

Stewardship of Plastic Packaging in Manitoba: A Multi-stakeholder Model

By
Lisa Quinn

A Thesis
Submitted to the Faculty of Graduate Studies
In Partial Fulfillment of Requirements
For the Degree of

Masters of Natural Resources Management

Natural Resource Institute
University of Manitoba
Winnipeg, Manitoba

**THE UNIVERSITY OF MANITOBA
FACULTY OF GRADUATE STUDIES

COPYRIGHT PERMISSION**

Stewardship of Plastic Packaging in Manitoba: A Multi-stakeholder Model

BY

Lisa Quinn

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of
Manitoba in partial fulfillment of the requirement of the degree
Of
MASTER OF NATURAL RESOURCES MANAGEMENT**

Lisa Quinn © 2004

Permission has been granted to the Library of the University of Manitoba to lend or sell copies of this thesis/practicum, to the National Library of Canada to microfilm this thesis and to lend or sell copies of the film, and to University Microfilms Inc. to publish an abstract of this thesis/practicum.

This reproduction or copy of this thesis has been made available by authority of the copyright owner solely for the purpose of private study and research, and may only be reproduced and copied as permitted by copyright laws or with express written authorization from the copyright owner.

Abstract

Plastics comprise one of the fastest growing material commodity markets. Over the last twenty years the sale of virgin plastic resin in Canada has increased threefold, with the primary end-use being packaging. While the popularity of plastics has increased dramatically, policies and programs to ensure the proper management of this material, or the waste it creates, have not developed at an equal pace. Instituting policies and programs which embrace the principles of packaging stewardship, a concept in which producers assume responsibility for the impact their packaging has on the environment throughout its lifecycle, is one possible way to diffuse the negative impact of plastic packaging on the environment.

The purpose of this thesis was to explore the different options for the stewardship of plastic packaging in Manitoba, with the final product being a model to guide the implementation of packaging stewardship in the province. The objectives set for this study were: to review the use of both regulatory and voluntary packaging stewardship initiatives adopted in other jurisdiction (Germany, Sweden, Austria, Australia, Ontario, Nova Scotia and British Columbia), to assess the potential advantages and disadvantages of implementing these initiatives in Manitoba, and to gain feedback from industry stakeholders regarding the concept of packaging stewardship and a proposed model for implementing packaging stewardship in Manitoba. In order to achieve the objectives of the study, four activities were conducted - a literature review, a packaging stewardship policy and program review, a case study and a workshop.

The literature and program review determined that the benefits of packaging stewardship initiatives went far beyond simply diverting waste from landfills and reducing municipal waste management costs. The benefits also included, improved package design (e.g. less packaging on the market, less material per package, improved recyclability), increased producer and consumer awareness of environmental and waste management issues, advancements in recycling technology and capacity, greater recognition of industry's environmental responsibility, reduced

greenhouse gas emissions, lower energy consumption, decreased dependency on virgin materials, and new economic opportunities. Unfortunately, the study also determined that while a number of Canadian provinces have begun to adopt programs that incorporate elements of packaging stewardship, no Canadian jurisdiction has instituted a full-scale packaging stewardship initiative such as those implemented in Europe. Further, the case study determined Canadian plastic packaging manufacturers and fillers have no plans to voluntarily expand their environmental responsibilities for plastic packaging.

Based upon this information, a model for implementing packaging stewardship was developed for Manitoba. The model recommends the adoption of a full-scale, regulatory approach to packaging stewardship. It requires the participation of a variety of players, including: the provincial, municipal and federal governments, industry, consumers, and the Waste Reduction and Prevention Council (non-government communication and education organization). The research also identified the need for a variety of tools for a successful packaging stewardship initiative. Therefore, the model incorporates a wide array of tools, including: industry take-back regulation; reduction, reuse and recycling targets; levies based on weight, volume and material type; landfill bans and fees; voluntary stewardship agreements; green procurement strategies; and education/awareness campaigns. The hope is that this model will provide a useful starting point for industry, municipalities and the provincial government as they embark upon revisions to the current waste management strategy in the province of Manitoba.

Acknowledgements

Here marks the end of a long journey. While I have learned a great deal about my chosen subject matter over these past two years, I believe I have learned a great deal more about myself. I have many people to thank for helping guide and support me through this process. Thank you to my advisor, John Sinclair, for your guidance and patience, for the occasional nudges, for calming my nerves, and for sharing your wealth of experience in the area of stewardship. To Jim Ferguson, thank you for your support and forthrightness, imparting your knowledge of EPR, and your tremendous help with the workshop. Thomas Henley, thank you for keeping me on my toes and ensuring I considered all the different angles. And to Rudy Schilling, your enthusiasm was greatly appreciated, as was your ability to ensure I communicated my ideas with clarity.

I am also grateful to all those who participated in this research project. Thank you to the many individuals from Europe, Australia and Canada who graciously agreed to share with me the details of their jurisdiction's waste management policies and programs. I would also like to thank the many industry, trade association and NGO representatives who chose to participate in the case study.

The success of the *Options for Plastic Packaging Stewardship Workshop* was the result of many hardworking people including, Barry Friesen, Jim Ferguson, Sheldon McLeod, and Leslie Wilson. But the greatest thanks must go out to participants for sharing their ideas, concerns and comments on packaging stewardship and the proposed model for the province. Their feedback and guidance was invaluable.

This project, however, would not have been possible without the financial support of the Waste Reduction and Prevention Program Fund. Therefore, a special thank you to Manitoba Conservation for their generous support. Thank you also to Dr. John Sinclair for sharing the funding he received through the City of Winnipeg's Waste Minimization Grant. Special recognition must also go to the University of Manitoba Graduate Fellowship Program, Manitoba

Hydro, Natural Resources Institute, Clarence Bogardus Sharpe Memorial Scholarship Fund and University of Manitoba Student Union Scholarship Program for providing financial support throughout my graduate program.

I would like to thank my family and friends for their encouragement and understanding over the last two years. A special thanks to my parents who have always been there to provide a helping hand and words of encouragement, to my father-in-law who so kindly agreed to edit this document and to my mother-in-law for helping turn an intimidating undertaking into an enjoyable adventure. And finally I would like to thank my husband for his eternal patience and never ceasing faith in me. Without his encouragement and support I would never have been able to embark on this journey in the first place. Thanks Todd.

Table of Contents

Abstract	i
Acknowledgements	iii
List of Tables	xi
List of Figures	xii
Acronyms	xiii
 Chapter One – Introduction	
1.1 Background	1
1.1.1 Sustainable Development	1
1.1.2 Extended Producer Responsibility	1
1.1.3 Plastic Packaging	2
1.2 Purpose	4
1.3 Research Objectives	4
1.4 Research Strategy	4
1.5 Scope	5
1.6 Thesis Organization	6
 Chapter Two – Plastic Packaging Stewardship	
2.1 Extended Producer Responsibility	7
2.1.1 Current Roles and Responsibilities	7
2.1.2 New Roles and Responsibilities Under EPR Policies	8
2.1.3 Why the Producer?	10
2.1.4 Packaging Stewardship	10
2.2 Implementing Packaging Stewardship	11
2.2.1 Product Take-back Programs	13
2.2.2 Economic Instruments	14
2.2.3 Government Instruments	19
2.2.4 Eco-Labeling Programs	21
2.3 Challenges to Implementing EPR Policies and Programs in Canada	22
2.3.1 Opposition from Canadian Industry	22
2.3.2 Harmonization of Provincial Stewardship Programs	26
2.3.3 Cost and Availability of Landfill Space in Canada	29

2.4 Packaging	30
2.4.1 Plastic Packaging	32
2.4.2 The Popularity of Plastic Packaging	33
2.4.3 Attributes of Plastic Packaging	34
2.4.4 Canadian Plastic Packaging Industry	36
2.5 Coping with Plastic Packaging	38
2.5.1 Source Reduction	38
2.5.2 Reuse	40
2.5.3 Recycling	41
2.6 Chapter Summary	43

