DEVELOPMENT OF AN ENVIRONMENTALLY SENSITIVE PURCHASING POLICY FOR THE UNIVERSITY OF MANITOBA

by

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A Practicum Submitted in Partial Fulfillment
of the Requirements for the Degree
Master of Natural Resources Management

Natural Resources Institute
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June 1993

ISBN 0-315-85979-2

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DEVELOPMENT OF AN ENVIRONMENTALLY SENSITIVE PURCHASING POLICY FOR THE UNIVERSITY OF MANITOBA

BY

BRIAN LADD

A practicum submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF NATURAL RESOURCES MANAGEMENT

Abstract

This study examined the purchasing policy of the University of Manitoba in light of the environmental impacts associated with the production and consumption of goods and services in a modern economy. The purpose of the study was to explore and recommend to the University of Manitoba purchasing policies that would help minimize adverse environmental impacts. A simple product evaluation process was also developed as an integral part of environment-related purchasing policies.

The methods employed to produce and evaluate purchasing policy options consisted of a literature review, on-campus interviews, an environmental purchasing policy questionnaire (administered to several universities in North America), and a policy evaluation matrix.

As a foundation for action addressing the environmental impacts of purchasing, and as a proxy for other kinds of environmental impacts, (solid) waste reduction was recommended as an initial focus for the University of Manitoba.

Five purchasing policies were finally recommended for adoption at the university: preference for recycled-content and recyclable goods; sharing/exchanging goods and materials on campus; inter-institutional purchasing cooperation; promotion of supplier waste minimization planning; and purchasing education. The five recommended policies are to provide a basis for further environmentally sensitive purchasing policy change--and possibly other environment-related initiatives--at the University of Manitoba. The creation of a university "Environmental Procurement" committee, able to consider the environmental implications of University of Manitoba purchasing practices and to authorize policy changes, was also recommended.

Acknowledgements

Thank you to all committee members--Mr. Derek Coyle, Dr. James Gardner, and Dr. Peter Miller--for their encouragement, support and assistance in seeing the project through to its final form. I would also like to especially thank my advisor, Dr. John Sinclair, whose timely advice and concern not only for the completion of the project but for the mental health of the researcher did not go unnoticed! My thanks go out to Judy Zieske in the Natural Resources Institute office as well, for her help in getting the questionnaire ready for mailing and for her administrative assistance.

Finally, I should like to thank family and friends who supported me throughout the study, and above all the God of Jesus Christ in whose creation we dwell.

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CHAPTER I

INTRODUCTION

1.0 INTRODUCTION

Purchasing is the process of obtaining goods and services through financial transaction. It is but one aspect of procurement, a broader term that, in addition to purchasing, describes the functions of inventory control, traffic, receiving, incoming inspection, and salvage operations (Aljian, 1973). For many organizations, the bulk of goods and services obtained are purchased.

Purchases made by individuals or corporate bodies have environmental, social, and economic implications. Consumer choice exercised in local, national, and international markets influences the rate of natural resource depletion, personal livelihoods, and the functioning of economies, from local to international. The materials and energy used in the production of a product and in its transportation, the human input at every stage, and the effects of a product's use and disposal or recycling are all influential in defining the total environmental impact of a society's material flows.

Increasingly, corporations, institutions, and governments are discovering that purchasing is more than just the procedures of financial transaction and that it is an activity implicated in environmental issues. Twenty years ago a major purchasing guidebook indicated the role of purchasing in ecology thus:

> "Purchasing people must now concern themselves with the cost of low sulphur fuel and pollutant-monitoring equipment, as well as with the ultimate use and destination of plant refuse and plant processes that may contaminate the atmosphere or the water supply." (Aljian, 1973).

More recently, advice given to corporations (Achieving Environmental Excellence: A Handbook for Canadian Business, 1990) and to institutions (53 Simple Things Universities and Colleges Can Do to Reduce Waste, 1992) has included recommendations to make purchasing sensitive to environmental conditions. The "4Rs" (Reduction, Reuse, Recycling, and Recovery) are frequently invoked as guidelines for purchasing decision-making. There are also periodicals such as The Ethical Consumer (ECRA Publishing) that advise individuals to buy from producers who purchase their own inputs with environmental foresight, who are fair to employees, and who are aware of the social implications of their investment decisions.

In most organizations purchasing decisions are guided by *purchasing policy*. Purchasing policy may be defined as the collection of directives and customs that determine the kinds, quantities, and sources of goods that will be bought. For large organizations that consume a variety of products and that make many purchasing decisions each day, purchasing policy often takes written form as a procedures manual that provides guidelines or rules on how to process internal requisitions, how to solicit bids, and how to select suppliers and keep relations with them. Criteria used to differentiate between like products are conventionally price, quality, and availability. Because it is often the "...overwhelming concern of purchasing departments...to minimize short-term costs" (Schwartzel, 1992), the reckoning of environmental considerations in purchasing policy can be neglected.

There exist, nonetheless, organizations that have begun to work environment-related terms into purchasing policies. These policy changes have often been undertaken as part of broader environmental policy initiatives or with respect to specific goals such as solid waste minimization.

1.1 THE UNIVERSITY OF MANITOBA: PURCHASING POLICY AND ENVIRONMENTAL PLANNING

The University of Manitoba has a student, faculty, and support staff population of over 30 000. The central Purchasing Department at the Fort Garry campus processes about 40 000 requisitions per year from researchers, faculty, administrative personnel, and service departments (Coyle, 1992). Purchasing is guided by rules and procedures set forth in the University of Manitoba's Policy and Procedures Manual ("Purchasing/Accounts Payable Operating Procedures") and by precedent established by Purchasing Department staff in day-to-day operations.

Various persons have input into purchasing decision making at the University of Manitoba. With purchase orders, researchers or administrative or service personnel usually initiate the process by submitting a requisition form to the Purchasing Department. The Department then locates a suitable supplier and makes the purchase. A lower-priced alternative good, of comparable specification to the product requested, can be recommended to the requisitioner by the Purchasing Department--after receipt of the requisition but before finalization of any transaction. For goods purchased through systems contracts or standing orders, user departments have somewhat less immediate involvement. The Safety Office on campus may be involved in purchasing if goods to be purchased are hazardous and/or require special handling on campus. Senior administration may be involved in interpreting purchasing policy if there is disagreement between parties. In such cases, the Research Administration office and the labour unions represented on campus might also be involved. Finally, the consumption activities of all students, faculty, and staff on campus are relevant to the purchasing function, even if these persons are not directly involved in purchasing decision-making.

The written portion of the University of Manitoba's purchasing policy was drafted in 1978 and has been revised only slightly since, coming under review in the 1992-93

academic year. The environmental implications of the policy--the extent to which the policy hinders or facilitates environmentally sensitive purchasing--are uncertain. Further, the ways that the university's purchasing policy can begin to promote the well-being of the environment are not clear.

In July-August of 1992 a preliminary report entitled: "The University of Manitoba and the Environment: A Framework for Action" was prepared by the Office of the Vice-President (Academic) and Provost and the Natural Resources Institute. The purpose of the report was to provide an overview of environmental planning and action initiatives at the University of Manitoba and at other institutions, and to suggest ways that teaching and research at the University of Manitoba could be linked with university operations to reduce the adverse environmental impact of campus activities. An examination and revision of the purchasing policy at the University of Manitoba was proposed as a means by which positive environmental action at the University of Manitoba could be taken, since almost all university activities are touched in some way by the effects of the decisions made through purchasing policy.

1.2 THE PROBLEM

The extent to which the purchasing policy of the University of Manitoba promotes the environmentally sensitive procurement of goods and services is not clear. However, the influence that the purchasing function at the university has on the environment is significant. For example, it is not unusual for three or more tonnes of solid waste to be taken from the Fort Garry campus to Winnipeg's Brady landfill site in one day. Much of this material (such as paper, cardboard, packaging, food, and disposable products) was initially bought by the University of Manitoba in light of current university purchasing policy.

The University of Manitoba's purchasing policy does not make clear provision for the formal inclusion of environmental considerations in decision-making, and the most effective ways of improving the University of Manitoba's purchasing policy in this regard have not been established. The purpose of this study is, therefore, to develop environmentally sensitive purchasing policy options for the University of Manitoba.

1.3 OBJECTIVES

The objectives of the study are as follows:

i.) To identify the components of the university's current purchasing policy--i.e. how purchasing decisions are made at the University of Manitoba;
ii.) to determine how the current purchasing policy facilitates, permits, hinders, or prevents adverse environmental impacts;
iii.) to identify and review purchasing policies at other institutions that incorporate environmental considerations;
iv.) to identify alternative methods of making the University of Manitoba's purchasing policy inclusive of environmental considerations;
v.) to evaluate these alternative methods in the University of Manitoba context; and
vi.) to make recommendations regarding the formal recognition of environmental considerations in the University of Manitoba's purchasing policy and to propose a decision making process for the evaluation of products purchased at the University of Manitoba.

1.4 DELIMITATIONS AND CONTEXT

The study focuses on the purchasing policy of the University of Manitoba's Purchasing Department, Fort Garry Campus. This policy, as a guide to decision making, may however include influences external to the Purchasing Department itself. The study is

concerned only with purchasing that is the responsibility of the Purchasing Department. Library acquisition, Bookstore retail inventory, certain food service contracts, and private business purchasing on campus are excluded, except where such purchasing impinges on Purchasing Department policy. Services as well as goods purchased are within the scope of the study, with distinctions being made where appropriate.

The study provides explanatory detail and raises questions beyond its immediate practical applications. In this sense the work has an "educational" function. The development of a concise manual or brochure, to serve as a guide for implementing the various recommendations of the study, is suggested as a follow-up exercise. Such a guide would be a help but not a necessity.

As mentioned in Section 1.1, making changes in the University of Manitoba's purchasing policy is understood as one way of taking environmental action at the university. This study can therefore be seen in the context of the development of a broader "green plan" for environmental action at the University of Manitoba.

1.5 METHODS

The methods employed in attaining the study objectives were several. They are listed and explained here, with reference to the objective(s) to which they apply.

Literature Review

The literature review entailed a search into several different kinds of written records. Since there is not a significant body of journalistic or expository literature on the subject of purchasing and the environment, other sources were consulted. In respect to objective (i), sections of the University of Manitoba Policy and Procedures Manual were reviewed.

Objective (i) also warranted an examination of internal purchasing records, such as purchase order forms and the like that reflect trends in purchasing. Review of the literature on environmentally sensitive and/or ethical purchasing--to help describe the kinds and extent of environmental impacts that may accrue to purchasing activity--were part of efforts to meet objective (ii). This literature included research papers, consumer guides and government publications, and a few books. Objective (iii) required that documents received from other institutions and organizations be reviewed for purposes of discovering the rationale for the specific measures there taken and for generating policy change alternatives for consideration at the University of Manitoba. Finally, the portion of objective (vi) regarding the proposed product evaluation decision making process was attained largely through a review of the literature. Information gained from informal consultations and from the questionnaire portion of the study was also utilized to this end.

Interviews/Consultations

Since purchasing policy is implemented by people, interviews or consultations with persons involved in different aspects of purchasing decision making was required in the attainment of objectives (i), (ii), (iii), and (v). Interviews with selected persons working in the Purchasing Department of the University of Manitoba, and with representatives from other departments or bodies on campus that have a part in purchasing decisions were scheduled in a semi-structured format for application in objective (i).

In the course of administering the purchasing policy questionnaire (described below), brief telephone interviews with purchasing representatives from other institutions were undertaken. This less formal interviewing was to explore some of the first-hand experiences that purchasing personnel have had with the policies they were questioned on through the questionnaire.

Finally, consultation was required in pursuit of objective (v), as evaluating purchasing policy alternatives in the University of Manitoba context requires an understanding of the attitudes towards those alternatives by the persons who would play central roles in their implementation. For this reason the review of draft policy alternatives with key decision makers was pursued prior to finalization of recommendations.

Hypothetical Product Scenario

An analysis of the potential environmental impacts of a product purchased at the University of Manitoba was included among the methods presented to attain objective (vi). The scenario method was employed to provide an example of how a product or service evaluation process (explained preceding the case) could be applied on campus. Specifically the hypothetical product scenario method involved a cursory probing into the selected item's life-cycle environmental impacts (i.e. through its production, transportation, use, and disposal). A review of the work done on life-cycle analysis by product evaluation programs (e.g. the Environmental Choice Program of Environment Canada) provided the basis for the hypothetical product scenario method.

Questionnaire

A questionnaire on purchasing policy was developed and sent to purchasing representatives at selected institutions, for their completion and return. The questionnaire technique formed the basis of the effort to attain objective (iii) (the review of purchasing policies at other institutions that heed environmental considerations).

Questionnaire development involved the generation of a list of potential questions, addressing several subject areas relevant to the other objectives of this study (policy development, policy content, policy administration, policy monitoring and evaluation, policy integration, and policy awareness and future directions). The final form of the

questionnaire was determined after reviewing potential questions with a purchasing representative at the University of Manitoba. The questionnaire mail-out included a covering letter, the questionnaire, and an addressed and stamped return envelope. Follow-up calls were placed to those institutions which had not responded by the return deadline. Sections of the completed study were offered to institutions wanting to receive them.

Evaluation Matrix

In order to evaluate the range of policy alternatives generated for potential application at the University of Manitoba (objective v), an evaluation matrix was constructed. Evaluation criteria were determined through the literature review, interview and consultation, and questionnaire components of the study. Different weightings were applied to the evaluation criteria, consistent with recommended environmental objectives of the University of Manitoba and the other priorities of the institution. Questionnaire results also helped inform the weighting of criteria. Criteria lent themselves to point-system scoring of estimated quantities (e.g. dollar costs) as well as to subjective valuations (speculation) based both on principles described in Chapter II and the University of Manitoba's policy context. The goal of the evaluation matrix was to identify less tenable policy alternatives and to prioritize tenable policy alternatives for implementation.

1.6 IMPORTANCE OF THE STUDY

The study is important for the purpose of clarifying the role of purchasing policy at the University of Manitoba as a means of improving environmental conditions. In doing this, and in making positive changes in policy, consequent environmental, social and economic benefits to the university and to the off-campus community will be realized. The study will

also have implications for other environment-related initiatives at the University of Manitoba and at other institutions.

1.7 ORGANIZATION

This study is organized into seven chapters. Following a review of the related literature (Chapter II), the purchasing policy situation at the University of Manitoba is explored (Chapter III). This helps confirm the utility of the Environmental Purchasing Policy questionnaire, the subject of Chapter IV. Chapter V describes the product evaluation process developed for the university, and provides a lead-in to Chapter VI which presents both the environmental purchasing policy alternatives considered for the University of Manitoba and the evaluation matrix used to screen them. Chapter VII concludes the study with details on policy recommendations and concluding remarks.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.0 INTRODUCTION

The purpose of this review chapter is:

i.) To relate purchasing to environmental issues;
ii.) to introduce three principles relevant in the consideration of environmental problems;
iii.) to describe recent work respecting product evaluation which has implications for purchasing policy ;
iv.) to review guideline and legislative efforts that have impacted on purchasing policy change relevant to the environment;
v.) to present examples of purchasing polices that have been changed or adopted to include environmental considerations;
vi.) to discuss some of the issues germane to consideration of purchasing policy change directed towards environmental improvement; and
vii.) to show that the problem--in short, how the purchasing policy at the University of Manitoba can begin to be sensitive to the environment--is both a unique and valid topic for applied research.

2.1 BACKGROUND: THE ENVIRONMENT AND PURCHASING

Since the first widespread concern of North Americans with the state of the environment in the early 1970's, many questions about the way we do things--and the way these things impact on the environment--have been asked. The wealth and waste in much of the industrialized Northern hemisphere glares against the poverty and environmental degradation in much of the South. Use of the earth's resources is profoundly unequal. The Group of Green Economists, for example, asserts that the energy consumption of one

citizen of the United States equals that of more than 160 Tanzanians or 900 Nepalis (1992, p.16). It is clear that environmental issues are not just about natural things and processes as distinct from people but are closely linked to human activity. As one journalist has put it: "...the environmental crisis has nothing to do with external things called 'acid rain' or 'global warming'. It has to do with us" (Gordon, 1990).

Responses to this reality have been many. People have spoken out, radically altered their lifestyles, become yet further entrenched in their ways, or just carried on. Within the academic community, environmental economics has emerged as a more prominent sub-discipline (Pearce and Turner, 1990), environmental science programming has expanded, and many environmental journals (such as *Environmental Ethics*) have been established. Governments of the world have responded with efforts to ensure the sovereignty of states while seeking solutions to global environmental problems; the June 1992 UNCED Conference in Brazil is evidence of this. Industries and businesses have sought to maintain a "good corporate image" and to protect themselves from liability for environmental damages. They have also developed new products deemed "green", or "environmentally friendly." In all, there have been both token efforts and serious attempts to address contemporary environmental problems.

The world's environmental issues are linked through the ecology of natural and human systems. Indeed, the term "environment" may be interpreted as inclusive of:

> ...both natural and built environments, living systems, geophysical processes as well as the peculiar conditions which obtain within the massive systems of interventions imposed by human beings (e.g. urban centres, managed forests, agriculture) (Donovan 1992, p. 45)

These environmental issues are however often researched as if they were discrete . The problems of global warming (the "greenhouse" effect), ozone depletion, deforestation, acid

rain, biological diversity loss, waste (mis)management and pollution, and land degradation and desertification are the major environmental problems being studied.

It is clear that the environmental problems we face are related to the way we use the resources of the earth. The methods chosen for the satisfaction of the needs and wants of human beings, meshed with the energetics and material flows of natural systems, have helped define the present global environmental condition. Though it is but one link, the relationship between consumption in the economies of the North and the environmental situation is an important one. For example, the demand for refrigeration, air conditioning, aerosols, and polystyrene products has meant the release of chlorofluorocarbons (CFCs) in the production, use, and disposal of these goods. CFCs in the upper atmosphere are a major cause of ozone depletion (Manitoba Environment, 1991). Other links between production processes, the use and disposal of goods, and the environmental problems of today are readily made. The questions of what will be produced, how it will be produced, and to whom the output will be distributed--three fundamental questions of economics--are also questions central in determining the impact of human activity in the environment. The answers to these questions depend largely on the nature of the relationships between consumers, producers and natural resources. In this knowledge the link between the corporate purchasing function (as a means of effecting collective consumer demands) and the state of the environment can be seen.

The impact of purchasing decisions on the environment has been the subject of much public education literature, directed mainly towards individuals and households. For example, The Canadian Green Consumer Guide (1991) suggests ways that our consumer behaviour can be more environmentally sensitive. The advice given is basic: reduce consumption of material goods and reuse goods before recycling them or recovering some other value from them; choose simplicity over complexity in product production and

consumption; and support those activities that foster life and the perpetuation of sound ecosystems and economies.

While intended for individuals or households, the collection of hints and tips prescribed in the public education literature can apply to large corporate entities as well, insofar as these bodies are analogous to persons. Individuals and corporate bodies face personal and systemic inertia, respectively, in regard to consumer behaviour change. It is clear that there is a need for environmentally sensitive purchasing policy in the organizations and institutions of today.

2.2 PRINCIPLES RELEVANT TO THE CONSIDERATION OF ENVIRONMENTAL PROBLEMS

The consideration of environmental problems requires that we begin with certain understandings about human activity in the environment and about the features of natural systems. Our understandings then become a basis for developing principles to guide the assessment and evaluation of environmental and economic policies. The principles developed must be intelligible to a broad segment of society and must be based on scientifically established facts and the lessons of history. The principles chosen for inclusion here embrace the concepts of a sustainable economy and a conserver ethic. They recognize that natural systems have a finite resiliency.

Miller (1989) outlines two of these principles. The Biosphere Preservation Principle and the Resource Stewardship Principle are foundational principles because of their scientific sensibleness and the respect for life that they imply. The third principle, the Environment/Economy Principle, warns against viewing economic activity as something decoupled from the environment, and has been selected for inclusion because of the clear

economic implications of the purchasing function. The principles provide a basis for considering change in the purchasing policy of the University of Manitoba.

The Biosphere Preservation Principle states that an ultimate environmental objective should be to preserve intact a viable, flourishing biosphere containing the most extensive and varied natural ecosystems possible. This principle recognizes that:

1. The survival of human beings is related to the survival and health of the natural systems of which we are an ecological part.
2. In nature is a storehouse of benefits - foods, medicines, building materials, fuels - the existence of which is jeopardized when natural systems are destroyed or degraded.
3. Understanding natural processes and the human role in them requires baseline knowledge gained from systems which have been kept largely unaltered by human activity.
4. Human beings value living systems for reasons other than the physical resources they provide, and these values too are threatened by the destruction of nature.
5. There is value in the natural world apart from its utility to people and the existence of humankind.

The second principle is the Resource Stewardship Principle, which counsels to utilize finite natural resources in the environmentally most efficient ways to sustain human life and human well-being into the indefinite future. The principle is embedded in the oft quoted Brundtland Commission's (1987) definition of sustainable development as: "...development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (p.41). The Resource Stewardship Principle requires that we reject the assumption that all value is created by human productive and economic activity and is thereby added to an otherwise valueless natural world. In this respect the second principle is related to the first. An ethic of individual and social-institutional collective responsibility for the impact of our lives on the environment is upheld.

To these two principles a third and related principle may be added. This may be called the Environment/Economy Principle. It emphasizes that the environment and the economy cannot sustainably be decoupled as they have in numerous times and places in history, and especially in the industrialized North over the past three hundred years. It recognizes that the production and distribution of goods and services on any scale is very much an environmental and cultural issue.

Neo-classical economics has operated with the understanding that the economy is circular in respect to the flows of inputs and outputs through production and consumption activities. The addition of environmental considerations expands this understanding. The natural environment provides raw materials for productive processes, acts as a waste sink for the by-products of production and consumption, and is valued as an amenity in and of itself. Pearce and Turner (1990) provide two rules that represent the practical conclusions of the Environment/Economy principle which ought to govern human activity in the environment. These rules are:

1. Always use renewable resources in such a way that the harvest rate (the rate of use) is not greater than the natural regeneration rate.
2. Always keep waste flows to the environment at or below the assimilative capacity of the environment (p. 44).

The principles of Biosphere Preservation, Resource Stewardship, and Environment/Economy (and the two action rules it implies) provide a basis for assessing human activity in the environment.

A commitment to sustainability and conservation , like commitments to other valued goals such as a just social order, universal and accessible health care, and peaceable international relations, is evidenced when efforts are made to transform the institutions that

hinder movement towards those goals. A commitment to sustainability and conservation is also logically commensurate with other valued social goals.

2.3 PRODUCT EVALUATION

With an increased awareness of environmental issues and three of the principles that can guide the assessment of the impact of human activity in the environment, the problem of the present study can be approached. Because there is so little substantive literature dealing with purchasing policy and the environment per se, it will help to begin with the usual subjects of purchasing--products (and by implication services insofar as products are used in their provision). The evaluation of products in respect to durability and safety has been the crux of consumer advocacy and protection efforts for many decades. New environment-related aspects of product evaluation are an extension of this.

A significant amount of work has been done recently on the specific issue of evaluating products under environmental criteria. Investigative work in this area indicates that consumer education is indeed taking on an environmental emphasis. The underlying assumption is that market forces of supply and demand will move to "green" the marketplace and thereby reduce the adverse environmental impact of economic activities. In Canada, the main example of product evaluation work is found in the Environmental Choice Program (ECP), initiated in 1988 by Environment Canada in conjunction with the Canadian Standards Association (CSA). The CSA is also presently working with several large corporations from the United States and Canada to develop "...a North American Standard for product design" (Cutter Information Corp., 1992). A few universities, and the non-governmental organization Pollution Probe are also involved in the CSA project, showing the breadth of support for the initiative.

In Canada's Environmental Choice Program, various product groups are researched through their life-cycles for impact on the environment (in terms of natural resource and energy use, toxicity, amount of resource recovery, etc.). Products that meet or exceed standards are approved for labelling with the Environmental Choice logo. Because the ECP considers product-specific safety and performance standards, the evaluation criteria vary across product groups.

The use of life-cycle analysis techniques for product evaluation (as in the ECP) is a very time-consuming and highly speculative activity. Life-cycle analysis is nonetheless the predominant product evaluation approach in countries like Germany and Japan, as well as in Canada. Some product evaluation approaches other than the ECP use a single evaluation criterion only. An example is the "Green Cross" eco-labelling program in the United States. A non-governmental venture, the Green Cross program certifies products "...if their recycled content is at least 80% of the maximum recycled content attainable for that item with state-of-the-art technology" (Watson, 1991, p. 54). Such an approach can mean faster product evaluation and certification, and relative accuracy under the selected criterion, but it may also simply perpetuate environmental problems associated with previous incomprehensive product evaluation efforts. While the information implied or made explicit in eco-labelled products may help purchasers make choices that are better for the environment, product labelling does not necessarily cover all the aspects of environmentally sound purchasing.

The focus on the environmental effects of products is expanded in consumer advocacy guides such as Shopping for a Better World (Council on Economic Priorities, 1989). In such guides, products are evaluated not only in terms of their anticipated environmental impacts but also with respect to the reputation of the producer regarding: the nature of its corporate investing; gender, race, or other discrimination in labour relations; and the level of its involvement in community development. These concerns are also some that "The

Campus Environmental Audit" (Student Environmental Action Coalition, 1990) suggests warrant examination in environmental audits of university operations. Purchasing policy, by this understanding, has impacts beyond merely the material and financial. The university campus is viewed as a corporate entity that makes decisions about investments, sources of research funding, and relations with the business world that affect the environment and people in not always obvious ways.

Essentially, the literature on responsible purchasing provides evidence that values other than price and availability are being taken seriously in product evaluation and purchasing decision-making. By certain of these standards, preference might be given to an environmentally more destructive producer or vendor, if, for example, the alternative suppliers had unacceptable records of worker discrimination or safety violations; the product that has less direct adverse impact on the environment may not be the one chosen when *all* factors are considered. Such "ethical" evaluations consider the producer's or supplier's whole sphere of activity, and involve many value judgements.

Product evaluation and labelling based on a narrower physical definition of "environment", and product and producer/vendor evaluation based on a broader (physical-social) definition of "environment", and on other values, are two related but different kinds of analytical activities undertaken by consumers or consumer advocates. A corporate purchasing policy could presumably make use of either as a partial basis for guiding the more environmentally sensitive procurement of goods and services.

2.4 LEGISLATION AND GUIDELINES

The vast number of laws and regulations that govern the commercial aspects of purchasing set the legal bounds of purchasing activity. When the laws of the state influence the direction of purchasing policy, the prospects for addressing environmental

problems through purchasing are either improved or diminished. Guidelines or legislation directing or requiring, respectively, the revision of purchasing or procurement policies in regard to the environment do exist in some federal and provincial or state documents. The legal impetus for institutional change is one whose influence can be quite powerful. Legislated policy change is one of the forceful ways that statements of environmental concern can be translated into action.

Detailed work in the area of legislation and guidelines has been undertaken by the Federal Government of the United States. The government has attempted to regulate purchasing done by federal agencies through the issuance of Environmental Protection Agency (EPA) guidelines. The purpose of the guidelines is to assist purchasers in fulfilling statutory goals on waste reduction set forth in the Federal Resource Conservation and Recovery Act (RCRA). To date, guidelines have been developed to help reduce waste in five product groups (paper products, lubricating oils, retreaded tires, building insulation products, and cement and concrete containing fly ash). The guidelines are to designate items that can be produced with recovered materials and that, when procured, will further the objectives of section 6002 of the RCRA (i.e to ensure the procurement, by federally funded agencies, of products containing the highest percentages of recovered materials practicable). Product performance standards that have the effect of excluding items containing recovered materials are also to be revised. The EPA guidelines for each product group provide recommendations on how purchasers can take affirmative action, including: product preference programs (amounting to, for example, the inclusion of minimum-content standards for certain items), promotion programs (such as those that make vendors and bidders aware of new purchasing policies and commitments), estimation and verification programs (to ensure the fulfillment, for example, of minimum-content standards), and annual review and monitoring (to track progress and to assist in further specifications revision).

