reduction in waste. Meeting regulatory requirements was seen as a benefit by one organisation.

What costs were involved in implementing TNS?

Four out of eight organisations recorded minimal TNS implementation costs. One organisation noted an opportunity cost and another consultancy fees attributed to TNS implementation. Organisations could report more than one factor involving cost of implementation. These numbers are shown in Figure 6.

Figure 6
Cost for the implementation of TNS



6.3.4 Outcomes

What were the challenges in implementing TNS?

The integration of TNS as a concept and its application as a framework was seen as a challenge by three respondents. Both changing entrenched attitudes and application to the organisations’ supply chain were further identified by two organisations as challenging. External challenges and getting past the easy first challenges were identified by one organisation.

How were those challenges addressed?

Three out of eight organisations addressed these challenges principally by internal education and two out of eight by communication with suppliers. The remaining organisation adopted a number of strategies, e.g., writing manuals for clients, integrating TNS into the quality programmes and extending life cycle understanding within organisation.

Has TNS met your objectives?

Two organisations, one large and one small, considered that TNS had fully met their objectives. Three considered that it has partially met their objectives. One small organisation explained that TNS has contributed only in decision making while one large organisation stated that TNS has been useful in providing a framework to build a “formal” EMS on. Only one organisation responded that as the reasons for starting TNS were unknown due to institutional loss of knowledge, it is difficult to estimate if it met initial objectives.

Did you get any feed-back from customers?

Five out of eight organisations received very positive feedback from their customers. Two organisations made no comment and one stated that the customers did not know about TNS.

What is your overall conclusion? Was implementing TNS worth while?

Seven out of eight organisations found implementing TNS worth while with two organisations saying that it enhanced their business and one commenting that it was a useful framework for building their formal EMS on.

6.3.5 Future

What would you change in your implementation of TNS?

Organisations provided a diverse range of responses. Similar key points were: Keep better contact with TNS and attend more training, extend TNS over whole business, couple TNS with sustainability and financial reporting and employ dedicated staff. Only two organisations answered that they would not change any aspects of their TNS implementation.

What would you like to change within TNS or within your organisation related to TNS if you could?

Once again a wide variety of responses were recorded. Better communication with TNS was highlighted as important coupled with more reviews and local auditing and compliance assessments as well as more training. One organisation stated that competitive business would be the driver for changes in TNS application. It was noted by one company that TNS needs to be easier to use or more user-friendly.

What would make your organisation stop using TNS?

Six out of eight organisations could not identify any issues that would stop them from using TNS. One organisation remarked that the reliance on one knowledgeable individual was a potential risk to maintaining the use of TNS within the organisation. The owner of a small organisation was concerned about the risk of TNS no longer evolving to meet increasing environmental challenges within the business environment.

How do you see the TNS evolving within your organisation (in the next 10 years)?

Two organisations indicated that TNS would principally evolve through staff engagement and addressing issues as they present themselves. Two organisations were more specific in their objectives, one would buy and serve more organic products and the other considered the construction of a zero-energy-house.

6.4 General

Most organisations found TNS covered a range of regulatory and sustainability issues, but agreed that continued support and exposure is necessary to maintain momentum for TNS. The lack of a strict structure suited many organisations, who could adapt TNS to suit the needs of their organisation and clients. One organisation had concerns regarding the lack of support from TNS following implementation. There was limited follow up from TNS experts and some thought forum or community for TNS could be beneficial. A commitment to ongoing training of staff was identified by one organisation as important to maintain the underlying principles attributable to TNS within the organisation.

Chapter 7

Analysis

7.1 Costs and Benefits

Overall, all organisations observed both financial and marketing advantages following TNS implementation. For four organisations, including one large organisation, benefits were related to sustainability. Cost saving, enhanced quality, waste reduction and increase numbers of customers were experienced by all organisations surveyed.

Four out of eight organisations surveyed indicated that there were no significant financial costs associated with the implementation of the TNS. Out of these four organisations, three were small which was unexpected since small organisations tend to limit their spending. It should be noted, however, that two of the large organisations that participated in the survey could not comment on the cost of TNS implementation due to a loss of institutional knowledge. While none of the organisations indicated that financial cost was an issue in TNS implementation, several cited other costs. These include cost associated with time and consultancy fees which were identified by two small organisations as significant. Other significant costs identified were related to the procurement of environmental friendly products and with products redesigning.

7.2 Management

Four out of the eight organisations stated that implementation of TNS was too reliant on one champion. This meant that one person was responsible for the implementation and management of TNS and had to encourage and convey this throughout the organisation. An issue relating to this was that two of the large organisations found that information was lost over time through employees leaving. This institutional knowledge was lost due to the lack of documentation required in TNS framework.

The management of TNS was shown to be implemented easily within the organisations. The lack of a formal structure and the flexibility of implementation meant the framework was suitable to be used by each organisation. The majority did not have to create a new department in order to manage the system within the organisation. This also relates to the monitoring and adherence of the system for the organisations. Five organisations do not have a system in place to ensure adherence while three have, along with only two organisations having official procedures to report non-compliance.

7.3 Sustainability

All organisations presented sustainability as one of their main drivers in the implementation of TNS within their organisation. It was further seen as one of the main objectives to achieve by five out of eight organisations, but was interestingly also named as a challenge by some of the large organisations. This is probably due to more complicated production processes and higher costs of changing structures and attitudes to reduce environmental impacts. However, in general and in the long run most of the changes proved to be beneficial to the organisations.

