

*Lund University
LUMES
Masters of Environmental Science
Lund, November 2000*

***How Eco-Procurement Can Help Steer the
Public Sector Towards Sustainable Solutions***

*An Initial Study of Incontinence Product Procurement
in the Health Sector*

Author: Philippe Charest

ABSTRACT

This thesis is based on procurement theory, which covers public procurement and extends to the application of eco-procurement of goods. The objective is to gain a better understanding of how procurement can be used by the public sector to advance environmental considerations, and influence suppliers and products on the market. Further, this endeavours to analyse possibilities and constraints for the integration and application of environmental criteria, to assess the main instruments currently available for purchasers to identify “green products”, and the type of information needed to integrate and apply environmental considerations into the public procurement field. Incontinence products represent the fourth largest item found in the domestic waste stream, and is a contributor to CO₂ and among others CH₄.

The eco-procurement function is entangled in an array of fields ranging from environmental, to legal, to engineering (just to name a few). It is thus that procurement functions in a multi-disciplinary environment. To that end, if eco-procurement is to be realised, then considerable teamwork among various actors will be needed to ensure success. Setting the tone, and demanding greener products by the means of specifying, for example, environmentally benign materials, chemicals and energy saving devices, strives to reduce the public sector's impact on health and the environment.

A nation wide survey concluded that 82% of purchasers operate outside the legal framework, demonstrating a considerable lack of knowledge in areas pertaining to rules and legislation, which regulate public procurement. A key aspect in relation to much of the research in regards to possibilities and constraints for public sector eco-procurement has been founded on the importance of information communication.

Clearly stated and communicated information in the form of product requirements should translate into suppliers' awareness of the specified criteria. In conjunction, the tools used to ascertain environmentally preferable suppliers and products should communicate key information in order to enable procurement decisions. Against this, it was noted that due to the level of knowledge on the applicability of certain tools, rather than using one predominant

tool, purchasers often amalgamated several tools to support and validate their procurement decisions.

The case study indicated that eco-procurement involves decision-making that balances and weighs various economic and environmental problems, which are pitted against each other. In this sense, these issues are not always “black and white”, therefore, it has been noted that certain organisations may target environmental aspects which are deemed to be the most relevant to the organisation's preoccupations.

Results from the case study indicate, based on balanced evidence, that eco-procurement – if properly harnessed – can lead to a reduction of overall environmental impacts. Additionally, the study indicates that a product should be properly calibrated for its journey throughout an organisation's entire system. The end-of-cycle handling of products should be also considered in procurement decisions. An association of cause and effect has revealed that incontinence products constructed with the least amount of plastics and with higher amounts of cellulose would be better suited for hospital incineration.

By streamlining their approaches and using the advantages provided by the economies of scale, organisations may be able to decrease their budgets and increase the prospects of sending a signal to the market in a bid to green their value chain.

Finally, evidence resulting from the study demonstrate that while environmental product information communication may at times be deemed as an encumbrance, it may also serve as a good indicator of where improvements may be needed to further develop tools and processes to enhance eco-procurement and the purchaser-supplier relationship.

Key words: Eco-Procurement, Environment, Incontinence Products, Public Sector, and Sustainability.

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1. OBJECTIVE.....	2
1.2. LIMITATIONS	3
1.3. METHODOLOGY.....	3
2. BACKGROUND: CONSIDERATIONS FOR SUSTAINABLE DEVELOPMENT	6
2.1. SUSTAINABLE DEVELOPMENT IN THE EU	6
2.2. SOCIETY, RESOURCE USE AND WASTE.....	6
2.3. REMEDIAL EFFECTS: SUSTAINABLE DEVELOPMENT POLICIES & INITIATIVES	7
3. THE PROCUREMENT THEORY	8
3.1. PROCUREMENT OBJECTIVES AND PRINCIPLES	8
3.2. THE PROCUREMENT FUNCTION AND ITS ENVIRONMENT.....	9
3.3. PROCUREMENT AS A STRATEGY	11
3.4. INFORMATION MANAGEMENT	13
3.5. THE EVOLUTION OF THE PROCUREMENT FUNCTION	13
3.6. SUMMING UP THE PROCUREMENT SECTION	15
4. PUBLIC PROCUREMENT FRAMEWORK	15
5. ECO-PROCUREMENT: INTEGRATING ENVIRONMENTAL CONSIDERATIONS INTO PUBLIC PROCUREMENT	20
5.1 GOING GREEN AND ECO-PROCUREMENT: WHAT DOES IT REALLY MEAN?	21
5.2 ENHANCING THE ENVIRONMENTAL PERFORMANCE OF THE PUBLIC SECTOR.....	24
5.3 LEGAL APPLICATION OF ENVIRONMENTAL CONSIDERATIONS.....	24
5.4 SUMMARY OF CHAPTER 5.....	25
6. APPLYING ENVIRONMENTAL CRITERIA	26
6.1 INFORMATION, KNOWLEDGE & A GOAT?.....	26
6.2 SETTING THE TONE: INTEGRATING THE ENVIRONMENTAL CRITERIA	27
6.4 ENVIRONMENTAL TOOLS: IDENTIFYING ECO-PRODUCTS	29
6.5 SUMMARY OF CHAPTER 6	32
7. THE CASE STUDY – INCONTINENCE PRODUCT PROCUREMENT FOR THE HOSPITAL SECTOR	32
7.1 THE PROCUREMENT ORGANISATION	33
7.2 CHARACTERISTIC ENVIRONMENTAL IMPACTS OF THE HOSPITAL SECTOR.....	33
7.3 CHARACTERISTICS OF DISPOSABLE INCONTINENCE PRODUCTS.....	35
7.4 CRITERIA FOR QUALITY, ENVIRONMENTAL AND PRODUCT PERFORMANCE	38
7.5 THE CRITERIA SELECTED FOR THE INCONTINENCE PRODUCT.....	39
7.6 COMMUNICATION OF ENVIRONMENTAL PRODUCT INFORMATION	42
7.7 RESULTS OF CASE STUDY.....	43
8 DISCUSSION	45
8.1 THE PROCUREMENT ACTIVITIES – RE-VISITED.....	47
8.2 PROSPECT FOR THE FUTURE	49
9 CONCLUSION	50
10. REFERENCE LIST:	52
11. APPENDIX 1	57

1. INTRODUCTION

The recent spectrum of attitudes that has shifted toward the adaptation of a more environmentally and socially responsible ethos, has attempted to look at society's broad challenges through the lens of a sustainable development. Sustainable development is a broad policy concept and a basic value that is rapidly gaining legitimacy in business practices. Sustainable development is development that meets the needs of the present without imperilling the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). This endeavours to achieve a society that is ecologically sustainable, economically solvent, and socially responsible. From an entrepreneurial viewpoint, environmental pressures are increasingly becoming recognised as new market opportunities in which good environmental performance will increasingly be seen as a pre-requisite for good management practices. A case in point, it may be argued, is the rapid changes occurring in electricity utilities and energy sector, where air quality and global warming have enlightened companies to manage alternative paths of development in the form of renewable energy. As such, environmental solutions are no longer perceived as problems and commercial risks. Rather, they may be seen as new opportunities emerging through the newly created markets. The commercial risks of failing to anticipate environmental problems can be quite considerable, as entire markets can become threatened or practically disappear (e.g. leaded petrol or CFC in aerosol). Therefore, it may be in the interests of the entrepreneurs to follow very closely the environmental debate and stay in line with legislation. Thus, it may also be imperative that public sector, as an important consumer of goods and services, takes an active part in developing sustainable solutions by engaging society.

At the heart of sustainable development is the principle of integrated decision making. This principle implies a wide range of factors that include social, economic and ecological reference, which ought to be reconciled and given due consideration as a basis for sound decision making. In this spirit, much activity has sought to better manage the use of our natural resources. This paper's position is founded on the premise that diffuse sources of pollution and waste emanating from unsustainable production and consumption patterns must be curtailed and their impacts minimised. The current patterns of production and consumption along with the continuous waste generation problems lend greater urgency to the need for key actors, like the public sector among others, to co-ordinate their efforts and work together in order reduce their collective vulnerabilities.

The public sector purchases and makes use of an enormous amount of products. According to European Commission reports, the EU's public sector spends €1000 billion per year alone on goods and services, which corresponds to slightly less than 15% of the EU's GNP (Europa, June 22, 2000). Due to its expenditures on goods and services, the public sector is identified as a powerful actor with enormous purchasing clout to catalyse the greening of the market by demanding that greater significance be attributed to environmentally preferred products. In this instance, we may impart the concept of Eco-procurement, which stands for environmentally and economically responsible purchasing (ICLEI, September 18, 2000). Correspondingly, the key objectives with regard to a public sector Eco-procurement strategy is to minimise the public sector's environmental impacts that originate from its consumption of products. Advocates also justify eco-procurement as a way to promote the development of new innovative technologies (e.g. Nader, Lewis & Weltman, 1992). From this perspective, it

may be argued that public procurement can provide a larger market for eco-products, consequently allowing suppliers to lower costs through economies of scale.

To that end, it can be argued that if environmental requirements are more widespread, and integrated in public sector tender demands, then this can stimulate market demand for environmentally preferred products. If a powerful purchaser like the public sector reduces its own impact by incorporating such a strategy, it may influence a shift in cross-sector product demand. By engaging the private sector to help “green” the market, this should systemically contribute to sustainable production and consumption solutions. For this process to occur, the key objectives should ensure sufficient co-ordination among actors in order to reduce costs and develop an effective cross-sector-wide material flow management system. A better understanding of the dynamics between these factors is therefore essential for such a holistic sustainable development strategy. Therefore, sound understanding of Eco-Procurement and its effects on the environment will be communicated.

1.1. OBJECTIVE

In recent years, there has been a growing interest in the western world to adopt a more proactive approach towards environmentally preferred products. Many are recognising the need to integrate market forces in order to integrate environmental criteria. To that end, when considering the public sector’s significance as a purchaser, it is contended that in this area of concern, the results do not yet meet expectations.

The objective of this study is to gain a better understanding of how procurement can be used by the public sector to advance environmental considerations, and influence suppliers and products on the market. Further, this thesis endeavours to analyse possibilities and constraints for the integration and application of environmental criteria into the public procurement process. The purpose of the study is to focus on processes in order to assess the main instruments currently available for purchasers to identify “green products and organisations” and the type of information needed to integrate and apply environmental considerations into the public procurement field.

The thesis proceeds in the following manner: The first part of the thesis introduces the subject, identifies the aim and outlines the methodological framework used throughout the work. The second part of the thesis provides background information on issues that have developed to surround the discussion. Part three provides the procurement theory, identifies its functions and capabilities. The procurement environment is introduced whereby it becomes understood that the position occupies a pivotal role that can influence the market. The fourth chapter introduces public procurement, and explains the legal parameters and various organisational procedures associated with the function. The concept of eco-procurement is presented in chapter five, where examples are given to explain the basic principles. Chapter six identifies tools and instruments that may be used to further enhance and incorporate environmental considerations into public sector procurement. The seventh part of the thesis undertakes the case study of Halland County’s procurement of incontinence products. Conclusions and discussion are drawn in the final chapters of the thesis.

1.2. LIMITATIONS

The focus of this thesis will remain on public sector procurement of products. Information gathered by way of a case study will provide an example and will lend support to the research on how environmental considerations can be integrated and applied into procurement practices. The instruments and tools used to apply these environmental considerations will be highlighted inexhaustibly. Notably, the environmental aspects associated with production and consumption patterns will remain sensibly limited.

1.3. METHODOLOGY

In order to explore linkages between Eco-Procurement practices, sustainable development objectives and EU requirements in regards to economic competitiveness, this thesis pays particular attention to the drivers and considerations in public purchasing management decisions. The study can be characterised as an evaluating analysis of eco-procurement as a steering mechanism towards public sector sustainability.

This thesis is based on procurement theory, which covers public procurement and extends to the application of eco-procurement of goods. While recognising that many other optics could have been applied, such as organisational theory, the procurement theory was chosen because an initial literature survey indicated that this may be the root source of the problem to undertake, specifically in relation to the public sector. Since this paper addresses issues relating to certain consumption and production trends, the emphasis lies on incorporating eco-procurement strategies to steer the public sector towards sustainability. Due to its considerable purchasing clout, I have chosen to identify the public sector as a key champion to lead by example and undertake a sustainable development responsibility to its primary benefactor - society.

The public sector was selected for this study for three basic reasons. First, it is a large customer of goods. Second, in most cases, the public sector uses citizen, business and taxpayer money to purchase these goods. The decision to undertake public sector procurement of goods creates an enticing scenario for sustainable development, especially when bearing in mind the public sector's accountability to the general public. Conceivably, public expenditure may either be used:

- i.) **counter-productively** - by purchasing goods that may unknowingly contribute to economic, environmental and social debility, or;
- ii.) **productively** - by consciously taking into account the life cycle impacts of procured products.

This thesis will advance options which can hopefully lend transparency to this process. Lastly, a third reason for choosing the public sector is due to the fact that this sector is governed by rules, which regulate procurement proceedings. As will be demonstrated, the legal obligations to adhere to EU laws constrict the public sector's ability to procure products independently. Due to these binding rules, many procurement practitioners interviewed often wrongfully assume that public procurement functions cannot be harnessed and refined to take on the challenge of putting bold environmental criteria on products. This paper endeavours to invalidate this claim.

The study undertakes procurement concepts and information used to identify opportunities to help improve the public sector and its suppliers' environmental performance. My intent is to gain a deeper understanding of how eco-procurement relates to sustainable development, optimal resources use, and eco-product supply. A case study has been adopted to gain an appreciation of how instruments and practices are used in the hospital sector to identify green products. This provided the means to focus on the environmental criteria demanded during the procurement practices from the hospital sector, which also contributed to the understanding of how incontinence products (diapers) and suppliers have been benchmarked. Additionally, this helped provide in-depth knowledge on how the hospital sector selected tenders that best suited its needs. A model was developed to emulate how environmental considerations could be integrated in procurement practices.

Additional European experiences were highlighted and an assessment of eco-procurement's influence on the demand side market and public purchasing steering mechanisms (economic / policy instruments) was employed. Due to practical considerations such as time and scope, the study engages in a brief overview of the nature and differing characteristics of eco-procurement, and assesses its relative importance (from the perspectives of suppliers and purchasers) within the broader field of the public sector. Although the paper addresses issues pertaining to unsustainable production and consumption patterns, the associated environmental impacts as such have been sensibly limited.

The research findings have been based on information gathered by literature review, public investigations, conferences, questionnaires, interviews and a case study. Secondary sources of information consist of books, reports, articles, journals and instruments such as Eco-Labels, Life Cycle approaches, the Västernorrlands Binder and databases used by companies. A systems approach necessitated an inside view at organisations' operations. Therefore, I have met with several prominent persons at the Federation of Swedish County Councils (landstingsförbundet), which is the principal purchasing entity for 18 Swedish counties, two regions and one municipality. I have consulted with firms that create environmental criteria for products purchased by landstingsförbundet, and I have also met with the purchaser of (Landstinget Halland) Halland county's hospital sector.

I have interviewed the Principle Secretary of the Committee for Ecologically Sustainable Procurement for the Swedish Ministry of Environment, have met environmental coordinators in various hospitals and I have also gathered information (via telephone/email) from various other organisations in Denmark, Germany, Norway and Sweden. Additional primary data was handled by conducting other interviews, and observation of organisations' operational procurement procedures. Further general information was gathered by personal communication at "Eco-Efficiency 2000" conference in Malmö, Sweden and at the "EcoProcura Lyon" conference in Lyon, France, where the Lyon Declaration for Eco-Procurement was adopted. The afore-mentioned qualitative information allowed for a good understanding on how environmental concerns are effectively integrated and applied into public purchasing.

1.3.1 METHODOLOGICAL FRAMEWORK FOR THE CASE STUDY

The hospital sector was chosen since it occupies a potentially hazardous sector in society. Simply put, it is widely held that hospitals handle a great deal of chemicals, diseases and disposable products. Therefore, due to time constraints, a general overview of certain procurement practices was undertaken by looking at a global, disposable product. I decided to focus on the procurement of goods, as opposed to services, simply based upon the fact that I perceive products to be more tangible to deal with than services. The decision to use a global product was based on the premise that the availability of product information from large multi-national companies was more accessible. Secondly, since larger companies are usually more influential on the market than smaller, local companies offering competing products, a decision was made to look at multinational companies.

The case study of the hospital sector in Halland County, Sweden, permitted the identification of key issues relating to the success and challenges of public sector eco-procurement of disposable incontinence products. Specifically in relation to the case study, the practical constraints surrounding the accessibility of key information have been three-fold; first, this is still an under-developed field; second much key-information in Sweden and Scandinavia was not available in English. Lastly, in addition time limitations, much of these difficulties were compounded by the fact that companies in the incontinence product industry guarded much of the key information that was needed in regards to their product's contents. As such, this has considerably limited the case study.

Consensus among the many people that I interviewed pointed to the many-fold environmental threats posed by disposable diapers. Of key interest for my research is the fact that diapers are notably energy intensive, and often infused with chemicals. Additionally, disposable incontinence products represent the fourth largest single item (after newspapers and food containers) in most of the western countries' waste streams (Olsson & Retzner 1998). It is important to highlight that this case study did not endeavour to take on the so called "great diaper debate" where disposable diapers are compared to cloth diapers. Rather, the focus rests on disposable incontinence products.

A meeting with the head purchaser of (Landstinget Halland) Halland county's hospital sector lead to a case study of this public organisation's procurement process. At the time of writing, Halland County was in the midst of creating criteria for a significant contract estimated to be worth an excess of SEK 48 million¹. The criteria were mainly targeted for companies that could compete to offer an environmentally responsible incontinence product, based on certain criteria as found in the Nordic SWAN eco-label. Hence, I selected three random multinational firms (Finess Hygiene AB, Paper Pak Inc., and SCA Hygiene Products AB) that that agreed to be approached in order for me to obtain company information for initial review. Therefore, some information will be based on these companies, but additional use of information obtained by various organisations has been applied. Also, a recent report commissioned by the Danish community of Kolding will be used as reference to further support my findings.