The EPA's investigative work on recoverable materials technology and markets, the trial and error work of the EPA and of federal agencies respecting policy revision, and the character of the EPA guidelines and of the RCRA's purpose bring to light some issues relevant to purchasing policy. Most notable of these is that the EPA's guideline development work is not primarily aimed at decreasing the adverse environmental impact of product manufacture, use, and disposition (though this may be a result). The reasons have been (as in the case of final paper product guideline development) rather to reduce the high cost of solid waste disposal (estimated at more than $US 9 billion annually), to decrease the difficulty that many communities have in siting new landfills, and to fulfill a Congressional mandate.. Further, "EPA has not concluded that there will be any significant environmental impact, positive or negative, from the Federal procurement of paper and paper products containing recovered materials" (EPA 1990, p.16). The rationale for policy review and revision reveals the values and priorities of the initiating organization (in this case the Federal Government of the United States) as well as the uncertainty surrounding product evaluation in terms of environmental impact. The criteria under which the EPA selects items for which Federal procurement guidelines are considered appropriate also testify to these values and priorities. In order for items to be considered:

1. The waste material (associated with the item) must constitute a significant solid waste management problem due either to volume, degree of hazard, or difficulties in disposal.
2. Economic methods of separation and recovery must exist.
3. The material must have technically proven uses.
4. The Federal government's ability to affect purchasing or use of the final product or recovered material must be substantial.

(EPA 1990)

The approach to purchasing policy change that the Federal Government of the United States has taken through legislation and guidelines is one that could be applied in Canada, perhaps under the auspices of Environment Canada. Aspects of such a legislative approach can be helpful in the consideration of policy change at the University of Manitoba. The approach shows the linkage between the environmental, social, or other objectives of legislative bodies and the purchasing policies that they influence. It also suggests that an intermediary advisory body, serving between the legislative and purchasing bodies, may be useful in guiding policy.

Purchasing policies with environmental implications necessarily make use of definitions ("environment", "waste", "recyclable" and others) and so bespeak the importance of being unequivocal about these terms. Definitional concerns have indeed been a problem in the establishment of procurement guidelines such as those discussed above. The public is now quite familiar, for example, with the "pre" and "post" consumer waste distinctions that pertain to paper products. But the distinctions become finer when all sources of waste paper are considered. There is "mill broke", which is woody waste available for pulping prior to the preparation of final paper products; there is pre-consumer waste resulting from paper product finishing (such as trimming work) and from unsold inventory; and there is post-consumer waste (purchased paper products) both before and after this has become part of the solid waste stream. Other types of products will bring their own definitional problems with respect to their environmental impact, and this will have implications for the development of meaningful product specifications to meet waste reduction or other goals.

Further to the definitional problems respecting waste are those associated with other environment-related terms such as "recycled" and "recyclable." California, New York, and Rhode Island in the United States have passed laws to standardize operational definitions for these terms, and the EPA has indicated that other terms such as "environmentally friendly" and "environmentally safe" require definition as well. The state of Rhode Island

has totally banned the use of the terms "biodegradable", "photodegradable", and "environmentally safe" from product labels (Kashmanian et.al. 1991). Such activity provides evidence both that the truthfulness of product claims to environmental sensitivity is a public concern, and that clarity of meaning is important in matters of purchasing policy change that embraces the revision of product specifications. A fuller resolution of these definitional problems in the context of purchasing policy remains to be seen.

A final point in respect to the American EPA procurement guidelines is the product substitution that they facilitate. The emphasis is not on reducing the overall consumption of products but rather on enabling the development of--and access to--new markets for recycled-content products. The objectives of the purchasing body are again determinative of the purchasing strategies employed.

At the (American) state level of government, laws have been passed mandating the inclusion of a certain percentage of recyclable materials--the emphasis has been on recycled paper fibre--out of total product volumes purchased by state-funded agencies. In Colorado and Wisconsin recycled-fibre paper percentages in overall supply are to be increased--and phased in--each year. Colorado's House Bill 11-40 stipulates a 10% increase in recycled fibre content each year, while Wisconsin has drafted a comprehensive waste reduction bill that addresses several purchasing concerns. The Wisconsin Bill (Senate Bill 30, 1989) is reviewed here for exemplary purposes.

The express intent of the Wisconsin Act is:

> ...to establish programs and regulations that reduce the amount of municipal solid waste disposed of in landfills and burned without energy recovery in this state (Wisconsin) and thus protect the public health and welfare and the environment. (p.2)

Respecting procurement, the Act mandates the state Department of Natural Resources to establish a resource recovery and recycling program to promote "...the procurement of

recycled materials and recovered materials" (p.3). Specifications for products written under this mandate are to include requirements for the purchase of products made from recycled and recovered materials if their use is "technically and economically feasible", and to discourage the purchase of single-use, disposable products in lieu of durable products. Specification re-writing was stipulated for paper products, plastic products, glass, motor oil and lubricants, construction materials, furnishings, and highway equipment.

Further to the activities mandated in the Act are the maintenance of a clearinghouse for information regarding products made from recyclable and/or recovered material and information on vendors of such products. The Department is also to make this material available to purchasing agents and to help agents comply with new policy. Annual reports, specifying the recycled content of total purchases made, are also required of affected agencies.

Other parts of the Wisconsin Act describe policy changes for contracts and for the bidding process (to promote consideration of the life-cycle costs of products). The Wisconsin Act, paralleling the Colorado legislation, describes a phased approach to increasing the percentage of paper products that contain recycled fibre (10% by 1991, 25% by 1992, 40% by 1993) in total purchases.

A waste reduction emphasis is apparent throughout the Act, and is the theme underlying the changes in purchasing policy. Two additional points are salient as well. The first is that the University of Wisconsin--as a state-funded agency--is bound by the legislation, and so provides an example of an educational institution purchasing policy change induced partly through a legal impetus. The second point is that the general intent of the Wisconsin Act (the protection of public health and welfare and the environment) differs from the economic and political intent of the Federal Government's legislative and guideline efforts discussed previously. The same basic approach (product evaluation and guideline-setting)

to purchasing policy change has been chosen by levels of government with somewhat different goals.

Canada's Green Plan (1990) is a federal environmental policy and action framework with implications for governmental and non-governmental purchasing policies. Portions of the Green Plan relevant to the subject of purchasing policy include advice to individuals on consumer practices, the exchange of environmental learning resources on a national and international basis under the Canadian Environmental Citizenship Program, the Environmental Choice Program for product labelling, the National Waste Reduction Plan which mandates the expansion of the National Waste Exchange Program for recyclable materials, the Canadian Council of Ministers of the Environment-National Packaging Protocol's 50% waste reduction targets for the year 2000, and the express commitment of the Canadian Federal Government, under the code of Environmental Stewardship, to "...ensure that environmental considerations are integrated into purchasing policies and practices" (Green Plan, p.163). The Department of Supply and Services, the central purchaser for the federal government, does not yet have an official written policy describing how environmental considerations are in fact to be taken into account in purchasing decision making. Environmental criteria may be applied voluntarily, according to the disposition and knowledge of the purchaser or the user department's knowledge of product specifications. The Green Plan presents general statements typical of government environmental policy literature intended for broad audiences. The plan does present the challenge of finding ways and means to evaluate these statements and to translate them into action. Changed purchasing policy can be seen as one of these means.

2.5 PURCHASING POLICY CHANGE: PROVINCIAL, MUNICIPAL, AND INSTITUTIONAL INITIATIVES

At the provincial level of government in Canada, the Supply and Services Division of the Ministry of Government Services of Ontario has taken action respecting purchasing policy. This has entailed the development of a checklist for purchasing management staff that presents environmental considerations to be taken into account when preparing product specifications and when setting contract terms and conditions. The checklist is reproduced in Appendix 1 for reference. The environmental considerations are straightforward and deal with the recycled materials content in products, the opportunities for safe handling of expected waste products, and the elimination of needless packaging, among other things. Recommendations for preparing specifications include specifying Environmental Choice Program products (or equivalents) and specifying that "...all services be carried out in an environmentally sound manner minimizing the pollution created by the equipment and supplies used, and in the disposal of waste generated in the process" (Ontario Ministry of Government Services, 1991). The extent to which the environmental considerations are taken into account in final product or service selection or in developing specifications is left to the discretion of the purchasing manager, in contrast to the legislated purchasing standards of certain of the American states. The Government of Ontario does require that all paper purchased by the government be composed of at least 50% "recycled" fibre with at least 10% post-consumer waste fibre content.

The Waste Reduction and Prevention (WRAP) Act (1990) is the most significant recent legislation in Manitoba in the area of purchasing policy and the environment. The Act purports to help reduce and prevent the production and dissemination of waste in the province, and to encourage consumers, producers, governments, and government agencies to develop and adopt programs and practices for reducing and recycling waste. The Act gives the Lieutenant Governor and Minister of Environment broad discretionary and

regulatory powers respecting waste management and the handling of recoverable materials. Specific instruction to alter provincial or other purchasing policies is not provided in the Act.

Soon after the WRAP Act came into force, the Manitoba Recycling Action Committee was formed to generate recommendations on how Manitoba should meet a 50% solid waste reduction goal by the year 2000. Certain recommendations pertain to purchasing practices. Specifically, Recommendation #46 (Action Plan, 1990) urges that:

> ...the Manitoba Government give the Interdepartmental Procurement Committee a continuing mandate to identify additional opportunities to purchase environmentally responsible products. The existence of that Committee and the procurement policy should be widely publicized (p.47).

The foregoing recommendation was developed in response to the Manitoba Government purchasing policy in place since 1989, which reads:

> The government will purchase recycled and environmentally sensitive products where practical and effective, while taking environmental considerations into account in its internal operating and disposal decisions, and encourage development in industry with respect to supply of recycled and environmentally sensitive products (p.47).

Another recommendation, Recommendation #48, asks that the Manitoba government require of organizations, as a minimum standard, the adoption of the above (1989) procurement policy as a requirement for receiving provincial funding in excess of $100 000 (The University of Manitoba would presumably be required to adopt the policy if this recommendation is institutionalized). Throughout the exposition of these recommendations the Recycling Action Committee stresses the role of purchasing in "closing the loop" for recycled materials and thereby exerting influence on producers.

The Government of Manitoba purchasing policy presented above also states that no price preference is to be given to recycled products, though it is conceded that short-term cost increases may occur as a result of the selected restriction of tenders to recycled or environmentally sensitive products. The provincial government follows federal Environmental Choice Program guidelines in determining the environmental "friendliness" of products not yet officially studied by the ECP. More recently, in April of 1991 Manitoba Government Services issued an appendix to the terms and conditions applicable to all Manitoba Government invitations to tender. The salient terms in this document are a "South African Policy" wherein no products originating in that country will be purchased by the Government of Manitoba, and a "Manitoba Preference" policy wherein locally produced products can be favoured.

There has also been purchasing policy change at the municipal level in Canada. Schwartzel and Haliniak (1991) reviewed the purchasing policies of six municipalities in Metro Toronto: the City of Toronto, the Borough of East York, the City of Scarborough, the City of Etobicoke, the City of North York, and the City of York. Information was sought for each municipality regarding the existence of "...official written environmental purchasing policy..." (p.3), the inclusion of recycled or reusable products among purchased goods, the premiums allowed for reusable or recycled-content products, and the implementation of any other environment-related purchasing initiatives.

The results of the study showed that the municipalities were not extensively incorporating environmental considerations into purchasing decision-making. Some effort was being taken to procure recycled paper, re-refined oil, and durable cups and dinnerware for cafeterias. The variation between municipalities was marked, with the City of Toronto faring best in terms of replacing virgin material products with recycled-content products.

Three barriers were suggested by Schwartzel and Haliniak to account for the absence of effective and progressive environmental purchasing policies. These were:

1. The higher cost of environmentally sounder products.
2. A complex bureaucracy inhibiting changes in purchasing practices.
3. A lack of information regarding new products and materials.
(Executive Summary, p. v)

These obstacles could arise in the University of Manitoba context as well, and are worth considering in an assessment of policy alternatives.

In October of 1990, the City of Winnipeg approved the establishment of a task force " to conduct a coordinated environmental review of City Hall" (City of Winnipeg, 1991). Purchasing practices and policy, office procedures, buildings maintenance and service, and other aspects of City Hall operations were reviewed. An extensive list of recommendations, linked to responsible departments and target dates, was compiled. Responsibilities were given to the purchasing department under "Procurement" and other subject headings. Principal of these responsibilities were:

1. The evaluation of bid prices for office paper products with recycled material content, by adjusting for the revenue received by the sale of scrap paper and the avoided cost of disposal.
2. The development of environmental standards for photocopiers.
3. The implementation of a used laser printer toner cartridge recycling program.
4. The revision of all specifications for sanitary paper products to delete any explicit or implicit prohibition of recycled material content or requirement for bleaching.
5. The requisition and comparison of Material Safety Data Sheets and other environmental information from manufacturers of photocopiers to ensure that the City purchases or leases the copier with the least chemical, ozone, heat, light, noise and other emissions.
6. The refusal to pay any premium or show any arbitrary preference for recycled material content of lubricants.
7. The coordination of effort and exchange of information with ACCESS (Association of Canadian Cities for Environmentally Sound Strategies).

8. The initiation and formation of a similar network to ACCESS with the larger Manitoba municipalities, Manitoba Hydro, MTS, the University of Manitoba, and other major purchasing bodies in the region.
9. The identification of products and services that have the highest potential for reduction of harmful impact to the environment.
10. The initiation of review and amendment of all specifications to ensure that wherever possible and economical, they provide for products and services that have the least harmful impact on the environment.

In November of 1990, City of Winnipeg Council approved the "City of Winnipeg Purchasing Policy with Respect to Sustainable Development and Environmental Issues" submitted to it by the purchasing department. The executive summary of this purchasing policy recommends a strategy that can be implemented mostly within the context of the current City of Winnipeg Policy on Purchasing Procedures and the Disposal of Surplus Supplies. Also it is believed that the issues surrounding the preservation of the environment can largely be addressed through purchasing by "...applying good purchasing practices,...following a planned strategy, and evaluating for best value on the basis of life-cycle analysis" (Executive Summary, p. ii). The policy report indicates that a directive from City Council to review purchasing policy with respect to environmental issues was the reason for the development of the new purchasing policy.

The City of Winnipeg purchasing policy argues for the extension of traditional purchasing practices related to product selection, specifications review, and supplier credibility. Consideration of the five principal recommendations of the policy provide good examples of some of the concerns related to purchasing when the environment is an issue. These concerns show that the narrowly construed environmental impact of a product may be only one of several product effects that require balancing. For example, the purchase of products from South Africa (and the implied support of the government and business interests of that country) is not rejected outright as it is in the Province of Manitoba's

tendering policy. The City of Winnipeg report states: "In some cases products that reduce harmful impact on the environment are dependent on scarce materials such as platinum which is largely available only from South Africa" (City of Winnipeg, p. 8).

The recommendations made in the City of Winnipeg purchasing policy report have been implemented only in small measure. Specifically, the City has made some waste reduction progress in respect to police vehicle tires, alkaline batteries, and some kinds of paper; it has evaluated a few new product groups; and it has prohibited the purchase of teakwood furniture. The purchasing department has not however taken further action to create an ACCESS-like consultation group with other major purchasing bodies in the region. The purchasing department has also not been provided with the extra personnel requested for implementation of the purchasing policy. The City of Winnipeg policy shows a willingness to probe into some of the issues surrounding purchasing policy and the environment. It makes clear the difficulty of accurate life-cycle analysis of products, the great informational requirements of evaluating different commodity groups, and the reality of special product cases that are not adequately addressed by very general purchasing policy statements.

The features of purchasing policy change made in government bodies suggest some of the ways that the purchasing policy issue at the University of Manitoba may be approached. In addition to government agencies, however, many North American universities have adopted new purchasing policies in light of environmental realities, and these policies may provide more useful models and ideas. Since the questionnaire component of the present research will explore some of these policies further, only two institutions will be mentioned here for illustration purposes, namely, the University of Illinois at Urbana-Champaign and Trent University in Peterborough, Ontario.

In May of 1990, the Vice-Chancellor for Administrative Affairs at the University of Illinois at Urbana-Champaign approved for inclusion in the Campus Administrative Manual

the policies entitled "Recycling", "Procurement of Products Made with Recycled Materials", and "Waste Reduction." The three policies were formulated "...to reflect a unified approach to campus waste management." The tri-policy objective was to "...save resources, reduce...(the university's) waste stream, and improve the market for recycled materials" (University of Illinois, 1990).

The second of the three policies, "Procurement of Products Made with Recycled Materials", is implemented by the university's Purchasing Division. Basically the policy directs the university to purchase products with recycled material content whenever costs, specifications, and standards of quality and availability are comparable to products without recycled content. Recycled content alternatives are sought for frequently purchased items, with preference given to products having higher percentages of recycled content. The university is also to seek to eliminate the purchase of non-recyclable materials when suitable substitutes are available.

Actual implementation of the University of Illinois policy entails:

1. Identifying and projecting needs at the university for those supplies for which recycled and/or recyclable substitutes may be available. This would be accomplished by reviewing past and present requests for recycled and/or recyclable products and by examining future needs to determine the extent to which these requests could be met by procuring recycled and/or recyclable products.
2. Striving to identify vendors that can competitively supply recycled products. This would be accomplished by reviewing bid responses and by utilizing federal, state, and local commercial directories.
3. Making efforts to inform campus users of recycled and/or recyclable product alternatives that would adequately meet needs and that would comply with established state and campus policies and procedures. This would be accomplished by reviewing user specifications for products, by supporting the campus Recycling and Materials Reduction Coordinator in identifying recycled products for testing and evaluation to determine suitability for campus use, by working cooperatively to develop a campus

recycled products list, and by coordinating procurement of recycled products with campus users to reduce waste from products that do not perform satisfactorily.

The University of Illinois Urbana-Champaign monitors their policy of purchasing recycled-content products. For example, the 1991 fiscal year revealed that total purchases of recycled-content goods went down, while the portion of total products purchased having recycled content increased (both in total dollar value and as a percentage). It seems that a reduction in the amount of materials purchased has decreased (suggesting waste reduction) and also that more of the products which are purchased are containing recycled content (meaning less waste and more conservation of resources). Further efforts at Illinois include expanding the list of the kinds of products that could be replaced with recycled-content alternatives. Premiums are being paid for many of the recycled-content materials.

At Trent University, the first task of the President's Advisory Committee on the Environment was to establish a recycling program. Following this, attention was directed to "precycling" strategies, which are simply ways of eliminating waste before it is produced. Purchasing was seen to be central in these precycling strategies, insofar as consumption could be curtailed and *less* purchasing done overall (in contrast, purchasing products in less packaging is an example of how waste can be reduced *while maintaining product consumption levels*). Specifically, Trent University has engaged in a "closed-loop" paper recycling project with other institutions, corporations and government departments. High grade paper is collected from Trent and the other institutions and is sent to a material recovery facility for sorting and marketing. After processing at a plant equipped for recycled fibre, notebooks and exam books are produced for sale. By purchasing these recycled notebooks and exam books, Trent students and staff are able to "close the loop"--through reuse of the very paper fibres they once consumed (Integrated Solid Waste Management Office, City of Los Angeles, 1992). Trent's purchasing policy

will be examined more closely as part of an upcoming campus environmental audit, according to a Purchasing Department representative at Trent (Hayes, 1992).

2.6 SUMMARY OF PURCHASING POLICY CHANGES

The purchasing policy change examples described here have certain features in common. In all the examples, an emphasis on product substitution is apparent. Whether this be for products with higher proportions of recycled material content or for products that are more durable or that come with less disposable packaging, product substitution recommendations appear as an almost universal component of purchasing policy reform directed towards environmental preservation .

Another clear emphasis among policies is the desire for the extension of policy ideas to other bodies, and more generally, for improved communication among persons involved in purchasing activities. The recommendation of the RAC in Manitoba that bodies receiving provincial funding in excess of $100 000 be required to adopt the Manitoba Government policy, the participation of the City of Winnipeg in the national information-sharing ACCESS group and the recommendation to form a similar consulting group locally, and the recycled paper contract that Trent maintains in cooperation with other institutions are examples of this policy extension emphasis.

Also notable in all the policy examples is that there is a diversity of persons and groups involved in purchasing decision making. In some cases, such as with the City of Winnipeg, the lack of sufficient personnel was seen as a main obstacle to implementation of the recommended purchasing policy. Policy at the University of Illinois at Urbana-Champaign implicates many persons both on-campus and off-campus in aspects of policy development and implementation. Also, the presence of a campus Recycling and Materials Reduction Coordinator at Illinois suggests that this policy is integrated with other waste

reduction activities. Indeed, waste reduction appears to be one of the main goals in all the policies.

Finally, though the City of Winnipeg policy makes reference to "special cases" of product evaluation, and implies that the purchasing function may serve other social goals, the policies described here do not diverge much from a waste reduction emphasis. Recommendation by the Ontario Government and the Manitoba Government to consider ECP products, insofar as environmental concerns other than solid waste reduction have been taken into account in product labelling, does extend policy considerations somewhat, but the potential for purchasing policy to help address other social issues is not explored.

2.7 OTHER ISSUES REGARDING PURCHASING POLICY AND THE ENVIRONMENT

Aljian (1973) sees the role of purchasing policy primarily as one of helping communication: communication within the purchasing department, communication between the purchasing department and other departments in the organization, and communication between the purchasing department and vendors, distributors, contractors, or brokers. It was this communication function that Schwartzel (1992) found impaired among the internal departments of municipal organizations. Poor communication and co-operation were presented as one of the main obstacles to "greener" municipal purchasing. Review or reform of purchasing policy might well consider the communication component. This would seem especially relevant with respect to environmental concerns that purchasing policy may seek to address, where information is often incomplete.

While it may be one of the primary functions of purchasing policy to facilitate communication among purchasing staff and between purchasers and suppliers, purchasing policy may help in the attainment of other objectives as well. Government purchasing

policies, for example, may be directed to different ends than purchasing policies in the private sector. For example, in 1984 the Canadian Federal Government formed a Task Force on Program Review to improve service to the public and to improve management of government programs. The Task Force indicated these goals and areas of concern respecting federal procurement:

1. Better management of the procurement system.
2. Potentials for reduction of barriers to government market access.
3. Use of procurement as a lever for the attainment of national objectives (as an instrument of national economic and social policy).

(Minister of Supply and Services Canada, 1986).

Respecting goal (3), the federal government stated national objectives of industrial and economic growth, international competitiveness, and job creation and increased productivity. Purchasing policy in the Task Force document is thus viewed as a means of promoting economic goals other than the efficiency of the purchasing body in its immediate organizational context. Such goals may or may not be considered acceptable.

Examples of "special cases" in purchasing, provided in one of the Purchasing Department of the City of Winnipeg's policy recommendations to City Council, show the limitations of overly general policy statements. These cases show where product selection criteria embracing social or economic objectives less directly linked to the environment may be given weight in purchasing decision-making. Choosing as suppliers local, small, or minority businesses, whose prices may not be competitive with those of large industrial suppliers and whose commitment to environmentally benign operation may be less formally declared, is one example. One of the policy alternatives subjected to the evaluation matrix in Chapter VI (alternative 4 (B)) has a more immediately social--as opposed to environmental--objective.

Prioritizing actions to meet broad policy objectives may be difficult. The example of purchasing policy with a solid waste reduction objective is a good case in point. The guidelines and policies presented in the foregoing sections, several of which have solid waste reduction objectives, show that paper waste reduction is often the central focus. Other kinds of solid waste (plastic, metal, glass, or vegetable) may be deemed of secondary importance. The prioritization of paper waste reduction in solid waste reduction policy may be explained by the fact that paper products comprise the largest percentage of landfilled materials (Canada's Green Plan, p. 60). A problem with this rationale, however, is that compared to other substances, most paper waste is benign; products such as batteries and cleaning products pose a much greater environmental contamination hazard. Another point is that paper waste comes from a renewable resource while plastic, metal, and glass come from non-renewable resources. Perceptions of the relative importance of the different environment-related characteristics of products will thus bear on the action priorities assumed. Information needs for highly rational decision making become very great, and the question of whether a purchasing body will collect the desired information itself or whether it will rely on information collected by others (as through a product labelling program) becomes an important policy question.

Finally, as mentioned in the introduction to Chapter I, purchasing is only one aspect of procurement, and represents only one way of obtaining goods and services. In much of the literature the terms purchasing and procurement are used interchangeably. However, if procurement is construed broadly to allow for other ways of obtaining goods and services, then a "procurement policy" may be better able to embrace a wider range of values and commitments than a "purchasing policy." For instance, barter, exchange in kind, volunteer work, and leasing arrangements are some of the ways that conventional money transactions may be avoided. Allowing for such methods of obtaining goods or services could open new doors for interaction with suppliers and with the recipients of university services.

2.8 CONCLUSION

From sections 2.0 to 2.7 of this review it should be clear that the problem of reforming purchasing policy to the benefit of the environment is a complex one. There are a lot of issues and a lot of gaps in the knowledge that is relevant to such reform. No single policy model or approach is suitable for application everywhere. There are questions of what values and goals purchasing policy can and should embrace as far as the environment is concerned, and whether these values and goals are compatible with other objectives of the purchasing organization. There are concerns about informational needs, and about communication among and between persons involved in purchasing transactions. There is also the potential for unconventional approaches to procurement when this term is broadly construed.

Purchasing policy reform is increasingly being considered as a viable means of translating statements of environmental commitment into action, which fact helps establish the validity of the present study as a work of applied research. The following chapters present the results, conclusions, and recommendations of this study, beginning with an assessment of the current University of Manitoba purchasing policy and its environmental implications.

CHAPTER III

PURCHASING POLICY AT THE UNIVERSITY OF MANITOBA

3.0 INTRODUCTION

There are several formal and informal components of purchasing policy at the University of Manitoba. While the University of Manitoba Policy and Procedures Manual outlines the basics with respect to carrying out purchasing transactions, much "policy" is embedded in the daily decisions and activities of the user departments on campus, the Purchasing Department staff, and representatives from related departments on campus. This section explores these components of the current University of Manitoba purchasing policy.

3.1 THE UNIVERSITY OF MANITOBA POLICY AND PROCEDURES MANUAL

The Purchasing Policy of the University of Manitoba consists of the directives and procedures spelled out in the University of Manitoba Policy and Procedures Manual under Policy 303 (Financial Commitments) and in a draft document developed from Policy 303 entitled "Purchasing/Accounts Payable Operating Procedures." The Financial Commitments Policy was approved in August of 1971 and primarily serves to ensure that anything purchased with funds administered by the University of Manitoba be purchased with the knowledge of, and/or through, the Purchasing Department. Policy 303 also gives authority to the Director of Purchasing to handle special or unusual purchasing cases and to establish special procedures where necessary.

The Draft "Purchasing/Accounts Payable Operating Procedures" document is dated March 30, 1992 and describes in detail the manner in which the requisitions from user

departments or individuals should be processed, vendors should be selected and monitored, and related matters of purchasing protocol and user department and Purchasing Department liability and responsibility should be addressed. On page 2 of this document, the potential for improvements in requisitioner-purchaser communication related to things used on campus and the way they are obtained is evident in the broad statement: "Whenever possible, the buyer should assist the requisitioner with pre-requisition help in locating the best practical solution to equipment and service requirements." With respect to product and vendor selection, price, quality, availability and record of service and reliability criteria are emphasized. Environmental considerations and environmental issues related to the purchasing function are not addressed.

Several other University of Manitoba policies and procedures implicate the Purchasing Department in resource-use and hence environmental issues. The following two quotes, from Policies 209.1 (Photocopy Services) and 210.1 (Letterhead) respectively, are typical of policies that have *not* well embraced resource use and other environmental considerations:

> "The debt renting machines will be assessed annual rental charges which are completely independent of the number of copies run on the machines during the year."

> "Only white bond bearing the two-colour logo is used for letterhead." (*Note: In December of 1992, the conversion of University of Manitoba Letterhead to recycled-content--albeit bleached--paper stock was approved*)

Other policies with clear environmental implications are 307.1 (Purchasing and Receiving), 309.1 (Disposal of Surplus Furnishings and Equipment), 211.1 (Envelopes and Interdepartmental Memos) and 226.1 (Archives and Preservation and Destruction of Records). Within many of the University of Manitoba policies are implicit demands for products or services obtained through the Purchasing Department.