Chapter Three – Methodology

3.1 Literature Review	45
3.2 Packaging Stewardship Policies and Programs	46
3.2.1 International Packaging Stewardship Policies and Programs	46
3.2.2 Canadian Packaging Waste Management Approaches	47
3.3 Case Study	48
3.3.1 Case Study Procedure	48
3.3.2 Manitoba Food Producers & Canadian Plastic Food Packaging Manufacturers ..	49
3.3.3 Provincial and National Trade Associations & Non-Government Organizations ..	50
3.4 Options for Plastic Packaging Stewardship Workshop	50
3.5 Packaging Stewardship Model for Manitoba	51

Chapter 4 – International Plastic Packaging Stewardship Policies and Programs

Regulatory Approaches to Packaging Stewardship

4.1 European Union Approach to Packaging Stewardship	53
4.1.1 EU Directive on Packaging and Packaging Waste	53
4.1.2 Packaging Recovery Organization Europe	57
4.1.3 Plastic Packaging in Europe	59
4.2 Germany	60
4.2.1 German Packaging Ordinance	61
4.2.2 Duales System Deutschland	66
4.2.3 Successes of the German Packaging Waste Management Approach	68
4.2.4 Shortcomings of the German Packaging Waste Management Approach	70

4.3 Austria	73
4.3.1 Austrian Packaging Regulation	74
4.3.2 ARA System	77
4.3.3 Successes of the Austrian Packaging Waste Management Approach	78
4.3.4 Shortcomings of the Austrian Packaging Waste Management Approach	79
4.4 Sweden	81
4.4.1 Ordinance on Producers' Responsibilities for Packaging	82
4.4.2 Act on Certain Beverage Containers	84
4.4.3 Successes of the Swedish Packaging Waste Management Approach	86
4.4.4 Shortcomings of the Swedish Packaging Waste Management Approach	87
4.5 Key Components of the Regulatory Approaches Reviewed	89
4.5.1 Essential Elements	89
4.5.2 System Shortcomings to be Avoided	91
 <i>Voluntary Approaches to Packaging Stewardship</i>	
4.6 Australia	97
4.6.1 National Packaging Covenant	98
4.6.2 National Environmental Protection Measure for Used Packaging	102
4.6.3 Successes of the Australian Covenant/NEPM System	103
4.6.4 Shortcomings of the Australian Covenant/NEPM System	105
4.6.5 Key Components of the Voluntary Approach Reviewed	106
4.7 Direction for the Manitoba Packaging Stewardship Model	109
4.7.1 Voluntary or Mandatory Approach?	109
4.7.2 Essential Elements	109
 Chapter 5 – Canadian Packaging Waste Management Systems	
5.1 Manitoba	113
5.1.1 Waste Reduction and Prevention Act	113
5.1.2 Multi-Material Stewardship (Interim Measures) Regulation	115
5.1.3 Manitoba Product Stewardship Corporation	116
5.1.4 Recycling Plastic Waste in Manitoba	116
5.1.5 Strengths of the Manitoba Multi-Material Stewardship Approach	119
5.1.6 Shortcomings the Manitoba Multi-Material Stewardship Approach	120
5.1.7 Summary	125

5.2 Ontario	126
5.2.1 Waste Diversion Act	126
5.2.2 Stewardship Ontario	127
5.2.3 Blue Box Program Plan	128
5.2.4 Key Components of the Ontario System	133
5.3 British Columbia	136
5.3.1 Industry Product Stewardship Business Plan	137
5.3.2 Beverage Container Stewardship Program	140
5.3.3 Key Components of the British Columbian System	142
5.4 Nova Scotia	144
5.4.1 Solid Waste-Resource Management Strategy	144
5.4.2 Resource Recovery Fund Board	146
5.4.3 Packaging Waste Management Tools	147
5.4.4 Key Components of the Nova Scotia System	150
5.5 National Challenges	153
5.5.1 Plastic Film	153
5.5.2 IC&I Packaging Waste	154
5.5.3 National Harmonization	154
5.6 Direction for the Manitoba Packaging Stewardship Model	155
Chapter 6 – Plastic Food Packaging Case Study	
6.1 Part One: Manitoba Food Producers and Canadian Plastic Packaging Manufacturers ..	156
6.1.1 Case Study Participants	156
6.1.2 Packaging Design and Selection Criteria	159
6.1.3 Environmental Impact	160
6.1.4 Reduction, Reuse and Recycling	161
6.1.5 Packaging Stewardship	165
6.1.6 Concerns About Packaging Stewardship	166
6.1.7 Producer’s Role	167
6.1.8 Consumer’s Role	169
6.2 Part Two: Trade Associations and Non-government Organizations	170
6.2.1 Case Study Participants	170
6.2.2 Need for Packaging Stewardship	171
6.2.3 Packaging Stewardship	172

6.2.4 Role of Key Players	173
6.3 Interpretation	175
6.4 Direction for the Manitoba Packaging Stewardship Model	177

Chapter 7 – Packaging Stewardship Model for Manitoba

7.1 Development of the Packaging Stewardship Model for Manitoba	179
7.1.1 Regulatory or Voluntary Approach	179
7.1.2 Key Participants	180
7.1.3 Essential Elements for Packaging Stewardship	180
7.1.4 Stakeholders Feedback	181
7.2 Draft Packaging Stewardship Model	182
7.3 Feedback from the Options for Plastic Packaging Stewardship Workshop	186
7.3.1 Provincial Government	188
7.3.2 Industry	190
7.3.3 Municipalities	191
7.3.4 Manitoba Product Stewardship Corporation	192
7.3.5 General Comments on the Model	193
7.3.6 Workshop Limitations	193
7.4 Packaging Stewardship Model Revisions	194
7.4.1 Revisions Based on Workshop Feedback	194
7.4.2 Additional Packaging Stewardship Model Revisions	199
7.5 Packaging Stewardship Model for Manitoba	202

Chapter 8 – Conclusion and Recommendations

8.1 Project Summary	210
8.2 Conclusions	211
8.2.1 Provincial Action	211
8.2.2 Mandatory Packaging Stewardship	213
8.2.3 Packaging Stewardship Model	215
8.3 Recommendations	217
8.3.1 Implementation of the Packaging Stewardship Model for Manitoba	217
8.3.2 Further Research	219
8.4 Final Thoughts	221

Appendices

Appendix A: Plastics Used in Packaging 223

Appendix B: Manitoba Food Producers Survey 225

Appendix C: Canadian Plastic Packaging Manufacturers Survey 228

Appendix D: Trade Associations and Non-Government Organization Survey..... 231

Appendix E: Workshop Agenda 232

Appendix F: European PRO Stewardship Fees 233

Appendix G: Duales System Deutschland Recycling Rates 1999-2001 234

Appendix H: Manitoba Product Stewardship Corporation Recycling Rates 235

References 236

List of Tables

Table 4.1: EU Directive on Packaging and Packaging Waste Targets	54
Table 4.2: German Packaging Ordinance Minimum Recycling Targets for Sales Packaging ..	66
Table 4.3: Austrian Recycling Targets for Self-Compliers	76
Table 4.4: Austrian Beverage Container Recovery Targets	76
Table 4.5: ARA Recycling Targets and Rates 2001	78
Table 4.6: REPA Recycling Targets and Rates 2000-2001	87
Table 4.7: Plastic Recovery and Recycling Rates	90
Table 5.1: Plastic Waste Generated Annually in Manitoba	117
Table 5.2: Stewardship Ontario First Year Packaging Levies	131
Table 7.1: Organizations Represented at the Plastic Packaging Stewardship Workshop	187