¹ At the time of writing: €1 = SEK 8.50

2. BACKGROUND: CONSIDERATIONS FOR SUSTAINABLE DEVELOPMENT

2.1. SUSTAINABLE DEVELOPMENT IN THE EU

The Brundtland Report and Rio Declaration are often referred to as main catalyses of Agenda 21 that was formulated to identify ways of applying sustainable development policies in various areas, including conservation and resource management. According to UNCED, chapter 4 of Agenda 21 sets out two basic objectives regarding consumption and production:

- i.) promotion of sustainable patterns of production and consumption;
- ii.) to develop a better understanding of the role of consumption and how to influence more sustainable consumption patterns (OECD, 2000).

In response to this, the OECD and the EU proposed action programmes for, among other things, 'Green Public Procurement Policies' (OECD, 2000). The Treaty of Amsterdam further extends the framework for environmental policy in the EU and provides an impetus for the integration of environmental procurement possibilities (Jeppesen, 1998).

2.2. SOCIETY, RESOURCE USE AND WASTE

Historically, environmental protection was seen as separate from business. Today, however, it is becoming commonly known that environmental problems emanate from well-defined sources, and are often the result of the way materials are used and handled before, during and after their usefulness to society. An important element of the transformation to a sustainable society is the economic use of energy and materials. The environmental effect of a product depends on its content and the way in which it was manufactured. At present, prevalent worldwide production and consumption patterns represent a skewed distribution of resources. Enormous quantities of non-renewable resources are being used, and vast amounts of pollution and waste are continuously being generated (Bars, 1997). In an era where much attention has been paid to recycling reuse and the like, most materials moving throughout the industrial economies are still designed to be used only once and then thrown away (Brown, Flavin & French, 1999). As such, in order to make optimal use of resources, products on the market should strive to be sustainable.

Waste represents a tremendous loss of resources both in the form of materials and energy (Bars, 1997). Since waste generation may be attributed as a symptom of inefficient production processes, low durability of goods and unsustainable consumption patterns, then waste quantities can be considered an indicator of how efficiently society uses raw materials (EEA, 1999). Arguably, we are beset with pollution and waste problems that inhibit the Earth's sink capacities to absorb and transform them. Even if we may not be running out of material resources, toxic and non-toxic waste is consistently mounting by an average of 10% per annum in the EU, while economic growth is approximately 6.5% in constant prices (EEA, 1998). These statistics point to the inefficient use of resources and materials. The associated environmental aspects located at disposal phase of a product's life, may be influenced if considerable improvements are made early on, notably by steering the customer's preferences towards environmentally improved products, and thereby indirectly influencing the waste output.

2.2.1. IMPLICATIONS: CURRENT PRODUCTION & CONSUMPTION PATTERNS

Arguably, the most common method used worldwide, for making waste disappear, is to bury it, burn it or to dump it into waterways, a solution that can generate greenhouse gases, dioxin, toxic leakage and other significant threats to the environment and human health (Ibid.). To that end, researchers and policymakers are looking at ways to reduce the impacts of materials that flow into, through and out of economies. Much has been written about the unsustainability of today's material flows. All too often, demand for wood and paper production strips forests, leading to soil erosion, and a loss of biodiversity. The long list surrounding the use of chemicals during mining, processing, and manufacturing activities has manifested in our historic ignorance of carcinogenic substances. In addition, other perhaps less noticeable examples include Persistent Organic Pollutants (POPs) which, for many years, have been bio-accumulated in the polar spheres, causing diseases in people and wildlife. The issues surrounding the use of natural resources, and the way in which they are processed serve as reminders of ozone depleting substances, the dispersion of hazardous-substances, water stress and transboundary air pollution. Along with the depletion of natural resources, these are attributed to global warming, changes/loss of biodiversity and impact human health. Such warnings that affect biota, animals, individuals and business alike, are only now starting to be understood and accepted.

2.3. REMEDIAL EFFECTS: SUSTAINABLE DEVELOPMENT POLICIES & INITIATIVES

The markets that we created helped shape much of the Industrial Revolution and the recent IT Revolution. Therefore, if properly harnessed, one may postulate that the market can be used as a strategic apparatus to help society towards the path of sustainable development. The western notion of "standard of living" and the need for ever-increasing productivity may never fully be reconciled with nature. However, material substitution, by integrating strict environmental criteria on required products, is one of several avenues that may be explored to alleviate the pressing concerns that are stifling our sustainable development. Countries in the EU, notably Sweden, have progressively adopted strategies to minimise the impacts associated with current production and consumption patterns. Many countries have successfully implemented "Take Back" systems, Extended Producer Responsibility programmes, Integrated Product Policy, eco-labelling schemes and other procedures striving at resource management, reuse and recycling of materials of goods.

As an example, Sweden has developed a framework policy, which aims for a society with closed-circuit material flows (Kretsloppsdelegationen, 1995). This involves awarding more importance to environmental considerations at the product design phase, and strives for zero toxic emissions during the production phase. Once manufactured, due consideration is given to the durability of the products along with high value-added benefits. The ultimate aim is incorporate the ability to salvage the products once they are discarded in order to recycle the components back into the design / manufacturing phase for new products (Knutsson, June 20, 2000). Material flows are given priority by consideration of their impacts on the environment and human health in the light of natural resource management. The ordinance, as an example of applying the principle of producer responsibility, states that 60% of used tyres by the year of 1996 and 80% by the year of 1998 shall not be disposed of in landfills (Kretsloppsdelegationen, 1995). Rather, these tyres should be taken care of in an

environmentally acceptable manner. Whether such targets have been met remains to be researched, but companies striving to adopt such environmental concepts are arguably doing so on the heels of Cleaner Production and Eco-Efficiency strategies. The former seek 'to get more output from less input' whereas Cleaner Production aims to cut wastes and emissions, reduce liabilities associated with adverse environmental and health effects (WBCSD, 1997).

2.3.1 THE CURRENT STATE OF AFFAIRS FOR ECO-PRODUCT DEMAND

In 1998, the Swedish government appointed the Committee for Ecologically Sustainable Procurement (EKU) to actively promote public procurement as a means of achieving ecological sustainable development. According to a survey conducted in Sweden in 1999, which consisted of approximately 200 of Sweden's 289 municipalities, more than half of the respondents claimed to have integrated environmental considerations in more than 80% of procurements performed in 1998 (Swedish Cabinet Office, August 12, 2000). However, it was not determined whether these procurements referred to the number of products purchased, or share of money spent. According to Pernilla Knutsson, the Principal Secretary of EKU, when interviewed for the purpose of this thesis, it was acknowledged that it was quite possible that the applicable requirements mainly related to a small line of product groups which are purchases that are renewed on a yearly basis such as office equipment, stationary, detergents, etc (Knutsson, October 3, 2000). Hence, the survey indicates that some form of eco-procurement does exist in the public sector. However, a follow-up revealed that although purchasers are able to apply environmental criteria in procurement procedures, these criteria are conservatively applied to a handful of product groups.

To summarise from the foregoing, it seemingly appears that many large-scale initiatives that strive for product-flow related sustainable development focus on the supply-side / production-perspective of the problem rather than undertake the root source of the problem – that is the *demand-side* of a product and its implication for the production, hence the constitution of a product. Albeit, unless such problems are addressed holistically and more emphasis is put on the ultimate source of unsustainable consumption and production patterns (product demand), it is this author's contention that Cleaner Production and the like will, in the future, possibly appear as mere sophistication of end-of-pipe solutions. This line of thought relates to what appears to be a widespread lack of demand for a more sustainable, environmentally preferred product. Whilst eco-procurement does exist in the public sector, it is not a widespread application because only a few products groups are being targeted. There is still a growing need for instruments to advance information, and to provide as accurately as possible the environmental issues associated with a product (Wijkman, 2000). Hence, this paper endeavours to apply eco-procurement as a tool to help steer society towards the path of sustainability.

3. THE PROCUREMENT THEORY

3.1. PROCUREMENT OBJECTIVES AND PRINCIPLES

The main objectives of procurement in an organisation are the acquisition of goods and services, as seen in purchasing that involves taking a series of incremental steps towards the attainment of an objective. Purchasing can be defined as the process by which an organisation

contracts with third parties to obtain goods required to fulfil its business objectives in the most timely and cost effective manner (Steele & Court, 1996). In essence, a common definition for purchasing is to buy proper equipment, materials, supplies and services for the right quality at the right price, from the right source at the right time in the right quantity (Van Weele, 1994). The theory of purchasing as described here is the ideal sought by all purchasers. In practice, however, the purchasing department can seldom fulfil all these objectives without compromise due to some inherent procurement conflicts that exist between these afore-mentioned characteristics. In order to address these problems, purchasers meticulously calculate and weight the alternatives against each other, and choose the best option to meet their needs.

To that end, purchasing can also be used to optimise costs and resource uses, in addition to add more value. If such objectives are sought, then there is a greater need for today's organisations to adopt an even more integrated and streamlined approach. Hence, this is what the modern day term of 'procurement' endeavours to do. As depicted below in Box 1, procurement is comprised of several main activities, and encompasses the discipline of purchasing that is becoming ever more convoluted and intertwined with procurement.

Box 1: Some Basic Characteristics

<i>PURCHASING ACTIVITIES</i>	<i>PROCUREMENT ACTIVITIES</i>
Identification of purchasing needs	Material specification
Posting of product specification	Material studies and value analysis
Identification of key suppliers	Market research
Market survey	<i>PURCHASING ACTIVITY</i>
Negotiations (depends on type of purchasing method)	Supplier quality management
Review of tenders	Transportation
Supplier selection	Management of investment recovery (save surplus/scrap)
Administrative paper work (contract and the related)	
Notification	<i>(Source:Dobler & Burt, 1996, p.37).</i>

As seen above, 'purchasing' activities relate to the acquisition of materials, equipment, and services required for the daily operations of the organisation, whereas 'procurement' encapsulates broader, complex functions of supply activities, material specification and logistics focus to develop a proactive strategy for the organisation (Dobler & Burt, 1996).

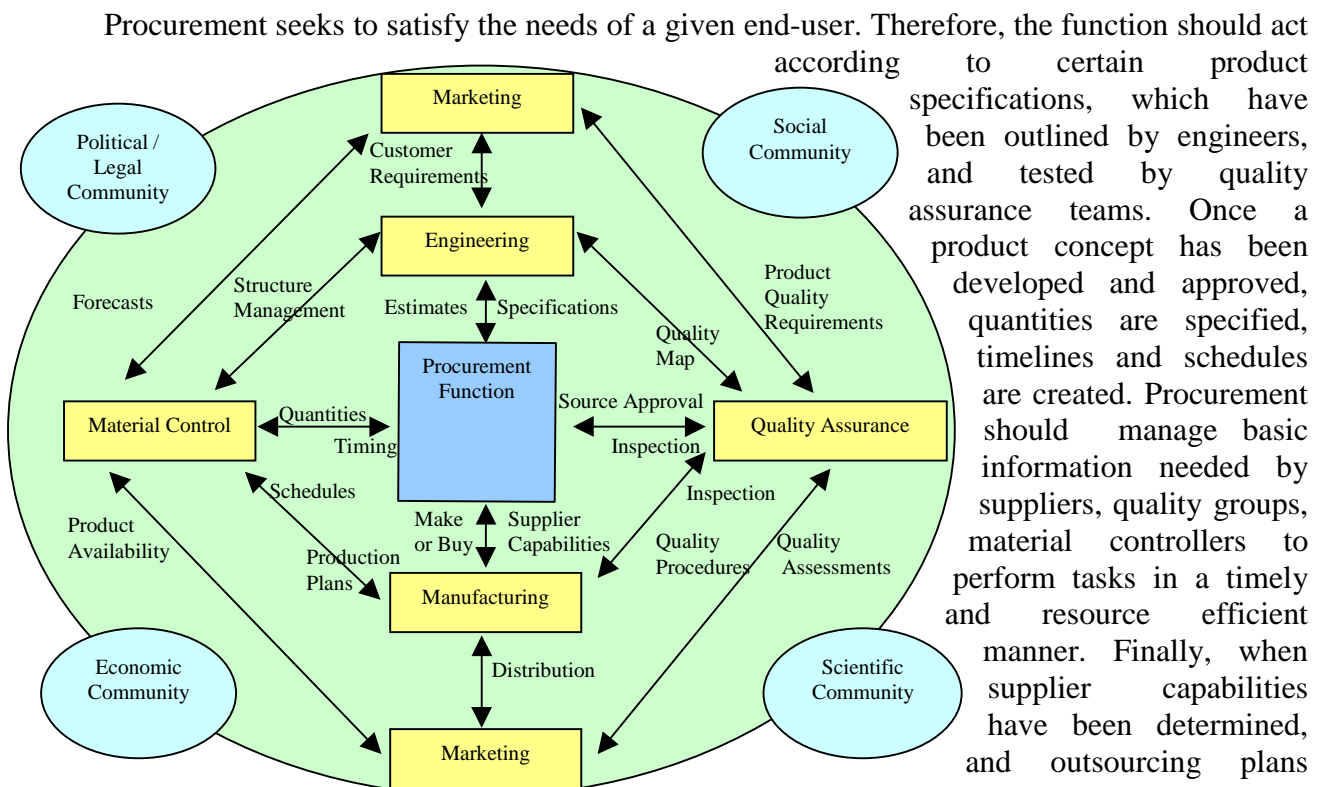
3.2. THE PROCUREMENT FUNCTION AND ITS ENVIRONMENT

The procurement function searches for best possible sources, analyses product information and production processes and, should it be necessary, it has the capabilities of identifying alternative means to meet certain ends. In short, procurement strives to balance the best possible cost while also taking into consideration diverse criteria such 'quality, service, and among others, efficiency' (Scheuing, 1989). It is, however, a profession that requires specialised knowledge in scientific principles of business, technical and relationship management (Dobler & Burt, 1996). In addition, procurement professionals must have a

sound understanding of different internal and external influences such as laws, technological innovations, and stakeholder interests. Because the procurement function interfaces with so many variables and departments, the function may serve as a hub of internal and external affairs that affects operations.

The procurement function is one of the key linkages between the core departments, operations, and other various product-planning groups. As illustrated below in Figure 1, business settings take place in an environment (larger circle) that is beset with political, legal, scientific, economic and social influences. Although, the environment is host to a multitude of activities, the procurement function is at the nucleus of these external influences and acts as the pivot of information and decision making which ultimately affects other departments downstream of the organisations' value chain.

Figure 1: The Procurement Function's Field of Interaction



(Adapted from Dobler and Burt, 1996.)

have been decided upon, the procurement function provides all the essential information for management in the manufacturing division of its operations (Dobler & Burt, 1996). Therefore, it may be argued in many ways that procurement occupies a key role in an organisation's information and decision-making system. The procurement function interacts with key stakeholder groups, obtains vital information and communicates it back to internally relevant groups. Therefore, according to the above, it is a key linkage between various value-generating departments and it helps shape certain relationships with external stakeholders.

3.3. PROCUREMENT AS A STRATEGY

The recent upsurge of the purchasing function has been driven by several factors, which in many cases, are interconnected in a dynamic procurement system. Often, the focus of procurement is seen as a strategic tool to gain considerable positioning in the market, to increase efficiency and savings by lowering overall costs. The acquisition of the latest technology and associated complexity can permit organisations to develop into leaders. Other organisations, such as certain health care organisations, which need not worry about market positioning, are increasingly being required by government to operate with less money (Bogren, October 3, 2000). This has meant that stringent efforts have been made by such public organisations to reduce costs by harnessing an effective procurement strategy (Ibid.). In the midst of refining their approaches, organisations are faced with external pressure from stakeholders to elevate purchasing principles so that organisations may recognise their role in a holistic system that is becoming oriented on a more sustainable form of production and consumption system (Nordström, October 2, 2000). In lieu of this, procurement has arguably evolved into an activity of significant strategic importance because the function acts as a gatekeeper of material flow. This revelation has prompted several leading organisations to identify procurement and supply professionals as ‘the architects of the value stream’ and has fostered a strategically integrated, holistic view of the interactions between several organisations and departments which make up the value chain (Baily, et al., 1998).

The value chain, which may be characterised as a series of organisations that take part in a system or series of value-adding steps, extends back to the extraction process of raw materials from the earth to manufacture a product or service for a particular end-user. In essence, the basis of a value chain is axed upon a series of procurement inputs of goods/services, which effectively flow in, through and out of inter-linked organisations. Within this value chain context, firms ordinarily (voluntarily or not) position themselves value chain strata. In short, organisations either operate within existing market boundaries or try to extend / create new boundaries by creating a new competitive arena for themselves in the market system.

3.3.1. PROCUREMENT INFLUENCE: A SYSTEMIC APPROACH

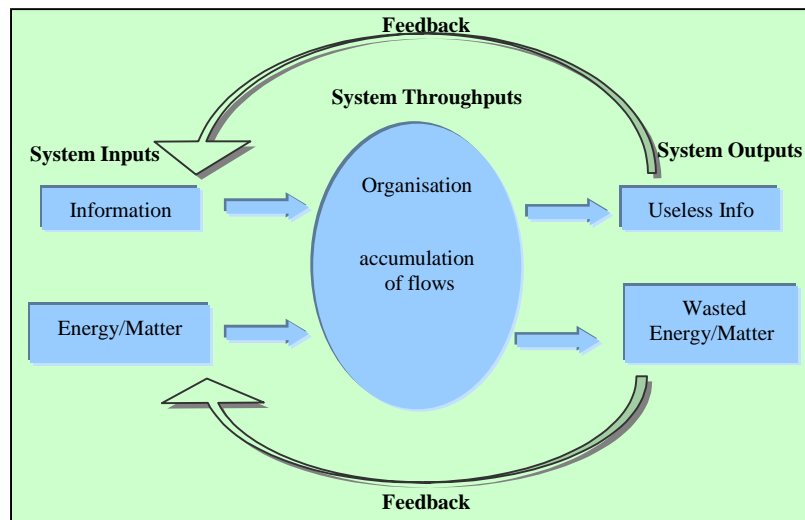
Since procurement as a strategy is deemed to have influence on the value chain, as has been presented above through Dobler & Burt (1996), then we may safely assume that the procurement function interacts with other systems. The term system is defined by Anderson & Johnson as a set of interacting, interrelated and interdependent components that form a unified whole (Anderson & Johnson, 1997), and have a basic structure consisting of inputs, throughputs and outputs (see figure 2).