Generally a divergence in interpretation of sustainability between large and small organisations was observed. Large organisations mainly viewed sustainability from the point of efficient resource usage (e.g. energy, raw material) and reduction of waste, while small organisations, three out of four, sampled took a more ideological view on sustainability.

While the *Triple bottom line* concept of sustainability was specifically identified by only one of the organisations sampled, nearly all perceived that the everyday life awareness of sustainability by the public was low.

7.4 Training and Communication

Training levels and uptake for TNS were variable across the organisations participating in this research. All undertook initial training under the supervision of TNS staff as part of the implementation phase. There were varying levels of satisfaction expressed by those organisations. Large organisations described the initial training undertaken by key staff members, from which they based in-house training, as satisfactory and two of the four larger organisations undertook further training. It seems that the inertia from these training sessions combined with existing institutional knowledge was sufficient for these organisations to effectively implement the TNS. In contrast there were concerns among a minority of the small organisations that the clarity of message, follow up training and support from TNS was inadequate for their needs. All the smaller organisations expressed concern about the provision of adequate time for training and the associated financial implications. Most of the small organisations stated that attendance at training was voluntary with one exception stating that it was irregular.

TNS communication was observed at different levels, that is, communication of TNS principles between the organisations and the public, internal communications and communication between the TNS team and the organisations. TNS communication among the staff members, carried out through training sessions, was generally poor in all organisations. In all organisations, key persons in charge of the TNS implementation communicate TNS matters through a mix of formal and informal systems. In one of the small organisations, the staff members were encouraged to read about TNS from the organisation's website. This information is also available to the public. A minority of the small organisations felt that the TNS team has not performed very well in feeding the TNS implementing organisations with information.

7.5 Framework and Structure

All of the large organisations and half of the small ones stated that TNS was a good framework for building an EMS on. The arguments were diverse, ranging from personal support, to broader application inside the organisation. For both small and large organisations, TNS was an aid for structuring thoughts and ideas of the person in charge. Mainly for large organisations, it was also a useful tool for meeting regulatory requirements and to establish a good marketing and managing strategy.

Some organisations stated that the flexibility and non-mandatory character of TNS was considered as an advantage, allowing them to decide about the organisation's own priorities without focusing on being compliant to any norm. However, other organisations, mainly

small ones, mentioned that the lack of structure, including clear rules and assessment system, was a challenge for the application of TNS. Therefore, some of them suggested improving its user-friendliness in terms of better delivery.

Chapter 8

Conclusion

The findings from our qualitative research of organisations employing The Natural Step (TNS) in Christchurch indicate that the 'system' provided a moral compass for a focus on sustainability which was flexible and adaptive to an organisation's needs. It tended to fit the organisations' ideologies and the framework was practical to follow. There were no significant costs associated with implementation. TNS therefore has the capability of providing the basis for complementary addition of a process-based EMS such as ISO 14001, which in view would strengthen its ability to deliver sustainability outcomes.

Some organisations found it difficult to conceptualise TNS principles and a general lack of support and structure was an issue for smaller organisations. The lack of documentation requirement meant in some instances institutional knowledge was lost over time. This was a particular risk when implementation was too reliant on a committed but single champion and challenges were identified in attaining staff engagement.

Overall, the organisations we studied found TNS implementation worthwhile, however only one found that TNS had fully met their objectives. All organisations found the financial and marketing implications of TNS worthwhile. There was a delineation of how sustainability was defined within organisations and between large and small organisations. Small organisations tended to view sustainability from an ideological perspective, larger organisations tended to focus on sustainability as a function of resource utilisation efficiency. However all organisations viewed sustainability as a priority and considered TNS an appropriate means to meet their goals by focusing on sustainable management of their organisation.

In terms of methodology, our research was limited by the small sample size and issues associated with a common interpretation of interview responses. We were fortunate in gaining a positive response to our initial request for a personal interview from eight out of the nine organisations approached. The process would have benefited from a uniform understanding of questionnaire responses and the use of some quantitative data could have been used to help address this issue.

There were some similarities in conclusions found with the previous qualitative studies of the ISO 14001 and Enviro-Mark EMS in Christchurch (Alexander et al., 2008, Goalabre et al., 2007), e.g. financial benefits, improved environmental outcomes and difficulty in establishing staff commitment.

One of the major differences between TNS and the two EMS evaluated in the previous two studies is the absence of formal requirements to document or audit their environmental performance. In contrast to ISO 14001 and Enviro-Mark, which can be described as process based EMS, TNS takes a more holistic view and can be described as an end state system (Upham, 2000).

Chapter 9

Recommendations

Consistent with the analysis and conclusions we recommend that:

- TNS needs to more consistently support organisations and provide standardised training especially during the implementation phase.
- There is a need for TNS to have a higher profile and provide opportunities for marketing leverage for participants in the programme, e.g., increasing public awareness with a distinctive labelling or logo.

We also think that organisations should consider implementing a process focused EMS like ISO14001 EMS in conjunction with TNS to more effectively monitor performance.