3.2 INTERVIEWS

Discretionary or informal components of the University of Manitoba's purchasing policy, and the effects of the written components in practice, were determined through personal interviews. Five interviews were conducted with representatives from the University of Manitoba's Purchasing Department, the Safety Office, and the University Stores. Interviews were semi-structured, with unique but overlapping sets of questions prepared for each interviewee. Mr. Derek Coyle (Director of Purchasing), Mr. Paul Dugal (Manager of Resource Services), Mr. Ray Ness (Assistant Director of Purchasing), Mr. Irv Gusdahl (Occupational Health & Safety Officer), and Mr. Tom Kerr (Freight and Traffic Coordinator - University Stores) were interviewed. The main points from these interviews, relevant to the environment and the purchasing function, are presented as follows in point form.

3.2.1 Mr. Derek Coyle, Director of Purchasing

1. "Academic freedom" was emphasized as a relevant issue in product selection respecting requests from researchers on campus. The Purchasing Department has the authority to purchase from the supplier they determine, if the product that that supplier provides can be shown comparable to the one requested by the researcher. Situations have arisen where researchers have wanted to retain *supplier* selection freedom in addition to *product* selection freedom. Environment-related policy changes that determine the suppliers patronized by user departments or researchers may be perceived as a restriction of academic freedom--a valued freedom in the university context. It was noted that there is at present no constitution for the University of Manitoba that defines the meaning and limits of "academic freedom."

2. For the most part, the fund-granting agencies that support research projects on campus define in their contract terms that the purchasing policy of the university is to be respected.

3. The University of Manitoba's purchasing policy is described as largely "reactive" to the market for the goods and services purchased, to daily requests from user departments on campus, and to supplier and distributor concerns on and off campus. This kind of reactive approach contrasts with a "pro-active" purchasing approach consisting of regular and thorough supplier (and product) review and development. For large purchases (such as under systems contracts arrangements for laboratory supplies) there may be a more thorough but "lumpy" investigation of potential suppliers.

4. Currently, suppliers are not stressing the merits of their products with respect to their environmental sensitivity, life-cycle manageability or other related characteristics. Rather, as per the policy of the University of Manitoba, suppliers are competing to provide goods at the lowest immediate cost, subject to quality and consistency-of-availability criteria of the University of Manitoba. Suppliers are seen to be "selling what they can where they can."

5. Authority to institute formal policy change in the Purchasing Department (and therefore at the University) must come from Senior Administration, subject to approval by the Board of Governors.

3.2.2. Mr. Paul Dugal, Manager of Resource Services

1. Systems contracts represent one kind of arrangement for procuring goods, and apply mainly to low-value, repetitiously used, multi-department items. Examples are fine paper products, laboratory supplies, cleaning supplies, and electrical supplies. Purchase orders and standing orders (representing, respectively, individual product or service requests and repetitious-item requests not yet embodied in systems contracts) are the other types of purchasing vehicles employed. Terms for a further kind of purchasing arrangement, a sort of mini-systems contract, are forthcoming.

2. Though largely determined by the expressed request of the user department, some consultation of the Purchasing Department with user departments does occur in the

determination of systems contract terms. An example of this at the University of Manitoba is found with the Chemistry Department, with whom the terms of laboratory supply contracts are negotiated.

3. Specifications provided with products by suppliers are usually on what is being purchased only, and rarely include mention of alternative products, whether for environmental or other reasons.

4. Contractors are sought based on the criteria of the price of the specified product, servicing of the inventory, certain standards of quality, ability to service the account, and delivery reliability. Local producers or distributors may be selected because they can usually better service the contracts.

5. Systems contracts are not locked into specific items, but into categories of items (for example those products considered under the rubric of "stationery"). The cost of administering separate contracts for individual items at present discourages a more diverse slate of suppliers.

3.2.3. Mr. Ray Ness, Assistant Director of Purchasing

1. Purchasing responsibilities at the University of Manitoba are distributed between several buyers, each responsible for a different area of campus. Three senior buyers work at the Fort Garry Campus. Two buyers work at the Health Sciences campus.

2. Disposal of used goods at the University of Manitoba takes place through advertisement of these goods in the U of M Bulletin newspaper and in the local Winnipeg newspapers. Items such as desks, typewriters, and computers are commonly disposed items. Occasionally a purchaser will know of a community organization that could use the items, and arrangements are then made with that body. Instances of used goods exchange between departments on campus do occur. For example, the Chemistry Department can occasionally find users on campus for "waste" or surplus chemicals.

4. The variety of goods and services purchased by the University of Manitoba, and the culture of the organization, make the university a very unique purchasing context.

3.2.4. Mr. Tom Kerr, Freight and Traffic Coordinator

1. Only a very small inventory of items (mainly ethyl alcohol, hazardous waste collection pails, and business forms) is kept on campus, to reduce the costs of maintaining a large university stores. Incoming supplies are delivered to end-users on campus as quickly as possible, emphasizing the distribution function of the University Stores.
2. The administration of some systems contracts and standing orders is such that some stock may be renewed without consultation with the user department.
3. Every year, one sixth of the hard-copy accounting records stored in the University Stores are trashed, amounting to about 1500 kg per year.
4. The University of Manitoba is part of the Western Universities Association, which has cooperated on some purchasing matters. For example, the Association has put out a tender for courier service, and the combined volume of the member universities led to large savings in courier costs. The differences in performance expectations of couriers from campus to campus, however, meant that services were considered excellent and efficient at some universities (such as UBC) and inefficient at others (such as the University of Manitoba).
5. The Electronic Data Invoicing system at the University of Manitoba has eliminated about 10 000 manually filled invoices per year. Currently, however, the paperwork at Freight and Traffic Control (University Stores) is great. Coincident requests by different user departments can add to paperwork and also contribute to excessive goods delivery services on campus.

6. It was suggested that many operations at the university may not be efficient because the profit motive is not present. Hold-ups, duplications of effort, and inertia may follow from the bureaucratic nature of the university and the character of interdepartmental relations.
7. There are some cases of collection and re-use of products and packaging at the University of Manitoba. For example, the plastic containers for some janitorial supplies are taken back by the supplier (Marrin Bros. Ltd.) for refilling. WESCO collects heavy wooden wiring spools for re-use. And many departments return laser printer toner-cartridges for refilling and re-use.

3.2.5. Mr. Irv Gusdahl, Safety Officer

1. Certain materials purchased for use on campus must pass through the Safety Office before distribution to the user department. Such materials include radioactive substances and other goods regulated under the Transportation of Dangerous Goods Act (Manitoba).
2. Chemicals inventory is kept for the campus, and there are plans to improve Purchasing Department access to information about the inventory.
3. Although the Safety Office is brought into the procurement function by ensuring that potentially hazardous purchased goods are handled and stored properly while on campus, the Office does not have to be consulted before purchase of an item by the Purchasing Department.
4. The Safety Office has done some consulting with researchers on campus regarding the volume of hazardous chemicals used in laboratories.

3.3 CONCLUSIONS REGARDING ENVIRONMENTAL IMPLICATIONS OF CURRENT UNIVERSITY OF MANITOBA PURCHASING POLICY

From the review of the written components of the University of Manitoba's Purchasing Policy and the interviews conducted on campus, it is concluded that the environmental implications of the university's current purchasing policy stem from several features of the organization and motivation of purchasing on campus. These features are as follows:

1. Freedom for user departments and researchers to specify products.

The current purchasing policy gives researchers or user departments license to justify product specifications for requisitions howsoever they choose. This is clear from page 6 of the March 30, 1992 Draft "Purchasing/Accounts Payable Operating Procedures document, which reads:

> "While *the requisitioner can decide on the make, model, quantity*, (italics mine) etc., where there are alternate sources for the same item and all other terms are equal, the supplier will be chosen by price and availability."

The role of the Purchasing Department, to find the lowest cost source of supply for the requested product consistent with the quality specification, therefore permits the purchase of environmentally harmful products.

2. Price focus in product selection.

Since getting the product requested to the end-user at the lowest possible cost is the main goal of the Purchasing Department, purchase of products that are less environmentally harmful will only occur if these products have a lower price tag (or if a researcher or user department specifies the product). The "reactive" orientation of the Purchasing Department

is evidenced here, and it is left to producers and suppliers to consider the environment in production and distribution if they so choose.

3. Lack of holistic view of campus operations in respect to cost savings.

The compartmentalization of the university community into faculties, academic and service departments, and other bodies, is seen to serve the educational purposes of the university but presents problems for environmentally sensitive purchasing practices and materials management generally. The pricing of goods for the purpose of ensuring that user departments pay the lowest price may not take into account the cost to the university--realized through a different department--of managing the waste associated with the product. Paper products which are recyclable (and are in practice recycled) is the most obvious example. A paper product made without contaminants that prevent recycling may be costlier up front to the user department but of lower cost to the university as a whole when deferred tipping fees at the landfill are figured into the cost calculation. The mix of operating budget monies and funds provided to specific researchers or programs on campus can create not only economic inefficiency but environmental problems when the university is not viewed as a unit.

4. Small Central Stores Inventory.

This feature of the University of Manitoba's materials management system is justified by the extensive use of systems contracting at the university. However, small inventories may promote the use of overly packaged goods supplied in small volumes.

5. Characteristics of related University of Manitoba policies.

Some of the policies mentioned earlier, such as those pertaining to university letterhead, envelope specifications, and the like commit the Purchasing Department to product choices that can be environmentally harmful.

The foregoing features of the University of Manitoba's purchasing system suggest that the current purchasing policy of the university permits the purchase of virtually any product, subject to the legality of the marketing of that product and transport of the same.

The freedom to choose given to user departments (point 1 in the conclusions) permits all manner of environmental impacts associated with the production, transportation, use and disposal of goods purchased by the university. The environmental impact of the purchasing policy of the University of Manitoba is therefore defined by the sum of the environmental impacts associated with all its individual purchases. As an especially high-volume item, the purchase and use of paper products will be a major source of environmental impact. By upholding requisitioner freedom in paper product selection, purchasing policy may hinder coordinated and effective recycling efforts that require standardized paper specifications. In addition, markets for recycled-fibre papers are not strengthened as they might be by a consistent demand for a few standardized products. When user departments are purchasing equipment, requisitioner freedom allows different departments to specify different products for the same function--thereby limiting on-campus exchange opportunities which could reduce solid waste, conserve energy, and maximize product life.

The environmental impacts of the price focus in product selection policy (point 2 in the conclusions) are those which more inclusive cost accounting tries to mitigate, such as the extra non-renewable resource consumption (petroleum fuels) that makes immediate delivery possible, and the practice of relaxing environmental standards in plant operations (respecting effluent releases, airborne emissions and the like) in order to maintain

competitiveness at lower prices. This issue of the "environmental price" of a product, versus its selling price, is relevant as well to the non-holistic view of campus operations (point 3 in the conclusions) which the current purchasing policy tends to support. Disposable products and packaging which are convenient for specific departments create waste management responsibilities for other departments (e.g General Services) and also contribute to the negative environmental impacts associated with unsustainable rates of natural resource use and landfilling of solid waste.

It is not clear whether the maintenance of a very small University Stores inventory, supported by current purchasing policy in order to reduce costs associated with large inventory maintenance, is a less harmful practice in terms of the natural environment than a large inventory system would be. Energy-use impacts are probably the issue here. The more frequent delivery required with a small stores may have net energy-use impacts (i.e. non-renewable resource depletion and related impacts) greater than those accruing to a large stores requiring less frequent deliveries. Further, bulk purchasing options, which can reduce solid waste for both suppliers and users, may be reduced with a small stores.

Finally, it should be noted that the purchasing policy of the University of Manitoba is not the only policy with significant environmental implications. All university policies that in some way discourage the use of more benign materials, or that prevent more functional and sensible product choices because of outdated specifications, will have adverse environmental implications.

An inquiry into the environment-related purchasing policy directions that other universities have been taking, in light of their own understanding of the environmental implications of their current purchasing policies, is the focus of the Environmental Purchasing Policy Questionnaire (EPPQ) detailed in the next chapter.

CHAPTER IV

ENVIRONMENTAL PURCHASING POLICY AT OTHER INSTITUTIONS

4.0 INTRODUCTION

A questionnaire entitled "Environmental Purchasing Policy Questionnaire" (EPPQ) was administered as the main investigative tool of the present study. The purpose of the questionnaire was to determine the environmental purchasing policy (EPP) situations at institutions comparable to the University of Manitoba, in anticipation of obtaining information useful to EPP development at the University of Manitoba. The questionnaire was mailed out to the purchasing departments (or proxies) of sixteen universities in Canada and the United States on February 11, 1993. Information was sought on: motivations for environmental purchasing policy development, specific content of policies, policy administration, policy monitoring and evaluation, integration of EPPs with other environmental and non-environmental policies and initiatives, level of awareness of policy, and future policy directions. The questionnaire is reprinted in Appendix 2.

4.1 QUESTIONNAIRE DEVELOPMENT

The format and content of the questionnaire were chosen after review of the limited literature on environmentally sensitive purchasing, interviews with purchasing and other personnel at the University of Manitoba (as described in Chapter III) and review of existing purchasing policies (government, business, and institutional) which have in some way embraced environmental considerations. A draft of the questionnaire was vetted through Mr. Paul Dugal (Manager of Resource Services - University of Manitoba) to ensure intelligibility and appropriateness of terminology used.

Instructions accompanying the questionnaire (shown in Appendix 2) provided working definitions of "policy" and "environmental purchasing policy" (EPP). Respondents were instructed to consider both formal and informal policy, in order to cover the full range of environment-related purchasing initiatives.

4.1.1 Sections of the Questionnaire

Preliminary Questions (section 0) regarding the existence of EPPs at the university were included to ensure that the questionnaire could be completed by the respondent. Also, determining whether or not university purchasing policy was currently under revision provided an indication of the usefulness that the present study might have for other institutions (i.e. whether conclusions and recommendations from the study would be of use to policy revisors elsewhere).

The Policy Development section (1) was included to elicit the impetuses behind policy change. Learning the motivations for policy change and development will be helpful for initiating policy change in the University of Manitoba context. Questions in this section focused on forces on and off campus which might influence policy.

The Policy Content section (2) was the most extensive section of the EPPQ and sought details of EPPs in place at the respondent institution.

The Policy Administration section (3) included questions on the way the EPPs were implemented, who the persons responsible were, and what concerns and difficulties respecting EPP had arisen.

The Policy Monitoring and Evaluation section (4) of the questionnaire dealt with measuring the effectiveness of EPPs.

The Policy Integration section (5) proposed questions regarding the compatibility of EPPs with other environmental initiatives and with non-environmental policies as well.

The next section of the questionnaire, Policy Awareness and Future Directions (6) requested information on the university community's awareness of the EPPs, as well as on criteria employed in EPP selection. Information on anticipated policy development was also sought.

The final section of the questionnaire, Additional Comments, Questions, and Concerns (7), asked for additional information which the respondent might want to provide.

4.1.2 Selection of Universities

Due to the significant length of the questionnaire and the time frame of the study, sixteen universities were selected to receive the questionnaire. Universities were chosen on the basis of their proximity to the University of Manitoba, their comparability in size and diversity in the purchasing function, and their familiarity to the researcher. A few universities were excluded from questionnaire administration because their willingness to complete the questionnaire could not be confirmed before the mail-out deadline. All persons to whom the questionnaire was sent agreed to participate in the study and were contacted first by telephone to ensure this. Questions and comments at this initial stage were taken into consideration in question development as well.

4.2 QUESTIONNAIRE RESPONSE

Only one of the sixteen questionnaires was returned by the requested return deadline of March 5, 1993. Follow-up calls were made about two weeks later and again about three weeks after that. Eight of the sixteen questionnaires were received by April 16, 1993. At least two questionnaires were unaccounted for, having been posted to the Natural Resources Institute but not received. Other non-respondents indicated that they had not had time to complete the questionnaire before the initial deadline or within the extended time

provided. One questionnaire was re-administered (to the University of Winnipeg) after the initial questionnaire was lost. For purposes of questionnaire analysis the response rate is 50%. Percentage responses for individual questions are stated in terms of the 8 questionnaires received, such that if all eight respondents answered in the affirmative to a question, a 100% response rate would be recorded.

4.2.1 Response Percentages and Comments

The Questionnaire reproduced in Appendix 2 shows the percentage responses for questions 0.1 through 6.6. For purposes of analysis, the "yes/no" question responses are recorded as "yes" (affirmative), "no" (negative), "N/A" (not applicable--meaning the respondent has made a mark or comment about the question's non-applicability), and "no response" (meaning the respondent has not answered the question). The questionnaire as completed by respondents did not include "N/A" or "no response" check boxes. Other questions which did provide more than two response options show percentage responses for each possible response option. The Appendix 2 questionnaire also reproduces all comments received from respondents for questions which asked for more details on "yes" answers or which requested further information on multiple response-option questions.

4.2.2 Questionnaire: Analytical Overview and Interpretations

The questionnaire confirmed the state of transition that purchasing policy in general, and environment-related purchasing policy in particular, is in at universities in Canada and the United States. Environmental purchasing policy is mostly informal, described by the day to day decisions made regarding the suppliers, products, and business relationships in which the university has a concern.

The questionnaires received provided mostly sketchy information. Comments provided by respondents for certain questions suggested that the meaning of some questions was not

sufficiently clear. Question 2.1 (b) was interpreted by some respondents to be an inquiry about specifications for *specific products* purchased, rather than as an inquiry into the kinds of purchase *arrangements* (standing orders, systems contracts, purchase orders) associated with products being purchased under environment-related criteria. Also, question 3.6 and question 4.4 were apparently understood by some respondents as soliciting the same information, namely the response of affected persons on or off-campus to EPPs after implementation. Question 3.6 was actually intended to draw out information on specifically administrative concerns such as communication of policy to affected persons and clearance of policy with senior administration or a governing body.

Answers to the policy development questions reveal that there is not a well-defined legal impetus for EPPs in Canada, though in the United States many universities are subject to state or federal purchasing regulations regarding recycled material content in certain products--mostly paper. As discussed in the literature review, legislation such as the WRAP Act in Manitoba could have implications for university purchasing in the province of Manitoba if some of the implied regulations are instituted and enforced. Most universities noted that environmental groups, task forces, committees, or departments both on and off-campus had played a role in EPP development. Where multiple influences on EPP development were noted, they were seen to hasten policy implementation.

Most EPPs mentioned by respondents, in response to questions in the policy content section of the questionnaire, dealt with the purchase of products having a content of recycled materials. 50% recycled, 10% post-consumer fibre requirements for paper products was the dominant EPP. Re-refined motor oil was also mentioned as a recycled-content good being preferentially purchased. Product bans were not indicated by any of the universities as part of EPP. Termination of relations with a supplier was indicated by the University of Wisconsin as a result of EPP, on account of the failure of that supplier to meet state-mandated recycled-content specifications.

In general, product evaluation or eco-labelling programs such as the Environmental Choice Program in Canada did not figure into EPPs.

Review of specifications for products used on campus did not arise as a prominent theme in EPPs. Comments that were made on specifications pertained to the composition of paper and the waste-reducing features of equipment such as photocopiers and FAX machines.

Sharing goods among departments on campus or with other institutions, producing goods on campus, and leasing were checked by respondents as the ways that EPPs have involved new purchasing methods, contractual arrangements, or new ways of procuring goods or services. Further explanation on these points was not given. These practices are consistent with the conservation of resources and the conservation of energy in transportation used to obtain goods.

Several universities are involved in cooperative buying agreements with other institutions. Cooperation was reported both in general terms (e.g. University of Winnipeg membership in the Western Universities Purchasing Association) and with respect to specific purchasing (e.g. the University of Calgary's participation in a cooperative garbage bag purchase arrangement). EPPs that addressed communication issues or information-sharing were most often linked to relations between the purchasing department and suppliers, vendors, distributors, or contractors. Requests for information from suppliers (e.g. on recycled content product alternatives or on product processing methods) were a common aspect of EPP.

Efforts to re-use goods on campus and to salvage used equipment were reported by several respondents. Though not described in detail, the conventional practice is to first search university departments that might accept the used good(s), and then to go off-campus, either to a known organization or to the public through advertisements in the local media.

Three universities made comments about the payment of premiums for products considered to be more beneficial to the environment. The University of Ottawa was the only university to mention a set premium (10%). User departments were given discretion by Tufts, and the University of British Columbia indicated that no consistent premium percentage policy was followed. The distinction between premiums paid for unique user department requisitions, and premiums paid for goods purchased for general university operations, was not made clear.

Persons responsible for EPP administration were usually those within the Purchasing Department (specifically the Purchasing Manager, Senior Buyers, or Director of Purchasing Services) or Senior Administration. Tufts University indicated that responsibility for EPP administration lay with their multi-department Center for Environmental Management. Job responsibility changes as a result of EPP implementation were not cited by the majority of universities. The University of Wisconsin did mention that custodial workers, refuse collectors, and housing counsellors' responsibilities changed after EPP implementation, but details were not provided. These changes were presumably related to the recycled paper purchase and recycling program at the University of Wisconsin.

From the responses provided on the questionnaires, universities do not appear to be accessing sources of information which might be helpful in implementing EPPs. Tufts University did indicate that the Environmental Protection Agency (EPA) and vendors were consulted, while the University of British Columbia mentioned the Purchasing Commission of that province and Resource Integration Systems Ltd. of Portland, Oregon as consultants.

Only two comments were received regarding problems or difficulties encountered in the administration of EPP. The University of Regina reported no problems while the University of Wisconsin reported that the belief that recycled product substitutes are

inferior to virgin material products was commonly held. This comment was repeated in response to question 4.4 respecting reactions of affected persons to EPP.

Half of the respondents indicated that EPPs were being monitored or evaluated. Responsibility for monitoring and evaluation rested with the Center for Environmental Management (Tufts), "everyone concerned" (UBC) and a representative from the Department of Administration (University of Wisconsin). Among EPP evaluation-of-effectiveness criteria indicated in the questionnaire, resource conservation and waste reduction were noted more often than others. Short-term cost effectiveness was noted as the criterion most important to EPP evaluation at the University of British Columbia while market development was top evaluation criterion at the University of Wisconsin. Table 1 below shows the percentage of respondents indicating the use of each evaluation criterion for EPPs already in place.

Table 1.

EVALUATION CRITERION	RESPONSE RATE
1. Waste reduction	50%
2. Resource conservation	50%
3. Market development/support	37.5%
4. Short-term cost effectiveness	25%
5. Stimulation of other environmental initiatives	25%

Paper waste reduction and recycled paper purchasing themes run through the EPP evaluation comments. However, only the University of Winnipeg commented on the effect of EPPs on overall consumption; "less garbage" was the response.

Responses of persons on or off-campus to EPP mostly had to do with costs. For the University of British Columbia this was with respect to duplex-capable photocopiers and

with the University of Regina general and unspecified cost concerns. Tufts reported that overall the response was positive and that "...people realize it is good for the economy."

Other environment-related programs on or off-campus which were related to EPPs and which were mentioned by respondents in the Policy Integration section included car-pooling and vehicle emissions policies at the University of British Columbia, paper recycling programs at the University of Regina, the University of Wisconsin, and Tufts University, and waste reduction policies at the University of Wisconsin. The only comment received from a respondent regarding EPP linkage with non-environmental initiatives, policies, or programs was from the University of British Columbia who mentioned a surplus disposal program that has been in place for five years.

In the Policy Awareness and Future Directions section, Tufts University implied that people in the university community are made aware of Tufts' recycling program by being able to bring recyclables from home to the collection facilities on campus. Three universities indicated that EPPs were anticipated in the near future but did not comment further. At Tufts, the University of British Columbia, and the University of Regina, formalization of some currently informal EPPs is forthcoming.

Comments on the ranking of criteria which are or might be used to choose between policy alternatives revealed that cost of implementation was the priority concern. The extent and character of expected environmental benefits was given second place by the University of British Columbia but was not included at all in the six screening criteria mentioned by the University of Wisconsin. The relative success of policy at other institutions was either ranked last (University of British Columbia) or excluded entirely (University of Winnipeg and University of Wisconsin). The response rate for each evaluation criterion checked by respondent universities is provided in Table 2.

Table 2.

CRITERION	RESPONSE RATE
1. Cost of implementation	87.5%
2. Administrative feasibility	62.5%
3. Complementarity with existing university policy	62.5%
4. Extent and character of associated environmental benefits	50%
5. Clarity and Intelligibility	50%
6. Flexibility	50%
7. Amount of staff (re)training required	50%
8. Relative success of policy at other institutions	37.5%
9. Foundation in state, federal, or provincial legislation	37.5%

Universities may be quite unaware of environmental purchasing policy steps being taken at other institutions. The (very general) response of only one university to the inquiry about North American universities or colleges having especially innovative, effective, or radical EPPs (question 6.5) would support this conclusion.

The Universities of British Columbia, Ottawa, and Wisconsin provided documentation of environmental policies and legislation pertinent to these schools. Appendix 3 contains a draft summary environmental policy statement of the University of British Columbia (November 1992) and portions of UBC's purchasing policy which have environmental implications. Appendix 3 also contains reproductions of portions of the University of Ottawa's environmental policy statement, "Policy No. 36", and Materials Management procedures document; and excerpts from Information Memorandum 90-17 on the 1989 Wisconsin Act 335. Information from documents provided by other institutions helped

determine the environmental purchasing policy alternatives later recommended in this study.

As shown in Appendix 3, UBC's environmental policy statement commits the university to working to achieve "...minimal adverse impact on the air, water, and land through excellence in environmental control." The main elements of the UBC purchasing policy that could be turned towards this objective are the institution of end-user advisory committees and the directive to "Where appropriate, ...develop University-wide contracts for common equipment, supplies and services...." The standardization of common supplies and equipment is understood as an activity leading to minimum impact on the environment (per the "minimum impact on the environment" definition provided with the UBC purchasing policy). The relevance of the UBC policy to the present study is found in its understanding that the standardization of products, which may mean restriction on user department product choice, is a means of making university purchasing more environmentally sensitive.

The University of Ottawa's Environmental Policy Statement commits the university to: "Where feasible,...encourage the use of ecologically sound materials or processes..." (point 7). Those products which are by the University of Ottawa definition "ecologically sound" are those products which "are made up of recycled components, or are recyclable." The University of Ottawa's commitment to purchasing such products is shown in its willingness to pay a 10% premium on ecological products (over performance comparable non-ecological products). Study committees to determine technical specifications for ecological products have also been mandated, and the membership for committees on paper, glass, and plastic products is outlined. Statements made in the University of Ottawa's policy have a bearing on policy considerations for the University of Manitoba: in clarifying the need to define the terms "recycled" and "recyclable"; in suggesting the role of

product evaluation in EPP; and in pointing to the value of having suppliers provide environment-related information along with bids and quotations.

The questionnaire respondent from the University of Wisconsin stated that the 1989 Wisconsin Act 335 described the purchasing policy addressed in the questionnaire. In other words, the Act was considered tantamount to environmental purchasing policy at the University of Wisconsin. Excerpts from the Information Memorandum on the Act, which are included in Appendix 2, were highlighted by the respondent. Information from the Act helpful in determining policy recommendations for the University of Manitoba includes the definition of "recyclable material" (s. 16.70 11m of the Act), the directive of the Act to the Department of Administration (DOA) to write,wherever possible, procurement specifications that promote waste minimization (s. 16.72 f of the Act), and the directive to the DOA and other units to choose bids from the lowest life-cycle cost bidder (ss. 16.75 1m and 66.299 5 of the Act).

4.2.3. Critical Questions: Response Summary

Several questions from the Environmental Purchasing Policy Questionnaire may be considered as "critical questions" on account of the nature of the information they solicited, information considered especially relevant for consideration of policy alternatives at the University of Manitoba. These critical questions and the reasons for their importance are indicated in Table 3. A summarization of responses to the critical questions follows in Table 4.

Table 3.

CRITICAL QUESTION	IMPORTANT BECAUSE...
1.1 (Legislative impetus for EPP development)	Indicates the level of "voluntariness" of EPP implementation.
1.3 (Factors influencing EPP development)	Draws out local EPP context peculiarities and the importance of these as compared to other influences.
2.3 (Product bans)	Indicates the level of confidence regarding environmental cause-and-effect associated with some products--and the perceived importance of such effects.
2.5 (Utilization of Eco-labelling programs)	A measure of the use of environment-related purchasing information already compiled and interpreted.
2.6 (Review of product specifications)	Provides an indication of the extent to which current purchasing patterns are being critically examined.
2.8 (Cooperative buying agreements)	Indicates how "isolated" EPPs are at a given institution.
2.14 (Willingness to pay a premium for products or services)	Provides a measure of commitment to longer term environmental protection and/or willingness to consider purchasing criteria other than the conventional price, quality, and availability of a product.
3.3 (Jobs created or lost)	Measures impact of EPPs on employment and work responsibilities.
4.3 (Effects of EPP on overall consumption)	Provides a measure of waste reduction and may indicate a growing conservation ethic.
4.4 (On or off-campus responses to EPPs)	Gives an indication of how EPPs may be improved and what the issues are for those working most closely with the policies.
6.1 (Policy Awareness)	Implications for promotion, continuity, and improvement on EPP are indicated.