List of Figures

Figure 2.1: The Use of Plastics in Packaging	32
Figure 2.2: The Canadian Plastic Packaging Industry	37
Figure 4.1: Recycling Rates for PET Beverage Bottles in Sweden	86
Figure 5.1: Types of Plastic Packaging in the Manitoba Residential Waste Stream	118
Figure 5.2: Manitoba's Plastic Recovery Rates Versus the Overall Recovery Rate	123

Acronyms

ARA	Alstoff Recycling Austria AG (Austria)
BBPP	Blue Box Program Plan (Ontario)
BCSP	Beverage Container Stewardship Program (British Columbia)
CCME	Canadian Council of Ministers of the Environment
CSR	Corporations Supporting Recycling
DKR	Deutsche Gesellschaft für Kunststoff-Recycling mBH (Germany)
DSD	Duales System Deutschland (Germany)
EPIC	Environment and Plastics Industry Council
EPR	extended producer responsibility
FCM	Federation of Canadian Municipalities
FPI	Forpackningsinsamlingen (Sweden)
HDPE	high density polyethylene
IPP	integrate product policy
LDPE	low density polyethylene
MPSC	Manitoba Product Stewardship Corporation
MSW	municipal solid waste
NEPM	National Environmental Protection Measure (Australia)
OECD	Organization for Economic Cooperation and Development
PAC	Packaging Association of Canada
PET	polyethylene
PP	polypropylene
PRO	producer responsibility organization
PRO EUROPE	Packaging Recovery Organization Europe s.p.r.l.
PVC	polyvinyl chloride
REPA	Reparegistret AB (Sweden)
RRFB	Resource Recovery Fund Board (Nova Scotia)
WDO	Waste Diversion Ontario
WMR	Waste Management Regions
WRAP	Waste Reduction and Prevention (Manitoba)

Chapter One - Introduction

1.1 Background

1.1.1 Sustainable Development

In 1987, the Brundtland Commission presented a report entitled *Our Common Future* to the United Nations. The culmination of a three-year study, this report determined that the planet could not sustain our current pattern of living, and concluded that changes in our approach to resource consumption, economic development and social interactions were essential. The Commission used the term *sustainable development* to describe this new approach, a notion which they defined as “development which meets the needs of the present without compromising the ability of future generations to meet their needs”. While a relatively novel idea in the late eighties, sustainable development is now a readily recognized concept, playing an influential role in the development of public and private sector policies, programs and projects.

1.1.2 Extended Producer Responsibility

The drive to achieve a sustainable society is behind the advancement of the principle of extended producer responsibility. Extended producer responsibility (EPR) is a concept in which producers assume responsibility for the impact their products have on the environment throughout their lifecycle (Sinclair & Fenton, 1997). Packaging stewardship refers to EPR programs and policies which focus on packaging and packaging waste. Under such initiatives, producers assume a role in the management of the waste generated by the consumption and disposal of their packaging. The goals of such initiatives include: advancing source reduction, encouraging design for the environment, compelling industry to internalize waste management costs, and promoting overall waste reduction.

The stewardship of packaging waste was first legislated in Germany in the early 1990s. Over the last decade many other countries, including the member nations of the European Union, the

Czech Republic, Poland, Hungary, Latvia, Japan, Brazil and Australia have also adopted EPR policies and programs to manage packaging waste. The success many of these nations have had with packaging stewardship goes beyond reducing municipal recycling costs and extending the lifespan of landfills. The achievements of these nations include:

- Increased producer and consumer awareness of environmental and waste management issues;
- Improved processing and recycling capacity;
- Reductions in packaging (e.g. elimination, lightweighting and concentrated versions of products);
- Investments in sorting/recycling technologies and processes;
- Enhanced recyclability of packaging;
- Corporate cultural shift (i.e. greater recognition and acceptance of industry's environmental responsibility);
- Reduced greenhouse gas emissions;
- Lower energy consumption;
- Decreased dependency on virgin materials;
- Improved communication between government and industry;
- Litter abatement;
- New economic opportunities (e.g. new jobs, markets, businesses and facilities); and
- Fairer waste management system (e.g. polluter-pays principle).

1.1.3 Plastic Packaging

Plastics comprise one of the fastest growing material commodity markets. Over the last twenty years, the sale of virgin plastic resin in Canada has increased threefold (Earthbound Environmental Inc., 1999). While the popularity of plastics has increased dramatically, policies and programs to ensure the proper management of this material have not developed at an equal pace. Therefore, in addition to being one of the most popular commodities, plastics are also the fastest growing segment of the municipal solid waste stream (Stevens, 2002).

The largest end-use for plastics is packaging. Plastics are extremely versatile, durable and low in cost, and thus are the material favoured by many package designers (Stevens, 2002). Plastic resins are used to manufacture bottles, tubs, jars, wrap, bags and closures for a wide variety of commercial and consumer products.

There are a number of problems related to plastic packaging and its waste which are not experienced by other packaging materials, including:

- Plastic packaging is a highly visible segment of the waste stream and as such, is often the focus of public criticism;
- Plastic is rapidly replacing other packaging materials, such as paper, glass and aluminum, which can be readily reused and/or recycled;
- Progress in the fields of plastic engineering and polymer science have expanded the possible end-uses for plastics, but have also increased the difficulty of recycling these materials;
- The cost of collecting, sorting and recycling plastics is significantly higher than for other packaging materials;
- The capacity, technology and processes for sorting and recycling plastic packaging are underdeveloped; and
- The end-markets for secondary plastic materials are limited and typically unstable.

Instituting policies and programs which embrace the principles of extended producer responsibility is one possible way to diffuse the negative impact of plastic packaging on the environment. Packaging stewardship encourages producers to consider the life-cycle impact of products during the design process and involves industry in waste management, thereby encouraging the development of recycling capacity and end-markets for secondary materials.

1.2 Purpose

The purpose of this research thesis was to explore the options for plastic packaging stewardship in Manitoba. The final product of this study is a model designed to guide the implementation of packaging stewardship in the province. The intent of the model is to reduce the environmental impact of all packaging, including plastic packaging.

1.3 Research Objectives

- a. To review the use of regulatory and voluntary packaging stewardship initiatives used by other jurisdictions to reduce the negative environmental impact of plastic packaging.
- b. To assess the potential advantages and disadvantages of adopting the aforementioned initiatives in the Province of Manitoba.
- c. To gain feedback from industry stakeholders regarding the concept of packaging stewardship, the environmental impact of their packaging, and a proposed model for implementing packaging stewardship in this province.

1.4 Research Strategy

In order to satisfy the above research objectives, the following activities were carried out:

Literature Review

- The current literature on packaging stewardship and plastic packaging was reviewed and summarized.

Packaging Stewardship Programs and Policies

- A review of regulatory and voluntary approaches to packaging stewardship adopted internationally was conducted, including those in Austria, Germany, Sweden and Australia.
- An examination of Canadian packaging waste management initiatives in Ontario, British Columbia, Nova Scotia and Manitoba was undertaken.

Plastic Food Packaging Case Study

- Interviews were held with Manitoban food producers and Canadian plastic packaging manufacturers to determine their attitudes towards packaging stewardship and what action the organization had voluntarily taken to reduce the ecological effects of their packaging.
- Provincial and national trade-associations and non-government organizations involved in the promotion of packaging, plastics, or EPR principles were interviewed in order to assess their opinions regarding plastic packaging stewardship.

Options for Plastic Packaging Stewardship Workshop

- A workshop was held with representatives from industry, government and non-government organization to review a packaging stewardship model for Manitoba. This model was developed on the basis of the research material gathered through the literature review, policy analysis and case study.

1.5 Scope

The project focused primarily on means to increase producers' involvement in packaging waste management. Although many programs exist to reduce packaging waste and increase recycling of plastic packaging, such as 'All Bottles Programs' and product bans, these tend to be government run initiatives and are not dealt with in this document. Furthermore, this research concentrated on primary (sales) and secondary (grouped) plastic packaging generated by households, excluding transportation packaging and all waste generated by the industrial, commercial and institutional sectors.