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Appendix 1

Evaluation Framework (Questionnaire)

1. First, we would like to explore some questions about your Goals in utilising TNS

- Why did you choose TNS?
- What other options were considered?
- Did you envisage that the TNS would interface with other EMSs in your organisation, assuming you have or are planning to have other EMS?
- What were the principal drivers for you undertaking TNS? Importance of:
 - Market driven
 - Supply chain
 - Sustainability
 - Ideology
- How did you envisage that the TNS might impact on your organisation's operation/performance?
- What were/are your organisation's perceived areas of environmental challenges?
 - Regulatory, e.g. Resource Consent,
 - Competitive, e.g. Clean & Green,
 - Non regulatory (ideology), e.g. Vision for Sustainability
- Did you carry out initial benchmarking of environmental challenges? (starting point)
- Do you require your suppliers to have an accredited EMS?
- How do you see sustainability from your organisation's perspective and from a conceptual perspective?

2. Now we would like to discuss Implementation of TNS in your organisation

Training

- Who offered training?
- What levels of training did any of your employees undergo?
- Were the training sessions mandatory or voluntary?
- How many employees have been trained?
- If yes, after what period of time from first engaging with TNS?

Organisational Adjustments

- What did you have to change at the inception of the TNS?
- What are you yet to change?
- What might not change? (reasons)
- Did you have to establish a new department office or employ an expert?
- What challenges did your organisation face implementing the TNS?

Monitoring

- Do you have any processes in place to ensure continued adherence to TNS principles? Please explain if you do.
- How are the non-compliant cases reported / treated?

Documentation

- Do you have any system for documenting compliance with TNS principles?
- Who is responsible for overseeing this?
- What is his/her position in the organisation?
- How is the information about TNS communicated to the employees?

3. Now we would like to talk to you about TNS Performance

Initial situation and changes

- Was there an initial assessment of environmental performance?
- What was assessed?
- Is there a report?

- What environmental problems / gaps were found?
- In which areas did you find the performance already satisfactory?
- What measures did you undertake to address the found “problems”?

Efficiency and Effectiveness

- Were there measurable changes in (for example, Ecological footprint):
 - Water consumption
 - Electricity consumption
 - Amount of waste
 - “Energy” (e.g. fuel)
 - Other, please specify

Benefits and Costs / Challenges

- What benefits were you able to attribute to TNS
- What costs were involved in implementing TNS

Outcomes

- What were the challenges in implementing TNS?
- How were those challenges addressed?
- Has TNS met your objectives?
- Did you get any feed-back from customers?
- What is your overall conclusion? Was implementing TNS worth while?

Future

- What would you change in your implementation of TNS?
- What would you like to change within TNS or within your organisation related to TNS if you could?
- What would make your organisation stop using TNS?
- How do you see the TNS evolving within your organisation (in the next 10 years)?

4. Finally, is there anything else you would like to discuss, generally, about TNS?

Appendix 2

Results Table - Large Organisations

	Organisation A	Organisation B	Organisation C	Organisation D
1. GOALS				
Why did you choose TNS	<ul style="list-style-type: none"> Best available system 	<ul style="list-style-type: none"> Best available system Most rigorous framework 	<ul style="list-style-type: none"> Unable to answer – not employed at the time 	<ul style="list-style-type: none"> Champion who decided to use it
What other options were considered?	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None Possible Enviro-Mark 	<ul style="list-style-type: none"> Unable to answer – not employed at the time 	<ul style="list-style-type: none"> None
Did you envisage TNS being an interface for other EMS?	<ul style="list-style-type: none"> ISO9000 TNS ISO14001 	<ul style="list-style-type: none"> Enviro-Mark (if the organisation decides to use it) 	<ul style="list-style-type: none"> TNS ISO14001 They don't subscribe to but provide certification for Enviro-Mark 	<ul style="list-style-type: none"> TNS Organisation's Sustainability Policy
Principle drivers	<ul style="list-style-type: none"> Market driven Social side of sustainability Ideology 	<ul style="list-style-type: none"> To provide clarification and have a set of principles to use and explain sustainability in the organisation's framework 	<ul style="list-style-type: none"> Sustainability Market driven Ideology 	<ul style="list-style-type: none"> Ideology Sustainability
How did you envisage TNS might impact on your organisation's operation/performance?	<ul style="list-style-type: none"> Expected some design changes, expected energy savings, waste disposal savings 	<ul style="list-style-type: none"> Clarify thinking on sustainability 	<ul style="list-style-type: none"> Wanted to be aware of and improve environmental impacts (waste audit) Social responsibility and business decision 	<ul style="list-style-type: none"> Everything should change as nothing is sustainable
Organisation's perceived main areas of environmental challenges?	<ul style="list-style-type: none"> Need strict regulatory requirements Need to be competitive Keep up with competition, not just maintaining Social responsibility and obligation to keep New 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Regulatory requirement for research Competitive – sustainability is the core business Strong commitment to sustainability Need to reduce air travel, but 	<ul style="list-style-type: none"> No environmental challenges – they are all human challenges