CRITICAL QUESTION	IMPORTANT BECAUSE...
6.2 (Anticipated EPPs)	Indicates current state of commitment to ongoing EPP implementation at the institution.
6.4 (EPP Screening criteria)	Shows priorities of the institution from a policy-making standpoint.

Table 4.

CRITICAL QUESTION	RESPONSE SUMMARY
1.1 (Legislative impetus for EPP development)	Both American universities that responded (Tufts and the University of Wisconsin) indicated a legal impetus. Canadian universities are apparently under no strict legal obligations regarding EPPs.
1.3 (Factors influencing EPP development)	A "heightened awareness of social issues related to the environment" and "local environmental realities" (particularly landfill capacity and the cost of fees charged for dumping) were deemed most influential--from among the factor options--in EPP development.
2.3 (Product bans)	Product bans have not been a part of EPPs among respondents.
2.5 (Utilization of Eco-labelling programs)	The University of Winnipeg indicated that Eco-labelling programs were informally a part of EPP. Other universities responded in the negative or did not give details.
2.6 (Review of Product Specifications)	Mention of specifications review was limited. Tufts and the University of British Columbia indicated checking for pre and post-consumer recycled material content, and waste-reducing features of equipment such as FAX machines and photocopiers, respectively.

CRITICAL QUESTION	RESPONSE SUMMARY
2.8 (Cooperative buying agreements)	Most respondents are engaged in at least some cooperative buying. Products such as copy paper, printed forms, garbage bags, and waste management services were noted as instances of purchasing cooperation. Resistance to cooperative buying agreements was noted by Tufts. The University of Winnipeg pointed to their membership in the Western Universities Purchasing Association but did not give details.
2.14 (Willingness to pay a premium for products or services)	Tufts indicated that premium payment is up to each department. The University of British Columbia indicated some premium payment on products but that no specific percentages had been set. The University of Ottawa mentioned that a 10% cost advantage is given to bidders when requesting quotes on products. From other policy documentation provided by the University of Ottawa, this means a 10% premium will be paid for "ecological" products.
3.3 (Jobs created or lost)	Only Tufts University noted the creation of a new position: "Recycle Coordinator."
4.3 (Effects on overall consumption)	The University of Winnipeg mentioned "less garbage" but did not quantify this. No trend of reduced consumption was noted among respondent universities.

CRITICAL QUESTION	RESPONSE SUMMARY
4.4 (On or off-campus responses to EPPs)	The main concerns mentioned dealt with the cost of changing products as part of EPP. As well, the perception that recycled products are inferior to virgin product counterparts was mentioned.
6.1 (Policy Awareness)	The University of Regina and British Columbia assented to the importance of making the university community aware of EPPs, but did not give details. Tufts pointed to a recycling program, which allows university users to bring materials from home, as a (partly) policy awareness-raising initiative.
6.2 (Anticipated EPPs)	No respondent universities mentioned anticipated EPPs.
6.4 (EPP Screening criteria)	Where criteria were ranked, cost of implementation appeared as the most important consideration in EPP screening. For the University of Wisconsin, policy basis in state law was given top priority in EPP screening. Noteworthy here is that the "Extent and character of associated environmental benefits" was not ranked within the top six screening criteria by the University of Wisconsin. Administrative feasibility was an important but lesser concern than cost for those universities that ranked criteria.

4.3 QUESTIONNAIRE CONCLUSIONS

The low response rate to the EPPQ does not allow strong conclusions to be drawn. The mostly sketchy information provided by respondents may indicate either that EPP is really a very new concept without a clear terminology and praxis or that respondents were simply not well aware of the details of the policy situation of their university.

Nonetheless, the questionnaire does provide some ideas and guidance regarding EPPs that the University of Manitoba could adopt. The critical questions response summary (Table 4) in particular leads to the following conclusions:

1. A forthcoming legal impetus for EPP adoption (in Canadian universities) is possible but uncertain. The University of Manitoba can be pro-active rather than reactive.

2. The development of EPP has largely been spurred by concerns surrounding waste management. Specifically, these concerns have been the cost of solid waste disposal at landfills and the cost of siting new landfills in regions of limited capacity. The fact that waste management is a concern to institutions, and the direct relation between purchasing and solid waste, may make a solid waste reduction focus of EPPs at the University of Manitoba appropriate. An emphasis on waste-related environmental issues supports the development of a similarly focused product evaluation process as well.

3. Product bans and supplier termination are not well supported as policy initiatives. Developing new terms with suppliers and cooperating in purchasing to support fledgling markets for recycled and recyclable goods is a more prevalent approach and possibly a more effective one. In some cases product bans may be advisable.

4. Institutions may not be utilizing environment-related product information already available to them through eco-labelling programs such as the ECP (Canada). Opportunity for making use of such information in purchasing decision making does exist.

5. Reviewing product specifications in terms of environmental implications is still at an early stage in development. Problems in operationally defining commonly used terms such as "recyclable" and "pre" or "post" consumer waste require resolution.

6. The approach to EPP adoption appears mostly reactive and uncoordinated. A low response and lack of detail on the anticipated EPPs question (6.2) suggests that a more pro-active approach is warranted.

7. The cost of implementing policy is given top priority in EPP screening. Potential policy changes will require either a dollar cost justification or a definite commitment to non-monetary objectives in order to be feasible in the university community.

The tentative conclusions that can be drawn from the questionnaire exercise suggest the relevance of a product evaluation process as part of a broader package of EPPs. The conclusions also point to the value of considering policy trends at other institutions when developing policy at the University of Manitoba. Chapter V presents a product evaluation process for the University of Manitoba that can help effect the policies evaluated and explained in Chapters VI and VII.

CHAPTER V

A PRODUCT EVALUATION PROCESS

5.0 INTRODUCTION

As the literature review indicated, product evaluation processes can provide a partial basis for more environmentally sound purchasing decision making. Having capacity within the University of Manitoba to evaluate products and end-user needs in light of environmental considerations could strengthen and inform other environmental purchasing policies. For these purposes an evaluation process is developed here as a guide. The product evaluation process, when applied to a product either currently in use at the university or being considered for use at the university, will flesh out selected environmental implications of the consumption of that product. In this way products may be prioritized for elimination, substitution, or expansion of use on campus in a manner consistent with the environmental objectives of the university. The process may be followed by requisitioners from user departments prior to the submission of requisitions to the Purchasing Department, *or* by buyers reviewing products currently or potentially purchased through systems contracts or other arrangements. The basic purpose of the product evaluation process is to facilitate product comparisons so that products currently being purchased on campus can be the environmentally least harmful ones.

The evaluation process guides thinking into the areas where product purchase impacts on the environment. The literature review, questionnaire results, on-campus interviews, and conclusions drawn through consultation with other persons, institutions and sources off-campus all informed the development of the product evaluation process.

The process described here is conceived in terms of an issue hierarchy (described in section 5.1). Such a hierarchy permits the decision maker to focus on priority issues when research capacity and time is limited. Though narrower in scope, the objective of the

proposed evaluation process is similar to that of the life-cycle investigations undertaken in the Environmental Choice Program (ECP); i.e. to identify those aspects of a product's life-cycle which offer the greatest opportunities to reduce the adverse environmental impacts of the product.

Life-cycle analysis methodology has evolved through product evaluation programs like the ECP. According to the 1993 Draft Environmental Design Statement of the ECP, life-cycle review (as an aid to eventual eco-labelling) entails describing a product, highlighting its potential adverse environmental impacts, and indicating areas for which criteria should be developed. Specifically, ECP life-cycle analysis for products investigates:

1. Manufacturing: what raw materials are used, what are the energy inputs required, and what packaging is involved?

2. Transportation and Distribution: what are the energy input and related emissions realities?

3. Use: what is the energy input required in using the product, and what is the product's efficacy (i.e. in achieving its desired functional goal?)

4. Disposal: what are the transportation issues (i.e. energy inputs and emissions), landfill requirements, and opportunities for re-use, recycling or recovery of the product?

The process of manufacture, transport/distribution, use, or disposal may present the best opportunity for reducing adverse environmental impacts, depending on the product. Household appliances, for example, might best be addressed in their "use" features--with respect to energy efficiency and durability (effective life). For low-volume, exotic items, transportation and distribution features may present the best opportunity for environmentally considerate intervention.

To clarify the processes of life-cycle investigation, the example of printer toner cartridges is considered here. Toner cartridges are a product category that has actually been reviewed by the ECP, and standards for ECP certification have been set.

As a federal government institution, the ECP is authorized to access the quality control and production records of (toner cartridge) producers and to investigate production facilities unannounced. In this way the life-cycle questions of *manufacture* are answered. Toner cartridges are typically constructed of several materials, including aluminum, plastics, steel, and ink chemicals. Packaging often includes cardboard and polystyrene. The energy inputs required to produce toner cartridges from raw materials can presumably be only estimated--by dividing total manufacturing plant energy use (obtained from the manufacturer's records) by production volume.

It is not clear how *transportation/distribution* questions about toner cartridges are investigated. The ECP is concerned that toner cartridge transportation meets the requirements of all applicable government acts and regulations, including the Canadian Environmental Protection Act (CEPA). The adherence of product transporters and distributors to Canadian environmental legislation thus acts as a proxy for the actual environmental impacts of this aspect of the product's life. The location of the product user is also an obvious factor in the environmental impact of the transportation/distribution of a product, but this cannot be described as an invariable feature of the product.

The *use* aspects of toner cartridges are investigated by the ECP primarily with reference to the re-usability and useful life of the cartridge. That this focus has been taken is apparent from the final product guidelines issued for toner cartridges, which require: a performance warranty for cartridge replacement drums extending to at least eight renewals; and the provision of educational materials indicating installation and maintenance procedures for cartridges. As with transportation issues, some of the useful life measures for toner

cartridges are checked through a proxy: producer compliance with the Canadian General Standards Board standard for the rejuvenation of laser printer cartridges.

Investigation into the environmental impacts of cartridge *disposal* involves looking at the materials comprising toner cartridges and establishing their recyclability and/or toxicity if landfilled. The ECP checks for product manufacturer adherence to *National Packaging Protocol* policies and for the manufacturer's adoption of *Code of Preferred Packaging Practices* recommendations--evidencing again a legislation-as-environmental-impact-proxy approach. The ECP, with access to product testing labs, is likely also in a position to explore experimentally the impact of toner cartridge disposal on the natural environment. The final certification criteria for toner cartridges include the requirement that aluminum, polystyrene, and cardboard recovered from toner cartridge recyclers be directed to an appropriate recycling facility. The main conclusion drawn from life-cycle analysis of toner cartridges by the ECP is that the *reduction of waste entering landfill* and the *conservation of resources* will be the primary environmental benefits realized from eco-labelled (i.e. certified) toner cartridge consumption--as compared with uncertified toner cartridge consumption.

The foregoing suggests that while the basic manufacture, transportation/distribution, use, and disposal questions define the scope of life-cycle analyses, the techniques employed to gather the needed information are many. Life-cycle analysis can be laboratory-based; it can be an inference exercise based on environment-related legislation; it can involve interviews and plant visits; and it can be a thought exercise. Application of the product evaluation exercise presented in this chapter suggests all but direct lab investigation methods. This does not preclude product testing in regular applications.

Unlike the ECP investigations, the process presented here will seek primarily to identify the solid waste reduction opportunities associated with products. The option of not purchasing the product in the first place, the most obvious way to reduce waste, arises

when the "need" for the product itself is questioned. A word on need is provided at the conclusion of this section.

Capacity at the University of Manitoba (specifically in the Purchasing Department) to undertake the kind of life-cycle analysis done by the ECP is limited. There are clearly many kinds of environmental impacts associated with the production and consumption of goods, and a great deal of investigative work is required to determine them accurately. For this reason it is recommended that the University of Manitoba assume a solid waste reduction focus in product evaluation (and in EPP in general). As capacity improves, other environmental quality and sustainability questions can be addressed. Solid waste reduction may be understood as the foundation or first phase in the process of improving purchasing policy with respect to the environment. In general, solid waste reduction decreases the magnitude of other kinds of product-related environmental impacts. Subsequent phases in policy development can focus on these other more specific chemical and physical impacts of products, significant because of the changes they cause in air, water, and soil quality, and in living organisms.

The reasons for an initial solid waste reduction focus are several:

1. Solid waste is a highly tangible consequence of workplace, residential , and institutional activity, and changes in solid waste levels are immediately visible. The practical implications of solid waste reduction are usually easily understood and solid waste reduction may be accurately monitored.

2. National, Provincial, and Municipal levels of government are setting solid waste reduction policies, and institutions that are seeking to reduce waste will be better prepared for both corporate citizenship roles and potential legislation.

3. Reducing solid waste can have positive effects not just on landfill capacity, but on other basic environmental issues such as the rate of renewable and non-renewable

resources use and the nearness to critical threshold levels of various ecological variables.

4. Solid waste reduction is an activity consistent with the three basic principles (Biosphere Preservation, Resource Stewardship, and Environment/Economy) outlined in the literature review.

5. The "management" of solid waste is very expensive. Tipping fees alone for solid waste taken from the University of Manitoba to the Brady landfill are about $40 000 per year. Special treatment for quantities of solid hazardous waste involves additional costs. Savings realized from solid waste reduction could be used to support EPPs with higher implementation costs.

6. The chief components of the institutional solid waste stream--paper and paper products--are also major items, both in volume and in expenditure, in university purchasing.

7. At universities comparable to the University of Manitoba in size and function, solid waste reduction is the primary focus of environmental activity. There is information and there are examples available.

5.1 OUTLINE OF THE PRODUCT EVALUATION PROCESS

Four product-related concepts (the issue hierarchy) provide the framework for the product evaluation process. These are: (1) Prevalence; (2) Characteristics; (3) Source; and (4) Producer. Each concept entails questions that seek basic environment-related information associated mainly with waste reduction. The "Source" and "Producer" concepts move beyond this and begin to address questions of energy consumption and overall corporate environmental performance. A means of answering each of the questions is provided in the subsequent section "Working Through the Product Evaluation Process" (section 5.1).

These four concepts and the questions they entail are presented in Table 5 below. For evaluation purposes, "product" should be understood to include all packaging (including containers where non-solids are involved) and informational or other material included with the basic product. In many cases the packaging component of a product contributes more to the solid waste stream than the contents of the package.

Table 5.

CONCEPT	SPECIFIC QUESTIONS
1. Prevalence	a) What percentage contribution does the product make to the university's solid waste stream? b.) What is the scope of product use on campus? c.) How is demand for the product characterized on campus?
2. Characteristics	d.) What is the product composed of? e.) What are the environmentally relevant design characteristics of the product?
3. Source	f.) How far from the university is the producer? g.) What special provisions must be made to transport the product?
4. Producer	h.) What is the environmental record of the producer?

5.2 WORKING THROUGH THE PRODUCT EVALUATION PROCESS

Eight steps are presented in this section that explain how to answer questions a-h, respectively, in Table 5.

Step One: Determining the percentage contribution that a product makes to the university's solid waste stream

An approximation of a product's percentage contribution to the university solid waste stream can be made by using information on waste stream composition obtained from a comparable university, coupled with estimations from experience with the product. Results from a solid waste audit done at the University of British Columbia are used here to provide the percentage composition values for several broad waste (or material) categories.

The first step in approximating the percentage contribution of a product to the university's waste stream is to determine the percentage contribution of the waste (material) category to which that product belongs. Where products are composed of many materials, none of which are dominant in their construction, more than one waste category may apply, and the product may require treatment as two or more smaller "products." Waste categories and approximate percentage contributions to be used are as follows:

1.) Corrugated cardboard, shipping containerboard, and Kraft (brown bag) paper:	10%
3.) High quality office papers (copy, computer, letterhead, etc.):	24%
4.) Low quality or mixed paper (magazine paper, construction paper, carbon paper, boxboard, tissues and paper towels, etc.):	19%
5.) Container plastics (food and beverage containers, cleaning product containers, jugs; often "recyclable" but usually intended for single use):	7%
6.) Durable plastics (plastic materials originally intended for re-use and long product life; includes thermoplastics, toy-plastics, foam pads and plastic shells, consumer plastics such as cups and plates):	1%
7.) Other plastic (wraps and films, plastic bags, packing and shipping materials:	3%
8.) Wood and wooden products:	3%
9.) Textiles (natural and synthetic):	0.5%
10.) Miscellaneous organics (carbon-based materials including rubber,	

tires, leather, contaminated paper materials):	0.5%
11.) Beverage glass (all alcohol, pop, and juice bottles):	1%
12.) Container glass (food jars, chemical bottles, other consumer container glass):	1.5%
13.) Non-recyclable glass (ceramics, bulbs and auto glass, cookware, window glass, etc.):	2%
14.) Aluminum (all aluminum products):	0.7%
15.) Ferrous (iron based) metals (food containers, various metal equipment and parts):	1.3%
16.) Non-ferrous metals (bronze, brass, lead, copper, zinc, etc.):	1.3%
17.) Other (all materials not included in other categories):	24%

The second step in calculating waste stream contribution is to multiply an estimate of the fraction of the waste category that the product being evaluated comprises by the percentage value for that waste category. For example, the boxboard from staples packages used on campus might be estimated to comprise only 1/100 of the waste (campus-wide) in the low-quality or mixed paper category. Multiplying (0.01)x(19%) = 0.19%. This is an approximation of the percentage (in the example this would be only one part of the "product"--the staples themselves would be another) contribution of the product to the university waste stream. The sum of the contributions which the component parts of a product make to the waste stream describe its overall percentage contribution.

More precise determination of the percentage contribution of a product to the university waste stream could be done with the results of a University of Manitoba waste audit. For some products, simply knowing whether the waste contribution is very small or very large compared to other products may be sufficient for evaluation purposes and action.

Step Two: Determining the scope of product use on campus

The number and name of departments on campus that are consuming a product will be an important feature of product use to consider when taking action respecting the purchase of that product. If a product is used by one isolated researcher, policy alternatives will be different than if a product is used campus-wide. An estimation of the fraction of all

departments on campus using a product can be made in Step Two, but for precise determination of the scope of product use, a telephone survey of university departments and/or consultation with the Purchasing Department (i.e. review of purchasing records) will be required.

Step Three: Characterizing demand for the product on campus

Demand for a product on campus may be the collective demand arising from isolated requisitions from user departments, or it may be the longer-term demand implicit in a systems contract arrangement. Further, demand may be more or less strong, depending on whether the product is perceived as a novelty or a basic operations necessity. Characterization of the demand for a product on campus will help determine whether action respecting that product should focus on providing an environmentally less harmful substitute (demand is strong) or on cutting back or eliminating purchase entirely (demand is weaker).

Information on the contract arrangements (purchase orders, systems contracts, both, or other arrangements) under which a product is obtained can be sought from the Purchasing Department. Isolated, large-item purchases can be assumed to be the result of a purchase order.

The strength of demand for a product can be estimated or it can be determined more precisely, depending on the thoroughness of the investigation. Persons with experience using a product will be able to estimate its price elasticity of demand (i.e. how much demand changes for a given percentage rise in the price of the product). However, an accurate determination of price elasticity of demand requires a very complete body of information, not practically available to the product evaluator. For this reason the product evaluator is asked to reflect on the patterns of use of the product as he/she knows them and

as they may be determined through random questioning of product users. Consistency of use and perceived lack of functional substitutes are things of which to take notice.

Step Four: Determining the composition of the product

The materials from which a product is made help define its impacts on the environment in production, delivery, use, and disposition. In the product evaluation process, only the basic construction of the product will be explored. A visual and physical investigation of the product will be required, noting ECP "Eco-logos" and associated information if this is present. Where visual/physical examination is not possible, contacting the manufacturer directly by telephone and requesting details of product construction will be required. Suppliers may be able to provide this information as well. In either case, the purpose is to determine the nature of the dominant construction material(s). The main question to be answered in Step Four is whether the product is composed of renewable or non-renewable resource material. The answer will be "renewable resource" material if the product is composed of paper or cardboard, wood, or animal/vegetable products or byproducts--not including fossil fuel based materials. The answer will be "non-renewable resource" material if the product is composed of plastic, metal, or glass. Complex, multi-material construction should be noted as well, as should the presence of post-consumer (i.e. recycled) materials in construction. The material categories identified in Step One can help in describing product composition. The relevance of the product composition question to waste reduction is twofold: (1) it helps establish the recyclability of the product; and (2) it gives an indication of the range of reasonable substitutes for the product.

Step Five: Determining the environmentally relevant design characteristics of the product

For simplicity, the "environmentally relevant" design characteristics of a product will be those which affects its "recyclability" and durability.

For the purposes of the product evaluation process, "recyclability" is considered a function of a product's physical/chemical construction (with respect to existing and practiced recycling technologies) *and* the existence of an operational collection and delivery-to-recycling-facility system. The purpose of Step Five is to distinguish between products which are effectively non-recyclable, those which are potentially recyclable by reason of their construction, and those which are actually recyclable by reason of their construction and the existence of a working collection and delivery system. Very few products currently purchased at the University of Manitoba are of the latter variety; aluminum beverage cans are one example.

Determining the physical/chemical recyclability of a product (i.e. its potential recyclability) can be done by examining the product for "recyclable" indicators (such as a "mobius loop" or a written claim of recyclability). Where these indicators are lacking, the product evaluator should evaluate on the conservative side. Non-modular, multi-material construction generally renders products unrecyclable. Materials or products classified under any category except 4, 6, 13, and possibly 20 in Step One will generally be "potentially recyclable."

Determining the actual recyclability of products or materials may be done by contacting the Recycling Council of Manitoba (RCM). This organization should be able to provide information on the state of local recycling collection systems and facilities for different materials. Investigations of comparable organizations farther afield (i.e. in other provinces or in nearby states) may be necessary for a more complete evaluation.

The durability of a product may or may not be inversely related to its recyclability. The relevant design characteristic to consider, through visual/physical examination, is any form of "built-in obsolescence" (e.g. non-repairable construction). The producer, and for confirmation, the Consumers' Association of Canada (Nepean, Ontario) may be contacted for a more complete account of the durability of a product.

Mention of other environmentally relevant design characteristics (not directly related to recyclability or durability) that affect the amount of solid waste associated with a product is encouraged in Step Five. Characteristics might include obvious down-sizing of a product and use capabilities that conserve resources (e.g. duplexing capacity in photocopiers).

Step Six: Determining the transport distance and transport conditions necessary for the product.

A determination of the transport distances and transport conditions required to bring a product from its place of manufacture or production to the University of Manitoba provides a rough value of the magnitude of environmental impact associated with this important aspect of the purchase of a product. Impacts will be largely energy related: combustion of carbon-based fuels for locomotion and (possibly) climate control and the atmospheric consequences of this.

The distance between the city of Winnipeg and the place of manufacture of the product (which may be determined from product labelling or more certainly from the supplier) can be estimated using any standard place-distance table. More precision can be obtained by starting with the supplier of the product and working "backward" through all handlers to the manufacturer. Transport distance as an environmental impact indicator is qualified by the conditions of transport. Determining whether the product requires refrigeration, freezing, or other climate control during transport may be done by reading storage, use, spoilage, or other information which may accompany the product, by contacting the supplier, or by reasoned speculation.

Step Seven: Determining the environmental record of the producer

Since the environmental impacts associated with the purchase of a product do not lie solely in the construction features of the product, it is relevant in the product evaluation

process to know something of the producer's operations. Step Seven addresses the "Producer" issue and is last in the hierarchy of considerations from a solid waste reduction perspective. In evaluating the overall environmental impact of the purchase of a product, however, this can be an important step. Purchasing is a statement of support for a producer, and producers that are negligent of environmental or other considerations in their operations can be confirmed in their ways by steady demand for their product.

Three gross indicators of a producer's environmental record are proposed for consideration in the product evaluation process. These are: (documentation of) an environmental policy statement; (confirmation of) a completed environmental audit; and certification by the Environmental Choice Program (ECP) of any of the producer's products.

Information on environmental audits and environmental policy statements should be obtained from the producer. A statement of willingness to provide documentation of environmental policy statements or audit results will be sufficient to determine authenticity of claims. Firms that produce products certified by the ECP program are indicated in the "Certified Products & Services" listings of the ECP, or may be established by contacting the ECP in Ottawa, Ontario.

Table 6 presents the information sought in each product evaluation question and the acceptable form of information presentation. Ensuring standardization of information presentation, except where special comments are requested from the evaluator, will help in cross-product comparisons.

TABLE 6.

INFORMATION SOUGHT	PRESENTATION OF ANSWERS
(STEP 1): Estimated percentage contribution of product to university solid waste stream	Percentage contribution: (____%)
(STEP 2): Fraction of departments using the product	Percentage of departments: (_____%)
(STEP 3): (a) Purchasing arrangement(s) under which product is purchased	Indicate: systems contract, purchase orders, both, or other (specify)
(STEP 3): (b) Strength of demand	Indicate: high, medium, or low demand, and provide comments on perceived need for product
(STEP 4): Product composition	Indicate dominant construction material: renewable resource, non-renewable resource, uncertain, or no clear material dominance; comments if necessary (e.g. "contains post-consumer recycled materials")
(STEP 5): "Recyclability" and durability	Indicate recyclability: "non-recyclable", "potentially recyclable", or "recyclable." Indicate durability: comments on repairability, expected product life, "built-in obsolescence" etc. Other solid waste-relevant product characteristics may be noted as well
(STEP 6): (a) Transport distance	Indicate gross distance: (_____km)
(STEP 6): (b) Transport conditions	Comments on conditions: refrigeration, freezing, or other energy/chemical-using climate control
(STEP 7): Environmental record	Indicate: confirmed audit and/or environmental policy statement and/or producer produces one or more products certified by ECP

Answers to product questions posed in Steps 1 through 5 provide the basis for prioritizing purchasing policy action given a solid waste reduction focus. Answers to questions posed in Steps 6 and 7 provide information for more complete environmental impact comparisons.

With reference to Table 6, a product for which priority action is recommended would, *compared to other products*:

1.) Comprise a higher percentage of the university's solid waste stream.
2.) Be used by a higher percentage of departments.
3.) Be purchased under purchase order arrangements (as uncoordinated deliveries likely involve more solid waste).
4.) Have a lower demand.
5.) Be constructed of no clearly dominant material and contain no post-consumer recycled material.
6.) Be "unrecyclable" and less durable.

Where action priority decisions cannot be made on the basis of points 1-6, the product which comes from farthest away, requires the most climate control measures in transport, and which is produced by the producer with the poorest or most uncertain environmental record (in terms of audit, policy statement, and certification) warrants first response. Source and Producer (and other) environmental criteria for product comparison can be added and considered one-by-one when the waste reduction-related criteria do not clearly indicate the better purchasing choices.

The product evaluation process presented here may not always provide a clear indication of how products should be prioritized for policy action. Because estimations are required, and subjective evaluations are required where numerical information is not practicable to obtain, the process is not a "scientific" method of addressing solid waste reduction. It does, however, guide thinking into some of the areas where solid waste reduction opportunities exist.

As mentioned at the outset of section 5.0, the option of not purchasing a product at all represents a most basic solid waste reduction action. As with goods purchased for household use, luxury and novelty goods in university operations come to be perceived as

necessities over time. The question of the need for a product is to be asked *prior* to the evaluation process, although Step Three (Characterizing demand for the product on campus) does require the product evaluator to consider the perceived need for the product given that it is being purchased in at least some quantity. The opportunities for creative frugality in materials use at the university are numerous, but the emphasis on communication through the print media and the demand of campus users for "convenience" goods and services can frustrate efforts. Encouraging thinking in functional rather than in product terms is one way of stimulating waste reduction (at least respecting the generation of product alternatives) prior to application of the product evaluation process.