By looking through the “systems” lens, it is possible to identify the inter-relatedness and connections of events, which can therefore provide the means for a better understanding of processes and their effects on the surroundings (Senge, 1994). The connections between products and their effects may serve as examples. The effects of DDT, cadmium, and CFC are examples of products that have been pulled off the shelf in most western countries. Therefore, the understanding of the complex nature of influences, and contributing factors conferred by the procurement function, has the potential of promoting the technical understanding of how complex feedback processes can generate problems and solutions.

Hypothetically, an organisation burdened with financial and environmental problems may salvage itself by looking at its procurement procedures. The decision to purchase specific water saving devices, as a basic example, could garner substantial savings and value throughout the organisation.

Figure 2: General Organisations’ Flows: Input, Throughput and Output

A procurement strategy can arguably be linked in part to the concept of “value chain management” - the internal process by which organisations analyse the supply in order to



understand the “inflow” of added value (Lamming & Cox, 1996). Because, these substance flows enter an organisation where they are partially accumulated, understood and used to the organisation’s benefit, it is common sense to ensure that money spent for these resources are used as effectively as possible. Therefore, one way to ensure that the procurement function is being used

effectively may be, for example, to account for the amount of redundancies ending up in waste streams. Waste is essentially a part of a purchased resource. In business terms, my contention is a resource that is discarded is tantamount to money being discarded. Noteworthy, the second main law of thermodynamics implies that waste matter has the possibility of re-entering the system for future use (Miller, 2000). Therefore, the feedback arrows in the diagram indicate the disposal of energy / by-product can re-enter the environment from whence it came from, thereby permitting the option of reusing some of the output of waste. As such, an example could entail that the procurement function thus act upon this and acquire goods made from recycled materials, or other environmentally benign goods.

From a systemic viewpoint, many organisations are characterised by a substantial influx of flows, through flows and outflows. Procurement is thus a key part of a system. Based on several interviews conducted for this research, it may be postulated that since integration is the key champion, in the context of systems thinking, progressive organisations now understand that buyers and vendors are part of a continuum. Consequently, since many flows pass through the purchasing function, many organisations are now awarding purchasers more prominence, and according to Alvar Bogren, Procurement Director for Federation of Swedish County Councils, advanced organisations are wielding their procurement strategy to influence their position within the market in which they function (Bogren, October 3, 2000).

3.4. INFORMATION MANAGEMENT

In order to make sound decisions purchasers need comprehensive and current information. Reliable information is vital and is an all encompassing activity for choosing supply sources, conducting supplier background checks, stipulating product specifications, purchasing, etc. It is important to note, however, that information should not be confused with an overflow of random raw data. Rather, information should be structured and represent processed condensed and filtered data. In the context of specifying criteria, the information should be sorted by relevance, indexed, compared and analysed to become useful, actionable purchasing information (Scheuing, 1989). Computer applications and systems offer organisations the opportunity to increase dramatically the information on which to base decisions (Steele & Court, 1996). Since the Commission of European Communities is striving for widespread electronic-procurement for all EU procurement activities, electronic Data Interlinks (EDI) will be becoming prevalent in procurement practices. Accordingly, 25% of all procurement transactions is expected to take place electronically by the year 2003 (COM (98) 143). In this context, it is becoming more common place for organisations to express greater needs for support tools from the IT sector to benchmark products and suppliers (Bogren, October 3, 2000). This electronic norm, which is poised to become a cornerstone of procurement, is already well established in many forms of daily business activities.

3.5. THE EVOLUTION OF THE PROCUREMENT FUNCTION

These days, procurement policies are faced with greater constrictions and may therefore not easily evolve independently of external pressure. The WTO and OECD rules are in place to structure procurement decisions. Public organisations operating under the auspices of the EU must respect very strict rules that are stipulated in the European Community Suppliers Directive (93/37/EEC). The quest for proficiency for procurement is increasingly dependent on a well informed, educated and a competent staff since this function involves the considerable handling of a truly multi-disciplinary approach that balances legal aspects, socio-political pressures and strives to meet economic ends (Knutsson, October 3, 2000).

The role of ethics and growing public awareness of the plundering of natural resources has led many organisations to increase their environmental profile (Knutsson, June 20, 2000). In this respect, the growing recognition to become more responsible has had many implications for purchasers and has, in some ways, transcended the role of this function. Arguably, this shift in ethos, coupled with competitive benchmarking practices, has helped elevate certain organisations (Ibid.). Rather than simply reacting to the needs of users as they arise, the procurement function has helped organisations develop a more forward-looking, proactive approach that fully reflects the contribution which the input, and consequently output management can make (Baily, et al., 1998). In essence, although faced with greater rules, organisations still recognise the type of effects procurement decisions can have, even if such decisions are based on the sound evaluation of the information relating to the products.

3.5.1. UNDERSTANDING AND INFLUENCING THE SUPPLY MARKET

In recent years, many organisations have redefined their procurement strategy. It seems that much organisational expenditure has increasingly tried to focus on establishing a co-operation for mutual benefit with their key suppliers. In the interests of building a positive outcome together, many purchasing entities have combined efforts with suppliers with the intention of adding greater value in a reciprocal process (Rich in Cox, 1996). Such an approach commonly used in Japan (and emulated worldwide) to co-ordinate and develop suppliers in a “virtuous circle” of quality and productivity gains, as argued by Rich, may lead to greater cost-savings and more efficient resource use (Ibid.). This is not to imply that procurement will necessarily adopt the design function of a product. Rather, procurement may try to identify possible constraints and recognise opportunities surrounding certain product specifications (Nordström, October 2, 2000). Chiefly, the procurement process determines what product to buy, and analyses various merits associated with the product selection. This is an extremely crucial undertaking when determining what to buy since approximately 80% of the total cost is either designed in or excluded during this phase of procurement (Dobler & Burt, 1996). Therefore, the basic importance of material selection, due to the high costs associated with this action, is self-explanatory.

3.5.2. THE VALUE-ADDED ASPECTS OF PROCUREMENT

The procurement function can add-value to an organisation in numerous ways because a proactive strategy can help the organisation reduce inefficiencies in the value-chain (Baily et al., 1998). Direct, shrewd purchasing decisions, which generate an immediate positive contribution (such as the acquisition of needed goods at an optimum cost²) may contribute to organisations immediately. Secondly, indirect contributions such as supplier selection may lead to production efficiency, product and process innovation, and consequently overhead cost reduction. For example, it is possible for many companies to reduce aggregate material costs by 4% or more via the procurement function, whereas, in order to achieve the same increase in profit, net sales would have to be increased by approximately 30% (Dobler & Burt, 1996). Consequently, if procurement has such a direct impact, many organisations in both private and public sector should probably adapt the advantages of incorporating procurement goals in the development process at an early stage. Significantly, by involving procurement officers early on (such as involving them in a team liaising with engineers and the like), such an approach could provide the impetus to enable purchasers to understand, in more absolute terms, the technical aspects that are required at the suppliers’ end in terms of fulfilling the purchasing organisation’s logistics needs.

As a result, from a systemic viewpoint, procurement as a cross-functional integrated strategy could likely impact upon various operational areas within the rest of the organisation. Depending on the nature of the organisation, and the market in which operates the exact character of this value-added extent could be quantified either in the short term or in the longer term.

² Personal comment: I differentiate cost from price. Whereas price, from a buyer’s perspective considers only the fee which is paid for an item at the acquisitions stage, costs considers the whole life-owned expenses for the item such as operational fees, maintenance fees,, waste disposal fees, etc. Hence, price excludes a more comprehensive evaluation of a product’s long term cost. Therefore cost is distinguished from price.

3.6. SUMMING UP THE PROCUREMENT SECTION

In this section, the fundamental differences relating to purchasing and procurement activities were brought forth. Purchasing has essentially been defined as a function of service and materials acquisition. Procurement, on the other hand, has been identified to assume more complex significance, as it relates to a logistics approach because it takes on key linkages between various value-generating departments and stakeholders. Since it occupies a pivotal role, procurement is seen as an area of generating value, not simply reducing costs. Recognition of the complex environment in which the function operates can bolster procurement into a strategy. It has been argued that the procurement function may be streamlined and become more involved with other technical departments at an early stage, thereby granting the procurement department a better understanding of the technical complexities associated with the product in demand. The procurement department's role as a gatekeeper of substance flow can contribute to the organisation by undertaking key decisions that can lead to substantial savings, and influence the value chain in addition to the supply market.

4. PUBLIC PROCUREMENT FRAMEWORK

Much of the discussion has thus far focused on general procurement theory and its application in organisations. As will be demonstrated in the following section, procurement, in the context Sweden's public sector under the auspices of the EU umbrella, is a tool that can be wielded even more strategically to advance policy.

Private sector purchasing differs considerably from public sector procurement. Due to the fact that public tax money is used for public procurement, the public sector is bound to greater public scrutiny of their transactions. The public sector is regulated the Public Procurement Act, which imperatively, seeks objective, non-discriminatory competition for contracts (see Section 4.1). This coherent structure allows for full disclosure displaying a social responsibility that seeks to reassure the public that their interests are being met. The main objective is to attain and display verifiable best cost/quality ratio for any given product on the market.

Frits Bolkestein, the EU's Internal Market Commissioner stated: "Public procurement in the Union represents the equivalent of half the German economy, some €1 000 billion" (Europa, June 22, 2000). It is therefore apparent that the public sector in the EU is a powerful customer with considerable clout. As an indication that it is also an important consumer, the Swedish public sector bought for SEK 300 billion in 1998 (€35 billion), a sum that accounted for approximately 24% of expenditure shares of the country's GDP (OECD, 2000). Consequentially, it is understood that if properly harnessed and used to advance environmental procurement, this purchasing clout will have a profound impact on market trends, consumer demands, and production outputs.

4.1 PUBLIC PROCUREMENT ACT

EU initiatives and policies generally steer how goods are purchased in the public sector. Such instruments help shape both the approach to the market, and also act as key determinants on

the evaluation of the most economically advantageous tender to meet the purchasing entities' requirements. The EU supports directives that are based on open, clear, transparent and non-discriminatory approaches to the tendering process and the awarding of contracts (COM (98) 143). If procurement exceeds the set threshold values (see section 4.2), the EC Directives on supplies (93/36/EEC) takes primacy over all member states' national law regardless of when that law was created (COM (98) 143). In regards to product purchasing in the public sector, the directives affect aspects such as product specification, supplier evaluation, and evaluation criteria used for selecting best value for money offer amongst competitive bidders. For all purchases that fall below the threshold values, Sweden has decided to incorporate the procurement directives into national legislation through the 1994 Public Procurement Act (LOU) (National Board for Public Procurement, 1999). Unlike the private sector where direct deals can be made between one supplier and a purchasing organisation, it is generally required that public procurement operates in a regulated and competitive environment. Hence, unless special agreements are made, public procurement entities must – in the interests of competition law – publicly notify their procurement intentions before suppliers are selected.

4.2 THRESHOLD VALUES

For what pertains to goods / supplies, the threshold value has been set to purchases exceeding SEK 1.7 million (National Board for Public Procurement, 1999). According to LOU, the value of individual procurements shall be calculated by the purchasing entity and shall apply for the duration of the contract. This also includes the possibilities of contract extension clauses. Sweden's National Board for Public Procurement (NOU) supervises that these measures are conforming to the General Procurement Agreement ratified by the WTO and the EU (National Board for Public Procurement, 1999).

High value product procurements (above threshold values) must be publicised in the *Official Journal of European Communities* (OJEC) to ensure that procurement information needs are provided in advance so that businesses and the market may have an opportunity to react or respond accordingly (National Board for Public Procurement, 1999). The OJEC procurement entries are important because they increase transparency of procurement practices; a meaningful endeavour when considering public authorities are accountable to the public whose tax money is spent. OJEC publications not only ensure that transactions are transparent to the public, but they also aim to promote free movement of goods between member states as supplier competition develops in public sector practices.

4.3 ORGANISATION OF PROCUREMENT

Generally, public organisations tailor their procurement structure to meet specific requirements, based on particular objectives. In any case, a basic strategy involves organising the procurement function within a coherent framework.

4.3.1 STRUCTURE SETTING: CENTRALISATION VS. DECENTRALISATION

Currently, there are mainly two formal schools of thoughts in regards to the fundamental ways of administrating the procurement process. *Centralisation of purchasing*, which refers to the role of a purchasing entity that has full authority over the entire purchasing function; and *decentralisation of purchasing*, which occurs when personnel of other departments/functional areas take unilateral major purchasing decisions without collaborating with one another. In order to consolidate these ideals, a third informal method has risen to combine the strengths of both schools and to neutralise the weak aspects. As it stands, the three ways of organising procurement are:

- **Decentralisation**, allowing full autonomy for each unit;
- **Centralisation**, apart from small purchases all purchases are made from a central bureau;
- **Combination** of the two.

For the purpose of this paper, and due to its immediate relevance in Sweden, we will focus on the centralisation of procurement procedures since it relates directly to the currently employed functions of most significant public purchases in Sweden.

In an attempt to efficiently use resources, and to eliminate redundancies, a centralised procurement strategy consists of aggregating departments and thereby consolidating purchasing endeavours. Further, the purchasing entity can take advantage of the economies of scale and improve its purchasing power by entering into a contractual agreement to facilitate supplier relationships. Such a centralised, mass purchasing strategy provides an impetus for organisations to safeguard against price aberrations and also ensures that it maximises its position (by leveraging its purchasing clout) to obtain the most favourable price for goods.

However defined or measured, centralised procurement may, in some cases, merely comprise of a kind of ‘approval centre’ of purchase orders that have been negotiated by other departments. In such instances, Baily et al. (1998) argue that organisations may consider resorting to a hybrid system that seeks to obtain the benefits of both approaches while avoiding the disadvantages associated with one or the other strategy. However, it may be argued that the complicated lines of communication, especially when dealing with large bureaucracies along with multi-tier organisations, may limit such a hybrid approach to work efficiently without confusion.

Regardless of the organisation’s preference of procurement approach, sound purchasing practices require objective consideration of several aspects in the interests of the organisation as a whole. Therefore, it is essential that procurement be undertaken by individuals of calibre commensurate with the potential of the function within the organisation concerned (Baily et al, 1998). This is due to the fact that the procurement function interfaces with many actors, and handles various types of key information that can affect various organisational branches.

4.3.2 TYPES OF PROCUREMENT PROCEDURES

According to the EC Directives and Sweden’s National Board for Public Procurement, there are three types of procedures available for purchases above the set threshold values:

- **Open Procedure:** All those interested can tender. Most commonly used when where contracting authorities anticipate that competition will generally be limited due to a nature of goods specified.
- **Restricted Procedure:** Only those who received an invitation may tender. This type of procedure is often made when the specified goods are common in nature and when a potential exists for a very high turnout of bidders. If the procurement organisation publicised the tender notice on OJEC, it must select a certain number of carefully picked candidates from the pool of tenders to meet the needs of the purchasing organisation's criteria.
- **Negotiated Procedure:** This procedure is used when past tender notices have failed to elicit proper candidates or when a requirement is deemed difficult to fulfil. Therefore, it is in the interest of the concerned parties engage in negotiations in order to come to an agreement. (National Board for Public Procurement, 1999).

Once the procedure has been decided upon, the purchasing entity may then begin the intricate process for procurement.

4.3.3 THE PROCUREMENT PROCESS

Generally, the procurement process is characterised as a series of standardised steps, which are crucial to follow if one wishes to adhere to a well-organised activity. In order to be systematically efficient, proper planning is vital, and may be orchestrated as follows:

STEP 1 - RECOGNITION OF A NEED AND MARKET ANALYSIS:

A starting point for most purchasing procedures in organisations is to have a department identify a certain need which must be satisfied. The characteristics of this need is then defined and communicated via a purchasing requisition, which is sent to the purchasing department. A purchaser then examines the need for this item and makes a purchasing decision (Scheuing, 1989). When a decision is made to purchase a product for the organisation, the purchasing department then performs a market analysis. The identification of certain indexed goods, the evaluation of their attributes and other quality factors is then performed to ensure the avoidance of purchasing an item that deviates from the quality requirements, and / or is overpriced (Dobler & Burt, 1996).

STEP 2 - TENDERING PROCEDURES:

Depending on the procurement procedure chosen (see above) the next main step is to clearly set out, in detail, the order specification that describes the required product. This may be referred to as the tactical procurement stage. "The purchase description forms the heart of the procurement" (Dobler & Burt, 2000, p.161). For the purpose of efficiency, there is no greater need for clarity and precision during specification of the criteria. This process cannot be undermined. Logistical aspects, such as the technical requirements the contract/product must comply with, must then be arranged. This step includes varied and vital aspects such estimating costs, selecting the material that the product will be made of, and other basic product characteristics (Dobler & Burt, 1996). Here, it is understood that product

performance expectations are listed in addition to the item's composition characteristics along with the user requirements, contractual conditions, and general instruction to suppliers. The tender documents must be written in a formal way, and all procurement documents should be coherent and clear, in accordance to the country's Public Procurement Act. Once this had been worked out, depending on the value of the contract (estimated by purchasers), the tender notice must be publicly posted to ensure all competitors are allotted proper response time.

STEP 3 - TENDER EVALUATION:

The evaluation of tenders that have been submitted and received in due time involves looking at the tenders that are most compatible with the purchasing entity's requirements. Only these tenders, which fulfil the majority of criteria as described in the tender documents will be considered and evaluated.

STEP 4 - PRODUCT SOURCING AND FEEDBACK:

The next step to be carried out is supplier selection. Practices vary from one organisation to the other, but this may involve drawing up a short list of possible candidates, perform an evaluation the finalists' tender application, and select the most appropriate bid. Supplier selection is based on the identification of the most advantageous offer in consideration of the criteria where the key determinants are weighted against each other, based on comparing the competing offers and measuring which tender is best suited for the purchasing organisation (Bogren, October 3, 2000). Scheuing aptly points out that it is courteous and good business practice to notify the losing finalists and explain why they were not selected (Scheuing, 1989). Arguably, this not only helps to promote awareness of the candidates' shortcomings, which may be used as reference points for self-improvement, but such practice is essential to foster innovation. Generally speaking, feedback into the network of potential suppliers can be important driver for all parties concern since it can motivate future candidates to provide a superior product offering, which will be beneficial for the contracting authority who will be purchasing the product.