	Zealanders employed		also need international collaboration in research field	
Carry out initial benchmarking of environmental challenges	<ul style="list-style-type: none"> • Yes - Used TNS to priorities their environmental effects 	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • Unable to answer – Institutional knowledge lost 	<ul style="list-style-type: none"> • Annual report carried out within the organisation
Do you require your suppliers to have an accredited EMS?	<ul style="list-style-type: none"> • No but suppliers have to meet organisation's regulatory requirements 	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • Not for the current suppliers, but is something the organisation is currently considering 	<ul style="list-style-type: none"> • No but suppliers are asked to provide sustainability policies
How do you see sustainability from your organisation's perspective and from a conceptual perspective?	<ul style="list-style-type: none"> • Economic and social sustainability as priority 	<ul style="list-style-type: none"> • See sustainability as an important factor. • Can be used to increase social responsibility and becoming a role model for society 	<ul style="list-style-type: none"> • See sustainability as a crucial part of the organisation. • Can be used to enhance brand and reputation 	<ul style="list-style-type: none"> • Sustainability = survival.
2. IMPLEMENTATION				
2.1 Training				
Who offered training?	<ul style="list-style-type: none"> • TNS consultant 	<ul style="list-style-type: none"> • TNS consultant 	<ul style="list-style-type: none"> • TNS consultant over 6 weeks 	<ul style="list-style-type: none"> • TNS consultant
What levels of training did any of your employees undergo?	<ul style="list-style-type: none"> • Block course from TNS – limited number of people 	<ul style="list-style-type: none"> • 3 departments participated in a workshop for 2 days 	<ul style="list-style-type: none"> • 6 weeks training for an initial group. Then they reported back to other staff 	<ul style="list-style-type: none"> • 2 days workshop for initial staff. Few people from each department.
Were the training sessions mandatory or voluntary?	<ul style="list-style-type: none"> • Voluntary 	<ul style="list-style-type: none"> • Voluntary 	<ul style="list-style-type: none"> • Voluntary and ISO14001 now part of induction process 	<ul style="list-style-type: none"> • Voluntary
How many employees have been trained?	<ul style="list-style-type: none"> • 10-15 	<ul style="list-style-type: none"> • 3 departments 	<ul style="list-style-type: none"> • Small focus group around 12 people 	<ul style="list-style-type: none"> • Approximately 15 people from the Strategy and Planning Department
If yes, after what period of time from first engaging with TNS?	<ul style="list-style-type: none"> • At the inception period 	<ul style="list-style-type: none"> • 2004 	<ul style="list-style-type: none"> • Unknown 	<ul style="list-style-type: none"> • At the inception period and then fizzled out and then morphed into something different
2.2 Organisational Adjustments				
What did you have to change at the inception of the TNS?	<ul style="list-style-type: none"> • Attitude changes • Changes in production (Especially in packaging) 	<ul style="list-style-type: none"> • Hasn't been used in organisation (was asked what would change if you 	<ul style="list-style-type: none"> • Attitudes of some existing staff 	<ul style="list-style-type: none"> • Everything, this is an ongoing journey

		were to – gave reasons)		
What are you yet to change?	<ul style="list-style-type: none"> Lots (Didn't specify) 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Low lying fruit e.g. Have to work on more challenging improvements Not sustainable completely or carbon neutral Minimising consumption 	<ul style="list-style-type: none"> People's attitude, "hearts and minds" It's about getting the community "healthy, wealthy and wise"
What might not change?	<ul style="list-style-type: none"> Depends on economics – if not viable cannot change it 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Long term employees – attitudes a few hard to change existing practices Air travel, energy to run business 	<ul style="list-style-type: none"> No Answer
Did you have to establish a new department office or employ an expert?	<ul style="list-style-type: none"> No new job was created but did employ short term consultant 	<ul style="list-style-type: none"> No, but for a new building project they employed a short term consultant 	<ul style="list-style-type: none"> Yes, established Environmental Coordinator and a manager at level 3 of sustainability 	<ul style="list-style-type: none"> No, but developed sustainability policy which lead to creation of new jobs
What challenges did your organisation face implementing TNS?	<ul style="list-style-type: none"> Attitudes Change in manufacturing and product specifications 	<ul style="list-style-type: none"> No Answer 	<ul style="list-style-type: none"> Attitudes Change in short term focus of the Executive Team. Some staff (especially staff with science background) buy in to what some see as "more form filing" 	<ul style="list-style-type: none"> People Communication Have to change peoples hats
2.3 Monitoring				
Do you have any processes in place to ensure continued adherence to TNS principles? Please explain if you do.	<ul style="list-style-type: none"> Yes, ISO14001 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> ISO14001 compliance – documentation system in place – internal and external audits annually 	<ul style="list-style-type: none"> No but have monitoring of environmental effects
How are the non-compliant cases reported and treated?	<ul style="list-style-type: none"> Have documentation system that reports non compliance 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Reported through line management and to the Board if necessary 	<ul style="list-style-type: none"> NA
2.4 Documentation				
Do you have any system for documenting compliance	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> n/a 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> No but have documentation of environ effects