5.3 PRODUCT EVALUATION: USE OF THE PROCESS IN A HYPOTHETICAL CASE

A hypothetical case of the product " 3-M (Canada Inc.) Post-it™ Notes" (hereafter "Notes") is explored to show how Steps One to Seven outlined above could be followed in the evaluation of a product. Notes are an actual product being purchased by the University of Manitoba. In this exercise, however, assumptions about the product, as well as figures and comments, are made or contrived and may not reflect the actual University of Manitoba situation.

5.3.1 Following the Product Evaluation Process for 3-M Post-it™ Notes

Step One (solid waste stream contribution)

Notes likely fit into category 3 (High quality office papers) of the waste/materials categorization system presented in Step One, because except for the small amount of sticky glue, the paper comprising the Notes looks and feels like bond paper. According to the

figures provided, the High quality office papers category makes up 24% of the university waste stream. Estimating the fraction of this category that Notes comprise, a value of 1/200th is suggested. Using these two values, a solid waste stream contribution percentage of (.005)x(24%) = **0.12%** is assumed for Notes at the University of Manitoba. With this simple calculation it is recognized that in order to estimate the fraction of the waste category which Notes comprise, assumptions must be made about the scope of product use on campus (i.e. that which is determined in Step Two). For more accurate estimation of certain product characteristics, change in the order of progress through the steps may be warranted.

Step Two (scope of product use on campus)

Through consultation with the Purchasing Department, it is found that Notes are used by 100 out of approximately 110 academic, service, and administrative departments on the Fort Garry campus. The percentage of departments using the Notes is therefore (100/110)x100 = **91%**.

Step Three (a) (purchase arrangements under which product is purchased)

Through consultation with the Purchasing Department, it is determined that Notes are purchased entirely through purchase orders made from requisitions received from user departments.

Step Three (b) (strength of demand)

By review of purchasing records and survey of user departments, it is apparent that Notes have not been purchased by the University of Manitoba for a long enough time to arrive at a price elasticity of demand measure. However, from observation of use patterns and perceptions of users regarding the Notes, demand is considered "moderate." The

product is not considered a basic operational necessity but is held to have some functional value.

Step Four (product composition)

Notes are clearly composed mainly of paper--from pulpwood. Their composition is therefore classified as "renewable resource" composition. The glue used for backing on the Notes is non-toxic (according to the producer) and, comprising such a small portion of the product as compared to the paper portion, is not a dominant component of the product's construction. Notes contain 10% post-consumer (i.e. recycled) fibre, according to an ECP logo on Notes packages.

Step Five (recyclability and durability)

Notes, being from the High quality office papers category, are at least "potentially recyclable." However, after contacting the Recycling Council of Manitoba it is discovered that the nearest practicable paper recycling facility will not receive the Notes because it regards the glue residue on the Notes as a contaminant in processing. There is also no collection and delivery system in place (according to information obtained from the Department of Physical Plant of the university and, upon reference, to UMREG--the University of Manitoba Recycling and Environmental Group). Notes remain as "potentially recyclable."

Comments on the durability of Notes are as follows: Notes are intended for one-time use, and, because they have the stick-on feature, are less likely than non-stick notes to be used on both sides before disposal.

Step Six (a) (transport distance)

From information obtained from the producer, it is discovered that Notes purchased by the University of Manitoba are produced at a 3-M Canada Inc. plant in Thunder Bay, Ontario. The distance between Thunder Bay and Winnipeg, 715 km, was obtained from a common road-distances-between-Canadian-cities table. Further details on transportation distance were not sought, so the figure of 715 km is the value used for the exercise.

Step Six (b) (transport conditions)

Through examination of the Notes product it appeared obvious that no special provisions for climate control were required for transport. This was confirmed by contact with the supplier.

Step Seven (environmental record of producer)

The head office of the 3-M firm indicated, in telephone interview, that the company had undertaken an environmental audit of the Thunder Bay facility within the past year. They were willing to make a copy of the audit results available to the interviewer. As well, the 3-M company has an environmental policy statement and was able to provide documentation of this. The company does produce products that are certified under the ECP; Notes are one of these products.

5.3.2 Conclusions and Policy Implications from the Hypothetical Case

From the foregoing, the following conclusions may be drawn:

1. Notes are not a large component of the University of Manitoba's waste stream.
2. Demand is entirely from user departments, the sum of discrete requisitions processed through the Purchasing Department.
3. Notes have not been in use long enough to be deemed an operations necessity, but reflect a strong demand for a product having a seemingly high substitutability.

4. Purchase of Notes by the University of Manitoba means a net loss of organic material from the forest area providing the raw material, since Notes are not being recycled (or composted) but buried in landfill with other solid wastes.
5. The design feature of the glued portion of the Notes is a problem for the most accessible recycling facilities. This, in addition to having no collection and delivery system in place, prevents recycling of the Notes. As well, the "convenience" of having the stick-on feature may discriminate against more thorough use of the product.
6. Impacts of transportation associated with product use are fairly large given the size of the product and the role that it serves in operations.
7. The producer's environmental record is good, insofar as it is evaluated by the proposed criteria.

In light of these conclusions about Notes, the Purchasing Department could take several actions. For example, all user departments currently requesting Notes could be informed that using substitutes for the notes (such as paper scraps from the office) for short memos would be simple and less harmful to the environment. Further to this the Purchasing Department could seek authorization for the right to refuse to purchase Notes demanded by user departments. User departments would still be free to buy Notes privately (from funds not under the management of the University of Manitoba).

Another option for the Purchasing Department would be to request information from the producer on less environmentally harmful alternative products with similar functions (for example Notes using a glue that did not hinder recycling), and to base a continued purchasing relationship with the supplier on the availability of such products.

Other options are also possible, including setting new size or colour standards for basically the same product, and appealing to the producer's environmental policy statement in order to promote producer responsibility for Notes waste management. Finally, it can be seen that where measures are taken to eliminate the use of some products on campus (especially those products that do not require the purchase of a substitute because the function of the product can be served by materials already on hand) there are

straightforward cost-savings and environmental benefits to be realized. It is with regard to such actions that the pre-evaluation "needs" question is relevant.

5.4 PRODUCT EVALUATION PROCESS CONCLUSIONS

As one part of environmental purchasing policy, the product evaluation process provides a means of involving user departments and Purchasing Department personnel in more environmentally sensitive purchasing.

Any product evaluation process will be limited by the time and access to information that product reviewers have. A value of the process presented here is its relative simplicity and its waste reduction emphasis. A solid waste reduction emphasis in product evaluation is consistent with other environmental objectives and provides an initial focus of activity which can be expanded. Specialized knowledge of environmental particulars is also not required to make waste-minimizing purchasing decisions.

Conclusions drawn about evaluated products can show the many opportunities for purchasing policy intervention. These opportunities include product specifications changes, supplier development and dialogue, product substitution and/or elimination, cooperative ventures on and off campus (such as might support recycling efforts), and requisitioner or buyer education. Chapter VI goes on to present potential environmental purchasing policies that also reflect these themes.

The product evaluation process, as a starting point for further environmental purchasing policy development, will itself require EPPs within which it may be applied. Product evaluation should also not lead just to a focus on the details of specific products, and to product-focused action, but should help evaluators see through some of the assumptions underlying patterns of material goods consumption at the university.

CHAPTER VI

POLICY ALTERNATIVES

6.0 INTRODUCTION

In order for the product evaluation process outlined in Chapter V to have a sure influence on purchasing practice, a supporting body of environmental purchasing policy at the University of Manitoba is suggested. The literature review and questionnaire results also show that institutions which are trying to purchase with more environmental sensitivity have adopted formal purchasing policies as part of their efforts.

Several environmental purchasing policy (EPP) alternatives for the University of Manitoba were determined through an analysis and interpretation of questionnaire results and through ideas stimulated mostly by the literature review and interviews/consultations.

6.1 POLICY ALTERNATIVES

EPP alternatives are grouped into the following categories:

1.) Product control/evaluation and supplier development
2.) Purchasing Department authority and responsibility
3.) On-campus cooperation
4.) Off-campus cooperation
5.) Materials management
6.) Others

1. Product control/evaluation and supplier development

A.) Revise paper specifications in systems contracts to require a minimum of 10% post-consumer fibre content in all envelopes, stationery and fine papers; 100% unbleached post-consumer recycled fibre in toilet tissue; and 100% post-consumer recycled fibre in all disposable food service products (serviettes, paper plates, french fry containers etc.).

B.) Institute product bans on all paper products purchased on campus which are rendered unrecyclable or non-reusable due to their construction. This would include items such as envelopes with "windows" that confound re-pulping processes.

C.) Institute an ozone-depleting substance product ban.

D.) Form a product evaluation committee with authority to institute product bans and to revise product specifications for university purchases.

E.) Improve access of Senior Buyers and user department requisitioners to information on environmentally less harmful products and services.

F.) Allow for a premium to be paid on selected products that are less harmful to the environment but which are currently available only at a higher cost. Budget for the premium allowance in university fiscal planning on the grounds that the allowance reflects a long-term social/environmental commitment of the university (rather than a strictly long-run cost reduction measure) and is to be considered as such during budget revisions.

G.) Include detailed waste minimization preference terms on Requests For Quotations (RFQs) and contract bids.

H.) Where construction or repair work is put out for tender, include preference terms for contractors using goods made from recycled materials and supplies obtained from Winnipeg's Habitat Re-Store or another used/surplus construction materials outlet.

2. Purchasing Authority and Responsibility

A.) Provide the Purchasing Department with the authority to veto non-research product requisitions on environment-related grounds. This would mean extending the authority of the Purchasing Department to refuse to buy products for which environmentally less harmful (and performance, price, and availability comparable) alternatives are known.

3. On-Campus Cooperation

A.) Ensure replacement of single-use packaged cleaning products (i.e. contained in non-reusable or non-recyclable containers) with bulk dispensation units and re-usable containers, through changes to cleaning products systems contracts and caretaking practices.

B.) Formalize a policy statement committing the University of Manitoba to a progressive phase-out of cleaning products that contribute to sewer-bound untreated toxic waste on campus.

C.) Mandate three yearly procurement seminars for Senior Buyers, user departments and all interested university staff, in order to keep abreast of developments in

environmentally less harmful purchasing and to clarify the operations changes implicated in such purchasing.

D.) Institute a cost-sharing arrangement whereby different user departments on campus could share re-usable goods germane to all departments (such as re-usable envelopes used for inter-departmental mail).

4. Off-Campus Cooperation

A.) In cooperation with other large institutions in the City and Province, standardize specifications for recycled-content products in common use by all (e.g. plastic garbage bags).

B.) Formalize a policy commitment to employ persons working in local rehabilitative and sheltered workshops and community development initiatives, where feasible, for the purchase of miscellaneous goods used by the university. Considering opportunities for goods to be produced on campus by teaching and operations departments having this capacity broadens this commitment. Potential goods include bicycle racks, signs and bulletin boards, small carpentered items, and small textile products.

5. Materials Management

A.) Ensure that the quantity of archival material (basically accounting records) from the university that is currently landfilled each year is instead recycled.

B.) Promote supplier activities involving container collection and re-use (such as with some Marrin Bros. Ltd. cleaning products) and dispenser re-use (such as with

WESCO wire and cable spools) through the inclusion of preference terms in new contract bids and through consultation with current suppliers.

6. Others

A.) Clearly define "academic freedom" at the University of Manitoba with special attention to the implications of this for product requisition (i.e. purchasing) freedom.

6.2 THE EVALUATION MATRIX

In order to evaluate the policy alternatives presented in section 6.1 in a manner that facilitates comparison of policy options, an evaluation matrix was developed. Criteria under which policies are evaluated were determined with respect to the interviews conducted on campus, the environmental principles set forth in the literature review, current policy issues at the University of Manitoba, and the EPP questionnaire results.

6.2.1 Evaluation Criteria: Description and Rationale for Inclusion

Eight evaluation criteria were chosen for inclusion in the evaluation matrix. The following provides a description and rationale for each.

1. Implementation Cost

The cost of implementation of a policy is the sum of costs associated with the opportunity costs of wages paid to persons working with the policy and expenditures on gathering and communicating information, keeping records, changing or creating new documents, and so on.

The cost of implementation criterion relates to the cost of initiating the policy itself, and does not include costs or savings associated with actual product or service changes that may result from the policy. Nor does it include costs of policy monitoring.

The implementation cost criterion is included for policy evaluation purposes because of the finite budget of the university.

2. Operational Cost (Savings)

The costs or savings resulting from a policy once it is in place are the additional amounts that distinguish operational costs from implementation costs. These values may include savings from reduced purchasing overall, savings in tipping fees at the landfill, energy expenditure savings, and so on--realized over the longer term. Operational savings may be most evident where, as "policy", the product evaluation process is followed: initial costs of undertaking evaluation may be recovered later in waste management savings or in reduced product consumption.

Recent cuts in operating funds from the Province of Manitoba, the extra cost associated with the ongoing administration of new contracts, and potential costs of policy monitoring are three reasons for including the operational cost criterion in the evaluation matrix.

3. Expected Environmental Benefits

The Expected Environmental Benefits criterion accounts for several phenomena which EPPs may influence:

i.) Solid waste production;
ii.) renewable resource use rates;
iii.) non-renewable resource use rates;
iv.) quantity and quality of uncontrolled release of toxins and other hazardous substances into the environment; and

v.) global environmental concerns (ozone depletion, greenhouse gas accumulation, biological diversity conservation).

Phenomena i, ii, and iii above all have solid waste implications, and together evince the solid waste reduction emphasis in policy evaluation. The scoring rationale for the Expected Environmental Benefits criterion (section 6.2.2) explains how this emphasis is upheld in actual policy evaluation. The intent was to weigh the composite Expected Environmental Benefits criterion more heavily than the other criteria in order to show the importance placed on *any* environmental benefits accruing to a policy. *Under* the Expected Environmental Benefits criterion, solid waste reduction as a particular benefit is further stressed (consistent with the focus taken in the product evaluation process and with the questionnaire conclusions) through its potential realization in at least the first three of the Expected Environmental Benefits (noted in section 6.2.2) for which points may be allotted.

In the questionnaire, variation among the universities in ranking of "Extent and Character of Environmental Benefits" as an EPP screening criterion was great. It was not given chief importance by any of the universities that provided criteria rankings in their responses. Further, with respect to evaluating operational EPPs, the University of Wisconsin indicated that Market Development was the criterion of most importance (from the selection provided), and Tufts University indicated Waste Reduction as the EPP evaluation criterion of most importance. These responses indicate that EPPs are understood to play a role in broader purchasing concerns and university operations issues and that their value is not placed solely in their expected environmental benefits. However, working both from the three environmental principles presented in the literature review and from the belief that the University of Manitoba should promote environmentally sensitive operations not just for fiscal reasons, Expected Environmental Benefits is a justifiable evaluation criterion. The Economy/Environment principle in particular stresses that

economic goals (with their attendant social implications) cannot be realized in an environmental wasteland.

Inclusion of the Expected Environmental Benefits criterion is self-evident, given the objectives of the study.

4. Administrative Feasibility

The administrative feasibility of a given EPP will be a function of that policy's:

i.) Challenge to existing contract administration (respecting information management);
ii.) challenge to existing allocation of work responsibilities in purchasing (buying, product evaluation, supplier development, record-keeping, etc.);
iii.) need of formal authorization (e.g. from the university's Board of Governors) for implementation; and
iv.) interdepartmental relations changes and behavioural changes implied for students, faculty, staff, and off-campus persons.

As an evaluation criterion, administrative feasibility is justified by the current organization of the purchasing system at the University of Manitoba. For example, goods are purchased under several arrangements, from purchase orders to systems contracts. A policy requiring a change to these arrangements would be less administratively feasible than one which did not. Lack of communication between user departments on campus with regard to commonly purchased goods or services is another concern that calls for the inclusion of administrative feasibility as a policy evaluation criterion.

5. Policy Flexibility

Policy Flexibility is a concern to certain universities (such as the University of Wisconsin). Policy flexibility (a measure of the ease with which policy can be adapted to changed circumstances or terminated) is expected to be especially important to EPPs, since

understandings of environmental issues change and opportunities for cooperation and new initiatives in purchasing constantly arise.

6. Policy Intelligibility

This criterion relates to the "straightforwardness" and clarity of the policy: Are terms unambiguously defined? Are the responsibilities of persons involved with the policy made clear? These are some of the questions that can be answered affirmatively when a policy is "intelligible." Steps required to implement the policy would also be clear in an intelligible policy. Policies chosen for evaluation in the matrix present a range of intelligibility. Policy intelligibility will likely be related to the success of the policy, and high intelligibility will make policy monitoring and future evaluation less difficult. The questionnaire and literature review revealed that consistency of meaning of ecological terminology employed on product labels or submitted with supplier claims is often lacking, which points to the need for intelligibility where policies embrace such terminology.

7. Relative Success of Policy at other Institutions

For EPPs not wholly original, the success of the EPP at other institutions provides an indication of what to expect with the policy at the University of Manitoba , given a comparable range of operations between the institutions. Greater confidence that a policy will meet its objectives may be established and opportunities for revising or adapting the policy can be discovered vicariously. The possibility may also exist for information sharing between universities regarding the policy--with opportunity for cooperative arrangements.

The importance of the success-at-other-institutions criterion as an evaluation criterion is not supported by the results of the questionnaire, but is included to help evaluation because it does not entail the speculation and assumptions of the other criteria.

8. Ease of Monitoring

Having a measure of the effectiveness of a policy once it is in place is important if progress in environmentally less harmful purchasing is to be charted. For policies the main objective of which is to reduce solid waste, policy monitoring implies tracking changes in solid waste generation at the university. The confidence with which the operation of a policy can be attributed to solid waste reduction, and the relative difficulty of measuring a policy's effects in waste reduction terms (a function of the organizational or task-focused nature of the policy) will largely determine the ease of policy monitoring. Whether or not new record keeping is required to monitor policy will bear on the ease on monitoring as well.

Some of the policies presented in section 6.1 clearly do not have solid waste reduction as their central environmental objective. Monitoring of the effectiveness of these policies in environmental terms could be very difficult, and might best be done in terms of their immediate effects. For example, the impact on the slowing of ozone layer deterioration resulting from a ban on ozone depleting substance-containing products at the university would be practically impossible to determine. However, the effectiveness of the product ban in simply eliminating such products from campus would not be difficult to determine.

The criterion is included in the evaluation matrix to promote further work in EPP development, revision, and implementation.

6.2.2 Evaluation Criteria: Weighting and Scoring

The eight evaluation criteria described above are weighted equally with the exception that "Expected Environmental Benefits" (criterion 3) is weighted twice as heavily as the other criteria. Twice the evaluation points of the other criteria are possible under the Expected Environmental Benefits criterion.

Under criteria 1, 2, 4, 5, 6, 7, and 8, policy alternatives receive from 0 to 7 points. Although the scoring procedure differs across criteria (such that absolute value comparisons cannot be made), under all criteria more points mean better policy. The highest possible score for each policy alternative in the matrix is 63.

In the evaluation process, an attempt was made to consider some of the interactional effects of the criteria. A policy that scores well on Expected Environmental Benefits, for example, may through those benefits affect the operational cost of the policy--thereby affecting the policy's score under that criterion.

The scoring procedure for each criterion is as follows:

1. Implementation Cost

A policy will receive either 7, 5, 2, or 0 points under this criterion, as shown below.

i.) Net savings anticipated in implementation of policy: 7 points.
ii.) Zero implementation cost: 5 points.
iii.) Implementation cost of $0-1000: 2 points.
iv.) Implementation cost > $1000: 0 points.

2. Operational Cost

Operational cost is an estimate of the costs or savings projected in the longer term. Seven years is the term used for evaluation purposes in the matrix. Seven years is the time until the year 2000, the goal date indicated in national and provincial 50% solid waste reduction policy statements. Operational Cost is the net cost of the policy, inclusive of implementation costs.

A policy may receive either 7, 5, 2, or 0 points under this criterion.

i.) Net savings anticipated in seven-year term of policy adoption: 7 points.

ii.) Zero costs in seven-year term: 5 points.
iii.) Operational cost in seven-year term of $0-5000: 2 points.
iv.) Operational cost in seven-year term > $5000: 0 points.

3. Expected Environmental Benefits

The scoring for the Expected Environmental Benefits criterion differs from scoring for the Implementation and Operational Cost criteria. For each of the following environmental benefits that a policy alternative may bring, 4 or 2 points are allotted. A policy will receive a score of 14 points if all of the benefits below are realized. Solid waste reduction benefits are the most highly valued, being associated with the first three points below.

i.) Solid waste diverted from landfill by re-use, integration back into productive processes, or assimilation into the natural environment (4 points).
ii.) Slowing of renewable resource depletion or regeneration capacity destruction (2 points).
iii.) Slowing of non-renewable (physical) resource depletion (2 points).
iv.) Reduction in opportunities for discharge of harmful chemicals into the environment (2 points).
v.) Reduced harm to other natural systems or resources (air, soil, water etc.) (2 points).
vi.) Encouragement of other initiatives or action beneficial to the environment (2 points).

4. Administrative Feasibility

Under this criterion, all policy alternatives are given the maximum 7 points to start, and the points indicated below are subtracted for each feature characteristic of the policy. A policy to which i, ii, iii, and iv all applied would receive the *lowest* score (i.e. +7-2-2-2-1 = 0) under this criterion.

i.) Requires University of Manitoba Board of Governors authorization, as formal university policy change would be required (-2 points).
ii.) Requires significant additional job responsibilities or the creation of a new job position on campus (-2 points).
iii.) Requires significant changes in the activities of persons and organizations involved with the policy (-2 points).
iv.) Requires significant additional information management work in implementing and/or operating policy (-1 point).

5. Flexibility

Under this criterion, the points indicated are allotted for each characteristic of the policy alternative being evaluated. The maximum score under this criterion is 7 (i.e. 3+2+2).

i.) Scope exists for policy to be intensified or relaxed as policy goals are or are not being achieved (3 points).
ii.) Policy is such that progress towards the goals of the policy could be attained through other policies (2 points).
iii.) Immediate termination of the policy is possible with a minimum of disruption to the activities of involved parties (2 points).

6. Intelligibility

Under this criterion, the points indicated are allotted for each characteristic of the policy alternative being evaluated. The maximum score under this criterion is 7 (i.e. 3+2+2).

i.) Terms used in the policy can be easily and unambiguously defined (3 points).
ii.) Policy implementation procedures can be expressed clearly and precisely (2 points).
iii.) Responsibilities of involved persons can be made clear and understandable (2 points).

7. Success of Policy at Other Institutions

Under this criterion, policy alternatives are evaluated with reference to both the existence of a comparable policy at (an)other institution(s) and the effectiveness of that policy in attaining its objectives. Comparable policies in place at other institutions may be geared towards objectives other than those of U of M policy; "success" is therefore qualified. Nonetheless, the effectiveness of a policy in attaining to one objective may be an indication of its effectiveness in attaining to related objectives as well. Policies known to be in place at other institutions but for which effectiveness is not known are less highly valued (for reasons of uncertainty) than policies known to be in place but neutral in effectiveness. Furthermore, policy alternatives that are in place elsewhere but which are there proving ineffective or problematic are still valued more highly in the matrix than policies not known to be in place elsewhere, since there is opportunity to learn from the difficulties experienced by the other institution(s) with the policy.

Policy alternatives may receive either 7, 6, 4, 3, 2, or 1 points, according to the situation below that best describes the policy.

Situations and points are as follows:

i.) The policy is in place at other institution(s), the range of activities of the institution(s) is comparable to the U of M, and the policy is effective (7 points).
ii.) The policy is in place at other institution(s), the range of activities of the institution(s) is not comparable to the U of M, and the policy is effective (6 points).
iii.) The policy is in place at other institution(s), and the effectiveness is neutral (4 points).
iv.) The policy is in place at other institution(s), and the effectiveness is unknown (3 points).
v.) The policy is in place at other institution(s) and has been ineffective or problematic (2 points).
vi.) The policy is not known to be in place at other institution(s) (1 point).

8. Ease of Monitoring

Under this criterion, points are allocated for each of two characteristics which the policy may have. The maximum score possible is 7 (i.e. 4+3). While the objective against which most of the policies would be evaluated is solid waste reduction, some policies have other immediate objectives (e.g. Policy 5 in the matrix--Senior Buyers: Info Access). For such policies assignment of points under the Ease of Monitoring criterion was more speculative.

i.) Data to measure effectiveness of the policy can be obtained or inferred from changes in records already being kept (4 points).
ii.) Change in the variable(s) used to measure policy effectiveness can be attributed to the policy with high confidence (3 points).

6.2.3 The Process of Assigning Points to Policy Alternatives in the Evaluation Matrix

Each of the eighteen policy alternatives, in the form presented in section 6.1, was evaluated under each of the eight criteria outlined in section 6.2.2, according to the scoring system presented there. Each *single* number in a cell in the evaluation matrix (Table 7) represents a *summary score* for the policy under that criterion. Hence numbers in the cells do not indicate the breakdown of the points allotted for each criterion. For example, it is not clear from Table 7 *which* of the 6 environmental benefits (for which 4 or 2 points were allotted) summed to "10" for Policy 1. Other policies with Expected Environmental Benefits values of "10" may conceal a different selection of benefits.

Under criteria in the matrix, points for policies were determined largely through reasoned speculation and estimation. For each policy (in the form presented in section 6.1) certain features could be predicted with more confidence than others. This was especially true in assigning points under the Administrative Feasibility and Success at other Institutions criteria. As an example to clarify the points determination procedure used in the

matrix, the scoring rationale for Policy 1 in the matrix (i.e. Paper: Recycled Fibre Content) is outlined, with reference to the points breakdown described in section 6.2.2.

6.2.4 Policy 1: Scoring Breakdown and Rationale for Each Evaluation Criterion

1. Implementation Cost

Some costs in communicating new terms to suppliers and in gathering information on the recycled content products to be purchased are expected. Such costs are not expected to exceed $1000. 2 points are therefore allotted under the Implementation Cost criterion.

2. Operational Cost

Over the longer term, it is predicted that the mix of products which may be more expensive initially (e.g. recycled-fibre fine papers) and those which may be less expensive initially (e.g. recycled unbleached toilet paper) will mean lower overall expenditures as compared with the present expenditure level. Taking into account the implementation costs, the operational cost is expected to be about $0. 5 points are therefore allotted under this criterion.

3. Expected Environmental Benefits

As a result of purchasing *post*-consumer recycled-fibre content products, solid waste is diverted from landfill back into productive processes--not directly but through the demand for recycled-content products which require post-consumer waste collection and recycling to produce. 4 points are allotted for this feature of Policy 1.

The purchase of recycled-fibre content products also in theory slows the rate of renewable (forest) resource harvesting, since less virgin fibre is required for each unit of product. A further 2 points are allotted for this environmental benefit of Policy 1.

Slowing of non-renewable resource depletion rates is not an expected consequence of Policy 1, so no points are allotted for this potential environmental benefit.

Reduction in harm to other natural systems or resources (air, soil, or water) would be difficult to confirm with confidence for Policy 1. No points are allotted for this potential environmental benefit.

With the substitution of unbleached for bleached paper products (e.g. toilet paper) there is a reduction in opportunities for discharge of harmful chemicals into the environment. 2 points are therefore allotted for this Expected Environmental Benefit.

Finally, the purchase of various recycled-fibre content paper products can be expected to encourage other actions beneficial to the environment, such as recyclable materials collection efforts (for paper and other materials) and the movement of firms to using more recycled materials in the manufacture of their products. 2 points are allotted for the encouragement-of-other-initiatives benefit. A total of 4+2+2+2 = 10 points is given for Policy 1 under the Expected Environmental Benefits criterion.

4. Administrative Feasibility

As with the other policies evaluated under this criterion, Policy 1 starts with 7 points and points are subtracted for policy characteristics which would hinder administrative feasibility. It is expected that Policy 1 would in fact require Board of Governors authorization, since initial departures from purchasing practice (i.e. choosing some products on an other than lowest-cost-to-end-user basis) would conflict with Board of Governors expectations about Purchasing Department practice. An officially recognized University of Manitoba commitment to purchase some goods for environmental reasons is

something that would eventually have to come from the Board of Governors. 2 points are therefore subtracted from Policy 1's starting score of 7.

With Policy 1, no significant additional job responsibilities, nor the creation of a new job position on campus, is expected, since only product composition is changing (not product function or level of use). No subtraction of points for this administrative feasibility characteristic ensues.

Policy 1 may require significant changes in the activities of persons or organizations involved with the policy--especially suppliers who would now be working to supply the different products. 2 points are subtracted for this policy feature.