1.6 Thesis Organization

This thesis is divided into eight chapters. Following this chapter, chapter two summarizes the literature related to extended producer responsibility and plastic packaging. Chapter three outlines the research methods used to satisfy the objectives of this study. Chapter four provides a summary of international packaging stewardship policies and programs. Chapter five describes selected packaging waste management programs in Canada. Chapter six compiles the interview data collected during the case study. Chapter seven describes the development of the packaging stewardship model for this province, summarizes the feedback provided by participants of the *Options for Plastic Packaging Stewardship Workshop*, and presents the final *Packaging Stewardship Model for Manitoba*. Chapter eight concludes this thesis and provides a number of recommendations for the further study and development of packaging stewardship.

Chapter Two - Plastic Packaging Stewardship

2.1 Extended Producer Responsibility

Extended producer responsibility is an environmental principle in which producers assume responsibility for the impacts their products have on the environment throughout their lifecycle (Sinclair & Fenton, 1997; Fishbein, 1998). While the concept of EPR encompasses the entire lifespan of a product or packaging, EPR policies tend to focus on the post-consumer stage, meaning the producers must assume a role in the management of the waste generated by their products. Such strategies encourage producers to think beyond simply marketing and selling their goods, compelling them to consider the effect their products may have on the environment after the consumer has discarded them (Friends of the Earth, 1998).

2.1.1 *Current Roles and Responsibilities*

Traditionally the burden has been placed on municipal governments to administer waste collection and disposal programs. Since manufacturers have not been responsible for the financial or physical aspects of refuse management, they have not been too concerned with reducing the amount and type of waste generated by their products. "As long as noncompetitive government agencies use tax dollars to finance the disposal and recycling of garbage, consumer-product companies can choose to market a diamond ring in a refrigerator box and not worry about the consequences" (Hershkowitz, 1993, p.109).

Under the current system, provincial and federal governments are responsible for setting and enforcing general environmental standards and policies for environmental protection and conservation. The provinces set legislation and regulations related to the use of provincial land and natural resources. The provinces' jurisdiction also includes the governance of municipalities, who are responsibility for solid waste disposal. The federal government has jurisdiction over

inter-provincial and international environmental matters, including emissions and effluent expelled as a result of manufacturing processes.

Producers (brand owners) are the decisions-makers for products and packaging. They determine the raw materials which will be used, the design of the unit, and the production process which will be employed. Traditionally, they have only been responsible for environmental concerns directly related to the production processes, such as the health and safety of employees and the prevention and treatment of harmful effluents and emissions (OECD, 2001).

The public plays a role in both waste production and waste management. As consumers, the public is responsible for waste generation and as taxpayers, the public is charged taxes to support refuse management systems. When products do not include waste management costs in the sales price, and taxes do not reflect the amount of garbage a household generates, there is no financial incentive for the public to reduce their consumption or consider the environment when selecting goods (Santoriello & Block, 1996).

2.1.2 New Roles and Responsibilities Under EPR Policies

Instituting EPR involves transferring the traditional responsibility of waste management from municipal governments and taxpayers to product producers and consumers. The goal of transferring the financial and/or physical management of the waste stream is to encourage producers "...[to] design according to the 3Rs principles, [to] take steps to divert materials from disposal, [to] actively use recovered materials and [to] ensure proper handling in the event of disposal" (Environment Canada, 2001, p.1).

There are four general areas of responsibility which may be transferred to producers:

1. *Physical responsibility* involves the producer engaging in the physical management - the collection, processing, and treatment or disposal - of their products or packaging at the end of the life cycle.

2. *Financial responsibility* entails the producer paying part or all of the costs associated with the physical management of the waste generated by their products or packaging.
3. *Informational responsibility* requires that producers provide information to consumers regarding the environmental impact of their products or packaging. Producers may supply data on the environmental impact of the product throughout its lifecycle, toxic components, appropriate handling and use, or proper disposal techniques.
4. *Legal responsibility* extends a producer's traditional liability for their products or packaging to the post-consumer stage.

(ILSR, 2000; OECD, 2001)

Under EPR initiatives, the role of municipalities in waste management is typically reduced. The nature of their participation is dependant on the policies adopted. Under some EPR configurations, municipalities are contracted by producers to collect and treat waste materials, while under other systems the producer, retailers or contracted private waste collection companies take responsibility for the physical management.

The role of senior governments remains that of policy developers and enforcers. In Canada, either the provincial or federal governments would be responsible for establishing extended producer responsibility policies and ensuring the actors in the product chain fulfill their assigned obligations (Sinclair & Fenton, 1997).

When producers assume responsibility for the packaging, the costs they incur are incorporated in the final price of their goods. By including the environmental costs of production and consumption in the prices of products, consumers become aware of the costs of waste management and are able to make informed decisions regarding the goods and services they purchase (Taylor, Jaccard & Olewiler, 1999; Hershkowitz, 1993). Consumers also play a role in collecting, separating and returning waste materials (Fishbein, 1998).

2.1.3 *Why the Producer?*

Successful EPR programs require all the members in the product chain, including resource extractors, raw material suppliers, packaging producers, fillers, distributors and retailers, consumers, government (municipal, provincial, federal), to take responsibility for their behaviour. However, due to the complexity and range of actors, it is necessary when creating EPR policies and programs to delegate one of the participants with the explicit responsibility for managing the product at the end of its useful life (OECD, 2001).

Producers are in the best position to take a leadership role in the reduction and prevention of product and packaging waste. Producers are in control of the product development process; they are the party responsible for selecting the inputs and approving the final design of the product. Producers have access to the technical experts, control of proprietary information and the greatest understanding of the goods they supply. Thus, this group has the greatest influence over the amount and type of waste being generated. Producers have the knowledge and capacity to develop products that contain less material, disassemble with ease after their useful life, and facilitate re-use and recycling. In addition, because of their central role in the product chain, producers have considerable influence over the other actors in the chain and can use their position to encourage others to accept responsibility for their actions (OECD, 2001).

2.1.4 *Packaging Stewardship*

The concept of extended producer responsibility has been applied to a variety of products, including automobiles, hazardous waste (e.g. paint, solvents, nickel-cadmium rechargeable batteries), tires, oil and oil containers, and electronic equipment (e.g. computers, cellular phones, televisions). However, the focus of the oldest and most ambitious EPR programs has been packaging waste.

Packaging stewardship is a form of EPR in which a producer's responsibilities are extended to encompass the environmental impact of the packaging they produce or use to package their products. The Canadian Council of Environmental Ministers has defined packaging stewardship as:

"A concept by which industry, governments, and consumers assume a greater responsibility for ensuring that the manufacture, use, reuse, recycling, and disposal of packaging has a minimum impact on the environment. This includes prime responsibility by industry to design packaging according to the 3Rs principles, take steps to divert packaging from disposal, actively use recovered materials, and ensure packaging is properly handled if it must be disposed of. Governments have a responsibility to promote packaging stewardship and to encourage the widespread recognition and adoption of the principles as outlined. Consumers have a responsibility to make appropriate packaging choices when purchasing products and, where facilities exist, to divert packaging from disposal" (CCME, 1996, p. 1).

2.2 Implementing Packaging Stewardship

The choice of implementation mechanisms is dependent on the goals of the EPR policy and the product or waste stream targeted by the program.

The four basic EPR goals are:

1. *Source reduction.* Source reduction refers to decreasing the toxicity and/or quantity of waste material at the point of generation. Policies and programs with a goal of source reduction would focus on reducing resource consumption and encouraging the use of non-toxic inputs during the material selection, design and production phases. Tools

generally used to support such goals include: take-back programs, material taxes and minimum recycled-content targets (OECD, 2001).