4.3.4 THE PROCESS OF EVALUATING SUPPLIER BIDS

According to the EC procurement Directives, when assessing a supplier's bid, the contracting entity is expected to be open and is expected to disclose full information surrounding the criteria to be used for selecting or rejecting prospective tenders. The directives specify that tender selection may be based on one of the following:

- i) **Lowest price only**; where contracting authority may only choose the lowest priced bid without consideration of any other factor, or;
- ii) **Most economically advantageous tender**; where value for money factors are weighted off against price to allow recognition of quality, durability, disposal costs, etc. in the choice of best offer to meet the purchasing entities' requirements. (National Board for Public Procurement, 1999).

The Commission of the European Communities puts forth that the “best value for money” principle may incorporate considerations such as social and environmental factors (COM (98) 143).

4.3.5 TACTICAL PROCUREMENT FUNCTION

As described in the tendering procedures, the tactical procurement is a very delicate process whereby the purchasing entity must explicitly set out detailed, technical and performance specifications of the required product. This is when particulars such as environmental parameters may be incorporated in the specifications (e.g. “product must contain recycled materials, must not possess ozone-depleting substances, and should be equivalent to the SWAN eco-label”). These specifications are then included in the call for tender.

4.4 FRAMEWORK AGREEMENTS

The role of framework purchasing in the public sector is to safeguard public organisation against certain fluctuating and volatile market prices. “On markets, which are constantly changing, such as the markets for information technology products and services, it is not economically justifiable for public purchasers to be tied to fixed prices and conditions” (COM (98) 143, 1998, p.8). Thus, under certain circumstances, framework agreements and contracts may be signed to cover the most frequently used goods and services at set prices and pre-determined conditions over a period of a few years. These frameworks, signed on behalf of different purchasing organisations within the same public authority, exempt the formal proceedings as stipulated under LOU. The basic argument here, is that such a process enables public-sector purchasers, in certain circumstances, to make procurement decisions under better conditions without having to repeat the procedures for each purchase. It may be argued that the implications of using framework agreements more frequently will result in trends leading to fewer procurement transactions and also to fewer suppliers, thereby stifling competition. This short term solution may undermine the long term viability of the market, and may inhibit the development of new, competitive and innovative products.

5. ECO-PROCUREMENT: INTEGRATING ENVIRONMENTAL CONSIDERATIONS INTO PUBLIC PROCUREMENT

In theory, the complete integration of environmental considerations into common procurement practices can bring about positive gains for society. In practice, however, the following obstacles confronting purchasers in the public sector have been recognised:

- Rigidity of EU codes and legislation that regulate public sector procurement
- General concerns regarding price, quality and suitability of eco-products
- Lack of information concerning the identification of products and suppliers
- Lack of appropriate training in terms integrating eco-criteria into procurement demands

Although these obstacles may seem austere, it is argued that they are certainly not insurmountable. The following is a contribution to steer public sector procurement past these challenges which confront sustainable development.

5.1 GOING GREEN AND ECO-PROCUREMENT: WHAT DOES IT REALLY MEAN?

The term Eco-Procurement is defined as environmentally and economically responsible procurement that endeavours to achieve environmental policy goals while simultaneously meet budgets, based on the principle of the triple bottom-line. Accordingly, the “eco” prefix combines the principles of both economy and ecology: “By investing in environmentally and economically sound products and services, thus avoiding unnecessary follow-up costs, public institutions can save significant amounts of money. At the same time, they contribute to a healthy and sustainable environment by reducing their direct environmental impact significantly and by exerting a model function towards other consumers” (ICLEI, 2000).

5.1.1 ECO-PROCUREMENT: SAVING FINANCIAL AND NATURAL RESOURCES

Findings on the costs and benefits of eco-procurement are wide ranging. There has been much debate regarding the merits of environmental criteria. To most environmental scientists, one thing concerning the market is abundantly clear – the full costs of natural resources are not reflected in today’s economic market. Such costs need to be internalised (EEA, 1999). Correspondingly, the environmental service that a tree performs (e.g. in the form of CO₂ sequestering) has yet to be quantified and integrated into the market value of that tree. Having stated this point, we can move on to explore a basic example set in today’s economic system.

A case study conducted by the Widmer-Walty & Cie Oftringen group on the Swiss market concluded that ecological paper was significantly less costly, and less resource intensive than conventional paper. The findings demonstrate that recycled paper offers substantial savings, since it spares considerable amounts of energy, water, and does away with the use of an array of processing chemicals which are generally necessary for the production of virgin paper (Société Suisse pour la Protection de l’Environnement, 1999).

Box 2: Primary Resources and Energy Requirements to Manufacture 1000kg of Paper

Requirements	Virgin Paper	Newspaper	Ecological Paper
Primary Resources	Approx. 2000kg of wood	Approx. 1200kg of wood	Old Paper (recycled)
Clean Water	Approx. 150 000 litres	Approx. 100 000 litres	Maximum: 1200 litres
Energy	7800kwh	5900kwh	1750kwh

(Source: Société Suisse pour la Protection de l’Environnement, 1999. Indicators from Widmer-Walty & Cie Oftringen Group)

In principle, it is recognised that the consumption and production of virgin paper may not be exclusively linked to the destruction of the ozone layer and natural resources. However, compelling logic, founded on the above-mentioned statistics, indicate that purchasing practices that favour ecological paper such as recycled paper, will certainly alleviate certain

pressing environmental concerns in regards to the pulp and paper industry. These concerns invariably link to the use of resources, and also to the manufacturing costs of paper production. In this context, it can be argued that sensible procurement which is good for the economy of the organisation is usually good for the environment as well. In its simplest expression, resources saved is money saved. Hence, in accordance with Mäding (1999), it is essential for an economic, social and environmental development to take a systematic, co-ordinated approach between economy and ecology, and address the myth that saving the environment is more costly than conventional means of operations.

5.1.2 ECO-PROCUREMENT: BROAD POSSIBILITIES FOR ACTION

The proposal of eco-procurement is offered by the means of selecting an environmentally preferred product. In this sense, it is acknowledged that all products will inherently have a negative impact upon the environment through the extraction of resources from the natural environment, the consumption of energy needed to produce, manufacture, deliver and use the product. Lastly, the environment will bear the load during the disposal phase of the product back into the ecosystem. However, it is important to recognise that these impacts can be significantly minimised. Certain products are specifically designed to have less environmental impacts than other products.

As mentioned earlier, environmentally preferable products (or eco-products) basically have a reduced effect on human health and the environment when comparing them to products that serve the same purpose. This comparison may consider the environmental impacts throughout the products' life cycle (ADEME, 2000). The incentive to practice eco-procurement enables public entities to lead by example, thereby demonstrating consciousness, and setting certain standards that can influence industry and consumers to use eco-products. Choosing *not* to purchase certain dangerous or problematic goods (such as products containing PCP, CFC or tropical woods) helps stimulate demand for so called green products. A case in point for most western countries is the phasing out of aerosol products containing CFC. Thus, eco-procurement also acts as a market incubator that helps develop innovation by creating incentives for the use and creation of environmentally preferable products.

5.1.3 NEEDS VERIFICATION

Conversely, part of an eco-procurement strategy can also imply the *abstinence* of purchasing endeavours. Indeed, by adopting good practice, an organisation may perform an internal verification of its resources and find out that the service needed to be fulfilled by a certain product is either already in stock or can be performed by an alternate product. Defining which products are really needed and in what quantity enables the organisation to avoid unnecessary costs and reduce its demand for otherwise redundant products. Therefore, an internal probe based on key questions posed to selected users can help identify whether purchases are necessary.

Basic Questions to Identify the Type of Need:

- What is the actual need to be fulfilled?
- Other than through purchasing, how else can we satisfy this need?
- Would a change of methods and routines reduce consumption patterns?
- Can another product be re-used for a different purpose?
- Is this a strategic need, and for how long will this need exist?

Post-it Notes Case Study

Recent findings at Leeds Metropolitan University (LMU) in the U.K. indicate that the University used an excess of 480 000 “Post-it Notepads” every year. Regardless of whether these are made of recycled materials or not, per staff member, the sheer amount of such note pads purchased warranted an investigation. Since most Post-it notepads are difficult to recycle due to the adhesive on the backside of the paper, some LMU staff wanted the ‘need’ for this item’s quantity to be reviewed.

- **Findings:** Analysis results of whether Post-its were being used properly led the University to decrease purchase orders. Conclusive findings revealed the function of the Post-it was, in many cases, used improperly (as conventional paper blocks). Therefore, it was concluded that part of the ‘needs’ for Post-its were able to be satisfied by alternative means such as the re-use of scrap paper. Consequently, LMU significantly reduced the need for Post-it Notepads, and costs associated with the purchase of this product.

(Source: Leeds Metropolitan University, 1998).

Such internal verification not only reduces costs for the organisation, but it can be argued that when such strategies are aggregated throughout society, significant environmental outlays such as natural resource consumption and resulting processing pollutants can be checked and suppressed. Therefore, in its broadest application, the concept of eco-procurement can also be used when the organisation takes the following approaches:

- **Basic Necessity Test:** performed internally to identify the service needed for the product to fulfil, which products are really required and in what quantity.
- **Product Substitution:** replacement (at time of purchase) of products that have a significant environmental impact or substituting undesirable agents in products (such as chemicals composition, materials, etc.) for environmentally benign products.
- **Waste Avoidance:** declaration of waste reduction policy, emphasise products that are less intensive in terms of water and energy usage, products that generate little or no waste and emissions, products containing a high percentage of recycled materials, products that emanate from renewable resources, etc.

Thus, the concept of “going green and eco-procurement” is an activity which is based on sound management of resources and is founded on the ability of the purchasing organisation to recognise certain inherent advantages that are made available through the selection of environmentally preferable products. Further, eco-procurement strives to improve the

environmental performance of the purchasing organisation by systematically selecting goods that have a lessened environmental burden throughout the products' life-cycle.

5.2 ENHANCING THE ENVIRONMENTAL PERFORMANCE OF THE PUBLIC SECTOR

The discourse that surrounds the mounting attention paid to sustainable development suggests that the public sector is becoming increasingly perceptive to the environmental challenges confronting society. In lieu of this recognition, due consideration has been given to the sector's environmental performance. In fact, many organisations have started the accelerated process of developing a sustainable development strategy that encompasses eco-procurement.

The Swedish Prime Minister, Göran Persson, opened the first parliamentary session of the new millennium with a policy statement that stipulated that "environmental requirements shall apply to all public procurement" (Swedish Cabinet Office, September 19, 2000). Of course, popular opinion suggests that this political statement will be difficult to implement at *all* levels of public expenditure. The extent of achieving eco-procurement still relies on individual commitment. Still, the ultimatum has been set in order to help understand that public funds need to be channelled in key areas in order to bring around synergies. It is now understood that a calibrated strategy needs to be adopted to combat environmental problems. Undertaking the root cause of a problem (such as unsustainable production and consumption patterns) will certainly yield better results. In this context, the primary intentions for the public sector are to:

- **Improve environmental performance** and advance national environmental policy objectives by streamlining a life-cycle approach, and;
- **Advance economic performance** by improving the quality of spending, or by gaining remarkable savings;
- **Influencing the behaviour of other socio-economic actors** by setting an example, and sending clear signals to the market structures (OECD, 2000).

As an example of the precautionary principle, if eco-procurement is proliferated, it will help improve the environmental performance of large purchasers and consumers, and avoid considerable environmental damages and costs to future generations, thus achieving sustainability through prevention (Ibid.). Further, this concept of sustainability cannot prevail simply by dictum, enticing words and promises. To be truly fruitful, it requires actions which are measurable, and which are based on sound planning. The procurement of eco-products is one way to meet this tangible challenge.

5.3 LEGAL APPLICATION OF ENVIRONMENTAL CONSIDERATIONS

There are a number of EU Council directives that regulate public procurement in the EU. Among many diverse functions, the premise of these rules is to facilitate international procurement and to ensure these goods travel uninhibitedly across international borders. In addition, it ensures such various goods are tailored to meet relevant requirements without discrimination (Lefèvre, October 18, 2000). Environmental considerations have been

highlighted in COM (98) 143, the European Commission Communication on public procurement which states that possibilities exist to:

- Choose products that are commensurate with the procurement entity's pre-occupation for certain environmental issues. Such measures must comply with the rules and principles of the Community, notably that of *non-discrimination*.
- Alienate, under certain clear circumstances, a supplier that is violating national environmental legislation.
- Integrate technical specifications that call for environmental criteria, and thereby help stimulate innovation to encourage suppliers to develop proactive environmental approach towards product tender offerings.
- Include environmental protection in the criteria of selection, to such extent that these criteria are aimed at testing the technical capabilities of the supplier pool.
- Award contracts that are based on environmental criteria which serve to identify the most economic advantageous offer - as for example: costs maintenance, treatment of waste, or recycling; however these examples need not be exclusively measured in monetary terms (COM (98) 143).

As can be identified, the governance structures are in place to cater to certain environmental considerations. Notably, these do *not* allow for the inclusion of suppliers' production processes in the tender evaluation, nor do they permit to specify the use of a certain eco-label without following up with the phrase "or equivalent". Further, environmental management systems cannot be formally used as a measure of the tenderer's technical capability (Sveman, October 4, 2000). Therefore, appropriate consultation should take place before the placing a public notification for a call for tenders.

5.4 SUMMARY OF CHAPTER 5

From the foregoing, the underlying intricacies of applying environmental considerations are thus beginning to come to light. The above indicates that the procurement function is entangled in an array of fields ranging from environmental, to legal, to engineering (just to name a few). It is thus that procurement functions in a multi-disciplinary environment. To that end, if eco-procurement is to be realised, then considerable teamwork among various actors will be needed to ensure success. Ultimately, public eco-procurement - congruent to the established laws which govern the procurement practices - strives for the optimal use of resources, and aims to obtain a functional product, which is designed to fulfil environmental objectives and meet budget lines.

6. APPLYING ENVIRONMENTAL CRITERIA

Arguably, in order for sustainability to be met with success, it must develop into an involved process. Information gains by way of co-operative teamwork can enable the public sector to advance appropriate environmental requirements that can steer the eco-procurement process in the right direction. Fundamentally, in order to be able to select an environmentally preferable product, the purchaser may need information concerning the environmental performance of the product in demand. As diagrammatically expressed in figure 1 (Section 3), the procurement function can interface across sector and departmental lines in order to retrieve basic information in regards to material composition, engineering capabilities, manufacturer and suppliers, etc. This network is essential to assist purchasers address the variety of differing and often encumbering information in regards to, among others environmental procurement.

6.1 INFORMATION, KNOWLEDGE & A GOAT?

Over the last few years, there has been a considerable emergence of environmental information that has been geared towards products. As such, courses, instruments, questionnaires and tools have been developed to help purchasers integrate environmental considerations into the product demands.

A common response gained from the interviews conducted, was that most purchasers were very conservative in their application of environmental criteria. In fact, this caution was imparted by fear of the legal ramifications of using certain environmental tools or by posing environmental criteria in tender notifications. Purchasers expressed that they sought “lagom”³ - a well defined comfort zone of operation that neither challenges nor compromises environmental considerations in procurement standards.

Interestingly, a general survey conducted this year in Sweden in which 208 out of 289 municipalities responded, concluded that 82% of purchasers, in some form or way, put illegal general demands (according to LOU rules) on products and suppliers (Ohman, 2000). Such findings indicate that a high proportion of purchases are actually conducted outside the legal framework. Examples were cited such as preference for local suppliers in order to create “local opportunities”. Still, the survey reported that 15% of the respondents admitted that they knowingly broke the law, whereas 65% of respondents claimed that they did not know that the law was being broken (Ibid.). Based on these findings and on the interviews conducted, it is quite interesting to highlight that, in spite of a seemingly high prevalence to work outside the legal framework for the imposition of general criteria, many purchasers – who have been confirmed to be deviant – stated that the laws which regulate public procurement were actually considered as an inhibitor for putting environmental criteria on potential suppliers. Hence, it seems that through no fault of their own, many purchasers used legislation as a scapegoat for not implementing bold environmental criteria in their procurement documents.

³ The Swedish term “lagom”, in my opinion, has a unique meaning that is not easily translatable. However, as described in Nordstedts Svensk-Engelska dictionary (1992, p. 472) lagom may be defined as: “everything in moderation”.

The information received when conversing with purchasers and the Swedish Federations County Council's legal department leads me to believe that purchasers need considerable education in this area. To that end, Bogren put forth that in the coming year 5000 Swedish purchasers will receive training on various procurement issues on newly created County Council databases (Bogren, October 3, 2000). In this respect, it may be argued that ambivalence of incorporating bold environmental criteria should not be directed towards legislation since the survey demonstrates the high degree of uncertainty prevails in regards to purchasers' knowledge of the public procurement legal framework.

In fact, in accordance to the Swedish Public Procurement Act (LOU), a contracting authority is legally permitted to take into consideration a product's environmental impact (see LOU: Chapter 1, Section 22 and EKV, 1999). Consistent with the process chosen of evaluating supplier bids (see Section 4.3.4, above) the contracting entity should state which considerations are deemed important, and/or of particular priority.

6.2 SETTING THE TONE: INTEGRATING THE ENVIRONMENTAL CRITERIA

In order to stay in line with legislation, it is very important to make absolutely clear which requirements are obligatory, and which ones are considered to be important but not crucially essential. Therefore, if the general contract documents require that a certain criteria must be met, then they are considered as *obligatory* requirements that cannot be disregarded during the evaluation of tenders. In addition, the purchasing organisation may also have certain "desires" and may therefore be inclined to apply certain *conditional* requirements which are still important to be fulfilled by the potential suppliers, but not binding/mandatory criteria for the candidates to satisfy. As such, the following are examples (EKV, 1999) of these requirements:

- i.) *Detergents **must** be phosphate-free (obligatory requirement).*
- ii.) *Detergents **should** not contain more than 6% nitrilotri-acetic acid (NTA) by weight (conditional requirement).*

In order for these to be understood by the potential suppliers, these criteria should be clearly stated in unambiguous terms and communicated in the tender documents. In addition, for more complicated requirements, the evaluation methods that determine how these requirements are apportionable to one another during the evaluation of bids should be established prior to public posting of the tender notice (EKV, 1999). It is necessary that the product requirements clearly appear in the specification documents in addition to how a comparison will be made between all the criteria for the purpose of choosing the "most economically advantageous offer". Such a balancing scheme does not require a great deal of scientific formulations. It is sufficient to mention, preferably in order of priority, what characteristics will be awarded weight. To avoid legal ramifications, formulations in connection with environmental requirements/criteria are crucial and must be done in accordance with the EU rules (GRIP, 1996). This is not only in the interests of the law, but also in the interests of business relations.