Finally, from the Purchasing Department's perspective, significant additional information management work is not expected for implementing and/or operating the policy, providing recycled-content information about products could be easily incorporated into existing product or purchasing records data bases. The conclusion about Policy 1 on this point is not clear. No points are subtracted. The total score for Policy 1 under the Administrative Feasibility criterion is therefore +7-2-2 = 3.

5. Flexibility

Policy 1 provides a good example of policy that exhibits the first policy characteristic for which points may be allotted: scope for policy to be intensified or relaxed as policy goals are or are not being achieved. To intensify Policy 1, recycled-content percentage requirements could be increased, or the specifications could be extended to more products. Policy 1 could be "relaxed" by doing the opposite. 3 points are allotted.

The policy's goals (implicitly paper waste reduction) could foreseeably be attained by other policies: paper rationing, product substitution in some cases, etcetera. In this sense the policy is flexible and 2 more points are allotted under the criterion.

Finally, it is not clear how much disruption to parties involved with the policy would occur if the policy were immediately terminated. On the assumption that end-users of the product would not be affected (as the basic function of the new products has not changed) and that suppliers would be resilient, 2 points are allotted for this possible flexibility feature. A total of 7 (3+2+2) points for Policy 1 under the Flexibility criterion is therefore allotted.

6. Intelligibility

Policy 1 could foreseeably encounter term-definition problems. "Recycled" is the main term that would require a clear operational definition. The fact that the exercise of developing and adopting a definition for "recycled" would be required is deemed sufficient to prevent the allotment of 3 points for the "Terms used in the policy can be easily and unambiguously defined" feature.

It is expected that Policy 1 implementation procedures could be clearly and precisely expressed. Specifying target products, informing suppliers, obtaining approval from the Board of Governors for the policy (if required) and other steps could be spelled out. 2 points are allotted.

Finally, the responsibilities of persons involved with the policy could be made clear and intelligible. For example, Policy 1 involves changes to systems contract goods, for which responsibility is already designated in the Purchasing Department. 2 points are allotted for this characteristic. The total score that Policy 1 receives under the Intelligibility criterion is therefore 2+2 = 4.

7. Success of Policy at Other Institutions

The University of Illinois Urbana-Champaign has a recycled-content product preference policy comparable to that described by Policy 1. The University of Illinois policy is

described in Chapter II (section 2.5) of this study. As a large university with a diversity of purchasing concerns, the University of Illinois has a range of activities comparable to the University of Manitoba. From records kept by the university, the policy has been effective in waste reduction and in decreasing purchase of virgin-material products. This precedent at another institution therefore permits a score of 7 to be allotted under this criterion for Policy 1.

8. Ease of Monitoring

The effectiveness of Policy 1 in terms of waste reduction could largely be measured by information obtained or inferred from records already being kept. That is, purchasing records which indicated the volume of goods purchased and the respective recycled content of those goods could be used to (grossly) calculate solid waste reduction associated with the purchase of these products. For example, if one type of virgin-fibre stationery used on campus were replaced with 50% post-consumer fibre stationery, and the mass of stationery purchased remained at 10 tonnes, then a waste reduction of roughly 5 tonnes (i.e. 50%) could be realized and attributed to the policy. The waste reduction benefits might be realized off-campus. 4 points are allotted to Policy 1 for this feature.

It is difficult to say with what confidence waste reduction changes could be attributed to the action of the policy itself. If the waste-relevant characteristics of products are well-known (as expected with recycled-content paper products), confidence may be quite high. 3 points are allotted. Under this criterion, then, 7 points (3+4) in total are allotted.

As indicated in the matrix (Table 7), the total score for Policy 1 is the sum of Policy 1's scores under each of the 8 criteria: 2+0+10+3+7+4+7+7 = 40. The seventeen other policy alternatives evaluated in the matrix involved similar scoring rationales and speculation.

From the foregoing explanation of the scoring process required in order to evaluate each policy in the evaluation matrix, it is clear that the scope is vast for more or less thorough and confident scoring. As well, confidence in comparing policy alternatives, either under specific criteria or with respect to total scores, will largely depend on the thoroughness with which the various points subsumed by each criterion have been investigated.

In order to best utilize the matrix in policy alternative screening, input from persons outside the Purchasing Department is advised. For example, the evaluation of a policy under the Expected Environmental Benefits criterion could be done with the help of students in the environmental science program at the University of Manitoba and/or with the assistance of students working with UMREG. Students at the University of Colorado in Boulder, Colorado have been involved in university purchasing by undertaking recycled-content product evaluations as part of course credit. Policy evaluation by students as a course work component could be an extension of such a teaching-operations interface. It is realistic to expect the University of Manitoba, particularly the Purchasing Department, to gather the information needed for policy alternative evaluation through the matrix only if the University of Manitoba's commitment to environmentally sensitive operations is taken seriously. Having other persons or groups on campus help gather and prepare evaluation information will likely be required in environmental purchasing policy evaluation. In evaluating policies, a stronger environmental commitment could be shown by increasing the weight of the Expected Environmental Benefits criterion in the matrix (i.e. allowing more points for each expected environmental benefit). In similar fashion, environmental benefits other than those related to solid waste reduction could be more highly valued by selectively increasing the points allowed for them *within* the composite Expected Environmental Benefits criterion. Policies especially strong, then, on these points or under this criterion, would be more likely to be the priority policies.

6.2.5 Table 7: Evaluation Matrix Scores and Totals

The eighteen policy alternatives indicated in section 6.1 were evaluated under the eight evaluation criteria and results are displayed in Table 7.

Table 7.

	EVALUATION CRITERIA								TOTAL
POLICY	Implementation Cost	Operational Cost	Expected Envirn'l Benefits	Administrative Feasibility	Flexibility	Intelligibility	Success at other Institution(s)	Ease of Monitoring	
1. Paper: Recycled Fibre Content	2	0	10	3	7	4	7	7	**40**
2. Non-Recyclable Product Bans	5	0	10	2	4	4	1	7	**33**
3. Ozone Depleting Product Bans	5	5	12	1	5	3	1	3	**35**
4. Product Evaluation Cmttee.	2	7	14	2	5	2	3	7	**42**
5. Senior Buyers: Info Access	2	5	14	4	7	7	4	3	**46**
6. Premium allow'ce.	0	0	14	3	3	4	3	7	**34**
7. Waste Min. terms on RFQs	5	7	10	6	3	7	1	7	**46**
8. Tenders: Preferrence for recycled/ used materials	5	5	14	7	7	7	4	3	**52**
9. Purch. Dept. Authorization Change	5	5	7	5	5	4	1	7	**39**

	EVALUATION CRITERIA								TOTAL
POLICY	Implementation Cost	Operational Cost	Expected Envirn'l Benefits	Administrative Feasibility	Flexibility	Intelligibility	Success at other Institution(s)	Ease of Monitoring	
10. Bulk Cleaners	2	7	10	5	5	5	1	7	**42**
11. Toxic cleaner discharge Elim'n.	0	7	8	0	5	4	1	4	**29**
12. Procurement Seminars	2	7	14	3	5	5	1	7	**44**
13. On-campus reusables cost-sharing	5	7	10	4	5	3	6	7	**47**
14. Standrd'n of specs. on products across institutions	2	7	12	4	3	5	7	7	**47**
15. On-campus/ Special suppliers	2	5	10	3	3	5	1	7	**36**
16. Archival Material Recycl'g	5	5	8	4	7	7	1	7	**44**
17. Supplier Re-collection/re-use	2	7	14	3	5	7	1	4	**43**
18. Academic Freedom def'n.	2	5	2	3	5	2	1	0	**20**

From the values indicated in the Totals column of the matrix, a ranking of the eighteen policy alternatives can be done. The policies, from highest to lowest in value, and their respective scores, are presented in Table 8.

Table 8.

POLICY	TOTAL SCORE	RANK
8. Tenders: Preference for recycled/used materials	52	1
13. On- campus reusables cost-sharing	47	(2)
14. Standrd'n of specs. on products across institutions	47	(2)
7. Waste Min. terms on RFQs	46	(3)
5. Senior Buyers: Info Access	46	(3)
12. Procurement Seminars	44	(4)
16. Archival Material Recycling	44	(4)
17. Supplier Re-collection/re-use	43	5
4. Product Evaluation Committee.	42	(6)
10. Bulk Cleaners	42	(6)
1. Paper: Recycled Fibre Content	40	7
9. Purch. Dept. Authorization Change	39	8
15. On-campus/ Special suppliers	36	9
3. Ozone-Depleting Product Bans	35	10
6. Premium allowance	34	11
2. Non-recyclable product bans	33	12
11. Toxic cleaner discharge elimination	29	13
18. "Academic Freedom" definition	20	14

6.2.6 Priority Policies: The Top Five

Policies with the highest scores in the policy evaluation exercise are predicted to be most effective in the University of Manitoba context. Expanded and revised versions of the five highest scoring policy alternatives are recommended in Chapter VII for implementation at the University of Manitoba. The top five policies also suggest five focuses that environmental purchasing policy may have. These policies and the focuses they represent are shown in Table 9.

Table 9.

POLICY	FOCUS
8. Tenders: Preference for recycled/used materials	Material composition of goods used on campus
13. On- campus reusables cost-sharing	Re-using/exchanging goods on campus
14. Standrd'n of specs. on products across institutions	Cooperative ventures in purchasing
7. Waste Min. terms on RFQs	Activities of suppliers
5. Senior Buyers: Info Access	Purchasing education

The five focuses show the directions that new policy initiatives can take, and may be couched in terms of five questions, germane to the environmental implications of purchasing, which can be asked at any time.

1. What are products being purchased made of?
2. How is the life of the product being maximized?
3. How might cooperation in purchasing reduce harm to the environment?
4. On what grounds are suppliers being selected?
5. Are purchasers learning how to purchase (and not purchase) to the benefit of the natural environment?

6.3 CONCLUSIONS

The Evaluation Matrix constructed and employed in this study is a first attempt at developing a framework which can be used to screen proposed environmental purchasing policies. After consideration in the matrix, policies which will maximize environmental benefits subject to the limitations imposed by the University of Manitoba's structure, administrative processes, and (in some cases) goals and commitments as a post-secondary institution should be revealed. The matrix provides a means for ranking policy alternatives on an ordinal scale. A few points deserve mention regarding the matrix.

1. The initial selection of policy alternatives to be evaluated is an important step. In the present study a cross section of policies was chosen and ideas came from several sources. Application of the product evaluation process (Chapter V) and ongoing consultation with other institutions can help in the generation of new policy alternatives. Use of the matrix can only help show which policies should be implemented first among those chosen for evaluation. This study will recommend (in Chapter VII) that expanded versions of the top five policies be implemented first at the University of Manitoba. The five most highly ranked policies are not only considered to be the most feasible and effective of the policy alternatives considered, but they exemplify various policy focuses (indicated in Table 9) and so provide a broad base for further initiatives.

2. Assigning values to policies under most of the criteria involves a lot of guesswork. In some cases assigning values is practically arbitrary. Expected Environmental Benefits, and Implementation and Operational Costs, are especially difficult criteria under which to evaluate policies. With respect to the former, the environmental benefit of "slowed rate of renewable resource depletion" would only be realized if a policy had a great enough impact to actually influence, for example, the quantity of timber harvested in a forest management

area--and this with no off-setting increase in harvesting elsewhere. Implementation Cost estimates are difficult to estimate accurately because of the novelty of most of the policies. Operational Cost estimates are difficult to estimate accurately because of rapidly changing economic and environmental conditions and the uncertainty surrounding the effects that one policy can have on other policies and practices over the longer term.

Flexibility is another criterion under which evaluation is difficult. Is it a valuable characteristic of a policy when the objectives of that policy could be fulfilled by other policies? This was indeed considered a valuable characteristic in the present study. However, it may be that part of the value of an EPP lies instead in its uniqueness--i.e. that it is the only tool capable of attaining its associated objectives. Further, a policy that can be easily terminated (also a valued characteristic in the present study) may be simply a policy without substance and influence. Measuring the effects of the policy once it is in place could clarify this.

3. The evaluation criteria are not all of the same type. "Expected Environmental Benefits" is a *goal* of all evaluated policies while the other criteria represent practical *issues and concerns in the implementation, maintenance, and monitoring of policy.* Hence a major assumption of comparability was made in summing the values under each criteria to arrive at a total.

4. Policies with lower scores in the matrix are not necessarily poor policies, and should not be disregarded. The policy alternative of "Premium Allowance" (Policy 6 in the matrix) received the maximum Expected Environmental Benefits score (14) but received a low score (34) overall largely because it would be a financially costly policy. The weight given the different criteria will of course powerfully determine the final score which a policy alternative receives.

5. The four points allotted for a policy that effects "solid waste diversion from landfill by re-use, integration back into productive processes, or assimilation into the natural environment" (section 6.2.2, criterion 3, point i) suggests that *recycling* was understood as a more effective waste reduction strategy than, say, less rapidly harvesting a forest resource (a policy directly supporting the latter would receive only *two* points--for "slowing of renewable resource depletion or regeneration capacity destruction"). This higher value placed on recycling as a waste reduction strategy was not intended, and was discovered after policy evaluation and recommendation. Waste reduction can mean either reduction in the amount of material going to a landfill (i.e. through re-use, recycling, or energy recovery) or a reduction in the amount of materials *subject* to landfilling in the first place (i.e. through more efficient production processes and lower rates of consumption). It depends on where the "reduction" is measured--on the woodlot or at the mine, at the plant, or at the landfill. An evaluation of waste reduction benefits based on the specific environmental implications of each of the several ways of dealing with components of the solid waste stream would be a more sophisticated approach to measuring solid waste-related environmental benefits.

In Chapter VI, policy alternatives have been presented and evaluated. Chapter VII goes on to provide a summary of the study and to explain further the environmental purchasing policies recommended for implementation at the University of Manitoba.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

7.0 INTRODUCTION

The purpose of the Conclusions and Recommendations Chapter is to provide a brief summary of the study and the issues that it has considered and to recommend five environmental purchasing policies for the University of Manitoba. An outline of the actions required for implementation is provided for each of these policies.

7.1 SUMMARY

At the University of Manitoba, the Purchasing Department plays a key role in determining how the university makes an impact on the environment. In meeting the requests of user departments on campus, the Purchasing Department functions as a link between the demand for modern products and services on campus and the natural environment that provides material and energy for those products and services.

The main goal of purchasing at the University of Manitoba is to get the product or service demanded to the user on campus at the lowest possible cost. All manner of goods may be purchased and used on campus. This means significant and often uncertain impacts on the environment. The principles of Biosphere Preservation, Resource Stewardship, and Environment/Economy indicate the importance of establishing the links between modern production and consumption activities and ecological realities. These principles also recognize the interdependence of living and non-living things and the potential human and environmental destructiveness of actions based on economic analyses that do not embrace long-term sustainability values.

In government and business, current environment-related initiatives relevant to purchasing include product evaluation research and legislated procurement policy. Objectives of waste reduction (and waste management cost minimization) and market development (leading to sustained employment and business opportunities) are deemed important by government and business.

The higher costs associated with the purchase of products made from recycled materials (or products that are in some other way less harmful to the environment), the lack of information regarding products, materials, production processes and waste management opportunities, and the complex organization of most large purchasing bodies have been suggested reasons for the limited progress in moving from a purchasing function that promotes environmental degradation to one that promotes the integrity of environmental systems.

Common to governmental, business, and institutional efforts to change purchasing policy and practice, however, has been an emphasis on information sharing and improved purchasing department, supplier and user department communications, as well as cooperative buying arrangements.

The EPP questionnaire showed that purchasing policy is in a state of revision in Canadian and American universities. In those places where they are a part of purchasing policy, environmental considerations are mostly informal. EPPs include percentage-of-recycled-material-content specifications for certain products, and such requirements are more often encountered than outright bans on products, except where the latter have been required by law. Cooperative purchasing arrangements are fairly widespread, and have helped some institutions to reduce expenditures and support new recycled-goods markets. There are programs for used equipment salvage and re-use at several universities, and potential for expansion in this area. Senior administrators are the persons typically

responsible for EPPs, and short-term costs tend to be the overriding concern and main determinant of the kinds of EPPs in place.

The screening of environmental purchasing policy alternatives by means of a matrix of evaluation criteria is one way to determine the options that will be most effective in a given context. For the University of Manitoba, an assumption was made about the university's willingness to commit to environmental sensitivity in purchasing. This commitment was expressed by weighting the "Expected Environmental Benefits" criterion twice as heavily as other criteria. Evaluating potential policies is done with incomplete information and with much subjectivity. Overall costs and the range and magnitude of environmental benefits associated with a policy are particularly difficult to predict.

Several policy focuses arose in the evaluation process, and expanded and revised forms of the policies that typified these focuses (the five policies recommended in section 7.2) are considered feasible and worthwhile for the University of Manitoba to implement as soon as possible.

7.2 POLICY RECOMMENDATIONS AND IMPLEMENTATION

7.2.1 Preamble

In order to be most effective, implementation of the five environmental purchasing policies recommended for the University of Manitoba requires an overarching University of Manitoba commitment to support efforts in environmentally sensitive purchasing. A statement to this effect, approved by the Board of Governors of the university, would provide an official basis from which to proceed with policy implementation and would also ensure support for future efforts. Setting up and finalizing the terms of the policies could be done while waiting for such approval. An organizational expression of such a

commitment of support for environmentally sensitive purchasing would be realized by the creation of a campus Environmental Procurement committee, described more fully in section 7.5.

The Board of Governors should consider a University of Manitoba commitment to promote environmentally sensitive purchasing as one part of a farther reaching university environmental policy statement.

The product evaluation process outlined in Chapter V could be applied for product review immediately. The process is also understood as a complement to the five recommended policies, informing them and helping indicate where they may be developed further.

Details of the five recommended environmental purchasing policies are provided in sections 7.2.2 through 7.2.7.

7.2.2 Policy Titles

The five environmental purchasing policies will be titled as follows.

Policy 1: Preference for recycled and recyclable products at the University of Manitoba.
Policy 2: Sharing and maximizing re-use of materials on campus.
Policy 3: Cooperation with other institutions and organizations in purchasing.
Policy 4: "Waste minimization planning" terms for suppliers and on tenders and Requests for Quotations (RFQs).
Policy 5: Purchasing education and information access.

7.2.3 Policy 1.

Goal: Minimize solid waste through procurement of products constructed of recycled and/or recyclable materials.

Policy Statement: The University of Manitoba will seek to purchase products constructed of recycled and/or recyclable materials, provided these products provide net environmental benefits over their virgin-material and unrecyclable counterparts, and will seek to phase out the purchase of products which cannot be recycled and/or which contain all-virgin materials, subject to the same environmental benefits condition.

Implementation:

i.) Adopt definitions of "recycled" and "recyclable", based on post-consumer content and the current state of recyclable materials technologies and facilities respectively. A definition of the latter which takes into account the whereabouts and current operational status of recycling facilities (and not just the technical "recyclability" of the material) will ensure that environmental benefits can in fact be realized by purchasing products from suppliers making recyclability claims. Proposed working definitions of "recycled" and "recyclable" are as follows. These definitions are peculiar to the location and industrial climate of the University of Manitoba.

A.) **Recycled**: constructed at least partly from materials obtained through the collection and use as inputs of materials from post-consumer sources. For products distinguished on post-consumer recycled content and overall recycled content, the post-consumer content will be the relevant index.

B.) **Recyclable**: constructed of a material for which:

a.) There exists a commercially demonstrated processing or manufacturing technology which uses the material(s) as (a) raw material(s);
b.) there is a nearby facility that is currently using the technology; and
c.) a feasible collection and transport arrangement (for getting the material to the facility) is in place, and the material will be collected and transported immediately after use or in any case withheld from landfill.

The definitions of recycled and recyclable are strict. This will promote environmentally meaningful evaluation of product claims.

ii.) Implement a "start-up" action to learn the issues that will be encountered in policy implementation and to show commitment to the policy. The recommended start-up action is to replace all unrecycled or low recycled-content toilet paper on campus with 100% recycled (by the above definition) unbleached paper. The possibility of doing this through a cooperative bid with other institutions should be explored.

iii.) Request from all user departments on campus an inventory of goods currently being purchased and used which contain recycled material and/or which are recyclable according to the working definitions. Sent with the inventory request should be the Policy 1 statement and urging that user departments take responsibility as they can for finding ways to reduce waste through specifications reviews and product selection consistent with the goal of the policy.

iv.) Distribute to user departments an outline of the product evaluation process described in this study (Chapter V) and require that the process be followed (and product information obtained) by user department requisitioners before forwarding requisitions for any new products to the Purchasing Department. Basic information obtained by completing the product evaluation process should be forwarded with any new product purchase orders.

v.) Provide all suppliers with a statement of Policy 1 and request both an accounting for products currently being purchased from the supplier (again, using the working definitions) and information and quotes on recycled/recyclable alternatives. The Universities of Calgary, Ottawa, and Regina have requested similar information from suppliers and may be able to provide assistance.

vi.) Adopt the University of Illinois Urbana-Champaign procedure of compiling and maintaining a campus recycled/recyclable products list, such that only products from the list will be purchased unless requisitioners can provide an environmental or reasonable performance justification for the purchase of an unlisted product. Developing the list can be done through the inventories received from user departments and from the information provided by suppliers. Results from completed product evaluations and product guides such as the Directory of Environmentally Sound Products and Services (see Policy 5) may also help the process. The campus recycled/recyclable products list should be accessible to Senior Buyers, Purchasing Administration and staff, and user departments alike through the university's computer network.

vii.) Invite the student group UMREG to audit user department product and service selection and to recommend alternatives.

Monitoring:

The working definition of "recyclable" is such that waste reduction resulting from Policy 1 could be estimated by the mass of non-recyclable products replaced by recyclable products--information which could be obtained from purchasing records for products included on the recycled/recyclable products list. Waste reduction is only realized when an increase in the proportion of post-consumer material inputs used in production is matched

by a corresponding decrease in post-consumer material being landfilled, incinerated or otherwise taken out of human use. It is recommended that a small and tractable recycled/recyclable product list be compiled to begin with so that there can be assurance that purchase of an item on the list, however small in purchasing volume, is actually helping reduce waste.

7.2.4 Policy 2.

Goal: Reduce waste by maximizing the re-use of materials on campus.

Policy Statement: The University of Manitoba will support the efforts of all departments on campus in re-using products, and will commit to the purchase of new products only upon assurance that alternative means of obtaining (the services of) a desired product from the university community have been systematically explored.

Implementation:

i.) Issue policy statement to all user departments, Senior Buyers, and other frequent requisitioners on campus. Include with the Policy 2 statement a request for suggestions on how the sharing of materials on campus, product life extension of products used on campus, and the re-use of otherwise wasted products could be maximized.

ii.) Establish a computer-accessible campus waste exchange "bulletin board" and make terms of access clear. Used goods (furniture, paper or plastic containers, office equipment, etc.) or surplus supplies from too-large orders can be entered onto the bulletin board and the board can be searched by requisitioners before requisition forms are forwarded to the Purchasing Department. Direct contact between exchanging departments is encouraged, in

order to lessen the burden placed on the Freight and Traffic Coordinator for physically coordinating trades and sharing. The waste exchange component of the policy would be complementary both to Policy 1 and the use of the product evaluation process outlined in Chapter V; requisitioners should be advised to first check the bulletin board, then to consult the recycled/recyclable products list, then to go through the product evaluation process, and then to make the requisition if needed.

Monitoring:

The effectiveness of Policy 2 in reducing waste can be monitored by recording transactions made through the waste exchange bulletin board. Keeping record of completed exchanges would be the responsibility of trading parties. However, reductions in overall requisitions processed (hence goods purchased and hence waste) could reasonably be attributed to the operation of the waste exchange, and waste reduction could be measured (from the university's perspective) by the volume and kinds of purchasing deferred.

7.2.5. Policy 3.

Goal: Increase inter-institutional cooperation in purchasing.

Policy Statement: The University of Manitoba will seek to cooperate with other institutions in Winnipeg, in Manitoba, or nationally and internationally in order to reduce the adverse environmental impacts of purchasing.

Implementation:

i.) Implement initial "start-up" action: Contact the University of Calgary to investigate the standardization of recycled-plastic garbage bag specifications which has been undertaken there in conjunction with other groups. Determine the features of this initiative and take the lead in implementing a comparable agreement in Winnipeg (or southern Manitoba). Institutions with whom to cooperate include the University of Winnipeg, the City of Winnipeg, Government of Manitoba agencies, and local hospitals.

ii.) Determine the features of North Dakota's institutions of higher learning co-op within which cooperative purchasing is done. The North Dakota organization could serve as a model for a similar association in Manitoba. Explore the possibilities of working through the Western Universities Purchasing Association or the Association of Canadian Cities for Environmentally Sound Strategies (ACCESS) in order to purchase or contract-out cooperatively, and in order to share information on product and supplier alternatives and waste exchange potentials. Information on products obtained through application of the product evaluation process should help indicate areas where cooperative ventures would be most effective.

Monitoring:

Quantities of waste diverted from landfill as a result of cooperative purchasing arrangements (such as with multi-institution contracts for recyclable products or with packaging reductions in new delivery arrangements), and overall cost reductions which provide savings that are re-invested in environmentally sensitive purchasing initiatives provide measures of the effectiveness of the policy. The kinds of waste reduction associated with cooperative policies should be easy to determine, but the amount of waste reduction will be more difficult and must be estimated. Since at this point the cooperative

arrangements that could result from Policy 3 are not clear, monitoring can not be described precisely.

7.2.6 Policy 4.

Goal: To encourage all suppliers and contractors to minimize waste in their provision of goods and services.

Policy Statement: The University of Manitoba will request waste minimization activity outlines from all suppliers of products and services on campus, and will pay a premium up to the full cost of proven waste management savings at the University of Manitoba for products from suppliers who are minimizing waste in the production, distribution, and after-use management of their products.

Implementation:

i.) On any new notices to bid on systems contracts for the University of Manitoba, on Requests For Quotations (RFQs) for products in supplier development, and in the administration of existing contracts, require an outline of waste minimization plans and practices which will be followed by the supplier throughout the contract. Specifically, request information on:

A.) The waste minimization processes of the producer or manufacturer of the product(s).

B.) The provisions that will be made by the supplier for the collection and re-use of containers, packaging, or protective materials used to transport the product to, and to use the product at, the University of Manitoba.

C.) The provisions that will be made to take back and reuse, recycle, or safely dispose of any residual product, where this applies.

D.) How users of the product(s) on campus could access bulk dispensers of the product (if applicable) in place of small volume and/or single-use container forms.
E.) Features of the product which make it durable, re-usable, serviceable, and/or recyclable (per the "recyclable" definition provided in Policy 1).
F.) Contributions that will be made to waste reduction on campus. An example would be a commitment to take a load of recyclable materials such as tin, glass, or paper off campus after delivery of a product or performance of a service.

ii.) Provide suppliers with access to waste management expenditure figures for the University of Manitoba, including, where applicable, solid waste disposal costs (tipping fees), hazardous waste treatment costs, and expenditures to support campus recycling efforts, in order to help suppliers describe the economic impacts of waste minimization activities that they undertake. Initially, assumptions about the composition of the university's waste stream will be required, in order to arrive at values for the contribution which a product is making to the university's total waste management bill.

Monitoring:

Since the policy stipulates that a premium will be paid up to the amount of the reduction in overall campus waste management expenditures, effectiveness of the policy can be charted by the sum of these premiums. The premiums will reflect the estimated dollar costs of University of Manitoba waste management. Specific savings, such as in tipping fees at the landfill, can be translated into solid waste reduction quantities. Environmental benefits will be understated, given the low tipping fees in the area and numerous environmental values not figured into the economic calculation.

7.2.7 Policy 5.

Goal: To increase awareness of the environmental implications of purchasing at the University of Manitoba, and to provide opportunities for constructive environment-related action in purchasing.

Policy Statement: The University of Manitoba will improve the access of Senior Buyers and user department requisitioners to information and educational opportunities for more environmentally sensitive purchasing, and will promote purchasing in ways consistent with environmental protection and resource use sustainability.