2. *Cost Internalization.* Environmental externalities occur when manufacturers do not factor in the cost of environmental damage resulting from the production and consumption of their goods into the final selling price. Lower prices lead to more of the product being consumed than if the price reflected the actual societal cost (Taylor, Jaccard & Olewiler, 1999). The intention of some EPR policies is to ensure the costs of managing packaging waste, as well as the costs related to the ecological damage resulting from production and use of these products (e.g. emissions from extraction and production; energy consumption from extraction, production and use; waste pollution), are incorporated into the price of the final product. Product take-back programs and taxes on virgin materials are effective tools for ensuring the costs of waste management are internalized.
3. *Design for Environment.* Design for environment (DfE) describes the process of reducing the impacts products have on the environment (throughout their lifecycle) during the design stage of manufacturing. DfE policies are intended to encourage the design and development of products which are considered environmentally friendly, including products constructed of environmental-compatible materials, goods that facilitate reuse or recycling, and packaging produced with less energy and/or materials. To achieve such ends, mechanisms such as take-back programs, targets and quotas, green government procurement policies, and eco-labelling programs should be implemented (OECD, 2001).
4. *Waste Reduction.* Waste reduction goals focus on diverting post-consumer goods from landfills. Waste reduction activities include reuse, refilling, recycling and energy recovery processes. Take-back programs, deposit-refund initiatives, various tax/subsidy

systems and advance disposal fees are useful tools for achieving such goals (OECD, 2001).

The product or waste stream will also influence the choice of implementation tools. The number of products on the market, the variety of products within the product category, the size and complexity of the product chain and features of the product, such as the toxicity and durability, will influence the mix of EPR mechanism selected (OECD, 2001).

Packaging has a number of unique features which makes the selection of appropriate EPR mechanisms challenging. First, there are a significant number of actors in the product chain – packaging producers, packaging fillers, distributors and retailers, and final consumers or users. Each of these actors plays an influential role in the design and selection of packaging materials. Determining which group is ultimately responsible for collection, sorting and treatment of packaging waste is challenging. Second, the volume and turnover of packaging waste is substantial. Packaging accounts for a third of the municipal solid waste and has an estimated lifespan of one year. Third, unlike many other products, such as electronic equipment and vehicles, packaging has little to no value at the end of its useful life (Davis, 1999). Thus there is little financial motivation for packaging producers to initiate EPR programs.

2.2.1 Product Take-back Programs

Take-back policies require producers to collect or accept returned packaging from consumer after use and arrange for their appropriate treatment or disposal. Take-back policies can be legislated by government, such as the German Packaging Ordinance, or may be initiated voluntarily by producers, such as Kodak's disposable camera take-back program (Fishbein, 1998). Take-back programs place the onus on producers to manage financially and physically the waste generated by their products and packaging, thus stimulating the efficient use of inputs, the

design of ecological sensitive products and a reduction in the amount of waste being discarded in landfills (OECD, 2001).

It may not always be physically feasible or cost effective for a producer to collect and treat its own products. Most EPR legislation allows for the formation of a third party organization, or Producer Responsibility Organization (PRO), to oversee the producers' waste management obligations. PROs finance their operations by charging members fees. In order for these organizations to be effective at attaining EPR goals and objectives, fees must reflect the actual cost to collect, sort and treat the materials. This can be accomplished by basing fees on the weight, volume and package composition, thereby rewarding companies designing goods which contain less material or are easy to recycle (OECD, 2001).

2.2.2 Economic Instruments

Economic instruments are designed to encourage environmentally efficient products and purchasing decisions by providing direct financial incentive or disincentive to one or more actors in the product chain. Research into the effects of fiscal incentives for changing environmental related behaviour has identified a number of advantages and disadvantages of such methods.

Economic incentives tend to be more cost effective than the commonly used command and control (CAC) approaches. CAC regulations achieve government goals by defining how businesses must conduct certain aspects of their operations. These types of regulations are commonly used to achieve pollution control objectives, dictating to firms "how much pollutants they may emit, the type of technology to use, the goods they may produce, the production processes to employ, etc." (Wrobel, 1990). Economic tools, on the other hand, allow producers to decide the most effective and efficient way to alter their behaviour and reduce their ecological impact. If properly applied, fiscal tools may encourage producers to continually improve their practices by providing increased financial benefits for acting in an approved manner. With CAC

approaches, once the environmental standard is reached, there is no longer incentive to reduce their impact any further. Furthermore, studies have found that economic instruments tend to achieve results more rapidly and involve fewer administrative expenditures (Environment Canada, 1997).

However, the potential outcomes resulting from the use of economic mechanisms are often complicated to predict, for it is difficult to estimate how consumers and industry will react to new market signals (Environment Canada, 1997). Unfortunately, the incentives do not always produce the intended behavioural changes. For instance, many governments employing landfill taxes have had problems with the illegal dumping of waste (Thorgensen, 1993). Furthermore, governments do not always feel comfortable relying on market mechanisms to achieve their policies. Fiscal instruments allow business great decision-making power and result in less government control (Environment Canada, 1997). Finally, economic tools result in additional costs for businesses and can impact competitiveness if not all producers in an industry are subject to the same taxes or fees. Typically within a province or nation fiscal instruments will uniformly impact all producers in a sector. However, producers involved in trade beyond the borders of the regulation may find competing more challenging (Environment Canada, 1997).

The most commonly used economic tools are taxes, deposit-refund programs and advance disposal fees.

Taxes

Taxation is a commonly used economic tool and can readily be incorporated into the existing business infrastructure. Taxes evoke different responses when applied to different stages in a product's life cycle. Taxes can be applied to ecologically damaging resource extraction or production processes, non-renewable raw materials, virgin or toxic materials, unsound production process, non-recyclable products, waste collection, and landfill usage.

Virgin Material Taxes. The intent of material taxes levied on virgin inputs is to reduce the amount of materials utilized in products/packaging, to decrease reliance on virgin materials, to encourage the use of recycled inputs, and to further the development of new markets for goods manufactured from secondary materials. When the revenue generated from taxes is set aside for reuse and recycling programs, waste reduction goals can also be achieved (OECD, 2001).

Alternatively, some governments have chosen to reduce subsidies provided to raw resource extraction and processing activities. The removal of subsidies forces resource extractors to increase the costs of virgin raw materials, bringing them more into line with secondary materials (OECD, 2001).

Product Taxes. Some governments have levied a tax on products that have a negative impact on the ecosystem. Such taxes serve multiple purposes, such as deterring the production of such goods, correcting externalities (internalization of costs), and generating revenue. Problems may arise with product taxes when revenue generated is entered into general government revenue, rather than being earmarked for recycling or treatment programs. In such cases, funds are not being used to reduce the waste pollution, and producers and consumers become resentful of the tax, viewing it as a 'money grab' rather than an environmental initiative. Other problems arise when taxes are levied on essential products. Consumers in lower tax brackets may suffer as a result of the tax, unable to afford the product.

Waste Collection Taxes. Currently, most households in Canada do not pay directly for their waste collection and treatment; rather, households pay for these services through municipal taxes. As a result of indirect fees, consumers have no incentive to reduce their garbage production. Some municipalities in Manitoba have recently adopted, or are considering, new payment schemes for waste management in which households are charged a tax or fee based on the volume or weight of the garbage they produce (e.g. Altona, Portage la Prairie, Selkirk and Winnipeg) (J. Ferguson, October 9, 2003). While such systems send a signal to households to be more

conscientious consumers and minimize waste production, waste collection charges do not provide an incentive to producers to alter their material selection practices, product designs or production processes (Breslow, 1993).