with TNS principles				
Who is responsible for overseeing this?	<ul style="list-style-type: none"> Quality control 	<ul style="list-style-type: none"> Sustainability Advisor 	<ul style="list-style-type: none"> ? 	<ul style="list-style-type: none"> Principal Advisor of Sustainability
What is his/her position in the organisation	<ul style="list-style-type: none"> Departmental Manager 	<ul style="list-style-type: none"> Sustainability Advisor 	<ul style="list-style-type: none"> Environment Coordinator 	<ul style="list-style-type: none"> Principal Advisor of Sustainability
How is the info about TNS communicated to the employees?	<ul style="list-style-type: none"> Voluntary training/awareness sessions on environmental matters in general. 	<ul style="list-style-type: none"> One off voluntary training sessions 	<ul style="list-style-type: none"> At induction and ongoing training sessions 	<ul style="list-style-type: none"> Periodic voluntary training sessions
3. PERFORMANCE				
3.1 Initial Situation and Changes				
Initial Situation and Changes	<ul style="list-style-type: none"> Production changes, waste in packaging and energy 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Unable to answer - Institutional memory lost 	<ul style="list-style-type: none"> Initial situation revealed a lot of unsustainable activities that needed to change
What were the results of your initial assessment?	<ul style="list-style-type: none"> Considerable savings could be made 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Very bad, revealed a lot of areas to work in
Was there an assessment	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Assessments done in the organisation on building basis e.g. pools, libraries, civic offices
Is there a report?	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Yes
What environmental problems/gaps were found	<ul style="list-style-type: none"> Fuel, air travel, waste, toxic metal use, energy, recycling & Packaging 	<ul style="list-style-type: none"> Explain sustainability in thinking 	<ul style="list-style-type: none"> Resource consumption Chemical use impacts of field work and travel paper uses 	<ul style="list-style-type: none"> Resource wastage, inefficiency in resource use
In what areas did you find the performance satisfactory	<ul style="list-style-type: none"> Recycling of Pb 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Not Known 	<ul style="list-style-type: none"> None
What measures did you take to address the found problems	<ul style="list-style-type: none"> Replaced all light ballasts with electronic , Rationalised travel, replaced polystyrene packaging, reduced the use of solvent based glues, eliminated Cd & reduced Pb in products recycling reduced waste by 1830m3 reduced electricity use by >30% 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Measures include engage with staff, set targets, improved performance published, new vehicles appropriate to need and sustainability included in statement of corporate intent 	<ul style="list-style-type: none"> Implemented a sustainability policy that applies to the organisation and all of Christchurch
3.2 Efficiency and Effectiveness				

Water	<ul style="list-style-type: none"> Not an issue 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> No started from focus on benchmarking 	<ul style="list-style-type: none"> Organisation monitors water usage, trying to get water pumps that work more efficiently
Electricity	<ul style="list-style-type: none"> 30% reduction 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Energy management 	<ul style="list-style-type: none"> Reduce energy consumption – targeted at both the organisation offices and related office. Running the pools and recreational centres on biogas produced by landfill and the sewerage ponds.
Waste	<ul style="list-style-type: none"> Not an issue 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Waste audit with excellent results 	<ul style="list-style-type: none"> Implemented the new rubbish system in areas where the organisation oversee Trying to minimise waste going to landfill.
Energy	<ul style="list-style-type: none"> Reduced CC rating of vehicles, minimised air travel 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> New rationalised vehicle fleet – vehicles purchased with end use in mind instead of one type fits all situations 	<ul style="list-style-type: none"> Looking at options for purchase of electric cars etc or option of biogas fuelled cars
Other	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Air travel minimised with video conferencing 	<ul style="list-style-type: none"> NA
3.3 Benefits and Costs/Challenges				
Benefits	<ul style="list-style-type: none"> Meet regulatory requirements, Better supplier relationships, Cost savings, Positive organisation image with some customers (Developed countries especially Europe) 	<ul style="list-style-type: none"> Helps everyone think about sustainability , “creates a pro-active way, what are we impacting and how do we address this” 	<ul style="list-style-type: none"> Cost savings outweigh implementation costs so it makes “good economic sense” 	<ul style="list-style-type: none"> Biogas supply to pools will pay for itself in 3 years. Civic offices will pay for themselves in 3 years due to good design and biogas usage. Financially: people employed in business are the ‘right’ people, will stay in position longer, more engaged in their

				work
Costs	<ul style="list-style-type: none"> Product redesign 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Minimal – initial training 	<ul style="list-style-type: none"> Did not answer
3.4 Outcomes				
What are the challenges in implementing TNS	<ul style="list-style-type: none"> Primarily attitude especially older staff (Some habits are entrenched such as paper use and disposal). 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> “Early, low-lying fruit easy to harvest” then revisit strategy 	<ul style="list-style-type: none"> TNS adapted to produce the organisation’s own sustainability policy Initially people in denial that situation could be bad.
How did the organisation address the challenges?	<ul style="list-style-type: none"> Regular voluntary Environmental issues forums, creating a culture of change, integrated into the organisation QC framework 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Leadership team appointment responsible for Property, Procurement & Sustainability Continual revisit of strategy 	<ul style="list-style-type: none"> Change peoples attitudes / awareness The organisation provided a lot of education for staff.
Has TNS met your objectives?	<ul style="list-style-type: none"> TNS has met the organisation’s objective in providing a useful framework to build an EMS upon. 	<ul style="list-style-type: none"> Yes, TNS has met the objectives 	<ul style="list-style-type: none"> Reasons for starting TNS were unknown due to institutional loss of knowledge. So hard to gauge if it met initial objectives. 	<ul style="list-style-type: none"> TNS had in part (the organisation also uses ISO14001) help meet their sustainability objectives
Do you have any feedback on TNS?	<ul style="list-style-type: none"> Some very positive feedback from customers ability to present audit outcomes to customers 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Seen as international leader in field, highly regarded by clients and public Sought for conferences and as an example worldwide 	<ul style="list-style-type: none"> No feedback
Was TNS implementation worthwhile?	<ul style="list-style-type: none"> Yes the whole process has been cost effective. TNS was a useful framework to build an effective EMS 	<ul style="list-style-type: none"> When referring to one of project that used TNS in the organisation, the implementation was very worthwhile. Everyone was involved in workshops, architects, contractors etc. It helped in their thinking and how to address sustainability – a common understanding for all of them to do the project, 	<ul style="list-style-type: none"> Absolutely we sell this as part of our business Enhances credibility 	<ul style="list-style-type: none"> Definitely worthwhile to implement sustainability Policy which was an adaptation of TNS.