Implementation:

i.) Obtain a copy of volumes I and II of the Directory of Environmentally Sound Products and Services (from the Department of Purchasing and Supply, City of Toronto, City Hall, 18th Floor, West Tower, Toronto, Ontario M5H 2N2) and make this accessible to the Purchasing Department.

ii.) Provide access to Environmental Choice Program (ECP) product updates and information, through the ECP office (107 Sparks Street, Suite 200, Ottawa, Ontario, Canada K1A 0H3).

iii.) Obtain a copy of the Harmony Foundation's Workplace Guide (see references for this study) for Senior Buyers.

iv.) Review the quarterly Green Business Supplier's Guide and consider obtaining a subscription for the University of Manitoba (the guide may be available through the City of Toronto).

v.) Consider sending a representative from the Purchasing Department to the *Buy Recycled Business Alliance* workshop/seminar in Minnesota in September 1993.

vi.) Make three yearly seminars on environmentally less harmful purchasing a feature at the University of Manitoba, and enable Senior Buyers, requisitioners from all user departments on campus, and suppliers to attend. Seminars could be co-sponsored by the Recycling Council of Manitoba (RCM), UMREG, the Canadian Council of Ministers of the Environment (CCME) and other bodies, and would address such issues as reducing solid waste through purchasing, the efficient use of equipment and supplies, cooperative purchasing opportunities and product availabilities, and environmental and social concerns in purchasing.

Monitoring:

The effectiveness of Policy 5 will be realized in the extent to which the policy helps towards the adoption of other environmentally beneficial purchasing practices at the university. The response of persons participating in the procurement seminars or accessing the product and idea guides provides feedback for policy evaluation.

7.3 RESPONSIBILITY FOR POLICY IMPLEMENTATION

Implementation of Policies 1-5 will require the input of many people. Both the willingness to accept responsibility for policy by the persons indicated and the

appropriateness of the persons suggested for the task (in terms of skills and experience) are important considerations. For this reason it is recommended that the delegation of responsibility for Policies 1-5 and their constituent tasks, outlined in Table 10, be treated tentatively.

Table 10.

POLICY	TASK	PERSON(S) RESPONSIBLE
1.	Adopting "recycled" and "recyclable" definitions and editing U of M policy to embrace these definitions	D. Coyle (Director of Purchasing)
	Determining "recyclability" - product by product	P. Dugal (Manager of Resource Services) and user department requisitioners; possibly students
	Start-up action (recycled paper product replacements)	P. Dugal
	Drafting and dissemination of request for user department inventories	R: Ness (Assistant Director of Purchasing) and secretarial assistants
	Distributing product evaluation framework	secretarial assistants
	Information request and inventory from suppliers	P. Dugal, R. Ness, and Senior Buyers where applicable
	Set-up of computer accessible recycled/recyclable products list	D. Coyle, P. Dugal, R. Ness, and user department requisitioners, with the assistance of the computer services department of the university
	Informing UMREG of opportunity for their input in user department inventory and auditing	D. Coyle, with assistance of user departments
2	Issuance of policy statement to Senior Buyers and user department requisitioners	D. Coyle

POLICY	TASK	PERSON(S) RESPONSIBLE
2 (cont'd)	Implementation of waste exchange computer bulletin board	R. Ness (or person responsible for used goods disposition) in consultation with the computer services department at the university and with user departments. Both this task and that of maintaining a recycled/recyclable products list may warrant outside consultation, depending on the expertise available on campus.
3	Garbage bag specification initiative	D. Coyle, P. Dugal
	Exploration of inter-institutional cooperation opportunities	D. Coyle, P. Dugal
4	Drafting and disseminating supplier waste minimization planning and activity information request	D. Coyle, P. Dugal, R. Ness, other consultants as required, secretarial assistants
	Enabling access to University of Manitoba waste management expenditures information	Senior Administration, with assistance of Purchasing Department, Physical Plant and Safety Office.
5	Reviewing or obtaining product and service guides	P. Dugal, R. Ness, Senior Buyers in Purchasing Department
	Coordination of Procurement Seminars	To be determined

7.4 RESPONSIBILITY FOR POLICY MONITORING

Policies 1-5 demand different kinds of monitoring to evaluate effectiveness. It is recommended that Policy 1 (which requires tracking changes in the purchasing volume of products listed and not listed on the recycled/recyclable products list and translating these changes into gross measures of solid waste reduction) be monitored by the Internal Audit of the University of Manitoba in cooperation with the Purchasing Department.

It is recommended that Policy 2, which requires tracking the volume of purchasing prevented by the operation of the waste exchange bulletin board, be monitored on a circulating responsibility basis, user department by user department. At monthly intervals, the responsible department would collect the records of waste exchange transactions (kind and quantity) kept by each department for the month and arrive at a total volume figure for goods exchanged at the university. Since exchanged goods or materials are "post-consumer goods", the monthly volumes would provide a rough measure of the waste diverted from landfill or other ends. Again, actual waste reduction would be realized only if goods are finally recycled and there is a complementary reduction in the use of virgin materials.

Policy 3 does not entail any special monitoring. Specific cooperative ventures with other groups or institutions resulting from Policy 3 may warrant special monitoring.

It is recommended that Policy 4 be monitored by the Purchasing Department, as they would be in the best position to keep track of the premiums paid for goods purchased from waste-minimizing suppliers and the details of those premiums in terms of the University of Manitoba's waste management expenditures savings. Some assistance may be required from the Department of Physical Plant and the Safety Office.

Policy 5 requires no special monitoring, but informational materials provided to purchasers, and the procurement seminars conducted, should remain open for criticism and improvement.

7.5 POLICY EXTENSIONS AND FURTHER INITIATIVES

The real prospects for implementation of the recommended policies at the University of Manitoba is a key issue in a practical study, and one which employment of the Administrative Feasibility criterion in the evaluation matrix cannot fully address. Policies

that make the whole purchasing function more complicated will likely be rejected. The value to the environment of a policy that requires (for implementation) an intensification of the current system is suspect, since it is the current system which is understood to be permitting or causing the problems in the first place. The policies presented in this study should be manageable with the present staff and equipment capacities of the university. As user departments and other persons on campus begin to play a larger part in university purchasing, however, the Purchasing Department could find its responsibilities changing.

The five policies recommended for implementation in Section 7.2 are a starting point for more comprehensive environmental purchasing policy changes. They seek to reduce overall purchasing expenditures and solid waste through selective purchasing, maximizing re-use of goods on campus, cooperative buying, promotion of waste reduction by suppliers, and purchasing education. As the environmental benefits that the policies seek are mainly those associated with solid waste reduction, extensions of policies can focus either on reducing the waste of specific materials (for example single-use paper products) or on considering other environmental impacts of purchasing such as energy consumption, air or water pollution, and the many social and economic impacts resulting from producers' or distributors' broader spheres of operation. All of the policies recommended at the University of Manitoba require or imply the support and input of persons outside the Purchasing Department. The product evaluation process described in Chapter V complements policy recommendations.

In order to propose new policy ideas, coordinate the gathering of information for policy screening, authorize purchasing practices which would be environmentally beneficial, improve communication on campus regarding materials use, and otherwise assist in further purchasing policy development respecting product and service decision making, the formation of a University of Manitoba Environmental Procurement committee is recommended.

Broad and representative membership would be a key feature of the committee. The structure of the committee should facilitate input from students, faculty and staff on campus, as well as from off-campus consultants where this would be helpful. Minimally the committee would be composed of: the Vice-President (Academic) and Provost, the Vice-President (Administration), the Director of Purchasing, a faculty and/or student representative from the Natural Resources Institute, the director of the Environmental Science programme at the University of Manitoba (and possibly a student representative from this programme), a representative from UMREG, a representative from the Physical Plant, and a representative from the Food Services contracted by the University of Manitoba. Appointment of non-committee contacts in each academic and service department, who could be kept informed of committee activities and called on to participate in selected initiatives, would be a further possibility.

A tentative mandate for the Environmental Procurement committee is as follows:

1. To authorize specific environment-related purchasing initiatives which may be prevented by current University of Manitoba policy.

2. To delegate responsibility for, and to oversee, investigations into the environmental implications of materials and service alternatives at the University of Manitoba.

3. To enable students to do project work directed toward increasing the environmental sensitivity of university operations (especially purchasing).

4. To propose policy and procedure changes respecting materials and service use at the University of Manitoba.

5. To define the role of purchasing in the context of more comprehensive "green" planning at the University of Manitoba.

The coordination of an initial organizational, membership, and definition-of-committee-function meeting could be handled through the office of the Vice-President (Academic) and Provost. This meeting would ideally include representatives from all the groups and departments mentioned above. With an expansion of the committee's mandate, other initiatives aimed at reducing the adverse environmental impact of campus operations could be supported and monitored. Determining strategies for moving beyond the solid waste reduction emphasis adopted throughout this study could also be within the purview of the Environmental Procurement committee.

Waste, energy, and possibly water audits of the University of Manitoba would be indispensable in further developing environmental purchasing policy. Having a body of accurate data on the university's waste stream composition would increase confidence in estimating or determining the contribution of a given product to that waste stream (as is required in the product evaluation process and some of the policy monitoring). An energy audit of the university could establish those areas where equipment and behaviour changes would mean the greatest short, medium, or long-term savings. Energy-consuming equipment purchases on campus are a case study in purchasing decision making. The question from a purely financial point of view is: Will the savings in energy expenditures realized over the next "x" years be greater than the cost of purchasing more efficient equipment today? Information gained from an energy audit would help answer this question. Further study might explore the comparative costs of retrofitting or replacing energy-consuming or water-using equipment on campus. If long-term energy costs are not given consideration in seeking the lowest price source of supply for a requisitioner, the university may unknowingly subsidize user departments while incurring costs greater than the subsidies in power bills. To take a simple example, a compact fluorescent light bulb may cost ten times as much as an incandescent bulb providing equivalent illumination, but last ten times as long and require less than one-third the power to light. Energy savings

resulting from purchasing decisions to replace or retrofit energy-inefficient equipment could be significant. Future purchasing policy changes in this area might include authorization for the Purchasing Department to buy more expensive items (on longer-term energy-savings grounds) than those requisitioned. This is something that can be done even without considering the environmental implications of energy use.

The purchasing policy alternatives ranked sixth through eighteenth in the evaluation matrix should not be ignored entirely. Some of these policies (or adaptations of them) may be more feasible and effective at the University of Manitoba than the policies recommended, due to misapprehensions of the administrative context of the university, the interests of purchasing personnel, or the funding available for new purchasing initiatives. The proposed Environmental Procurement committee could consider further the merit of these policies or adaptations of them.

Bringing together the policies and recommendations of this study in a concise practical manual or brochure may be useful for implementing the initiatives at the University of Manitoba. Production of the manual could be a student project.

While the policies recommended in this study do suggest a new way of looking at the procurement of products and services for the university, they have not required radical changes. More radical policy changes would include delegating responsibility for purchasing from a central department entirely to user departments; and transferring purchasing responsibility entirely to a larger centralized body outside the university. Ecologically and economically, radical purchasing policy changes would foster a producer campus, one where renewable energy resources such as the sun and the wind would provide power for the campus, and where everything from food to pencils would be grown or produced on campus--and then returned to the local environment in an assimilable form.

Policy changes that last and which lead to a more realistic way of doing things will need committed people behind them, people who can say with conviction "It is well for me to be

here doing this work." Whether or not any recommended policy can make a difference depends on more than that which is indicated by evaluation matrix conclusions or general policy commitments.

7.6 CONCLUSION

This study has addressed the problem of determining the most effective ways in which environmental considerations can be embraced by the University of Manitoba's purchasing policy. Through review of the current policy situation at the university, review of the literature, interviews, administration of an environmental purchasing policy questionnaire to several universities in North America, and the construction and use of a policy evaluation matrix, five policy options have been proposed. The policies focus mainly on solid waste reduction and should stimulate the development of farther reaching environmental purchasing policies at the University of Manitoba.

The five study objectives set forth in Chapter I (section 1.3) warrant a re-visitation in conclusion. The first study objective was to identify the components of the University of Manitoba's purchasing policy. It was found that "purchasing policy" is a collection of official procedures and directives (described mostly by the Policy and Procedures manual of the University of Manitoba) as well as a collection of practices and conventions not recorded in writing. These practices and conventions determine, and are determined by, features of the University of Manitoba that include a very small university stores, user department freedom in product selection, several different kinds of contract arrangements, and situation in a larger economic system.

The second study objective was to determine how the current purchasing policy facilitates, permits, hinders or prevents adverse environmental impacts. It was concluded that the current purchasing policy of the University of Manitoba permits all manner of

adverse environmental impacts through the product selection freedom given user departments, through a narrowly-construed price focus in supplier selection, and through a compartmentalized view of campus operations. Supplier development done in ignorance of environmental considerations also promotes environmentally harmful purchasing.

Objective iii was to identify and review purchasing policies at other institutions that incorporate environmental considerations. Mainly this was accomplished through a questionnaire. Purchasing initiatives most commonly identified involved preferences for products which are recyclable or contain recycled material. Waste reduction was a central goal and policy change impetus. Universities seem to be in a state of transition with purchasing policy, and policy which seriously and in a comprehensive way incorporates environmental considerations is lacking.

The fourth study objective was to identify alternative methods of making the University of Manitoba's purchasing policy inclusive of environmental considerations. The "alternative methods" identified were described by eighteen purchasing policies. A product evaluation process and the creation of an Environmental Procurement committee were also identified as ways of helping the university's purchasing policy embrace environmental considerations. More radical ideas for university purchasing were noted in section 7.5.

An evaluation of the alternative methods (i.e. the eighteen policy options) in the University of Manitoba context described objective v. Evaluation by scoring under several evaluation criteria in an evaluation matrix proved a difficult exercise, due to the amount of speculation required in assigning values and the assumptions required to set the slate of evaluation criteria and their weighting. An evaluation matrix having unequivocal value for helping minimize the adverse environmental impacts of purchasing would require that greater stress be placed on the Expected Environmental Benefits criterion. Greater confidence that such benefits would be realized with policy implementation would also be required.

Objective vi (to make recommendations regarding the formal recognition of environmental considerations in the University of Manitoba's purchasing policy and to propose a decision making process for the evaluation of products purchased at the university) led to five policy recommendations, the proposal of an Environmental Procurement committee, and a unique product evaluation process. The five policy recommendations were revised versions of the five highest-scoring policies under the evaluation matrix. The Environmental Procurement committee was conceived to guide and authorize Purchasing Department initiatives, and the product evaluation process focused on waste reduction.

Objectives i, v, and vi have largely been met in the study. Determining more precisely how the current university purchasing policy facilitates, permits, hinders, or prevents adverse environmental impacts (objective ii) would take further work. As well, a more thorough review of the policy situations at other institutions (objective iii) would require tools other than a questionnaire and would demand that more universities be surveyed. Finally, the identification of alternative methods of making the University of Manitoba's purchasing policy inclusive of environmental considerations (objective iv) begs searching beyond that done in the present study.

In exploring the policy change opportunities for one university, the present work suggests the need for environmentally sensitive purchasing policy change at other universities and large institutions. This study may provide ideas and direction for policy initiatives at these other institutions.

Further to the immediate practical applications of the study, some areas where further research might be done are implied. For example, new methods of evaluating products will be required as the environmental implications of the production and consumption of various material goods are taken more seriously. The question of how effectively the institutional purchasing function can work for the betterment of the environment, so long as the existing

administrative (and specifically purchasing) structures remain, is also relevant, as is the question of what new structures may be envisioned.

Finally, this study suggests many areas where students could be a part of university operations reforms. Product evaluation, policy evaluation, policy implementation requiring student, faculty, or staff education, complementary environment-related activities on campus, and research projects such as the present study are some of these areas.

References Cited and Consulted

Aljian, George W., ed. Purchasing Handbook. Third Edition. New York: McGraw-Hill, 1973.

City of Los Angeles. "53 Simple Things Universities and Colleges Can Do to Reduce Waste." A collection of case studies prepared by the Integrated Solid Waste Management Office of the Board of Public Works. Los Angeles: August, 1992.

City of Winnipeg. "The City of Winnipeg Purchasing Policy With Respect To Sustainable Development And Environmental Issues." A report submitted by the Purchasing Department of the City of Winnipeg to Winnipeg City Council. Winnipeg: October, 1990.

Council on Economic Priorities. Shopping for a Better World. New York: 1989.

Cutter Information Corporation. Business And The Environment, Vol.3, No.11 (October, 1992), p.5.

Eagan, David J. and Orr, David W., eds. The Campus and Environmental Responsibility. San Francisco, California: Jossey-Bass Publishers, 1992.

Environmental Protection Agency (United States). "Procurement Guidelines for Government Agencies." An EPA publication produced through the Office of Solid Waste and Emergency Response (OS-305). Washington, DC: December, 1990.

_____. "Procurement Guidelines Advisory #2." A memorandum from Sylvia K. Lowrance, Director, Office of Solid Waste, to Federal Procuring Agencies. Washington, DC: November, 1990.

Gardner, James, Sinclair, John, and Ladd, Brian. "The University of Manitoba and the Environment: A Framework For Action." A Preliminary Report. Winnipeg, Manitoba: September, 1992.

Giarini, Orio and Stahel, Walter R. The Limits to Certainty: Facing Risks in the New Service Economy. Dordrecht, The Netherlands: Kluwer Academic Publishers, 1989.

Glenn, William M. and others, eds. The Canadian Green Consumer Guide. Toronto: McClelland & Stewart, 1991.

Government of Canada. Canada's Green Plan for A Healthy Environment. Ottawa: Minister of Supply and Services Canada, 1990.

Gordon, Anita, quoted from the radio series *It's a Matter of Survival*, in Fletcher, Frederick J., and Stahlbrand, Lori. "Mirror or Participant? The New Media and Environmental Policy." In Canadian Environmental Policy: Ecosystems, Politics, and Process. Robert Boardman, ed. Toronto: Oxford University Press, 1992.

Group of Green Economists. Ecological Economics. trans. Anna Gyorgy. London: Zed Books, 1992.

Harmony Foundation. Workplace Guide: Practical Action for the Environment. Michael Bloomfield and Louise Ward-Whate, eds. Ottawa, Ontario: Harmony Foundation, 1991.

I.D. Systems Ltd. "Opportunities Associated With Solid Waste Minimization at Winnipeg Hospitals: Phase I Report." Winnipeg, Manitoba, December, 1991.

Kashmanian, Richard M., Staeckle, Andrew and Ottman, Jacquelyn. "Environmental Consumerism Unfolds." Resource Recycling, Vol. 10, No. 4 (April 1991), p. 40.

Kowalski, Jamie C. Materials Management: Policy and Procedures Manual, 2nd. edition. St. Louis, Missouri: Catholic Health Association of the United States, 1990.

Maclaren, Virginia W. Sustainable Urban Development in Canada: From Concept to Practice (Volume I: Summary Report). Toronto, Ontario: ICURR Press, 1992.

_____. Sustainable Urban Development in Canada: From Concept to Practice (Volume III: Compendium of Initiatives). Toronto, Ontario: ICURR Press, 1992.

Manitoba Environment. "Action Plan: A Waste Minimization Strategy for Manitoba in the 1990's." The Final Report of The Manitoba Recycling Action Committee. Winnipeg, Manitoba: May, 1990.

_____. State of the Environment Report (1991). Winnipeg, Manitoba: Minister of Environment, 1991.

_____. "WRAP (Waste Reduction and Prevention) 1991 Strategy Report." A report prepared through the Waste Reduction and Prevention Branch, Planning and Innovation, Manitoba Environment. Winnipeg, Manitoba: March, 1991.

Manitoba Government. The Waste Reduction and Prevention and Consequential Amendment Act (Assented to March 15, 1990). Winnipeg, Manitoba: 1990.

Manitoba Government Services. "Terms and Conditions Applicable To All Manitoba Government Invitations To Tender." A publication for potential bidders issued from the Manitoba Government Purchasing Branch. Winnipeg, Manitoba: April, 1991.

Manuel, John, and Ludlow, Lawrence D. "Purchasing of Products Containing Post-Consumer Waste And/Or Products Which Are Environmentally Sound." Toronto, Ontario: M.M. Dillon Ltd., 1990.

Miller, Peter. "The Place of Recycling In Sustainable Development: A Manitoba NDP Environmental Task Force Report." Winnipeg, Manitoba: June, 1989.

Ontario Ministry of Government Services. Memorandum to all Chief Administrative Officers regarding the Environmental Procurement Checklist. From the Office of the Assistant Deputy Minister. Toronto: November, 1991.

Pearce, David W., and Turner, R. Kerry. Economics of Natural Resources and the Environment. Baltimore, MD: Johns Hopkins University Press, 1990.

Schwartzel, Ellen. "Removing Barriers to Government Waste Reduction Requires Political Will" (Draft). Alternatives, Vol. 19, No. 2 (1992), page numbers to be determined at printing.

Schwartzel, Ellen and Haliniak, Janis. "Putting Our Money Where Our Mouth Is: A Review of Environmental Purchasing Policies by Metro Area Municipalities". A research paper prepared by the Pollution Probe Foundation. Toronto: September, 1991.

Schumacher, E.F. Good Work. New York: Harper & Row, 1979.

_____. Small is Beautiful. New York: Harper & Row, 1973.

Stahel, Walter. 1986. "Product life as a variable: the notion of utilization." Science and Public Policy, Vol. 13(4). pp.185-193.

State of Wisconsin. 1989 Wisconsin Act (Vetoed in Part). Madison, Wisconsin: 1989.

Stead, W. Edward, and Stead, Jean Garner. Management for a Small Planet: Strategic Decision Making and the Environment. Newbury Park, California: Sage Publications, 1992.

Student Environmental Action Coalition (SEAC). "The Campus Environmental Audit: A Guide to Creating Campus Environmental Change" (Draft). April A. Smith and others, eds. Place of publication not indicated: 1990.

Turner, Jane and Harrison, Rob, eds. The Ethical Consumer. Issue 15 (August/September 1991).

(Undisclosed authorship). "Getting Business to Buy Recycled." Biocycle, March, 1993, p.45.

University of Illinois At Urbana-Champaign. "Recycling, Recycled Products Procurement, And Waste Reduction." A description of three policies approved for implementation at the University of Illinois. Urbana-Champaign: May, 1990.

University of Manitoba. "Policy 303 (Financial Commitments)" and "Purchasing/Accounts Payable Operating Procedures" (Draft). Policy and Procedures Manual. University of Manitoba, Winnipeg, Manitoba.

Watson, Tom. "The Eco-labelling Challenge." Resource Recycling. Vol. 10, No. 2 (February 1991).

Winter, Georg. Business and the Environment. Hamburg: McGraw-Hill, 1988.

Wisconsin Legislative Council Staff. The New Recycling Law (1989 Wisconsin Act 335): Information Memorandum 90-17. Madison, Wisconsin, 1990.

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

Personal Communications: Persons Cited and Consulted

Baranet, Ed, Purchasing Department, Manitoba Environment, Winnipeg, Manitoba, 1993.

Bater, Brian, Purchasing Department, University of Winnipeg, Winnipeg, Manitoba, 1993.

Berserak, G., Purchasing Unit, Manitoba Environment, Winnipeg, Manitoba, 1992.

Boehm, W., Department of Environment, Manitoba Government, Winkler, Manitoba, 1992.

Bowler, Kieth, Purchasing Manager, University of British Columbia, Vancouver, British Columbia, 1993.

Brazinski, A., Chair of Task Force for Sustainable Development, Red River Community College, Winnipeg, Manitoba, 1992.

Corcoran, Bill, Purchasing Department, Tufts University, Somerville, Massachusetts, 1993.

Coyle, D., Director of Purchasing, Purchasing Department, University of Manitoba, Winnipeg, Manitoba, 1992.

DeBell, J., Director, C.U. Recycling, University of Colorado at Boulder, Boulder, Colorado, 1992.

Dugal, Paul, Manager of Resource Services, University of Manitoba, Winnipeg, Manitoba, 1993.

Ferguson, B. Manitoba Environment representative, Winnipeg, Manitoba, 1992.

Ferraro, Mike, Director of Purchasing, University of Toronto, Toronto, Ontario, 1993.

Gardener, Don, Purchasing Department, University of Waterloo, Waterloo, Ontario, 1993.

Griswald, Chris, National Recycling Council (USA), 1993.

Grudeski, A., Commodity Manager, Purchasing Branch, Manitoba Government, Winnipeg, Manitoba, 1992.

Gusdahl, Irv, Safety Office, University of Manitoba, Winnipeg, Manitoba, 1993.

Hayes, L., Purchasing Department representative, Trent University, Peterborough, Ontario, 1992.

Hein, L., University Stores representative, University of Minnesota, Minneapolis-St. Paul, 1992.

Hoss, T., Coordinator - Recycling and Materials Reduction, University of Illinois at Urbana-Champaign, Urbana-Champaign, Illinois, 1992.

Howson, H., National Manager - Environmental Affairs, Quaker Oats Co., Peterborough, Ontario, 1992.

Husiak, Marilyn, Purchasing Department, Lakehead University, Thunder Bay, Ontario, 1993.

Kerr, R., Project Manager, International Institute for Sustainable Development, Winnipeg, Manitoba, 1992.

Kerr, T., Freight and Traffic Coordinator, University of Manitoba, Winnipeg, Manitoba, 1993.

Kunce, Raymond, Safety, Health and Environmental Affairs Division, Boeing Canada, Winnipeg, Manitoba, 1993.

Lerner, S., Department of Environmental and Resource Studies, University of Waterloo, Waterloo, Ontario, 1992.

Morin, Robert, Materials and Management Services, University of Ottawa, Ottawa, Ontario, 1993.

Ness, Ray, Assistant Director of Purchasing, University of Manitoba, Winnipeg, Manitoba, 1993.

Owens, R., Operations and Services representative, University of Wisconsin, Madison, Wisconsin, 1992.

Peacock, Mike, Purchasing Department, University of Calgary, Calgary, Alberta, 1993.

Pellerin, Steve, M.M. Dillon Ltd., Winnipeg, Manitoba, 1993.

Richardson, Jan, Purchasing Services Department, University of Wisconsin, Madison, Wisconsin, 1993.

Romuld, Linda, Purchasing Department, University of North Dakota, Grand Forks, North Dakota, 1993.

Seymour, I., International Institute for Sustainable Development, Winnipeg, Manitoba, 1992.

Shane, Al, Purchasing Manager, Simon Fraser University, Burnaby, British Columbia, 1993.

Simonson, Kurt, M.M. Dillon Ltd., Winnipeg, Manitoba, 1993.

Stefano, Mike, Purchasing Department, Queen's University, Kingston, Ontario, 1993.

Thomas, P., Department of Political Studies, University of Manitoba, Winnipeg, Manitoba, 1992.

Triplet, Karen, Purchasing Department, University of Minnesota - Twin Cities, St. Paul, Minnesota, 1993.

Van Mierlo, E., Director of Purchasing, City of Winnipeg, Winnipeg, Manitoba, 1992.

Woytuik, Jim, Purchasing Department, University of Regina, Regina, Saskatchewan, 1993.

Young, Elmer, Purchasing Department, Dalhousie University, Halifax, Nova Scotia, 1993.

Appendix 1

Ontario Ministry of Government Services:
Environmental Procurement Checklist

The following checklist was intended to assist government purchasing staff to reduce operations impact on the environment. Answers to the questions on the checklist were to form the basis of purchase specifications, tender evaluation, and environmentally sound contract award decisions. All questions were to be answered "yes" or "no." Sections 1.0 through 5.0 are reproduced verbatim from the checklist.

1.0 General Environmental Criteria for all Products
- Is the product size/magnitude necessary?
- Are all the features of the product necessary, or do they make the product less environmentally friendly (e.g. cosmetic plastic coatings on paper products)?
- Is there a suitable alternative which is less harmful to the environment?
- Is the product designed to be durable/long-lasting?
- Are recycled materials used to produce the product?
- Does the product contain any banned substances (e.g. CFCs)?
- Does the product contain any exotic/endangered materials?
- Is the product recyclable following use?
- Does the product require special disposal considerations (e.g. hazardous materials)?

2.0 Additional Environmental Considerations for Durable Products
- Is the product energy efficient?
- Are any components of required maintenance environmentally damaging?
- Is the product designed for easy maintenance and repair?
- Are recycled materials used to produce replacement parts?
- Are replacement parts recyclable (e.g. laser printer cartridges)?

3.0 Environmental Considerations for Consumable Supplies
- Are the supplies designed to reduce consumption (e.g. rechargeable batteries)?
- Are the supplies designed to minimize waste (e.g. carbonless multi-part forms)?