Deposit-Refund Programs

Under a deposit-refund program, the consumer pays a fee (deposit), when purchasing certain products, which is fully or partially refunded when the product is returned to the retailer, producer or appropriate treatment facility (ILSR, 2000; OECD, 2001). When goods are returned to the producer, either directly or via the retailer, the producer assumes financial and physical responsibility for the proper treatment of the product, thereby encouraging the producer to use less material and improve product design in order to reduce their financial and administrative obligations.

Deposit-refund programs provide financial incentives to consumers to return waste materials, leading to significant increases in material recovery rates. In addition to increasing the amount of material diverted from landfills, these programs also reduce litter and ensure a reliable source of post-consumer materials for companies manufacturing products with recycled inputs (OECD, 2001).

Every province in Canada, except Ontario and Manitoba, operates deposit-refund programs for non-alcoholic beverage containers. These programs have proven very successful, yielding recovery rates as high as 80%, while Ontario and Manitoba recovery rates range from 40-50% (Johnson, 2001).

In order to encourage reuse over recycling, some governments have combined their deposit refund system with an environmental levy. For example, in both New Brunswick and Nova Scotia, a standard deposit is collected on the sale of all containers in the province. Consumers

returning reusable containers receive a full refund, while those returning recyclable containers only receive a 50 percent refund (Rolfe & Nowlan, 1993; Province of Nova Scotia, 2002).

Critics state deposit refund programs often encourage the use of environmentally damaging products (i.e. those products which are not apart of the deposit-refund initiative because they cannot be reused or recycled). Those opposed believe that consumers will be encouraged to purchase these unfriendly products because they will not have to pay the deposit and will not have to return the container. Advocates believe this problem can be overcome by either levying a tax on containers which do not fall within the deposit-refund scheme, or ensuring that policies apply uniformly to all products within a particular category regardless of whether or not they can be reused or recycled (Rolfe & Nowlan, 1993). Another shortcoming of deposit refund schemes is the extensive and costly infrastructure (e.g. administrative system, enforcement program, collection and storage facilities, education campaigns) required to support these systems. Furthermore, these programs remove containers that have value and are easy to process from the recycling stream, such as PET bottles and aluminum cans, increasing the cost of operating municipal recycling program.

Advance Disposal Fees

Advance disposal fees (ADF) are levies placed on certain products, which are paid by consumers at the point of purchase. The revenue from these fees is used to pay for local recycling initiatives. In order for an ADF program to constitute as an EPR initiative, there must be an agreement or regulatory provision stating producers will assume full or partial physical responsibility for their used products (OECD, 2001).

ADF programs are useful for achieving waste reduction targets, but do not tend to meet source reduction and DfE goals. This is because the consumer pays the levy. If the cost is not borne by the producer, there is no financial incentive to reduce their inputs or redesign their

products (Davis, 1999; OECD, 2001). To combat this deficiency, some governments relying on ADF programs charge a reduced levy for products in which the waste management costs have decreased as a result of improved design (e.g. contain less material, increased recyclability) (OECD, 2001). It is believed consumers will seek out products with lower levies, thereby providing a competitive advantage to producers of 'green' products. ADF initiatives will be more effective if delivered in conjunction with an education program to inform consumers of the differences in levies and the types of products with lower fees.

2.2.3 Governmental Instruments

Aside from legislating economic instruments or take-back programs, there are a number of other measures governments can implement to support EPR objectives.

Targets and Quotas

Targets and quotas assist policy-makers to gauge the success of an initiative and to continually improve the efficiency and effectiveness of programs. Measurable objectives ensure performance expectations are clear, and compel responsible parties to take action. Many governments have set targets or quotas for reuse, recovery, and recycling, as well as minimum-recycled content (ILSR, 2000). Quantitative performance measures are most successful when legislated and supported by enforcement provisions (e.g. threats of further regulation, fines) (OECD, 2001).

Recovery and Recycling Targets. In 1994, the European Union devised Directive 94/62/EC on packaging and packaging waste, which established recovery and recycling targets to be met by producers in each member country for primary, secondary and tertiary packaging materials. The targets to be met by June 30, 2001 were as follows:

Overall Recovery Rate – 50 to 65-percent by weight

Overall Recycling Rate – 25 to 45-percent by weight

The data collected for 1998 found that all but three of the participating members had reached the recovery target and all but one had achieved the recycling targets. The EU Directive is currently under review and new, more ambitious, quotas have been proposed.

Material, Product and Landfill Bans

Some governments have implemented legislation banning the sale of products or materials deemed to be pollutants or hazardous to human health. Bans can also be used to restrict the disposal of products. Landfill bans can be placed on products the government has identified as hazardous and may leach into the soil, or on recyclable products, to ensure they enter the proper treatment stream (ILSR, 2000).

Bans should be used with caution, as the replacement packaging may result in unforeseen problems. For example, new or substitutes products may consume more energy in production and/or use, be of substandard quality, or be significantly higher in price than banned items (Levenson, 1990).

Bans set by municipalities or provinces may cause problems for producers who supply their product nationally. Critics of local product/material bans cite that such regulations may be used as inter-provincial trade barriers, restricting the import of products from other provinces in order to favour local suppliers. Many producers are also concerned that if each province introduced unique product bans, it could increase their costs considerably, especially if it required them to invest in new equipment, or if they had to supply different packaging to different jurisdictions (Levenson, 1990).

Government Procurement Policies

Governments have considerable purchasing power, which may be used to influence the design and material selection decisions of manufacturers. Green purchasing policies direct government agencies to purchase eco-friendly products (e.g. reusable, recyclable, non-toxic, recycled-content, less materials). For example, a policy may state that preference be given to environmentally compatible products as long as the price differential is no more than 10 percent.

Green purchasing policies inform suppliers of the government's preferences for products with a negligible impact on the environment and in doing so, can aid in the development of markets for goods designed in a benign manner, and set a positive example for the business sector (ILSR, 2000). Unfortunately, green products tend to be higher priced, thus cost is a limiting factor for government purchasing initiatives. However, as government departments and agencies at the federal, provincial and municipal levels get involved in eco-friendly procurement, the cost of green products will likely decrease (Dickmeyer, 2001).

2.2.4 Eco-Labeling Programs

Industry has also taken strides to encourage the development of eco-friendly products. One such initiative has been eco- or green labelling programs. Under such programs, producers seek permission to use logos or seals on their goods to signify to the public that their products meet certain environmental criteria. Some manufacturers have established their own internal programs, meaning they devise their own environmental criteria and place their corporate eco-label on their products. Other producers seek accreditation by a recognized assessment organization, such as Canada's Environmental Choice^M Program. These third-party organizations are responsible for establishing the environmental standards that products and services must meet. If a producer's product meets the criteria, it is granted the right to use the organization's environmental logo.

The goal of eco-labelling programs is to aid the consumer in identifying products on the market that are friendlier to the environment, thus allowing them to make well informed purchasing decisions. These programs are also beneficial to producers and distributors of green goods, as eco-logos serve as a marketing tool to promote their products.

Critics of eco-labelling programs state there are simply too many logos on the market and many labels promoting false claims. They believe the environmental criteria set is often not stringent enough and many assertions are never substantiated (Fulmer, 2001). Other critics have raised concerns over the use of eco-labelling programs as trade barriers. Under the WTO guidelines, a nation is not allowed to discriminate among products on the basis of production processes ("Eco-Labelling...", 1999). Advocates, on the other hand, argue that eco-labelling enhances free and fair trade by ensuring demand is driven by a well-informed consuming public.

2.3 Challenges to Implementing EPR Policies and Programs in Canada

In Canada, municipalities bear the physical responsibility for waste management, while the financial burden falls on the taxpayers. This system is clearly ineffectual at reducing the production of waste. While EPR is well recognized as an effective policy tool for managing solid-waste, a number of challenges impede the introduction of packaging stewardship legislation and programs in this nation.