		making sustainability part of the process and thinking, not just an “add on”.		
3.4. Future				
What would you change in your implementation of TNS?	<ul style="list-style-type: none"> Aim to have the business and products “Carbon Neutral” 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Ensure good integration with business strategy that way TNS not left sitting off to one side 	<ul style="list-style-type: none"> NA
What would you like to change within TNS or within your organisation related to TNS if you could?	<ul style="list-style-type: none"> Competitive Business aspects would drive change 	<ul style="list-style-type: none"> Within organisation, TNS can be used in all departments and can become a subject for teaching. At the moment only the Sustainability Advisor uses it personally 	<ul style="list-style-type: none"> Environmental Co-ordinator position disestablished with major change in senior executive which saw sustainability initiatives as working well and focused on other aspects of the business 	<ul style="list-style-type: none"> Clear framework for sustainability, more reporting eg coupled with financial reporting should be sustainability reporting
What would make your organisation stop using TNS?	<ul style="list-style-type: none"> Unlikely imbedded in established EMS 	<ul style="list-style-type: none"> Only if a better one came along, but I haven’t seen any others that are as good or the same 	<ul style="list-style-type: none"> Unlikely even as focus shifts to economic matters TNS is still a positive part of economic viability 	<ul style="list-style-type: none"> Organisation has adapted TNS to suit their own needs and currently have an evolving policy to suit the organisation. They would not stop using this but it does evolve
How do you see the TNS evolving within your organisation (in the next 10 years)?	<ul style="list-style-type: none"> Evolve to address issues as they present and undergo continuous improvement 	<ul style="list-style-type: none"> Using the natural step core in how we help our departments and individuals in sustainability, so that every department chooses to address it in their planning and actions. Staff could get credit for training regarding sustainability and it would help individuals personally and could include it in professional development 	<ul style="list-style-type: none"> Full, passionate engagement by all staff Environmental considerations become as fundamental as Health and Safety Values alignment improves as new staff recruitment influences workplace culture 	<ul style="list-style-type: none"> Need to get the right info to make decisions. Sustainability policy evolves to suit current conditions.

4. GENERAL DISCUSSION OF TNS				
<p>Is there anything else you would like to discuss, generally, about TNS?</p>	<ul style="list-style-type: none"> • Currently have a good EMS structure that meets both their regulatory and extended EMS goals. • Not aggressively green • Consider social responsibility and economic factors as a priority. 	<ul style="list-style-type: none"> • The organisation has an overall strategy on sustainability that was new from the end of last year. What would be useful is to use TNS in part of implementation. Useful to put ways of advising departments on sustainability and training modules, what it means for you, introduce the natural step to them. It could be applied that way I guess, like using it to advise departments in the organisation and groups on how to approach sustainability. 	<ul style="list-style-type: none"> • Recruit to EMS values • New staff values alignment to TNS principles and EMS decreases institutional resistance • New ideas • Passionate environmentalists in a diverse global forum • Video conferencing and conferences offer opportunity for cross fertilisation of ideas • Challenging other peoples thinking 	<p>None</p>

Appendix 3 Results Table - Small Organisations

	<i>Organisation E</i>	<i>Organisation F</i>	<i>Organisation G</i>	<i>Organisation H</i>
1. GOALS				
Why did you choose TNS	<ul style="list-style-type: none"> Fitted company Paid for by the city 	<ul style="list-style-type: none"> Fitted small company 	<ul style="list-style-type: none"> Available Paid for by the city 	<ul style="list-style-type: none"> Fitted company Helped to structure thoughts and ideas
What other options were considered?	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Tried EBEX 21 (didn't work out) 	<ul style="list-style-type: none"> Unaware of any other systems 	<ul style="list-style-type: none"> None
Did you envisage TNS being an interface for other EMS?	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> Others: first Biogro, currently agri-quality , no interference 	<ul style="list-style-type: none"> No
Principle drivers for using TNS	<ul style="list-style-type: none"> Ideology Sustainability Market driven 	<ul style="list-style-type: none"> Ideology 	<ul style="list-style-type: none"> Sustainability Ideology Market driven 	<ul style="list-style-type: none"> Ideology Sustainability Market driven
How did you envisage TNS might impact on your organisation's operation/performance?	<ul style="list-style-type: none"> Improvement of management practices 	<ul style="list-style-type: none"> Improve image and profile Expand network of clients Improve resource use efficiency 	<ul style="list-style-type: none"> No expectation initially 	<ul style="list-style-type: none"> Would help to structure ideas and thoughts Provide framework for decision making
Organisation's perceived main areas of environmental challenges?	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Ideology – raising awareness with staff 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Regulatory – NZ building code compromises some of the sustainability ideals
Carry out initial benchmarking of environmental challenges	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> Yes
Do you require your suppliers to have an	<ul style="list-style-type: none"> No, but pay attention to what being used by suppliers (i.e. 	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> Yes – suppliers are selected based on how “green” they