The Importance of Specific and Clear Criteria

Studies reveal that when environmental requirements are too general, this often results in a certain up-pricing of the offer because suppliers have too little experience as to what profitability effects a satisfaction of the environmental requirements might have for them. This suggests that environmental requirements and criteria which are included in the enquiry should be as specific as possible. Although, further experiences concerning the effect of the introduction of environmental requirements on prices and quality are not unambiguous, the Municipality of Gothenburg, Sweden, refers to its own experiences to the effect that the introduction of environmental requirements in contractual purchase agreements has generally not resulted in additional costs when the environmental criteria are stated explicitly.

(Source: Ibid.).

Other studies concurrently suggest that Swedish municipal authorities that have fixed eco-procurement criteria for products have not noticed anomalies in relation to cost and quality, but, although not quantified, they have claimed a noticed a reduction of environmental impact due to the enclosure of an eco-criteria (Jönsson & Thidell, 1999). The key, then, is for practitioners to keep the process simple and to strike a delicate balance to describe product characteristics. Hence, the focus should probably remain technical characteristics that enables, in more absolute terms, the product to meet a required performance.

6.3.1 ASPECTS TO CONSIDER WHILE FORMULATING AN ECO-CRITERIA

While formulating environmental criteria for tender documents, specific requirements may be taken into account. The following may serve as examples on how certain environmental exigencies may be considered during evaluation process:

Product Type	Example of Environmental Criteria
<ul style="list-style-type: none">Environmental Criteria for Substances that are Contained in Products	<ul style="list-style-type: none">Softeners in plastics must not contain bibutyl phthalates;Batteries should not contain cadmium.
<ul style="list-style-type: none">Environmental Criteria for the Product's Packaging	<ul style="list-style-type: none">The company should be affiliated to a register concerning packaging guidelines;The total concentration of lead, cadmium & mercury should not exceed 100mg/kg.
<ul style="list-style-type: none">Environmental Criteria for Notebook Computers	<ul style="list-style-type: none">Computers must have an energy-saving modeThe system's unit, keyboard, monitor should be recyclable

(Source: EKU, 1999)

Accordingly, by developing and incorporating criteria along this line of thought, my contention is public procurement can levy their initiatives to send clear signals to the market place. Since pollutant emissions and environmental problems are generally identified to come from the enormous turnover of materials, chemicals and energy, such criteria that target these sources will enable the greening of the market. It may therefore be important to pin-point strategies to reduce material and energy turnover and switch to more environmentally "benign" materials, chemicals and energy sources that make less impact on health and the environment.

6.4 ENVIRONMENTAL TOOLS: IDENTIFYING ECO-PRODUCTS

As has been recognised through my various meetings with purchasers, the Swedish public authorities have the opportunity of using several tools when making a decision to choose or refuse certain products. These environmental tools have emerged rather recently and may come in various formats such as manuals, questionnaires, eco-labels and other guiding principles that help steer decisions based on scientific credibility, and among others, legal compliance. The following may serve as examples of the type of tools that currently exist and employed for eco-procurement decisions.

6.4.1 ECO LABELS

Primarily used as a means of informing consumers and purchasers, eco-labels usually indicate that the product has satisfied the multiple environmental criteria of the eco-label issuing body, and thus, the label bearing products are distinguished from other similar products on the market (OECD, 2000). Accordingly, the distinctive aim of eco-labelling schemes is to develop transparency in the selection and establishment of criteria. Significant labels, have been developed by the International Standards Organisation (ISO, 2000), which have provided three main types of eco-labels:

- **Type 1:** Labels from independent third parties who award them for the best environmental performers in various product categories. The Nordic Swan, and Germany's Blue Angel are part of this group (ISO/FDIS 14024).
- **Type 2:** Self declared labels used by manufacturers to make environmental claims about their product. A Common type 2 label is the recycling "Mobius Loop" symbol, which is composed of three cyclical arrows (ISO/DIS 14021).
- **Type 3:** This eco-label is licensed by a third party and acts as a "report card" providing information on the possible environmental impacts of products (ISO/WD/TR 14025).

Many people spoken to felt that although eco-labels were a good tool to use for identifying certain environmentally benign products, they noted that the use of labelling schemes was quite restricted due to the fact that eco-labels had only been developed for limited product groups⁴, and also due to the fact that not all companies could afford to pay the yearly fees demanded by the licensing bodies. In addition, purchasers pointed the legal constraints for public procurement decisions solely based on eco-labelling schemes. Primarily, due to WTO and EU legal terms, which strive for the free movement of goods, eco-labelling schemes are deemed discriminatory because they are geographically restricted; and under the same legal terms, it is illegal to apply criteria that encapsulate production processes. Therefore, since many eco-labels consider life-cycle processes, purchasers usually adapt the eco-label criteria to legal standards in so far as to exclude reference to potential suppliers' production process.

⁴ Sweden has approximately 60 product groups under the Nordic Swan and Environmental Choice eco-labels (OECD, 2000).

6.4.2 VÄSTERNORRLANDSPÄRMEN – THE GREEN BINDER

Currently, many people spoken to acknowledge that they, along with several organisations, make use of the “Green Binder” (*Västernorrlandspärmen*), which was originally designed by the County of Västernorrlands to select environmentally preferred products. This binder, which has since been disseminated throughout much of Sweden, is updated twice a year and contains facts and information on national legislation, eco-label practices and other requirements concerning a vast group of products such as packaging, office equipment and supplies, etc (Kommunförbundet Västernorrlands, 1999). On the basis of various interviews conducted for this research, it was concluded that this tool has been used in some capacity as a common reference point by many purchasers in Swedish local authorities.

6.4.3 LIFE CYCLE THINKING AS GUIDING POINT

A literature survey indicates that life cycle thinking considers a long time perspective, which may be used as a basis of comparing different products or purchases against certain resources (EU COM, DG III, 1998; Kirkpatrick, 1992; Nord, 1995). In the context of making procurement decisions based on economic justifications such as “most economically advantageous offer”, this concept may provide an alternative for the purchasing organisation. As such, in the environmental field, the concept of life cycle thinking may be adapted to account for costs related to a product throughout its life cycle from its acquisition to its disposal. Generally speaking however, this process may be difficult to quantify for social costs as such, but these limitations may be possible to be justified qualitatively.

Due to the many complexities associated with life cycle thinking, a general case in point (GRIP, 1996) may be used as an example: The current value method endeavours to discount the net cash flow of the product for each year back to the year zero. As illustrated in box 3 (below), the possibilities of economising when life cycle thinking is used points to the fact that “hidden costs” need due consideration during the procurement process. As demonstrated, the higher (front-loaded) original cost does not reveal all costs – either environmental or financial. Notably, the author points out that present value calculations of this study have are not considered due to the short timeline (one year).

Box 3: General Life Cycle Thinking: Normal Light Bulb versus Low Energy Light Bulb

	<u>Normal bulb</u>	<u>Low energy bulb</u>
<i>Unit price:</i>	€ 0.62	€ 8.78
<i>Service life:</i>	2500 hours	10000 hours
<i>Energy consumption:</i>	60 W	11 W
<i>Replacement cost:</i>	€ 1.88	€ 1.88
<i>Price per kWh:</i>	€ 0.05	€ 0.05
<i>Over a period of 10.000 hours (more than one year's continuous operation) this gives the following result:</i>		
Approximate total annual cost:	€44	€17
<p>The unit price of low energy bulbs varies considerably. At the time of writing (1996), €8.78 for such a light was an appropriate and general price for most consumers. The replacement cost was calculated as the approximate time cost involved in finding out that the bulb needs changing, order/collect a new bulb, purchase a new bulb and change the bulb. In addition to the above-mentioned costs, there may appear costs in an office building with air conditioning in the summer. Approximately 240 W is used to cool the heat generated from a 60W bulb, whilst conversely, normal bulbs may contribute to the heating in the winter.</p> <p>*Note: Currency converted from Norwegian Kroner (NOK) to Euro. Therefore, at time of writing, €1 = approx. NOK 8</p> <p style="text-align: right;"><i>(Source: Adapted from GRIP, 1996)</i></p>		

The above example posits the fact that based on a life-cycle perspective, the originally-perceived more expensive light bulb is in fact the most economically advantageous choice. The environmental considerations supporting this economically advantageous choice, may be qualified in the excess of electricity resource used (depending on the electricity source), and the increase material usage associated the production with the shorter life span of the normal light bulb. Of course, disposal treatment has not been considered in this example, but it may also be applied to support the model represented above in order to further encompass additional dimension of the products environmental effects (OECD, 2000). In general, the former aspect of waste treatment should only be qualified based on waste management practices.

The feedback received from those interviewed for this research highlighted the practical problems stemming from the life-cycle's analytical complexity that makes such approach often uninteresting for many purchasers. A common explanation for purchasers' reticence towards full fledged life-cycle approaches was the fact that most felt these approaches were difficult to comprehend, especially when taking on a "cradle to grave approach". However, many purchasers claimed that they adapted certain concepts of life-cycle thinking for relatively "simple" products in combination with other more familiar tools.

Based on these discussions, it seems that although life cycle thinking, in itself, may not be accepted by all purchasers as the most appropriate approach to determine what products are best for the environment, in light of what was said, findings from the sessions indicated that if

purchasers properly understand life-cycle thinking, then it may be argued that such an approach that examines the products' interaction with other systems, may benefit and validate certain procurement decisions. In essence, the purchasers noted that with additional support from eco-labelling schemes or other tools such as the "green binder", the life-cycle approach could clarify certain nuances surrounding decision-making in regards to eco-procurement.

6.5 SUMMARY OF CHAPTER 6

The foregoing has demonstrated various public sector possibilities and constraints when attempting to apply environmental criteria in product demand. Setting the tone, and demanding greener products by the means of specifying, for example, environmentally benign materials, chemicals and energy saving devices, strives to reduce the public sector's impact on health and the environment. In spite of being legal, it seems that reluctant purchasers use the law as a scapegoat by claiming that certain practices supported by eco-procurement practices are considered illegal. However, a nation wide survey concluded that 82% of purchasers operate outside the legal framework anyhow, demonstrating a considerable lack of knowledge in areas pertaining to rules and legislation which regulate public procurement. A key aspect in relation to much of the research in regards to possibilities and constraints for public sector eco-procurement, has been founded on the importance of information communication.

The communication of environmental demands, and proper information in regards to the legal aspects is seen as an essential component for eco-procurement to steer the public sector towards sustainability. Clearly stated and communicated information in the form of product requirements should translate into suppliers' awareness of the specified criteria. In conjunction, the tools used to ascertain environmentally preferable suppliers and products, should communicate key information in order to enable procurement decisions. Against this, it was noted that due to the level of knowledge on the applicability of certain tools, rather than using one predominant tool, purchasers often amalgamated several tools to support and validate their procurement decisions.

7. THE CASE STUDY – INCONTINENCE PRODUCT PROCUREMENT FOR THE HOSPITAL SECTOR

In order to encapsulate the objectives stated in this study, the application of eco-procurement will further bring to light the process currently utilised for purchasers to identify "green products". In addition, attention will be given to the type of information needed to integrate and apply environmental considerations into the procurement of incontinence products by Halland County Council for its hospital sector.

The study was conducted in four main steps. First, interviews were conducted, and meetings were carried with individuals involved at different levels of the procurement process⁵. Second, various industries were contacted for information on incontinence products.

⁵ Some of the information presented in the thesis thus far has already been based on information gained through meetings and interviews.

Suppliers provided certain information on their respective products. Against this background, a third step was taken whereby a comparison was made between certain types of incontinence products available on the market. The fourth step involved the study of the nature of information communicated to and from both the supply and demand sides.

In lieu of the above stated objectives (section 1.1) the case study will enable the application of eco-procurement and will illustrate if such a practice can help steer a public sector towards sustainability.

7.1 THE PROCUREMENT ORGANISATION

In Sweden, the County Councils are responsible for an array of functions, from providing health care, to being active in areas of education. Given the wide scope of County Councils' activities, efforts have been made to undertake environmental challenges including energy and resource use, pollutant emissions and other significant problems, which affect human health and biodiversity.

Much like the rest of Sweden, Halland's County Council income consists primarily of tax revenues, in addition to user fees from patients. Although the County Council serves six municipalities comprising of Laholm, Halmstad, Hylte, Falkenberg, Varberg and Kungsbacka, it has recently allied itself with two other County Councils – Kronoberg and Blekinge – for the purpose of establishing a significant contract with a supplier of incontinence products. Lisbeth Andermyr, procurement co-ordinator for this contract, stated that the procurement will be centrally administered in order to reduce costs, combine purchasing power and to optimise the procurement process by eliminating redundancies. According to statistics obtained from internal official documents, these three municipalities will combine their procurement for approximately 6.8 million disposable incontinence products for adults per annum over the course of the next few years.

In consideration of their environmental vulnerabilities, the County Councils' have decided upon a proactive strategy to reduce the environmental impacts emanating from health care constituents such as the hospital sector. Bearing in mind the diverse environmental impacts associated to diapers and the hospital sector in general, high priority has been given to environmental considerations for the procurement of these incontinence products. As shall be determined later, the potential suppliers were expected to satisfy basic environmental criteria.

7.2 CHARACTERISTIC ENVIRONMENTAL IMPACTS OF THE HOSPITAL SECTOR

In principle, the nature of hospitals' existence is to serve the public by endowing society's overall well being and by contributing to a better public health (Hettenbach, 1998). Ironically, however, the very nature of a hospital's existence may contribute to an indistinguishable social malaise. Indeed, many hospitals may be directly and indirectly linked to pollution problems that have, for decades, played a significant part in bring about environmental problems due to their frequent handling of chemicals, diseases, and among other things, disposable products. In keeping with this paper's focus, it seems quite sensible to undertake an overview of this sector's environmental impacts in relation to certain material

consumption patterns before we apply the principle of eco-procurement to incontinence products.

7.2.1 MATERIAL CONSUMPTION AND RESOURCE USE

While a number of health care related activities present particular environmental impacts that are not widely encountered in other sectors of society, it may be argued that one of its main concerns – material and resource management – is commonly a held concern throughout much of society. As such, hospital supplies for patients' care typically account for an estimated 20-30% of aggregated costs (Davies & Lowe, 1999). This is certainly not an insignificant outlay by any standards, especially when considering the fact that over the course of the past few years, many hospitals in Sweden have been operating under stricter budgets. Hence, based on the interviews conducted for this research, it was acknowledged that there has been a growing desire among many hospitals and County Councils to reduce impending excessive costs. To that end, as can be appreciated, this can certainly put the onus of the procurement function's ability to make sound decisions to reduce costs.

In addition to financial matters, many people spoken to stated that hospitals and County Councils alike sought better resource management in order to reduce environmental burdens, and enhance their public image. Correspondingly, the perceived hospital sector's need for responsible material management, in addition with the County Councils' financial concerns can arguably be inter-linked with the concept held in sound environmental improvement by the means of eco-procurement. Due to the nature of the industry, and its dependence on a great amount of disposable items, many officials spoken to for this research felt a responsibility towards the reduction their environmental load.

Davies and Lowe (1999) put forth that 85% of the waste outputs emanating from hospitals is typically commercial waste that take the form of paper, plastics, metal, and among others, glass. However, they point to the fact that in the US, the demand for disposable medical supplies has been growing steadily, representing over \$30 billion of the market (Ibid.). Information gathered by way of interview has lead to the assumption that a similar trend, in which there has been steady increase in the use of disposable products, has carried over here in Sweden as well.

As demonstrated in the earlier sections of this paper, eco-procurement can be characterised as a potential driver towards environmentally preferable products since it can influence the supply chain. If hospitals choose certain products that contain reduced amounts of toxic substances, or reduce resource consumption and decrease the amount of their waste without compromising quality of care, it may be argued that such initiatives could steer hospitals towards sustainability. Hence, by the means of applying eco-procurement for incontinence products, the following will demonstrate the possibilities of reducing post-consumer waste, and among other things, the use of non-renewable resources. Before carrying this out, however, due consideration should be awarded for the environmental impact of disposable incontinence products.

7.3 CHARACTERISTICS OF DISPOSABLE INCONTINENCE PRODUCTS

In many western countries, incontinence products along with production of pulp and paper are considered to be among the top four contributors to waste streams, the third largest industrial consumers of energy, and significant contributors to both air and water pollution (Goldman & Wagner, 1999). Although the environmental impacts of disposable incontinence products occur at various phases of a product's life cycle, from a procurement viewpoint at face value of the law, purchasers cannot consider the manufacturing, production and transportation environmental aspects. Therefore, as previously mentioned, in spite of the possible use of chemicals and pollution generating agents used during the process, the finished product may only be evaluated based on its physical characteristics.

7.3.1 THE MARKET AND THE WASTE STREAM

Statistics compiled by the Swedish Industries Standards for Nordic Ecolabelling demonstrate the environmental significance of incontinence products in the Nordic countries. Accordingly, the total annual sale for these products is estimated at SEK 1.5 billion which accounts for an estimated one million children that use of disposable diapers, and approximately 1.4 million adults who suffer from incontinence (Nordic Ecolabelling, 1998). While it is possible to calculate that each child will use approximately 5000 disposable diapers before s/he is toilet trained, the number of incontinence products used per adult varies depending on the severity of the incontinence, and thus makes it more difficult to quantify (Ibid.). Industry representatives interviewed for this report very cautiously estimated that an average of two products may be needed per adult users on a daily basis, depending on their situation. Against this background, a significant scenario presents itself when considering the ageing of the population. It is assumed by many experts spoken to for this research, that there will be a projected 10% rise in adult incontinence product needs for adults over the next 15 years (discounting medicinal interventions), whereas children's diapering needs are expected remain mostly unchanged. Arguably, this projected increase will contribute to further environmental effects brought on by diapers. According to a 1998 Swedish waste audit report, post-consumer waste volumes from disposable incontinence products have been considerable in Sweden since they account for an estimated 140 000 tonnes per year, which is tantamount to the fourth most represented item in Sweden's waste stream (Olsson & Retzner, 1998).