2.3.1 *Opposition from Canadian Industry*

Canadian industry is opposed to assuming *full* responsibility for waste materials. They state that bearing the full burden of municipal solid waste collection and treatment would significantly hinder competitiveness, which could lead to business failure and job loss. Business advocates sharing the responsibility for waste management amongst all the members of the product chain (Robinson, 1997).

...[EPR] places the primary burden of product management on the producer or manufacturer. This would be the same as having one of the runners on a relay team bear the sole responsibility for winning or losing the race...If this were the norm many runners would want to change sports (Consumer Glass, 1998, p. 2).

Concerned over the threat of EPR in this nation, the Packaging Association of Canada (PAC) has lobbied all levels of government in an effort to convince those bodies of the need for an equitable cost sharing approach for waste management by industry, government and consumers. PAC has stated that EPR programs that place full financial responsibility on producers, fail to acknowledge that consumers assume ownership for products upon purchase and should share responsibility for disposal costs. Municipal governments also have a responsibility to maintain cost effective waste management programs. PAC is concerned that if municipalities do not maintain partial financial responsibility, waste management programs will not run efficiently, placing a significant economic burden on Canadian industry (Robinson, 1997).

Consumers, on the other hand, argue they have no control over the composition or design of products and packaging and believe it is unfair they must pay for the cost of management.

While we often have a choice in what we buy, generally the public has no say in how products are packaged ...If we have no say in how [products are] packaged, then it shouldn't be our responsibility to deal with the waste. It's high time manufacturers stood up and took responsibility for their package designs and for all the useless garbage they produce (Saunders, 2001, p. 27).

Similarly, municipalities argue they do not receive any benefits from collecting and disposing of refuse, while the manufacturers of goods make profits from the sale of their items and yet never contribute to the management of the waste their products generate. The Federation of Canadian

Municipalities is in favour of product stewardship programs which seek to redistribute the costs and benefits of waste management (FCM, 2003).

Market Pressures

Critics of EPR argue that competition for market-share creates pressure for manufacturers to develop more environmentally benign products and reduce their ecological footprint. Industry cites that increased consumer demand for 'green' products and trained purchasers looking for environmentally friendly products for their customers has provided incentive for producers to improve designs and company environmental practices (Consumer Glass, 1998). Business believes that EPR programs are not necessary as market demands and pressures will eliminate waste management issues.

However, Canada has been deemed one of the top-five nations in terms of waste production. The average Canadian produces 675 kg of garbage each year; this production rate is second only to the United States (Chua, 2002). Clearly competitive pressure alone has not been effective in reducing and preventing waste production in this country.

Significant Costs of EPR Programs

Corporations Supporting Recycling (CSR) states that EPR programs are too costly for producers to implement and waste management should remain the responsibility of municipalities and taxpayers. The organization recently conducted a study comparing the relative costs of recycling programs in Ontario to those in Germany. Ontario has a mixture of programs for recycling which are financed and delivered by municipalities, while Germany, under the Packaging Ordinance, has implemented a full EPR program in which producers are responsible for both the financial and physical maintenance of the waste generated by their products. The

study found Ontario's average waste management costs per tonne was \$60US, while Germany's average cost per tonne was \$600US (Consumer Glass, 1998).

Although the difference in these costs appears significant, the numbers do not take into consideration a number of factors. Germany's recycling program has far higher recovery and recycling rates than those in Ontario. The Duales System Deutschland (DSD), the national PRO which collects and recycles household packaging waste, reported in 2000 recovery and recycling rates for licensed packaging as high as 91% for glass, 167% for paper and cardboard, 93% for plastics, and 95% aluminum (DSD, 2001a). It is estimated that Ontario's overall recovery rate is between 40% and 50% (Johnson, 2001). Furthermore, the DSD is heavily involved in the research and development of new techniques and technologies for recycling in order to increase the array of materials that can be treated, and to reduce the long-term cost of recycling. Finally, better use of resources and advances in technology has led to a reduction in DSD's costs. Between 1998 and 2000, DSD reduced their waste management and recycling costs by 16% (DSD, 2001a).

Competitive Disadvantage

The United States, Canada's largest trading partner, has not implemented a national packaging stewardship legislation. The American federal government, under the leadership of the President's Council on Sustainable Development (PCSD), has developed its own notion of stewardship, termed "Extended *Product* Responsibility". According to its creators, the concept encompasses the entire life-cycle of the product, rather than focusing on the end of life as EPR generally does. Under "Extended Product Responsibility" producers, consumers and government share responsibility for the environmental impact of products; no single group is delegated with explicit responsibility (Fishbein, 1998; Hanisch, 2000). Critics of this view of product stewardship believe it is too broad. There is a risk that if no one is the responsible authority, and

the end-of-life stage is not the primary focus, waste management issues will not be resolved. “When you make everybody responsible for everything than nobody is responsible for anything” (Hanisch, 2000, p. 175).

If EPR legislation is implemented in this nation, Canadian businesses may find themselves at a competitive disadvantage, as they must convert their product and packaging designs, processes and equipment to meet the new legal requirements. PAC claims Canadian industry is already struggling with rising energy costs, a slowing economy, and higher taxation and environmental standards than the United States, and the introduction of EPR legislation may compel many packaging manufacturers to move their facilities to other nations (“PAC weary...”, 2001; Robinson, 1999).

However, PAC has also reported in recent years, that industry initiatives to reduce, reuse and recycle packaging under the National Packaging Protocol, has “led to a strong export demand for Canadian packaging, especially in the U.S.” (Robinson, 1999, p. 27). It is likely that further efforts to improve the environmental compatibility of packaging under EPR legislation will only strengthen American demand, providing a competitive advantage, rather than disadvantage, to Canadian packaging producers.

2.3.2 Harmonization of Provincial Stewardship Programs

The Canadian Constitution affords the provinces the authority to legislate municipal affairs and local undertakings, which encompasses waste management. The federal government has no power to influence how provincial governments conduct waste collection or treatment activities. Industry is concerned that as provinces begin to develop EPR policies and programs, businesses will have different responsibilities and requirements in each province, resulting in increased aggravation and expense for producers who distribute their products in more than one province,

and reducing their ability to compete ("Companies face...", 1995). Producers would like to see some uniformity in the design and implementation of provincial policies and programs.

Industry has also raised concerns over the use of EPR initiatives as barriers to trade. International and inter-provincial trade is a constitutional responsibility of the federal government. Provincially established EPR policies and programs would undoubtedly affect trade among the provinces and other nations, and thus the development of EPR goals and programs should be a matter for federal and provincial cooperation.

Scholars, government officials and environmental advocates have also expressed concern over the variation in EPR initiatives across Canada. Waste management problems are not confined within a jurisdiction. The implications of ineffectual collection and treatment of refuse is a national concern. Is it fair that some provinces have gone to great lengths to reduce their ecological footprint, while other provinces are continuing to pollute the environment and abuse valuable resources?

A national harmonization of legislation related to waste treatment standards, goals and implementation mechanisms would simplify matters for industry, create a "level playing field" for all companies selling within Canada and ensure that all provinces are participating in reducing waste pollution to the same degree. A mandatory and uniform EPR structure across Canada would likely lead to greater design innovations and advances in technologies and processes as producers share ideas for reducing, reusing and recycling. The development of producer responsibility organizations (PRO) would help facilitate the sharing of ideas and the pooling of resources.

In 1994, the Packaging Stewardship Group prepared a report for the National Task Force on Packaging, entitled *Principles and Harmonization Issues: Packaging Stewardship in Canada*. This report identified several areas in which national harmonization is needed for the successful implementation of EPR policies and programs. These included:

- National goals and objectives should be established and agreed to by all provinces and territories.
- The designated steward for a program should be at the same point in the distribution system across the country (e.g. not the packaging filler in one province and the retailer in another).
- The basis for steward levies (e.g. weight, volume, type of material) must be consistent in all provinces and territories.
- Penalties must be the same across Canada and all jurisdictions must enforce the regulations equally.
- Financial responsibility for waste management must be assigned in each province in the same manner (e.g. steward cannot take full financial responsibility in one province and only partial responsibility in another).
- The rules for importers must be uniform amongst all jurisdictions and must comply with NAFTA and WTO agreements.
- If eco-labels are to be a part of programs and policies, labeling requirements across the nation must be standardized.