accredited EMS?	packaging materials)			are
How do you see sustainability from your organisation's perspective and from a conceptual perspective?	<ul style="list-style-type: none"> Generally aware of sustainability due to location in botanical garden 	<ul style="list-style-type: none"> Triple bottom line ideals: social, economic, environmental sustainability 	<ul style="list-style-type: none"> Sustainability as an important concept for company and customers 	<ul style="list-style-type: none"> Sustainability should be part of every day life, still a lot to do raise awareness
2. IMPLEMENTATION				
2.1 Training				
Who offered training?	<ul style="list-style-type: none"> TNS (sponsored by CCC & Target zero) 	<ul style="list-style-type: none"> TNS (sponsored by CCC & Target zero) 	<ul style="list-style-type: none"> TNS NZ (sponsored by CCC) 	<ul style="list-style-type: none"> TNS
What levels of training did any of your employees undergo?	<ul style="list-style-type: none"> Initial workshop training 	<ul style="list-style-type: none"> Initial workshop training 	<ul style="list-style-type: none"> Chef: several workshops and personal training Key staff: some workshops Other staff: presentation 	<ul style="list-style-type: none"> NA
Were the training sessions mandatory or voluntary?	<ul style="list-style-type: none"> Voluntary 	<ul style="list-style-type: none"> Voluntary 	<ul style="list-style-type: none"> Mandatory for staff (with exceptions related to production) 	<ul style="list-style-type: none"> NA
How many employees have been trained?	<ul style="list-style-type: none"> 2 (Owner and chief chef) 	<ul style="list-style-type: none"> 4 	<ul style="list-style-type: none"> 2 key staff Other staff only one presentation 	<ul style="list-style-type: none"> NA
If yes, after what period of time from first engaging with TNS?	<ul style="list-style-type: none"> At the inception period No follow up training 	<ul style="list-style-type: none"> At the inception period No follow up training 	<ul style="list-style-type: none"> Irregularly 	<ul style="list-style-type: none"> At the inception period No follow up training
2.2 Organisational Adjustments				
What did you have to change at the inception of the TNS?	<ul style="list-style-type: none"> Buying supplies locally Asking for paper packaging Recycling Composting Send waste food to pig farm Changing detergents to organic products Improve housekeeping practices 	<ul style="list-style-type: none"> Recycling and reuse of paper Relying more on internet communication Leasing computer instead of buying Both sided printing Improve housekeeping practices Car pooling 	<ul style="list-style-type: none"> Nothing 	<ul style="list-style-type: none"> Company was already "green" Formalize thinking Changed office location (not primarily connected to TNS), reduced transport

		<ul style="list-style-type: none"> • Planning deliveries 		
What are you yet to change?	<ul style="list-style-type: none"> • Buy more organic produces 	<ul style="list-style-type: none"> • More training 	<ul style="list-style-type: none"> • Reduce carbon emissions (long term goal) 	<ul style="list-style-type: none"> • Continuous improvement
What might not change?	<ul style="list-style-type: none"> • Use of some corrosives for cleaning 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Using a car
Did you have to establish a new department office or employ an expert?	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • Yes – employed a part-time advisor for 1.5 years 	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • No
What challenges did your organisation face implementing TNS?	<ul style="list-style-type: none"> • Cost of “green” supplies • Disapproval of customers (e.g. no table cloth) • Time and cost for follow up training 	<ul style="list-style-type: none"> • Time for follow up training 	<ul style="list-style-type: none"> • Management time 	<ul style="list-style-type: none"> • External challenges: • NZ building code • Passing on the “green” message • No regulations
2.3 Monitoring				
Do you have any processes in place to ensure continued adherence to TNS principles? Please explain if you do.	<ul style="list-style-type: none"> • Informal check ups with chef and staff 	<ul style="list-style-type: none"> • Not necessary, since TNS is imbedded 	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • No (no tools, or regulations provided by TNS)
How are the non-compliant cases reported and treated?	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Correction are made as soon as they are noted 	<ul style="list-style-type: none"> • Compliance is not required by TNS, so non-compliance NA 	<ul style="list-style-type: none"> • NA
2.4 Documentation				
Do you have any system for documenting compliance with TNS principles	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • No 	<ul style="list-style-type: none"> • No
Who is responsible for overseeing this?	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Managing Director 	<ul style="list-style-type: none"> • NA
What is his/her position in the organisation	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Managing Director 	<ul style="list-style-type: none"> • NA
How is the info about TNS communicated to the employees?	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Encourage staff to read policies on website 	<ul style="list-style-type: none"> • Workshops, LCA images (i.e. in canteen or staff room) 	<ul style="list-style-type: none"> • NA