- Are the supplies required by the equipment non-toxic and/or do they require special disposal considerations?
- Are recycled materials used to produce the supplies?
- Are the supplies reusable?
- Can the supplies be recycled after use?
- If a cleaning product, is it biodegradable, phosphate free, and non-toxic?

4.0 Environmental Criteria for Packaging
- Is the packaging designed to be minimal?
- Is the product packaged in bulk (if functional)?
- Is the packaging reusable - specifically, will the supplier take it back for reuse or will the end-user re-use it?
- Are recycled materials used to produce the packaging?
- Is the packaging material recyclable?

5.0 Preparing Specifications

After considering answers to above noted questions, appropriate purchase specifications and supply terms and conditions can be developed. In the interest of safeguarding the environment, please:

- Specify the products that meet or exceed requirements of the Environmental Choice Program guidelines, where available;
- Specify other standards/guidelines issued by accredited standards writing organizations where ECP guidelines are not available;
- Write your own specifications to suit your procurement needs in accordance with general guidelines outlined in the documents when such specifications are not available from other sources;
- Specify all services be carried out in environmentally sound manner minimizing the pollution created by the equipment and supplies used, and in the disposal of waste generated in the process.

Appendix 2

ENVIRONMENTAL PURCHASING POLICY QUESTIONNAIRE

Instructions

1. Since the purpose of this questionnaire is to determine the kinds of *environmental* purchasing policy(s) existing at your university, please use the following working definition of "Environmental Purchasing Policy" when thinking about the questions. An Environmental Purchasing Policy (EPP) is:

> **Any purchasing policy the intention of which, in whole or in part, is to reduce the adverse impact of the university's use of resources on the natural environment or to promote the sustainability of local, regional, or global ecological systems.**

The foregoing definition *includes* purchasing policies that have environmental benefits but which were adopted primarily for other reasons, such as to reduce expenditures or to follow through on an ethical commitment. Mention of such purchasing policies in the questionnaire is encouraged.

2. The questionnaire is administered with the understanding that any university "policy" can occur in several forms, including:

i.) Broad statements or pledges (written or unwritten) of commitment, that do not include precisely defined courses of action;
ii.). Official, written directives, such as might be found in policy or procedures manuals;
iii.). Official, written directives committing the university to a policy stance, but originating externally, such as might be found in state or provincial legislation;
iv.) "Unofficial" and unwritten practices of purchasers and other personnel, engaged in through personal discretion or through the expressed or tacit agreement of involved persons; and
v.) Combinations of the above.

Please consider and include all these forms of policy when answering the questionnaire questions.

3. Please do not include the environmental purchasing policies of private businesses at the university or of university departments or bodies that do not purchase through the university's purchasing department.

0. PRELIMINARY QUESTIONS

0.1 Is purchasing policy at your university currently undergoing (or soon to undergo) review and/or revision, either for environment-related or other reasons?

Yes: 75.0% No: 12.5% N/A: 0.0% No Response: 12.5%

0.2 a.) Is *any* EPP (remember formal and written as well as "informal" and unwritten policies are both to be considered) currently in place at your university?

Yes: 87.5% No: 12.5% N/A: 0.0% No Response: 0.0%

1. POLICY DEVELOPMENT

1.1 a.) Has municipal, provincial (state), or federal legislation been an impetus to EPP development?

Yes: 37.5% No: 50.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", what legislation in particular?

- The University has a large core grant from the EPA. (*Tufts*)
- 1985 Wisconsin Act 335 on Waste Recovery. (*University of Wisconsin*)

1.2 a.) Have specific departments, committees, students, organizations or other individuals on or off campus been especially influential in spurring EPP development?

Yes: 75.0% No: 12.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", what departments, committees, organizations, students or other individuals in particular?

- CEM (Center for Environmental Management). (*Tufts*)
- Student Environmental Group; Development of faculty, staff, student, and community Group called The U.B.C. Community Recycling Group; (and) Presidential Task Force on Environmental Issues. (*University of British Columbia*)
- Physical Plant. (*University of Calgary*)
- Various Environmental Groups. (*University of Regina*)
- The Administrative Committee on Recycling and the Committee for Environmentally Responsible Campus Management. (*University of Wisconsin*)

1.3 a.) Have any of the following factors been a cause of, or defined the course of, EPP development? Please check all that apply.

1. Physical environment of the university	50.0%
2. Local political situation	37.5%
3. Local economy	25.0%
4. Heightened awareness of social issues related to the environment	87.5%
5. Local environmental realities (e.g. limited landfill space, polluted waters)	62.5%
6. Environment-related activity in the surrounding community	50.0%
7. Other (please explain below)	12.5%
(N/A)	0.0%
(No Response)	0.0%

b.) Please describe how the factors checked above have been influential in EPP development.

- Communities around the university all recycle; limited landfill space; Boston Harbour! (*Tufts*)
- High cost of landfill dumping fees provided an economic incentive to become serious about recycling. (*University of British Columbia*)
- Each one of the above criteria may touch lightly on why or why not issues and policies are or will be created. I believe we are receiving a clear message that educational institutes should be the front-runners. (*University of Regina*)
- Caused development to occur in a short time frame. (*University of Wisconsin*)

2. POLICY CONTENT

2.1 a.) Have environment-related criteria been adopted for the evaluation of *products or services* purchased by the university? An example of such a criterion would be "presence of post-consumer recycled materials in product composition."

Yes: 75.0% No: 12.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate the new criteria, and note as well the *purchase arrangements* to which they apply. For example, are the criteria only relevant for goods purchased through purchase orders, or do they apply also to goods obtained through systems contracts?

- All recycled paper must meet EPA minimum requirements. (*Tufts*)
- Minimum content (of) 10% of post consumer paper in all paper products; use of re-refined oil in all vehicles. (*University of British Columbia*)
- We do not have a formal policy in place but on products where the possibility of recycled process is available, we will request both on purchase orders and tenders for contract purposes. (*University of Regina*)
- Paper products - 50% recycled content. (*University of Winnipeg*)

- Recycled paper must contain 10% post-consumer paper and 50% recycled paper by weight. Also bids for some products contain specific specifications. (*University of Wisconsin*)

c.) What weight have the criteria mentioned in part b. been given compared to other evaluation criteria used in product or service evaluation (such as cost and availability)?

- All taken into consideration, depends on end users commitment. (*Tufts*)
- 10% cost differential preference. (*University of Ottawa*)
- All variables are weighed and applied against the given circumstances. Environmental concerns are a variable but its priority may change. (*University of Regina*)
- N/A. (*University of Wisconsin*)

2.2 a.) Have environment-related criteria been adopted for the evaluation of *suppliers, vendors, distributors and/or contractors* with whom the university deals? An example of such a criterion for a supplier would be "record of performance respecting all environment-related legislation."

Yes: 12.5% No: 75.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate the new criteria and to whom (suppliers, vendors, distributors and/or contractors) they apply.

c.) What weight have the criteria mentioned in part b. been given compared to other evaluation criteria used in supplier, vendor, distributor, and/or contractor evaluation (such as service record)?

2.3 a.) Has EPP banned any products or services?

Yes: 0.0% No: 87.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", what has been banned and why?

- Although answering "no" to the above, the *University of Ottawa* added "not to date."
- Although answering "no" to the above, the *University of Regina* added "Not that I am aware of, but I'm sure some of the processing for producing have changed."

2.4 a.) Has EPP meant terminating business relations with particular suppliers, vendors, distributors, and/or contractors?

Yes: 12.5% No: 75.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", what business relationships have been terminated and why?

- Although answering "no" to the above, the *University of Ottawa* added "not to date."
- Unable to provide products with recycled content. (University of Wisconsin)

2.5 a.) Have product evaluation or "eco-labelling" programs (such as the Environmental Choice Program in Canada or the Green Seal and Green Cross programs in the United States) been a component of EPP?

Yes: 25.0% No: 62.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate the program(s) and how they figure into EPP.

- Informal. (*University of Winnipeg*)

2.6 a.) Has the review and evaluation of specifications for products used on campus been a component of EPP?

Yes: 50.0% No: 37.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please explain this specifications review and evaluation process, describing any "life-cycle" product analysis methods or concepts employed.

- Pre/post consumer percentage. (*Tufts*)
- Move to replace single sided photocopiers with only those that have duplexing capability; replacing coated paper FAX machines with plain paper (machines). (*University of British Columbia*)

2.7 a.) Has EPP involved adopting new purchasing methods or contractual arrangements, or new ways of procuring goods or services?

Yes: 62.5% No: 25.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", what have these new methods or arrangements been? Please check all that apply.

1. Sharing goods among departments or with other institutions	37.5%
2. Barter or exchanges-in-kind	12.5%
3. Leasing	25.0%
4. Solicited or unsolicited volunteer services	0.0%
5. Goods produced on campus	37.5%
6. Other (please explain below)	0.0%
(No Response - for "yes" answers in a.)	25.0%

c.) Please expand on the methods and arrangements checked above.

- Recycling equipment on campus; See 2.6 (i.e. replacement of single-sided photocopiers with duplex-capacity photocopiers and coated paper FAX machines with plain paper FAX machines); All furniture vendors must recycle packaging material. (*University of British Columbia*)
- Multiple state contracts for recycled paper. (*University of Wisconsin*)

2.8 a.) Has EPP entailed any co-operative buying agreements with other institutions?

Yes: 75.0% No: 12.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please describe these co-operative agreements.

- We have tried, other institutions have resisted. (*Tufts*)
- Simon Fraser; University of Victoria; B.C. Institute of Technology and ourselves have been involved in co-operative buying for several years. (*University of British Columbia*)
- Local groups have all standardized recycled specifications on garbage bags. 3 000 000 used annually - cost reduction 40% per year! (*University of Calgary*)
- Copy paper; forms; waste management tender. (*University of Ottawa*)
- Although answering "no" to the above, the *University of Regina* added "Not at this time."
- Provincial universities co-op Western Universities Purchasing Association. (*University of Winnipeg*)
- See above (i.e. multiple state contract for recycled paper). (*University of Wisconsin*)

2.9 a.) Has EPP addressed communication or information-sharing issues between any of the following? Please check all that apply.

1. The purchasing department and user departments on campus	75.0%
2. The purchasing department and suppliers, vendors, distributors, or contractors	87.5%
3. The purchasing department and other groups or organizations on campus	62.5%
4. The persons within the purchasing or materials management department itself	62.5%
5. The purchasing department and organizations, groups, or persons off-campus	50.0%
(N/A)	0.0%
(No Response)	12.5%

2.10 a.) Has EPP encouraged or required new information from suppliers, vendors, distributors and/or contractors regarding the goods or services provided?

Yes: 87.5% No: 0.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", please explain.

- More information requested from vendors on availability of recycled supplies is specified in tender documents. (*University of Calgary*)
- Info request via "General Conditions" sent with every invitation to tender. (*University of Ottawa*)
- Questions aired about processing methods. (*University of Regina*)
- Informal. (*University of Winnipeg*)

2.11 a.) Does EPP involve special approval process(es) that are required for the purchase of certain goods or services or classes of goods or services for the university? An example would be the screening of some products through a Safety, Waste Reduction, or Environmental office before transaction finalization.

Yes: 12.5% No: 75.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", please describe the special approval process(es).

2.12 a.) Has EPP involved new arrangements for managing used goods on campus? An example would be policy for re-sale, reconditioning, or donation of goods.

Yes: 50.0% No: 37.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please describe these new arrangements.

- Surplus equipment sold for up to 75% off purchase price. (*Tufts*)
- In Nov. '87 we established an equipment recycling facility where all surplus equipment must be routed through - much of which is re-sold on campus or to other public institutions. (*University of British Columbia*)
- Administrative Services Manager in our department (Materials Management Services) is responsible for resale of all products. (*University of Ottawa*)
- On salvage material we try to recycle on campus or with organizations that may utilize the salvage material. (*University of Regina*)
- The *University of Wisconsin* answered "no" to question 2.12 but added "The university established a program for resale of items in 1985 and the EPP was established in 1989."

2.13 a.) Has EPP addressed the environmental implications of acquisitions (such as buildings or land) that the university may acquire?

Yes: 12.5% No: 50.0% N/A: 12.5% No Response: 25.0%

b.) If "yes", please explain.

- All buildings must provide area within the building and at the dock for recycling. (*University of Wisconsin*)

2.14 a.) Is the university willing to pay a premium for products or services that it considers to be more beneficial to the environment (i.e. has the university been willing to internalize any environmental costs)?

Yes: 25.0% No: 37.5% N/A: 12.5% No Response: 25.0%

b.) If "yes", what is the premium (percentage) and to what does it apply?

- It is up to each department. (*Tufts*)
- To some extent - no specific % (percentage) set. (*University of British Columbia*)
- 10% cost advantage to bidders when requesting quotes on products. (*University of Ottawa*)

2.15 Please list and briefly describe the EPP(s) in place at your university. Remember to include both formal and informal policy. Policy statements would be appreciated and may be appended to the questionnaire.

- See attached. (*University of British Columbia*)
- To investigate materials that may contain, through process, some percentage of recycled product; salvage material being recycled, if possible, in the the university's operation; to insure that methods carried out on campus are environmentally safe. (*University of Regina*)

3. POLICY ADMINISTRATION

3.1 a.) Have easily misunderstood terms (for example "environmentally friendly", "green" or "recyclable") been operationally defined for purposes of implementing EPP at the university?

Yes: 25.0% No: 37.5% N/A: 0.0% No Response: 37.5%

b.) If "yes", please list the terms and definitions you are currently using at the university.

- "Pre/Post Consumer", "Recycle Content", "Recycle/Reuse", "Environmentally Friendly." (*Tufts*)
- Although answering "no" to the above, the *University of Regina* added "We have no formal policy in place to define these terms, but most individuals are understanding of their meaning."

3.2 a.) Who has the major responsibility for the administration of EPP? Please note all persons who apply, if more than one person.

- Center for Environmental Management (CEM), Buildings & Grounds, Materials Management. (*Tufts*)
- Purchasing Manager - Senior Buyers. (*University of British Columbia*)
- The responsibility would fall with our senior administrators. (*University of Regina*)
- Informal. (*University of Winnipeg*)
- Director of Purchasing Services. (*University of Wisconsin*)

3.3 a.) Have new positions or jobs been created or lost as a result of EPP implementation?

Created: 25.0% Lost: 0.0% Neither: 62.5% N/A: 0.0% No Response: 12.5%

b.) If "created" or "lost", please note the positions or jobs created or lost.

- Recycle Coordinator. (*Tufts*)

3.4 a.) Have anyone's job responsibilities changed significantly as a result of EPP implementation?

Yes: 25.0% No: 50.0% N/A: 0.0% No Response: 25.0%

b.) If "yes", please describe the changes.

- Responsible clauses in contracts protecting the environment. (*University of British Columbia*)
- Custodial workers and refuse collectors and housing counsellors. (*University of Wisconsin*)

3.5 a.) Are any special information sources, agencies, or organizations (institutional, business, governmental, or non-governmental) accessed or consulted in order to implement EPP?

Yes: 37.5% No: 50.0% N/A: 0.0% No Response: 12.5%

b.) If "yes", please list these information sources, agencies, or organizations.

- Environmental Protection Agency (EPA), Vendors. (*Tufts*)
- Provincial Purchasing Commission; Other institutions; Resource Integration Systems Ltd., Portland, Oregon. (*University of British Columbia*)

3.6 What problems or difficulties have been encountered in the administration of EPP?

- None at this time. (*University of Regina*)
- Consistent quality of recycled products. Perception that recycled products are inferior to virgin product counterparts. (*University of Wisconsin*)

4. POLICY MONITORING AND EVALUATION

4.1 a.) Do any persons or organizations on or off campus monitor or evaluate EPP?

Yes: 50.0% No: 37.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate these persons or organizations and how they monitor or evaluate EPP.

- Center for Environmental Management. (*Tufts*)
- All parties concerned have input, and are encouraged to do so. (*University of British Columbia*)
- Dan Wehrman, Dept. of Administration (608) 267-6922. (*University of Wisconsin*)

4.2 a.) Are EPPs *evaluated* for their effectiveness using any of the following criteria? Please check all that apply.

1. Short-term cost effectiveness	25.0%
2. Resource conservation	50.0%
3. Stimulation of other environmental initiatives	25.0%

4. Market development/support	37.5%
5. Waste reduction	50.0%
6. Other (please specify in part b.)	0.0%
(N/A)	0.0%
(No Response)	37.5%

b.) Which of the above criteria are most important in EPP evaluation? Rank if possible.

- Waste Reduction. (*Tufts*)
- 1, 2, 5, 4, 3 (i.e. Short-term cost effectiveness, Resource conservation, Waste reduction, Market development/support, Stimulation of other environmental initiatives). (*University of British Columbia*)
- Market Development. (*University of Wisconsin*)

4.3 a.) Has the total amount of consumption decreased (as measured in volume of goods or dollar costs of goods and services) as a result of EPP?

Yes: 25.0% No: 37.5% N/A: 12.5% No Response: 25.0%

b.) If "yes", for what groups of goods or services has reduction been most significant?

- Less garbage. (*University of Winnipeg*)

4.4 What has been the response of affected persons (on or off-campus) to EPP? Please indicate specific grievances or positive responses which you consider important to the continuation of the policy.

- Overall: positive. People realize it is good for the economy. (*Tufts*)
- Cost relating to photocopiers with duplexing capability. (*University of British Columbia*)
- Most people on campus are acceptable to changes that may occur due to environmental friendly products that are available. Additional dollar costs are always a concern. (*University of Regina*)
- See 3.6 (i.e. Consistent quality of recycled products. Perception that recycled products are inferior to virgin product counterparts.). (*University of Wisconsin*)

5. POLICY INTEGRATION

5.1 a.) Is/are the EPP(s) described in the previous sections related to other *environmental* initiatives, policies, or programs on or off campus? An example here would be a recycled-fibre paper purchasing policy that compliments a campus recycling initiative.

Yes: 75.0% No: 12.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate these other environment-related initiatives, policies, or programs and briefly describe their relationship to EPP.

- As described in 5.1. That is what Tufts does. (*Tufts*)
- Vehicle emissions - in the works; car pooling - reduction of single-vehicle operators; post-consumer fibre content for paper; refrigerant emissions - proper bleeding service. (*University of British Columbia*)
- Paper recycling project. (*University of Regina*)
- As above (i.e. a campus recycling initiative for paper). (*University of Winnipeg*)
- There is a separate program mandating use of recycled papers and waste reduction. (*University of Wisconsin*)

5.2 a.) Is/are the EPP(s) described in the previous sections related to other *non-environmental* initiatives, policies, or programs on or off campus? An example would be a used furniture disposition policy that compliments a student housing programme.

Yes: 25.0% No: 62.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate these other non-environmental initiatives, policies, or programs and briefly describe their relationship to EPP.

- Surplus disposal program in place for 5 years - very effective in prolonging useful life (of) university assets. (*University of British Columbia*)

6. POLICY "AWARENESS" AND FUTURE DIRECTIONS

6.1 a.) Is the university community made aware of the ways that they may support the goals of EPP by their behaviour or input? For example, end-users of a product containing recycled materials might be advised on how they can maximize the useful life of that product.

Yes: 50.0% No: 37.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please explain.

- Paper; Plastics; Bottles; Cans can be brought in from home: recycled at (the) university. (*Tufts*)
- Some efforts are being made considering budget constraints. (*University of British Columbia*)

- Any program that would be implemented within the university would have the acceptance and knowledge of all staff members prior to implementation. (*University of Regina)*

6.2 a.) Are new EPPs anticipated for consideration or implementation in the near future?

Yes: 37.5% No: 37.5% N/A: 12.5% No Response: 12.5%

b.) If "yes", please indicate the anticipated EPPs.

6.3 a.) Are any steps being taken to make official or to formalize any unofficial or informal EPP(s) currently in place?

Yes: 50.0% No: 37.5% N/A: 0.0% No Response: 12.5%

b.) If "yes", please indicate which policy(s) are being made official or formal and how this is being done.

- A committee has been formed to evaluate such actions. (*Tufts*)
- Presidential Task Force. (*University of British Columbia*)
- We are in the process of developing policy & procedures for the university and this issue will be addressed for sure. (*University of Regina*)

6.4 a.) When considering prospective EPP(s), what criteria are (or might be) used to choose between policy alternatives? Please check all that apply.

1. Extent and character of associated environmental benefits	50.0%
2. Cost of implementation	87.5%
3. Administrative feasibility	62.5%
4. Clarity and intelligibility (e.g. preciseness of definitions employed in policy)	50.0%
5. Flexibility (respecting termination or revision of policy once in place)	50.0%
6. Complementarity with existing university policy	62.5%
7. Amount of staff (re)training required for implementation	50.0%
8. Relative success of policy at other institutions	37.5%
9. Foundation in state, federal, or provincial legislation	37.5%
10. Other (please explain below)	0.0%
(N/A)	0.0%
(No Response)	12.5%

b.) Please indicate which of these criteria are or would be most important in the final choosing between policy alternatives. Rank order the criteria if possible.

- 2, 1, 9, 3, 7, (4 5 6 8) (i.e. Cost of implementation, Extent and character of associated environmental benefits, Foundation in state, federal, or provincial legislation, Administrative feasibility, Amount of staff (re)training required for implementation; *and with Clarity and Intelligibility, Flexibility, Complementarity with existing university policy, and Relative success of policy at other institutions given equal ranking*). (*University of British Columbia*)
- It is difficult to rank criteria, as each issue may have a different ranking based on its nature. (*University of Regina*)
- Cost of implementation. (*University of Winnipeg*)
- #9, #2, #3, #5, #4, #6 (i.e. Foundation in state, federal or provincial legislation, Cost of implementation, Administrative feasibility, Flexibility, Clarity and Intelligibility, Complementarity with existing university policy. (*University of Wisconsin*)

6.5 Are you aware of any North American universities or colleges which have especially innovative, effective, or radical EPP(s)? If so, please note those institutions here.

- Numerous in the States. (*University of British Columbia*)

6.6 If you would like to receive the analysis of the questionnaires, or any portions of the practicum document once completed, please indicate your interest here.

Yes: 87.5% No: 0.0% No Response: 12.5%

7. ADDITIONAL COMMENTS, QUESTIONS, AND CONCERNS

Please attach (an) additional page(s) should you want to clarify or expand on any of the answers given in previous sections, or if you have any questions about the questionnaire itself. Thank you for all your work in completing the questionnaire.

Appendix 3

A. University of British Columbia: Draft Environmental Policy Statement (November 1992)

Policy:

The University of British Columbia is committed to continued excellence, leadership, and stewardship in protecting the environment. Environmental protection is a primary management responsibility, as well as the individual responsibility of all members of the University community.

In keeping with this policy, our objective is to reduce waste and achieve minimal adverse impact on the air, water, and land through excellence in environmental control.

Procedure Summary:

All procedures and policies implemented by UBC departments must be consistent with the following principles:

1. Environmental protection is the responsibility of every member of the university community, and pollution prevention is an important part of each person's work. We will actively foster environmental awareness, and a waste reduction ethic.

2. Waste minimization is the cornerstone of the University's Waste Management program. Minimizing the generation of waste is a prime consideration in all Research, Teaching, and Operations.

3. We are committed to an ongoing program to manage the generation, handling, and disposal of waste in the most environmentally sound manner available. We believe we are responsible for the wastes we generate, from cradle to grave.

4. We will meet or exceed government regulations on the environment which apply to our activities and we will regularly monitor our environmental performance.

5. We will provide community leadership in responsible and effective environmental action. We will seek to maintain positive relationships with campus neighbours by identifying and addressing common issues and by mitigating the impact of campus life and development on adjacent land uses.

B. University of British Columbia: Excerpts from Purchasing Policy with Environmental Implications

1. Purchasing Policy: Purpose

To ensure that the University's requirements for materials, equipment and services are met at optimum value with minimum impact on the environment and through consultation with end-user advisory committees and application of ethical and efficient procedures.

2. Purchasing Policy: Vendor Selection (Point 3)

Where appropriate, the Purchasing Department will develop University-wide contracts for common equipment, supplies and services...

3. Purchasing Policy: Definitions

Minimum impact on the environment describes activities that: promote the reduction, re-use, and recycling of materials and equipment; reduce the use of materials toxic to the environment; and standardize common supplies and equipment where possible.

C. University of Ottawa: Environmental Policy Statement

Policy:

The University of Ottawa is committed to managing its operations responsibly, in a way that will protect and sustain the natural environment. To this end, it will, among other things:

1. Take all steps to meet and, where possible, feasible and economically viable, go beyond the requirements of existing environmental laws, regulations and standards.

2. Identify, assess and manage environmental hazards associated with University activities.

3. Assess, plan, construct and operate university facilities in compliance with all legislation dealing with the environment, the University community and the general public.

4. Review the environmental impact of current or proposed operations or undertakings before making decisions or implementing projects.

5. In the absence of legislation, adopt, where feasible, standards that better protect the environment and minimize environmental risk.

6. Maintain an active and efficient self-monitoring program to ensure compliance with environmental legislation and University policies.

7. Where feasible, on the one hand, reduce activities that can harm the environment and, on the other hand, encourage the use of ecologically sound materials or processes, as well as recycling and reutilization programs.

8. Implement, maintain and regularly update contingency plans for dealing with accidental discharges so that effective remedial action takes place as soon as possible to minimize adverse effects.

9. Respond diligently to incidents resulting from University activities.

10. Contribute to the development of standards, procedures and legislation by actively participating in appropriate consultative processes.

11. Organize environmental management effectively at all levels, by clearly defining responsibilities and by requiring that all members of the University community be willing and able to enforce the University's environmental policies and procedure in their sphere of activity.

12. Ensure that the current policy as well as all future policies and pertinent legislation are actively promoted.

13. Implement appropriate measures to have all relevant environmental information distributed efficiently and in a timely manner to all members of the University community.

D. University of Ottawa: Excerpts from Policy No. 36 and Materials Management Procedure 4-3

Policy No. 36:

Point #3, Section 4 (Environment)

"Ecological products are made up of recycled components, or are recyclable."

Point #5, Section 4 (Environment)

"In order to safeguard the environment, and assuming products meet the requirements of the end users, the University will purchase ecological products providing that the price difference between the ecological and the non ecological products does not exceed 10%."

Point #1, Section 4.1 (Technical Specifications)

"To develop technical specifications for a given product, the Director of M.M.S. will proceed with the creation of specific committees established to study the maximum acceptable level or recycled ingredients bought by the University...."

Materials Management Procedure 4-3:

Point #4, Section 4 (Environment)

"Their (the Specifications Committees') mandate is to ensure the maximization of recycled material for the products purchased by the University. Products not containing recycled materials should be recyclable."

E. University of Wisconsin: Excerpts from Information Memorandum 90-17 on The 1989 Wisconsin Act 335

Page 32: [2 - Introduction] Market Development Through Government Activities

State and local government activities are utilized by Act 335 in two ways to promote recycling. First, since government is a large generator of solid waste, strict source separation requirements are imposed on state agencies. Also, since state and local governments collectively constitute one of the largest purchasers of goods in Wisconsin, procurement guidelines that favor recycled materials are established to help create stable markets for goods made from recycled materials. Also, in both of these functions, government agencies serve as role models through these activities, demonstrating the feasibility of both separating recyclable materials from solid waste and purchasing goods made from recycled materials.

Page 33: [2b(2)] Definition of "Recyclable material"

"Recyclable material" is material in waste for which there exists a commercially demonstrated processing or manufacturing technology which uses the material as a raw material.

Page 33: [2b - Implications of the Act following definitions]

The Act amends existing s. 16.72 (2) (e) to require the DOA and other designated state purchasing agents to write purchasing specifications that incorporate requirements for the purchase of products made from recycled materials, and recovered materials, if the use is technologically and economically feasible.

Page 33: [2b - Implications of the Act following definitions]

In addition, the Act directs the DOA and other designated purchasing agents, in s. 16.72 (2) (f), to incorporate into purchasing specifications requirements relating to the recyclability and ultimate disposition of products and, wherever possible, to write procurement specifications so as to minimize the amount of solid waste generated by the state...

Page 34: [2b - Implications of the Act following definitions]

In ss. 16.75 (1m) and 66.299 (5), the Act requires the DOA, other state purchasing agents and local government units to select bids for appropriate materials, supplies and equipment from a bidder who is the lowest life-cycle cost bidder.