The feedback gained from the interviews conducted for this research, indicate that there still does not appear to be a clear strategy from the responsible authorities on how to handle disposable diapers and similar waste for the future. At present, it can be said that we are faced with a skewed system in which incineration, landfilling, composting and recycling are the most probable destination for used disposable diapers. Although recycling and composting have been attempted for incontinence products, it has not been very successful due to the complexity of the products which consist of chemicals and non-biodegradable components that are difficult to separate from the diapers (information based on interviews). As a result, the most likely alternatives to manage this type of waste is either by incineration or by landfill.

Statistics on Swedish waste incineration practices are varied. The Swedish Association of Waste Management (RVF) estimated that approximately 38% of household waste is

incinerated, while the rest is sorted and sent to specific treatment places where landfill and recycling tracks the majority of refuse, accounting for approximately 25% and 29% respectively (RVF, 1999). Whilst more hospital waste is incinerated in comparison to household waste, statistics were unobtainable (at the time of research) to confirm that a high percentage of incontinence products were actually incinerated as opposed to landfilled. Therefore, an assumption will have to be made, based on the above mentioned findings, that incontinence products' are currently being channelled proportionally towards incineration and landfill. However, in light of an imposed landfill tax, Swedish incineration rates have been increasing over the past few years due to the SEK 250/tonne tax placed on waste going to landfills (RVF, 2000). We may therefore assume that although the amount of Swedish hospital waste is unknown, it may be argued that this sector will follow the growing trend of incinerating its waste.

7.3.2 SOME ENVIRONMENTAL EFFECTS AND IMPACTS

The impact of post consumer waste varies according to the composition of the product, and in the way in which it is handled after its usefulness to the user. Generally, according to Nordic Ecolabelling reports and other experts interviewed, conventional incontinence products consist of approximately 60% of fluff pulp (sulphate or chemically treated), in addition to the other materials used such as non-woven made from non-biodegradable plastics and petrol based non-renewable resources (Nordic Ecolabelling, 1998). One leading incontinence care company has recently, albeit informally, admitted to producing products containing as much as 47% of non-renewable, non-biodegradable materials such as plastics. As can be imagined, such characteristics can have an impact during the disposable phase of a product's life. The fact that they contain a high proportion of plastic components inhibits these products to decompose in the landfill, whereas if incinerated, there will be a significant release of carbon dioxide⁶ emissions, among other gases (Svensson, 1994; Hettenback, 1998).

A report (Svensson, 1994), prepared on behalf of the Swedish Society for Nature Conservation, compared eight different products, of which three of these types were disposable incontinence products relevant for this study. The attempt was to compare the environmental impact of three randomly chosen product groups that were representative of the Swedish market. The three chosen disposable products were essentially the same, all-in-one children's disposable diaper groups that consisted of the following characteristics:

Product Attributes⁷

Type	Plastic Contents	SAP Content	Type of Pulp
Product A	Approx. 24% per product	9% per product	CTMP
Product B	Approx. 24% per product	9% per product	Sulphate
Product C	Approx. 31 % per product	26% per product	Sulphate

The results of the study revealed several findings, which due to practical limitations can only be partially presented in this paper. In regards to total energy consumption during diaper

⁶ Carbon dioxide is generally responsible for 50-60% of global warming from greenhouse gases (Miller, 2000).

⁷ This information has been calculated based on statistics obtained in Svensson's report (1994). Note: SAP stands for super-absorbent pad that is made from non-renewable resources, namely oil.

manufacturing, it was concluded that the only notable difference was in fossil fuel consumption, which was highest for products containing greater amounts of plastics.

A second environmental factor studied was the greenhouse effect. In the case of diapers greenhouse gases are associated with the release of methane⁸ and carbon dioxide. Products containing higher amounts of plastics were identified to release larger amounts of CO₂ through their lifetime. During diaper incineration the release was reported to be immediate, whereas since the landfill process inhibited the plastic's decay (insofar as it was found to be very slow and gradual), this resulted in a reported delayed release of carbon dioxide. To that end, diapers in the landfill with higher amounts of cellulose pulp presented much larger methane loads than if incinerated. Further, landfill methane gases, if not captured, presented the greatest contribution to the greenhouse effect. Although the overall results of greenhouse effects of incineration were quasi-similar for products A and, there was a more noticeable impact associated to product C at the disposal phase.

Other effects undertaken included soil acidification and over-fertilisation, which again pointed to product C as having the most noticeable impact due to its higher plastic and SAP content. Here, when it comes to emissions of nitrogen oxides, it was found that if incontinence products were incinerated as opposed to being sent to the landfill, there would be significant increased emissions. The discharge of nitrogen and phosphorus into the water was also greater for product C due to, among other things, its higher percentage of plastic contents.

Hence, according to these findings taken from Svensson's report (1994), there is a clear indication that when measured against each other, products containing higher amounts of plastics have the greatest adverse impacts on the afore-mentioned environmental effects. While Svensson's study is based on certain assumptions, and although alternative factors could have been considered in her research, these results appear to be quite reasonable and scientifically credible since no other reports to counter balance these arguments have been found for the purpose of this research.

7.3.3 IMPLICATIONS FOR THE PROCUREMENT FUNCTION

The foregoing has highlighted certain aspects which should be considered by those involved in the procurement function. In order to make decisions that incorporate the principles held in eco-procurement, purchasers should consider certain product characteristics that will emit the least impact upon the environment according to their perceived priorities. As such, it may be argued that if the amount waste generated and the use of non-biodegradable plastics are the distinguished priorities to be checked, as it is assumed for the case study⁹, then environmental criteria for the product should be tailored according to the procurement entities' values. However, it is important to stress single issue criteria, from an environmental viewpoint, is a strategy that should strongly be discouraged since they tend to offset one environmental

⁸ Methane accounts for approximately 20% of global warming; each methane molecule traps an excess of 20 times more heat than a carbon dioxide molecule (Miller, 2000).

⁹ Although a holistic approach to reducing environmental problems is probably needed, certain aspects should be targeted according to the organisation's needs. Hence, an assumption for the purpose of this research, is that a reduction of waste along with a reduction in the use non-renewable resources are given a priority for the purpose of applying eco-procurement in a specific framework.

impact for another. Hence, the environmental contribution are thus questionable. The acquisition of products should ultimately focus on a series of environmental effects that may occur throughout a product's life cycle. In the context of a public organisation that is accountable to its citizens, such values should probably be reflected as the interests of society on the whole. Based on the facts presented above in relation to incontinence products and environmental impacts, the following section will illustrate how appropriate criteria during the procurement process may alleviate the hospital sector's impact on the environment.

7.4 CRITERIA FOR QUALITY, ENVIRONMENTAL AND PRODUCT PERFORMANCE

According to the many experts spoken to for the purpose of this research, product quality and cost were deemed the most important qualifiers, where quality should be demonstrable in order for suppliers and their products to be worthy of consideration. However defined, it was indicated that price and quality should be based on criteria of suitability and fitness for purpose as characterised by the purchasing organisation (Andermyr, October 20, 2000). As previously stated (section 3.4) information management becomes an important undertaking in the context of choosing the appropriate incontinence product. Here, we may argue that performance indicators, as a basic example, should be demonstrably attainable, reliable, and updated information. As such, relevant information on products and their components, which may be especially applicable for eco-procurement, may help steer decisions.

Experiences gathered by way of interview have demonstrated that there are at least three possible ways in which purchasers can incorporate environmental requirements and compare products to determine whether these are an appropriate choice for the organisation. One way to measure if an incontinence product is an appropriate choice, is for purchasers to take it upon themselves to perform a market survey, research certain attributes and aspects that are related to the organisations' needs and environmental concerns. Halland County could have chosen to dedicate resources and time in order to determine which characteristics the ultimate end-users sought in the diapers, analyse in detail the various components comprising the diapers, and assess the various environmental impacts associated with various diapers in addition to the overall product performance attributes. Based on this, and other findings, an evaluation could then be made by weighing certain factors against others. The requirements and criteria documents could then be drafted and tailored specifically for Halland's call for tenders for the upcoming incontinence product contract.

A second method of setting the criteria could be to adopt general principles held in miscellaneous credible tools such as databases, questionnaires and the Green Binder, in order to amalgamate diverse criteria into one tender document to be fulfilled by the potential suppliers. In comparison to the first option, this second alternative would seemingly have lessened the workload and the criteria could be partially based on other people's scientific work.

A third scenario, which is the one that Halland adopted, could be to completely base environmental tender requirements for the procurement of diapers on tools such as eco-labels. In fact, Halland's eco-label of choice was the Nordic Swan, which was adapted to omit supplier production aspects in order to be legally compliant. Further, it is also important to note that Halland's tender documents were specifically geared towards products that could

fulfil the Nordic Swan requirements “or equivalent” (information obtained from official tender documents, and based on interview with Andermyr, October 20, 2000).

Halland’s tender documents revealed no other significant criteria to measure the products’ environmental soundness. When asked why the Swan label was chosen as opposed to other criteria, the response given was that the Nordic Swan was suppose to be – overall – the least environmentally harmful and should therefore represent the best product for its category (Andermyr, October 20, 2000). The general opinion in regards to the Nordic Swan ecolabelling scheme is that it contributes to overall reductions of environmental impacts of raw material consumption and production, and it also generally endeavours to limit the amount of non-renewable resources used in products¹⁰. Ultimately, it should be kept in mind that the extent to which purchasers account for environmental considerations when selecting their tender criteria, can also be a factor that will also influence consumer preference. In other words, by choosing the Swan label criteria, which is a well recognised and established eco-label in Scandinavia, this can arguably help shape consumer preference due to the familiarity of the product’s eco-label and its established criteria.

7.5 THE CRITERIA SELECTED FOR THE INCONTINENCE PRODUCT

In order to make the “right” choice, it may be argued that purchasers need to obtain information about the environmental performance of products in order to determine whether these are the least harmful to the environment according to the organisation’s targets. Therefore, we may assume that it is crucial to incorporate specific environmental requirements in tender documents that target the environmental aspects the organisation wishes to curtail. Arguably, this will help steer the environmental procurement process towards sustainability.

Information gathered by way of interview acknowledged that since this is still a very undeveloped field, very few purchasers have been properly trained to deal with environmental issues. While the majority of purchasers spoken to would like more information from suppliers, they admitted that they felt they lacked the capabilities of shouldering the responsibility of creating their own specific environmental requirements (also, Jönsson & Thidell, 1999). Therefore, it was deemed to be much easier and more reliable to use the Swan eco-label or it’s equivalent (information based on interviews)

As for the case of incontinence products, the Swan requirements appear to be very strict in terms of materials used for the product composition. Of specific relevance for this case study, is the fact that according to the Swan criteria, the incontinence product must contain a maximum of 190 g/m² of non-biodegradable plastic materials which includes the SAP material whereas children’s diapers should include no more than 100 g/m² of material (Nordic Ecolabelling, 1999). This would appear to be the highest environmental standards in the industry, emitting the least environmental effects, since it was revealed during interviews that since the Swedish Institutes Standards exerted tremendous pressure on upstream suppliers of raw materials. Having spoken to various experts, products adhering to such requirements that aim to be environmentally least harmful, are not perceived to be prevalent

¹⁰ This information is based on various interviews. Also, (personal comment) notably, it has been corroborated at various international conferences, that the Swan ecolabel has some of the most comprehensive and advanced environmental criteria, and is thus very well respected by many experts.

throughout the industry. When asked why, the answer given was a lack of interest by the top three industry leaders, who preferred to concentrate on product performance, and the development of SAP technology rather than environmental performance. Hence, in order to remain competitive in the market, many companies chose to follow the trend as set by the industry leaders (Adolfsson, November 6, 2000; Christiansmith, November 7, 2000).

Noteworthy, the section relating to product performance in the Nordic Ecolabelling criteria document stipulates: "The manufacturer must demonstrate, e.g. with the results of laboratory tests or a consumer panel, that the products covered by the ecolabelling application do not rate lower than other products on the market in performance characteristics such as absorption capacity and surface dryness" (Nordic Ecolabelling, p. 11, 1999). Against this, a new medium sized company on the Swedish market has entered Halland's call for tenders to advance the only ecolabelled adult incontinence product in its class (Andermyr, October, 2000). According to Andermyr, the product performance has been tested and has gained Halland County's approval, based on the principle of fitness for purpose and also based on the fact that absorbent capacities along with other relevant criteria such as quality, price, aesthetics, (and more subjectively, comfort) were equal to other competing products on the market (Ibid.).

Based on our existing knowledge of the environmental impacts associated with non biodegradable plastics and oil based products, we may assume that, if by selecting this "new" product which appears to have the least amount of non-renewable resources and environmentally harmful plastic contents¹¹, it appears that Halland, along with the two other County Councils, will reduce their environmental impacts (normally associated with conventional disposable incontinence products) by the means of eco-procurement. In light of this being an ongoing process, it is impossible at this point in time to quantify the assumed impact reductions since the new procurement contract will only take effect as of January 2001.

However, it may be argued that in lieu of the landfill tax which seeks SEK 250/tonne of waste, it may very well be justified to assume that hospitals operating under restricted budgets may choose to follow the rest of the country's trend and increase their incineration rate of waste. Additionally, we may argue that Sweden's environmentally adapted technology to incinerate creates an added incentive for further energy recovery. This is especially significant when considering that by the means of eco-procurement, Halland's incontinence product waste will seemingly bear less plastic and oil based SAP (in comparison to conventional disposable products) which will reduce the amount of CO₂, and sulphur dioxide¹² emissions when burnt. Finally, from a prospective perspective, it may be argued that by consolidating their procurement approach in order to purchase SEK 48 000 000 worth of environmentally least harmful incontinence products, the three County Councils' purchasing clout will undoubtedly send a signal to the market place.

¹¹ The three companies consulted for this research presented different indicators which were not comparable in order to measure the amount of plastic in their respective products. Due to the inaccessibility of key-information, clear, critical and objective data could not be compared in this industry. However, since only one company was able to fulfil the Swan criteria, based on information obtained by Andermyr, an assumption is made that this product is the least environmentally harmful.

¹² Sulphur dioxide is a major contributor to acidification (Miller, 2000).

7.5.1 SAVING MORE THAN THE ENVIRONMENT

The above has highlighted the possibilities of reducing environmental impacts. Although, much has been written in previous sections of this paper concerning the direct and indirect financial prospects of eco-procurement, it has not yet been possible to bring forth the financial savings associated with this function, due to a lack of data. Therefore, in order to appreciate the financial benefits of eco-procurement in relation to incontinence products, we will briefly highlight experiences of the municipality of Kolding, Denmark. Kolding, whose eco-procurement strategy has been incorporated in calls for tenders by supplying requirements specification with a number of environmental questions, have found that the use of questionnaires facilitates eco-procurement without an increase in costs (Møller-Jessen, 2000). Of the several reasons stated by city officials, eco-procurement has been established since 1998 in order to:

- Prove that Kolding is a convincing and efficient environmental leader.
- Set an example for its citizens.
- Reduce its environmental impact.
- Promote environmental friendly production.

To that end, 25% of all municipal calls for tenders have integrated environmental criteria (Ibid.). As for the case that pertains to incontinence product procurement, Kolding Council streamlined their procurement strategy in order to minimise redundancies, save money and to reduce the weight amount of waste (Damm, October 18, 2000).

Kolding' Eco-Procurement Results:

A report (1999) commissioned by the municipality of Kolding indicates that although the total number of incontinence product users has increased over the last few years, the total amount of waste generated actually decreased by 27% or approximately 5.4 tons in 1999 (see appendix 1). The report was based on original results obtained from a case study of another Danish municipality, Frederiksberg. The results from this municipality were then re-calculated to the actual incontinence product use in Kolding.

The figures revealed a significant decrease in refuse for every adult user (811 clients in all of Kolding) which resulted in an overall decrease of waste that was estimated at 6.7kg per person per year, resulting in substantial overall savings for the municipality in financial terms. In fact, by re-arranging and streamlining their procurement practices in 1999, Kolding moved away from a procurement practice that involved several suppliers to a strategy which dealt with one sole supplier of incontinence products. As a result of choosing a sole supplier that offered a product that suited Kolding's environmental targets, they were also able to decrease their budget by approximately 20%.

(Source: Møller-Jessen, October, 26, 2000; Kolding Kommune, 1999)

Information obtained by Kolding's official questions to tenders documents revealed that the environmental criteria of the incontinence product was based on a questionnaire that also targeted products equivalent to the Nordic Swan eco-label. Additional environmental criteria pertained to post-consumer waste, and product packaging material, which were calibrated to generate as little overall waste as possible, according to the procuring entity.

Due to practical constraints and limitations, it was not possible to provide an overview of Kolding's waste management practices. Still, the financial rewards of utilising the advantages offered by scale economies approach, in addition to choosing a product that was in line with their environmental objectives of (among others) waste reduction, points to the fact that it may be possible to save money and the environment via eco-procurement practices. Since the public pays for municipality waste in terms of the loss of landfill space or pollution generated from municipal refuse, it can be argued that successful initiatives that seek to offset certain life-cycle environmental impacts at the acquisition phase, while not compromising the product quality, will help steer the procurement process towards sustainability. However, for this process to occur, decisions should be based on sound, reliable and relevant information and clearly communicated product criteria.

7.6 COMMUNICATION OF ENVIRONMENTAL PRODUCT INFORMATION

The information presented thus far in the case study has relied on certain findings which have been based for this study. However, in order to further develop the process of eco-procurement, certain issues relating to the communication of environmental product information should require additional attention. In regards to product information, a commonly held viewpoint was noted during various interviews which related to the following problems:

1. Purchasers have to filter a great deal of information that does not involve environmentally related issues. Many purchasers are faced with an already heavy workload, so it becomes difficult to take on an additional responsibility that extends out of their field of expertise.
2. Current lack of training opportunities are still at superficial level or "theoretical level", which did not tackle certain real challenges that occur in common practice / workplace.
3. Environmental information was often conflicting (too much information stating different things). Due to this, many purchasers were uninformed and could not adequately perform eco-procurement.
4. Often times, products are chosen based on individual purchasers' protocol to objectively make a decision. This usually entails creating some kind of ranking system, such as a matrix or a scorecard to determine a product's fitness for its intended purpose.