3. PERFORMANCES				
3.1 Initial Situation and Changes				
What were the results of your initial assessment?	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> Yes – done by a TNS consultant 	<ul style="list-style-type: none"> Yes
Was there an assessment	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> The whole system 	<ul style="list-style-type: none"> Whole organisation regarding energy conservation 	<ul style="list-style-type: none"> Whole organisation
Is there a report?	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> Yes – in the website 	<ul style="list-style-type: none"> Yes, but only CO2 report 	<ul style="list-style-type: none"> Yes
What environmental problems/gaps were found	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Not stated but training need mentioned 	<ul style="list-style-type: none"> Energy consumption, Packaging 	<ul style="list-style-type: none"> Too much waste and too much paper was used, transport (ways were too long)
In what areas did you find the performance satisfactory	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Introduced efficiency in the resource use. 	<ul style="list-style-type: none"> Sourcing raw materials 	<ul style="list-style-type: none"> All others
What measures did you take to address the found problems	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Savings of up to \$500 annually due to efficient use of the resources. 	<ul style="list-style-type: none"> Steam setup for the boiler and packaging change 	<ul style="list-style-type: none"> Moved office, Reduced paper and chemical use, Choosing office equipment based on its environmental performance recycling
3.2 Efficiency and Effectiveness				
Water	<ul style="list-style-type: none"> No measurement 	<ul style="list-style-type: none"> No measurement 	<ul style="list-style-type: none"> No measurement 	<ul style="list-style-type: none"> No measurement
Electricity	<ul style="list-style-type: none"> Decreased 	<ul style="list-style-type: none"> Decreased 	<ul style="list-style-type: none"> No measurement 	<ul style="list-style-type: none"> Decreased
Waste	<ul style="list-style-type: none"> Decreased 	<ul style="list-style-type: none"> Decreased 	<ul style="list-style-type: none"> No measurement 	<ul style="list-style-type: none"> Decreased
Energy	<ul style="list-style-type: none"> Decreased 	<ul style="list-style-type: none"> Decreased 	<ul style="list-style-type: none"> No measurement 	<ul style="list-style-type: none"> Decreased
Other	<ul style="list-style-type: none"> Good feedback from customers Enjoy implementing the system 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA
3.3 Benefits and Costs/Challenges				
Benefits	<ul style="list-style-type: none"> Marketing 	<ul style="list-style-type: none"> Savings on costs Improved company image Increased network 	<ul style="list-style-type: none"> Good strategy and enhanced quality 	<ul style="list-style-type: none"> Structuring ideas Financial benefits due to savings

		<ul style="list-style-type: none"> Broadened customer base 		<ul style="list-style-type: none"> Image attracts clients (competitive advantage)
Costs	<ul style="list-style-type: none"> No significant other than 	<ul style="list-style-type: none"> No significant cost except time constraint during the training period 	<ul style="list-style-type: none"> Consultancy fees 	<ul style="list-style-type: none"> Minimal
3.4 Outcomes				
What are the challenges in implementing TNS	<ul style="list-style-type: none"> Getting people to provide environmental friendly products Finding organic products Some principles were financially difficult to implement 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Understanding the concept of TNS and its use as strategic framework, integrating it into management 	<ul style="list-style-type: none"> No internal challenges External: awareness of clients Consultants are not experts in field of company, no support in decision making No regulations No overall coordinated consents in TNS No influence on “use of houses”
How did the organisation address the challenges?	<ul style="list-style-type: none"> Talked to suppliers about packaging Plant own vegetable 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> LC understanding 	<ul style="list-style-type: none"> Writing articles/manuals for clients
Has TNS met your objectives?	<ul style="list-style-type: none"> Partially 	<ul style="list-style-type: none"> Partially 	<ul style="list-style-type: none"> Only in decision making 	<ul style="list-style-type: none"> Yes, close to ideology
Do you have any feedback on TNS?	<ul style="list-style-type: none"> Good feedback in general 	<ul style="list-style-type: none"> No, but customer base has increased 	<ul style="list-style-type: none"> Not directly, but consumer behaviour showed positive feedback 	<ul style="list-style-type: none"> Don't know what TNS is
Was TNS implementation worthwhile?	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> In a small business all has to converge in one person, in this case the owner 	<ul style="list-style-type: none"> Yes – the implementation of TNS showed company was not as green as he thought, led to continuous thinking and improvement
3.4. Future				
What would you change in your implementation of TNS?	<ul style="list-style-type: none"> Keep in contact with TNS 	<ul style="list-style-type: none"> None but to attend more trainings in order to access more information 	<ul style="list-style-type: none"> Nothing 	<ul style="list-style-type: none"> NA

<p>What would you like to change within TNS or within your organisation related to TNS if you could?</p>	<ul style="list-style-type: none"> • More review • More organized 	<ul style="list-style-type: none"> • TNS should restructure their system in order to be more in touch with the implementing organisations. 	<ul style="list-style-type: none"> • Make it user-friendly, implement a logo, audits, compliance assessment 	<ul style="list-style-type: none"> • More training and consulting help from TNS with decision making
<p>What would make your organisation stop using TNS?</p>	<ul style="list-style-type: none"> • Nothing 	<ul style="list-style-type: none"> • Nothing at the moment unless in future, a new management team finds reason to stop using it. 	<ul style="list-style-type: none"> • No reasons 	<ul style="list-style-type: none"> • If TNS does not stay ahead of mainstream it might become irrelevant
<p>How do you see the TNS evolving within your organisation (in the next 10 years)?</p>	<ul style="list-style-type: none"> • Involve more TNS in business operation such as buy and serve more organic products 		<ul style="list-style-type: none"> • Probably if he sells his company they won't use TNS anymore 	<ul style="list-style-type: none"> • Keep constantly improving, build a zero energy house
<p>4. GENERAL DISCUSSION OF TNS</p>				
<p>Is there anything else you would like to discuss, generally, about TNS?</p>		<ul style="list-style-type: none"> • “There is need of continued exposure to TNS, keeping people implementing TNS connected and having a community of TNS.” 	<ul style="list-style-type: none"> • Good that it is not mandatory and he could choose the priorities himself 	<ul style="list-style-type: none"> • Support not very good, company is left alone with the implementation • No experts available (consultants are from different background, driven by different ideologies) • Communication issues • No real forum exists (use SBN as platform)