Further, based on various meetings and interviews, it appears that the public sector's assessment of selecting "green products" did not provide any clear indication as what type of environmental preference or tools were predominantly used to develop the eco-criteria. Most people spoken to revealed that purchasers tended to amalgamate an array of tools, and as such, it may be argued that purchasers' requirements have not always progressed in a systematic method. In other words, suppliers claimed that information requested by purchasers was often time consuming, since different purchasers proceeded in various ways and formats to collect product information. In addition to this perceived lack of coherence in

the requirements, various suppliers spoken to felt frustrated because certain purchasers did not always disclose how certain environmental criteria were measured against other criteria.

Based on information obtained via various tender documents, it seems that much of the criteria have targeted aspects other than the physical properties of the products. In fact, many questions have sought to obtain general information about potential suppliers' environmental activities and policies. As such, the nature of some of the information requested has pertained to supplier's environmental management capabilities, rather than just the product characteristic. The purchasers, however, claimed that this additional information was not officially considered during the awarding of contracts. Rather, this information was used after the establishment of the contract. As a client, some County Council, according to Bogren, would potentially ask their new supplier to work towards an EMS. In this way, the client could try and persuade or influence the supplier of adopting an EMS, if it was deemed important (Bogren, October 3, 2000).

As for the case of suppliers, many people spoken to for this research, claimed that they advanced their company's environmental information for the general public and customers. However, in light of these claims, the general information that was obtainable varied from mainly superficial documents¹³ to thorough corporate environmental reports. Whilst general company information was, to some degree, available to the public, much key information in regards to certain products (e.g. specific product contents) was unobtainable to compare different products at the time of writing¹⁴.

Hence, from the foregoing, although there has been movement towards information exchange between purchasers and suppliers, it appears (from both viewpoints) that this information exchange is relatively uncoordinated. It may be argued, based on my experiences which are founded on various meeting and interviews with those involved in this process, that the different methodologies adopted to demand and provide information appears to be a hindering factor for a full fledge application of eco-procurement.

7.7 RESULTS OF CASE STUDY

As has been demonstrated above, eco-procurement involves decision-making that balances and weighs various economic and environmental problems, which are pitted against each other. In this sense, these issues are not always "black and white", therefore, it has been noted that certain organisations may target environmental aspects which are deemed to be the most relevant to the organisation's preoccupations. As an example, Kolding deemed the total amount of waste as an important factor to minimise due to costs and associated environmental problems. Appropriate formulations in the procurement strategy enabled to satisfy the waste related problems. Clearly, eco-procurement does not endeavour to solve all environmental problems, however, if the procurement strategy successfully minimises overall environmental aspects and effects, then it demonstrates that eco-procurement has helped steer a decision towards a sustainable solution. Thus, the case study has revealed that tender criteria should be tailored to meet certain objectives.

¹³ Personal comment, by superficial I mean that corporate environmental claims were made, but raw data was not provided to support these claims.

¹⁴ Personal comment based on experiences dealing with several incontinence product companies.

Certain experiences (highlighted above and communicated by purchasers via interview) have presented eco-procurement as a relatively embryonic field. Therefore, purchasers have been highly dependent on the use of different support tools (section 6.4) that help with the product's evaluation, by the means of fulfilling tender criteria. Based on the foregoing, the development and application of these tools help eco-procurement strategies to meet quality, environmental and product performance objectives, while at the same time, these tools also provide help with material related costs and diminished environmental risks associated with the product.

Results from the case study indicate, based on balanced evidence, that eco-procurement – if properly harnessed – can lead to a reduction of overall environmental impacts. Based on our existing knowledge of the environmental impacts associated with non bio-degradable plastics and oil based products, Halland can reduce its environmental impacts by the means of eco-procurement, if the product specification has been based on a systems approach. This implies that the product should be accounted for not only when it comes into Halland's system of hospitals, but also when it is being disposed of within this system. An association of cause and effect has revealed that a product constructed with the least amount of plastics and with higher amounts of cellulose should be environmentally suited for incineration because, if disposed in this manner, the properties of the product will emit the least amount of CH₄, SO₂ and CO₂. Conversely, based on Svensson's report, products of the same properties (high amounts of cellulose) will have a higher impact if landfilled due to the slowly decomposing plastics and greater effects of CH₄ on the environment. Therefore, results of this study indicate that a product should be properly calibrated for its journey throughout Halland's entire system. The end-of-cycle handling of products should also be considered in procurement decisions. Additional results from the case study demonstrate that by consolidating their procurement approach in order to gain purchasing clout, and reduce redundancies, Kolding was able to reduce significant financial outlays. By virtue of streamlining their approaches and using the advantages provided by the economies of scale, Kolding was able to decrease their budgets by an estimated 20%, whereas the conglomeration of three Swedish County Councils to purchase a significant amount of eco- products, has the prospects of sending a signal to the market in a bid to green their value chain.

Finally, evidence resulting from various meetings and interviews demonstrate that while environmental product information communication may at times be deemed as an encumbrance, it may also serve as a good indicator of where improvements may be needed to further develop tools and processes to enhance eco-procurement and the purchaser-supplier relationship.

8 DISCUSSION

This thesis has brought forth the certain values that are essential to the character of eco-procurement. By seeking to provide a market for eco-products by engendering the economies of scale approach in order to reduce costs and redundancies, public procurement has also sought to provide an example for its primary benefactor – society. If public sector eco-procurement practices are successful in providing a market for eco-products, and by such actions the marginal costs and quality for green products are satisfactory, then it is possible that private consumer reactions may amplify the public sector's commitment to eco-procurement practices.

Nonetheless, it should be borne in mind that creating a demand for an eco-product could impact the market share of products and overall production. If eco-products are substituted for conventional products, then these stand the chance of having a generally more positive effect on the environment, by decreasing certain impacts by which the eco-product was designed for. However, if eco-products are simply added to the market in addition to the conventional products, then the environmental impacts may either positive or negative. The production aspects coupled with the fact that by simply adding a new product line to the market that will require the use of raw materials, and among other things energy could potentially offset the benefits gained from the eco-product market. As previously mentioned, all products will generate externalities on the environment throughout their life cycle. As such, if the total market share and the production output are increased due to a newly created market, then different environmental effects may occur:

- One outcome could hold that eco-products are streamlined into the market place, and compete successfully to replace a conventional product (as has been the case for recycled paper). This, of course, would contribute to a reduction of overall negative environmental externalities.
- A second possible outcome, could be that eco-products are added to the market but do not manage to elicit significant consumer interest. Such an occurrence that would simply increase the total production of products would run the risks of having the negative impacts associated to production outweigh the benefits of the eco-product.
- A third possible outcome that could emerge is eco-products would successfully compete against conventional products, taking away part of the “brown” product market share, and thereby still make a significantly positive contribution to the overall environment by reducing part of the externalities associated with conventional products. This would qualify as a positive effect on the environment.

Therefore, in order for public eco-procurement to occur successfully, it may be essential for the purchasing organisation to have a compelling need to achieve this practice. It can be argued that this could be equivalent to the private sector's “business survival” philosophy. In order to be successful, eco-procurement should be carried out with determination to achieve set environmental objectives within a feasibly economical manner without compromising overall quality or fitness for purpose of its objectives. Deviation from this will most likely

result in a compromised attempt to offer sustainable solutions to the procurement domain. After all, eco-procurement, as defined earlier, holds that environmental and economic solutions should be reconciled in order to contribute to a sustainable development.

Since the public sector must operate in a regulated spectrum, certain actions, such as persuading certain key players that “environmental values” are a necessity, may be needed for this process of change to move forward. In order for this to occur, it may be argued that the public sector may be more successful and / or effective in increasing its influence when it is a large buyer of goods. In this context, the case of Halland County, by combining three County Councils to form one procurement entity for adult disposable incontinence products, serves as an example. If their major purchases of incontinence products are directed towards an eco-product line, then the significance of that large contract will probably have a more pronounced influence on the market and stakeholders. As such, if this eco-product is successful, and the reductions of negative environmental effects are demonstrably attainable (as postulated in this thesis) at no additional cost, then this should arguably be a compelling reason for other organisations in Sweden to follow suit. Solvency in eco-procurement can alter public perception to enhance their green purchasing practices.

As may be expected, if eco-procurement becomes proliferated throughout the public sector, and can influence in other spheres, such as the private sector and the private consumer, then it could succeed in reducing the share of conventional products that emit more environmental impacts. The potential of transcending industry norms for the Swedish market may be precipitated by frequent and future demands of eco-products by means of large procurement contracts. Analysing this from a systemic viewpoint, as found in the case study results, an eco-procurement strategy should not only focus on product substitution, but should also address the continuum of its effects on total production and consumption patterns. If these are kept in mind, then eco-procurement should have a better chance of being understood and should therefore lead to a reduction of certain environmental vulnerabilities. Nevertheless, in order for organisations and eco-procurement to attain significance on the market and in society, it was argued that action should be taken at the root source of the issue.

Before action is taken however, there should be a perception of how to adequately frame the problem. In the context of eco-procurement, one way of determining where to start in order to obtain necessary results is by back-casting - taking a bottom-up approach to identify what should be done for Halland and Kolding to reach sustainability. Here, an internal look at procurement activities (box 1, chapter 3.1) should reveal ways in which action is carried out, and how results are obtained. Although the characteristics of procurement activities consider various implications, as demonstrated in chapters 5 through 7 of this thesis, there is much work to be done in order to adequately incorporate environmental considerations into a procurement framework.

From the onset, (unlike what may be professed in the private sector procurement theory), it was revealed that the public sector cannot strategically develop close relationship with would-be suppliers in the aim of developing processes leading towards the eventual realisation of a product. Additionally, since the public sector cannot specifically target suppliers with optimised production processes that might facilitate the advent of future eco-products, public purchasers could set out a transparent action plan before purchases are carried out. Since tenders are based on competition, in order to obtain the best product,

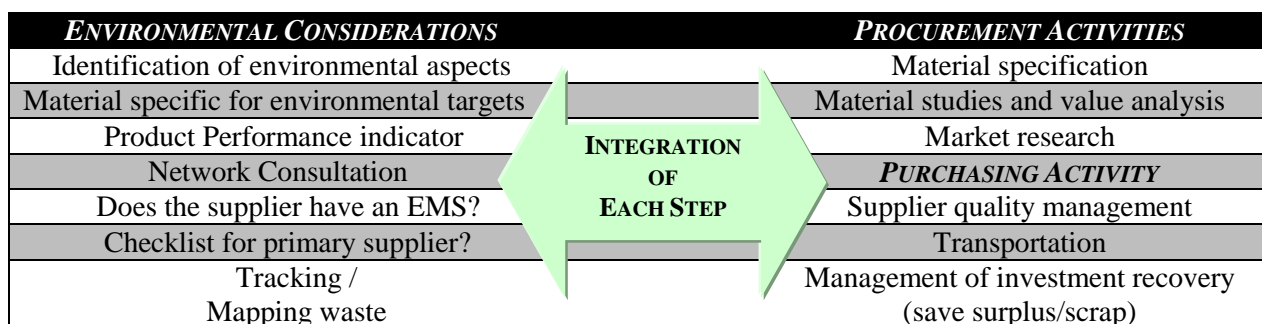
specific to the context in which the purchasing organisations operate in, procurement activities may need to be redefined.

8.1 THE PROCUREMENT ACTIVITIES – RE-VISITED

Much like what was written in chapter 3.1, purchasers can rarely fulfil all the objectives found in the theory of procurement. Due to some potential inherent conflicts between the “right quality, right source, right price, and right time” of purchased materials, public purchasers must balance and weight certain alternatives against each other, and decide which aspects to prioritise for a set time horizon (e.g. the duration of the contract). The same axiom should apply to public purchasers seeking to integrate environmental principles with the procurement activities. It has been acknowledged by way of the case study that, in certain instances, in order to make progress, certain environmental principles may need to be relinquished at the expense of other environmental problems. In principle, these trade-offs should be calculated and balanced according to the procuring organisations’ objectives. Objectives may take the form of broad goals set by the organisation to improve environmental performance related to the specified product.

Although it has been demonstrated through out this study that eco-procurement has been met with successful result, a common reproach had to do with the way in which the process was being carried. An important finding in this research was that administrating the information exchange was complicated, and time consuming. It appears that this had to do with the lack of co-ordination among actors to ask for and supply relevant information, and a lack of knowledge of what aspects to prioritise. To that end, it was understood that the environmental performance objectives of product procurement should then be made in the early stages of the procurement activities. In lieu of the perceived problems related to environmental information as highlighted in the case study, it may be beneficial from a systemic viewpoint, if the procurement objectives would be considered sequentially at the same time as environmental considerations. As seen in box 4 (below) an integrated, step-by-step process may facilitate the eco-procurement practice. Although these characteristics do take place, as we have seen throughout chapters 5 to 7, it appears that the steps are taken separately.

Box 4: The Integration of Environmental Considerations into Procurement:



The case study, indicated that under certain conditions, there has been an uncoordinated approach from purchasers requesting product information. Purchasers tended to put unrelated demands on suppliers, making it difficult for suppliers to know what the purchasers really want to achieve with these specifications. Tender documents and interviews for this research

highlighted purchasers' request for an array of information only to put confusing demands for a vaguely defined "green product". Against this, suppliers may benefit from a simpler, more direct approach taken by a network of purchasing organisations, such as Halland, Blekinge and Kronoberg. If organisations unite as such, this may be conducive to less skewed demands. If suppliers have a better understanding of what purchasers want, then in a competitive bidding situation, all parties may benefit from an integrated approach. In short, a blunt approach may be: "tell me what you want, I'll sell you what you need".

Box 4 may be used to illustrate this direct approach, whereby the case study can serve as an example. One of Kolding's objectives was to reduce the total amount of post consumer waste, whereas it was assumed that one of Halland's objectives was to reduce the amount non-biodegradable post-consumer waste. In the case of Kolding, an example of an objective could have been a 27% weight reduction of total post consumer waste related to incontinence products because of the aspects related to the environmental impacts on air, water or the ground.

Step 1 in the direct approach, calls for clearly stated relevant aspects which should be checked in relation to the material specifications. This may make the latter step clearer (e.g. knowing that plastics pollutants are to be avoided, then a clear specification could exclude this material from the diaper). In step 2, targets could be set which would relate to materials studies function (e.g. is this material a suitable alternative to the conventional product?). Knowing which aspects to check, which targets are set, and which materials to include or exclude, the organisation could move on to step 3. In this step, the product performance indicators which include environmental indicators could then be set congruent to step 1 and 2. The a call for tenders would enable market research for the best potential product-supplier, based on the above environmental considerations, and other relevant criteria would be communicated clearer. In the interests of clarity, the integration of such steps that combine incremental environmental requirements with procurement activities could arguably eliminate certain nuances regarding environmental product information, as seen in the case study. Since product related issues are not new, environmental aspects of product should be well known.

As previously seen by way of Halland, engendering a group procurement can make use of certain advantages held in economies of scales procurement. By acting as a network, more resources may be made available to cover not only the financial costs associated with this integrated approach, but also for capacity building purposes. By enlarging the pool of knowledge and experts in the purchasing entity, in other words, by creating a procurement network for commonly used goods (such as diapers in the health sector), multi-disciplinary cross-functional teams could support and provide input in various phases of this streamlined, direct eco-procurement approach.

Once the network of purchasing organisations have agreed upon standards and a purchase has been carried out (step 4), then it may be legally possible in the initial phase (if desired) to work with the supplier's environmental management, quality issues and the like (as proposed by Bogren). The last step, of procurement logistics includes waste. Since the inflows of material will be well known due to the previous steps taken, it should be possible to track/map waste to see if the targets are being met with success. A year end report could generate valuable feedback for all parties concerned. In this sense, eco-procurement could be determined by looking at absolute figures (figures for consumption of materials, type and

weight of waste) and relative figures by using the previous year as a reference for indices. Again, the way waste is handled, may be a key determinant at the procurement stage.

Although, it is admitted that the limitations in the above direct approach are great, and in practice would be difficult to incorporate, additional research in this area of reconciliation could still be worthy to consider, in light of the certain unsystematic approaches currently employed for eco-procurement. Based on the findings in this thesis, approaches that have successfully picked out environmental aspects to focus on have made it easier for suppliers to contribute to the process, as was the case for Kolding. Notably, it is fundamentally important to stress that this is not an attempt to outline an approach for a single issue criteria, since from an environmental point of view these tend to transfer one environmental impact into another. Rather, the optimum is to **link** the acquisition of products to a series of environmental effects that may occur throughout products' life cycle.

8.2 PROSPECT FOR THE FUTURE

The information obtained throughout this research, has provided insight on how the procurement process functions in the public sector. Although the procurement function holds an important role, and has arguably demonstrated that it is a value generating position that interacts among key stakeholders, the process illustrated in Figure 1 (chapter 3) does not accurately depict the public eco-procurement function. Even if public procurement has emanated from the same theory base, the model presented does not quite fit the reality of public purchasers' role. Although the complexity of eco-procurement may necessitate such a great deal of interface with the engineering and quality assurance departments, these relationships were not fully explicitly revealed. Whilst the relationship with the manufacturer was very strong, the latter relationships were rather latent. Potentially, the model represented could be applied to the public eco-procurement if purchasers realise that they may need to go further in order to elucidate product demands, and adopt an involved approach in the demand of eco-products. As it stands, it appears that input from an engineering perspective along with quality assurance would provide necessary insight to help purchasers gain a better understanding of the products they are seeking to alter. At present, a true "green product" seems to be a very intricate meaning which is based on the purchasing organisation's values.

Based on the case study, and interviews, the definition of an eco-product is still not quite successfully advanced in order to bring forth succinctly clear environmental criteria. In light of the uncertainty regarding environmental problems, purchasers and suppliers may need to rely on simplified tools, that promote factual documentation and greater transparency. This may not be well suited for certain companies, as demonstrated in the case study. However, for suppliers who may be enticed in making seemingly risky decisions that may alter the business approach of their company, it should be reminded that the eco-product industry is just now beginning to mature. As such, the work undertaken by the Committee for Ecologically Sustainable Procurement, the Swedish Federation of County Council, among other key players, is just now beginning to bear fruit. As has been discussed throughout this paper, organisations are just now beginning to grasp the complexity of this embryonic field. The landing of a major contract, such as the one offered by Halland, would be a tremendous boost to the eco-product industry, and could signal the beginning of an enlightened market reaction.

The discussion surrounding the applicability of tools in itself demonstrates the possibilities to green the market. Notably, the use of tools such as databases and eco-labels, although sensibly limited, has provided a very good outlet to exercise environmental criteria. The use of life-cycle thinking, as mentioned earlier, can provide an appropriate guiding point if properly understood, but may also be an impediment due to the enormous amount of information that needs to be filtered. In this respect, purchasers need assistance, and probably more importantly, they may need confidence in the learning by doing process. It has been argued that if specific information (based on existing tools) is advanced to suppliers in a coherent approach, this may help purchasers get the performance they seek out of a product, and minimise relevantly communicated environmental impacts. In short, if suppliers know that waste reduction is important to a network of purchasers, then supplier engineering focus could be directed to that end. Amid the confusing aspects which reconciles legislation, economics, scientific principles, and perhaps, an even more daunting public opinion, purchasers can take comfort in the fact that progress is usually a time consuming undertaking.

9 CONCLUSION

This study is a contribution towards a better understanding of how public eco-procurement can help steer the public sector towards sustainable development. It has been demonstrated by the means of examples throughout this thesis, that by integrating environmental criteria into the procurement process, purchasers will have possibilities of influencing environmentally least harmful product supply. The foregoing, based balanced evidence, has advanced that eco-procurement can help steer the public sector towards sustainable solutions. It has been noted that the importance of clear and specific criteria is fundamental to move forward the eco-procurement process. The consideration of various aspects and environmental effects into the demand of a product, quells several pressing concerns that would otherwise have greater adverse impacts throughout the product's life cycle. A responsible approach towards sustainability involves the development of an environmentally conscience procurement strategy. As demonstrated throughout this research, not only does this offer potential public money savings, generate value and saves resources, it also has the potential of being wielded to influence widespread production and consumption patterns.

Although financial arguments may be needed to convince some people of the potential merits offered by eco-procurement, it may be argued that it is unwise to promote this means as a vehicle for moving organisations towards sustainable development. Rather, values should arguably be shifted from a financial incentives towards a more holistic approach that considers environmental costs. This is especially relevant since decisions related to the procurement of eco-products may not be completely driven by cost, therefore, the actors – purchasers and suppliers – may need training to familiarise themselves with new priorities, procedures for evaluating or assessing decision making.

In that respect, it was noted that additional training and education programmes need to be established in order for eco-procurement to gain added significance in organisations. It is essential to cultivate knowledge, understanding and innovation for any results to be met with success. The ambivalence of a great number of purchasers to incorporate bold environmental criteria has primarily been attributed to the fact that they lack a knowledge in areas pertaining to legislation. Additionally, education is needed to reconcile communication problems that

have characterised the purchaser – supplier relationship. The lack of co-ordination and complexity of information demanded and supplied, along with the grave uncertainties regarding of the strength of purchasers' demand has encumbered the procurement process. In lieu of the uncertainties that characterise this process to tackle environmental problems, there is a pressing need adopt a systematised process. In this respect, until confidence is gained, and mature eco-procurement strategies become clearly defined, public organisations may begin the process by limiting their scope, and focus on areas which have the greatest opportunity to create a positive outcome. By tailoring strategies for high volume goods, and towards people who make the larger portion of procurement, environmental aspects would be curtailed and the procurement strategy would have time to mature.

In the interest of clarity, an underlying concern that should be addressed is a need to simplify the environmental decision making process by integrating tools that are easy to understand and use into the organisations procurement process. Since purchasers have identified that they are unlikely to use complicated tools as offered in life cycle approaches, user-friendliness is essential. In an effort to deploy greater responsibility for the advancement of eco-procurement, a multi-faceted approach will necessitate a collaborative, cross sector approach. Simplified tools and approaches need to be refined since it has been demonstrated in this study that there is an increasing demand for factual, reliable documentation and transparency. By streamlining procurement practices, and forming a network for large re-occurring procurement, it has been argued such a strategy may enable a more coherent spectrum with reduced customer demand anomalies. Although a sufficiently clear environmental criteria has yet to be developed and unanimously approved, it is expected that the development of experience, public opinion and innovative technology will enable purchasers to refine and develop the maturing field.

10. REFERENCE LIST:

- Agence de l'Environnement et de la Maitrise de l'énergie (ADEME). *Verdissement des administrations*, Ministère de l'Aménagement du Territoire et de l'Environnement: France, 2000.
- Anderson, V. & Johnson, L. *Systems Thinking Basics*, Pegasus: USA, 1997.
- Bailey, P., Farmer, D., Jessop, D. & Jones, D. *Purchasing Principles and Management*, 8th Edition, Financial Times Pitman Publishing: UK, 1998.
- Bars, Bert. *Incorporating Environmental Issues in Product Design and Realization*. UNEP, Industry and Environment, January – June 1997.
- Brown, L., Flavin, C., French, H. *State of the World 1999*, W.W. Norton and Company Inc.: USA, 1999.
- Commission of the European Communities. *Public Procurement in the European Union*. COM (98) 143, 1998.
- Committee for Ecologically Sustainable Procurement (EKU). *Apply Environmental Criteria in Public Procurement of Goods, Services, and Works*, Ord & Vetande AB, Uppsala: Sweden, 1999.
- Cox, Andrew. *Innovations in Procurement Management*, Earlsgate Press: UK, 1996.
- Davies, T. & Lowe A. *Environmental Implications of the Health Care Sector*. Resources for the Future: Washington, DC, 1999.
- Dobler, D. & Burt. *Purchasing and Supply Management: text and cases*. 6th edition, New York: McGraw-Hill, 1996.
- EEA (European Environmental Agency). *Environmental Assessment Report, No.2. "Environment in the European Union at the Turn of the Century"*. European Environment Agency: Denmark, 1999.
- European Commission, Directorate General for Industry (EU COM, DG III). *Adoption by Industry of Life Cycle Approaches – Its Implication for Industry Competitiveness and Trade*, European Communities: London, 1998.
- Goldman, Patti & Wagner J. Martin. *Trading Away Public Health*. Multinational Monitor, Vol. 20, Issues 10 & 11, p.21, Oct/Nov, 1999.
- GRIP Centre. *GRIP Purchasing*, GRIP Centre: Norway, 1996.
- Hettenbach, Todd. *Greening the Hospitals – An Analysis of Pollution Prevention in America's Top Hospitals*, Environmental Working Group, The Tides Center: Falls Church, 1999

Jeppesen, Tim. *The Amsterdam Treaty – A Clarified and Expanded Framework for Environmental Policy in Europe*, European Studies Paper, No.30/1998, Odense University: Netherlands, 1998.

Jönsson K., & Thidell, Å. *Environmental Communication in Procurement*, The International Institute for Industrial and Environmental Economics: Lund, Sweden, 1999.

Kirkpatrick, Neil. *Life-Cycle Analysis and Ecolabelling*, Pira International, 1992.

Kolding Kommune, *Inkontinens årsrapport 1999*, Municipality of Kolding, Denmark, 1999.

Kommunförbundet Västernorrlands, *Miljöanpassad Upphandling*, Härnösand, Kommunförbundet, Västernorrlands: Sweden, 1999.

Kretsloppsdelegationen. *Green Goods Rapport - 1995:5*, Regeringskansliets Offisetscentral: Sweden, 1995.

Lamming R. & Cox, A. *Strategic Procurement Management in the 1990's*, Earlsgate Press: UK, 1996.

Leeds Metropolitan University, *Green Stationery Guide*, Leeds Metropolitan University, UK, 1998.

Mäding, Heinrich. *Environmental Controlling in the Public Sector*. EcoProcura Magazine, August 1999.

Miller, G. Tyler. *Living in the Environment*, Brooks/Cole: New York, USA, 2000.

Møller-Jessen, B. *Kolding 25% Green Procurement – Integrating Environmental Criteria into Purchasing Practices*. EcoProcura Magazine, June 2000.

Nader, R. Lewis, E.J. & Weltman, E. *Shopping for Innovation: The Government as a Smart Consumer*. The American Prospect, Issue 11, pp. 71-78, 1992.

National Board for Public Procurement, *A Brief Description of LOU – The Swedish Public Procurement Act*, National Board for Public Procurement, June, 1999.

Nordic Council of Ministers (Nord). *Nordic Guidelines on Life-Cycle Assessment*, Copenhagen, Nord 1995:20.

Nordic Ecolabelling. *Ecolabelling of Disposable Diapers – Criteria Document, Version 3.2*, Swedish Industries Standards Nordic Ecolabelling: Stockholm, 1998.

Nordstedts svensk-engelska ordbok, Nordstedts Förlag AB: Oslo/Gøvik, 1992.

Olsson, T. & Retzner, L. *Plockanalyt Hushållens säck-och kärlavfall*. FoU 145, Stifelsen-Reforsk: Malmö, Sweden, 1998.

Organisation for Economic Co-operation and Development (OECD) *Greener Public Purchasing – Issues and Practical Solutions*. OECD Publications: France, 2000.

Rich, Nick. “*The Use of Quality Function Deployment for Relationship Assessment: Adversary, Associate or Partner?*” in: Cox, Andrew. *Innovations in Procurement Management*, Earlsgate Press: UK, 1996.

Scheuing, Eberhard, E. *Purchasing Management*, Engelwood-Cliffs, Prentice-Hall: New Jersey, USA, 1989.

Senge, P., Kleiner, A., Roberts, C., Ross, R., Smith, B. *The Fifth Discipline Fieldbook*, Doubleday: USA, 1994.

Société Suisse pour la Protection de l’Environnement. *Mise en œuvre d’une politique d’achat écologique à Genève*, Département de l’intérieur, de l’agriculture, de l’environnement et de l’énergie: Genève, Suisse, 1999.

Steele, P. & Court, B. *Profitable purchasing strategies : a manager's guide for improving organizational competitiveness through the skills of purchasing*. London : McGraw-Hill, 1996.

Svensson, S. *Environmental Effects of Choosing Between Cloth Nappies and Disposable Nappies*, Swedish Society for Nature Conservation: Gothenburg, 1994.

The Swedish Association of Waste Management (RVF). *Swedish Waste Management*, Swedish Association of Waste Management: Malmö, Sweden, 1999.

Van Weele, A.J. *Purchasing Management: analysis, planning and practice*. London: International Thomson Business Press, 1997.

World Business Council for Sustainable Development (WBCSD). *Cleaner Production and Eco-Efficiency: Complementary Approaches to Sustainable Development*. United Nations Environment Programme, 1997.

World Commission on Environment and Development. *Our Common Future*, Oxford: Oxford Univ. Press, 1987

PERSONAL COMMUNICATION:

Adolfsson, Andreas. Quality Logistics and Environmental Coordinator, SCA AB
Personal interview: November 6, 2000 (telephone)

Andermyr, Lisbeth. Procurement Officer, Halland County
Personal interview: October 20, 2000, Halmstad, Sweden.

Bogren, Alvar. Procurement Director, Federation of Swedish County Councils
(*landstingsförbundet*)
Personal interview. October 3, 2000, Stockholm, Sweden.

Kristian-Smith, Hans. Environmental Quality Coordinator, Finess Hygiene AB
Personal interview: November 7, 2000 (telephone)

Damm, Michael. Head of the Environmental Department, City of Kolding, Denmark; Chair of the European Green Purchasers' Network. Personal communication: October 18, EcoProcura Lyon Conference, France.

Knutsson, Pernilla. Principal Secretary. Committee for Ecologically Sustainable Procurement. Ministry of Environment, Sweden. Presentation Session: *National Procurement and Eco-Efficiency* at Eco Efficiency Conference 2000, June 20, 2000, Malmö, Sweden.

Knutsson, Pernilla. Principal Secretary. Committee for Ecologically Sustainable Procurement. Ministry of Environment, Sweden. Personal interview. October 3, 2000, Stockholm, Sweden.

Lefèvre, Pascal. Administrator, Directorate-General Environment, EU Commission. Personal communication: October 18, EcoProcura Lyon Conference, France.

Møller-Jessen, Bente. Technical Administration, Department of the Environment, Municipality of Kolding.
Personal communication: October 26, 2000.

Nordström, Anna. Environmental Consultant, Kemi och Miljö AB.
Personal interview, October 2, 2000, Stockholm, Sweden.

Sveman, Eva. Legal Advisor. Federation of Swedish County Councils (*landstingsförbundet*) and Member of Expert Group, Committee for Ecologically Sustainable Procurement. Personal interview. October 3, 2000, Stockholm, Sweden.

Wijkman, Anders. EU Parliament, Sweden.
Presentation Session: *Increased Eco-Efficiency in the EU – What is Required?* Eco Efficiency Conference 2000, June 20, 2000, Malmö, Sweden.

INTERNET RESOURCES:

Ohman, Daniel. *Strid om upphandlingslag*. Dagens Nyheter.
Website visited: October 13, 2000.

<http://www.dn.se/DNet/articles/135200-135299/135201/inbadhus.html>

Europa. *Public Procurement: Commission Proposes to Simplify and Modernise the Legal Framework*.

Website visited: June 22, 2000.

http://europa.eu.int/comm/internal_market/en/publproc/general/2k-461.htm

International Council for Local Environmental Initiatives (ICLEI). *EcoProcura Information*.
Website visited: September 18, 2000. <http://www.iclei.org/europe/ecoprocura/info/index.htm>

International Standardisation Organisation (ISO). *ISO 14000 Family*.
Website visited: September 5, 2000. <http://www.iso.ch/9000e/iso14000.pdf>

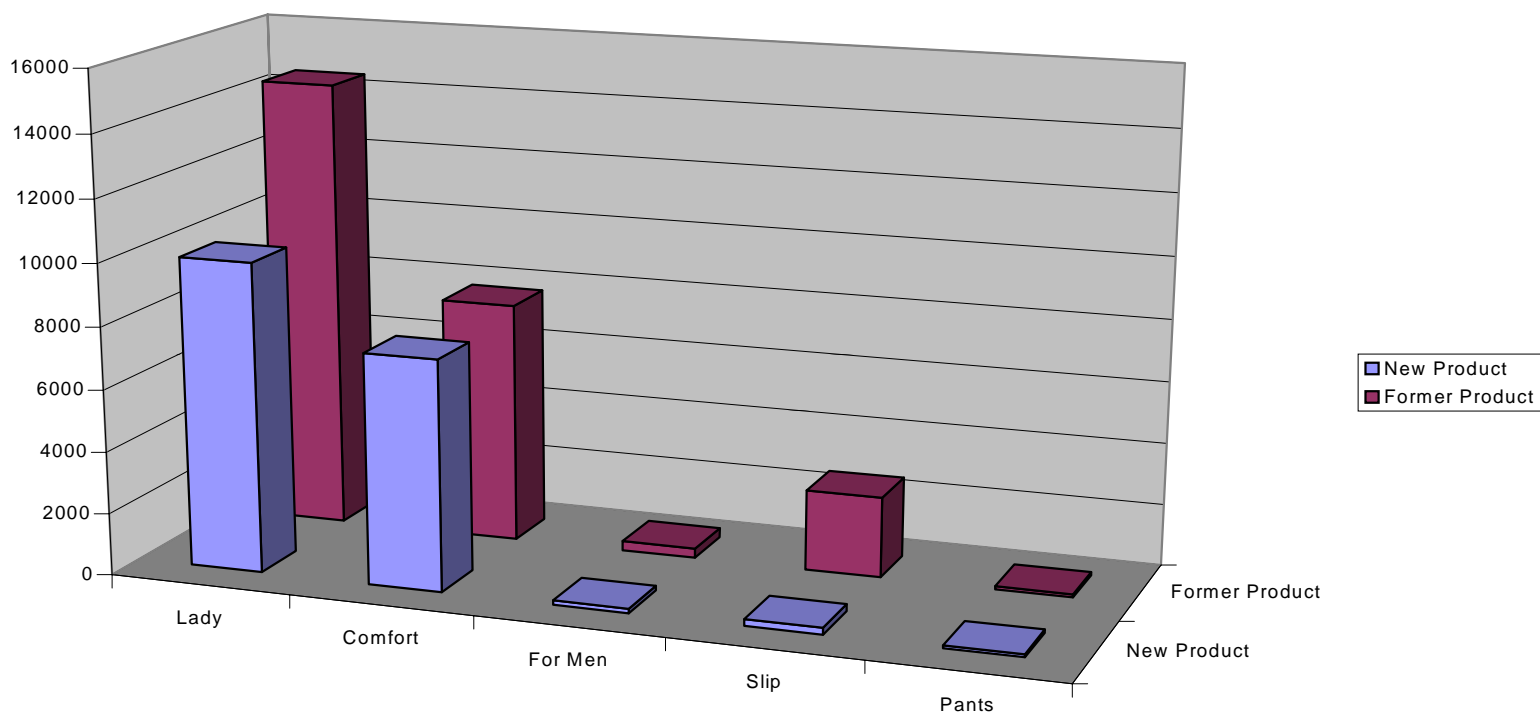
Swedish Cabinet Office. *Enkät mars 1999 – Mer än 200kommuner svarade*.
Website visited: August 12, 2000.
http://www.hallbarasverige.gov.se/vagar_till/upphandling/enkatmars99.htm

Swedish Cabinet Office. *Statement of Government Policy*. Website visited: September 19, 2000.
http://www.regeringen.se/regeringen/regeringsforklaring/tidigare_regeringsforklaringar/000919eng.htm

The Swedish Association of Waste Management (RVF). *Waste to Energy*.
Website visited: October 21, 2000. http://www.rvf.se/avfallshantering_eng/00/rub9.html

11. APPENDIX 1

Incontinence Product Environmental Load to Waste stream, Kolding, Denmark.



1999	Waste (Kg) (new product)	Waste (Kg) (former product)	Difference (Kg)	Difference (%)
Lady	9964	14503	4538	46
Comfort	7416	7771	355	5
For Men	146	307	160	109
Slip	226	2601	314	14
Pants	97	101	4	4
Total	19911	25282	5372	27

Note: Information obtained for Kolding has been based on previous studies from Frederiskberg Community, Denmark.

Source: Kolding Kommune Report, 1999