Unfortunately, while most government officials agree that harmonization is imperative, no steps have been taken to standardize provincial approaches to packaging stewardship. One entity must assume leadership, organizing the provinces and establishing a task force to determine how provinces could enhance the commonalities among their initiatives. This entity could be the federal government, the Canadian Council of Ministers of the Environment, or another organization. However, the longer the delay in moving forward the harmonization, the deeper programs will become ingrained and the more difficult it will be to get provinces to agree on a unified approach to packaging stewardship.

2.3.3 Cost and Availability of Landfill Space in Canada

Canada has a relatively small population living on a vast expanse of land. The nation has ample space available for landfills and as a result, the cost of using these amenities is relatively inexpensive. Without an immediate threat, Canadian governments have been slow to develop EPR legislation, and the programs that have been initiated, are not nearly as extensive or drastic as European efforts. Similarly, the lack of urgency to alter behaviour has resulted in resistance from Canadian industry to support product stewardship policies and programs.

It is currently more cost efficient to dump many products in landfills rather than to incur the high costs of recycling. For example, landfill tipping fees in Manitoba range from \$0 to 40/tonne, while the cost to collect and process PET is \$500/tonne (Earthbound Environmental Inc., 1999). Most landfill operators when setting tipping fees do not use full cost accounting techniques. Using full cost accounting methods could help MSW site operators establish appropriate and fair tipping fees, document the actual costs of MSW management, identify areas for cost savings and improve the efficient and effective of MSW programs (U.S. EPA, 2002).

Landfill taxes also could be implemented to increase the cost of using these facilities. Taxes would encourage businesses and consumers to make wiser purchasing decisions in order to reduce the amount of waste materials they generate. Revenue from taxes could be used to subsidize research and development initiatives, support collection and treatment programs, or educate consumers and producers on the value of our resources and the detrimental effects of waste. Landfill bans could also be instituted. The province could prohibit certain products from entering sanitation dumps. For example, bans could be placed on products that can be recycled. This practice would ensure materials are being properly treated and reduce the abuse of landfills. Such instruments must be carefully designed in order to avoid illegal dumping and to ensure an unfair burden is not placed on municipalities (instruments must target producers).

Municipalities could also introduce "pay-as-you-throw" programs in which residents are charged a fee to cover the costs of collection and treatment. If citizens were directly responsible for the cost of waste collection and treatment, they would likely make better purchasing decisions and place pressure on corporations to design products with less materials.

2.4 Packaging

Packaging is the ultimate symbol of our consumer culture. It tells the story of our technological achievements, preserves our food, protects what we buy, and raises our standard of living ... At the same time, packaging is also the largest single contributor to one of our nation's most troubling environmental problems: the municipal solid waste crisis (Stillwell, Canty, Kopf & Montrone, 1991, p. 1).

Packaging serves an essential function in society. Its primary purpose is to safeguard and preserve products during transport and storage - preventing contamination and decreasing the occurrence of breakage and spillage. In the case of food items, packaging reduces the incidences of spoilage and extends the shelf life of the product (Wolf & Feldman, 1991; Alexander, 1993). Food loss due to spoilage is drastically lower in developed nations (2 to 3 percent) which have advanced packaging and distribution systems, as compared to developing countries (30 to 50 percent). A study conducted by H. Alter found that for every 0.1 percent increase in the amount of plastic packaging entering the waste stream, the quantity of wasted food decreases by 0.165 percent (Bhat, 1996).

Packaging has improved the efficiency of distribution systems, increasing the ease of transport from manufacturers to retailers to the final consumer. Acting as a communication tool, packaging allows producers to convey vital product information to consumers, including ingredients, expiration dates, proper use instructions, and cautionary details (Bhat, 1996).

Packaging increases the convenience of many goods, making products easier to transport, store

and use. For example, modern-day frozen dinner packages are designed to be compact and to store easily in the freezer, to act as a container for heating in the microwave, to substitute for a plate for serving and eating and to be thrown away after use rather than being washed. Packaging is also a valuable marketing device. Producers use packaging to create attractive and alluring merchandise, to identify their product and to differentiate their goods from those of their competitors (Wolf & Feldman, 1991).

While packaging plays a vital role, it has developed a negative image in our environmentally conscious society. Valuable resources are used to create packaging, which has a limited life span, typically less than a year. Packaging is generally designed with cost, performance, manufacturability and consumer allure in mind, not the environment. Therefore, a great deal of packaging on the market does not follow the waste management hierarchy of reduce, reuse, recycle. Most packaging is discarded as litter or becomes a part of municipal solid waste, adding to the significant quantities of solid-waste pollution generated annually.

There are three types of packaging:

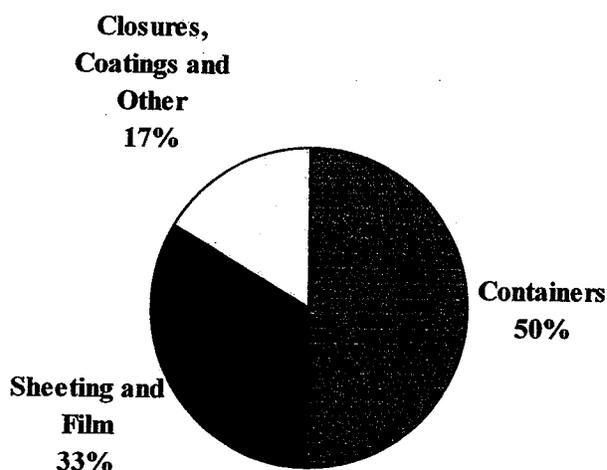
1. *Primary Packaging* (Sales Packaging) is the packaging that contains the product. This category also includes packaging provided to the final consumer by a retailer, restaurant or other service provider to ease the transfer of the product. Examples: plastic cereal bags, beverage bottles, disposable cups and plates.
2. *Secondary Packaging* (Grouped Packaging) is the outer packaging used to pack individual products, protect the product, add visual appeal or aid in the stocking of shelves. This type of packaging can be removed without impacting the product's performance. Example: six-ring holder for beverage cans, toothpaste boxes.
3. *Tertiary Packaging* (Transportation Packaging) is the packaging used to safeguard goods and facilitate product handling during transportation. Example: corrugated boxes,

wooden pallets, shrink-wrap (Bhat, 1996; Meyers & Lubliner, 1998; European Parliament and Council, 1994).

2.4.1 Plastic Packaging

Plastic is one of the fastest growing material commodities. Approximately 100 million tonnes of plastics are produced around the globe annually, which equates to 40 pounds for each individual in the world (Stevens, 2002). The largest use for plastics is packaging, accounting for 34% of the market, followed by construction materials (26%) and automotive parts (18%) (Industry Canada, 2001a). Half of the plastic used in packaging is fashioned into containers (e.g. bottles, jugs and tubs), another third is used to form sheeting and films, and the remainder is used for closures (e.g. caps and lids), coatings and other functions (Stevens, 2002) (Figure 2.1). The largest end-use market for packaging is food preservation. Plastics' durability, versatility and low cost make them ideal for food applications. An estimated 80-percent of plastic packaging is filled by food producers for sale to restaurants, institutions and food retailers (Jenkins & Harrington, 1991).

Figure 2.1: The Use of Plastics in Packaging



Plastics can be divided into two types: thermosets and thermoplastics. Thermosets are plastics which cure when heated and cannot be melted and reformed. These plastics are difficult and costly to process and as a result, are rarely used in packaging. On the other hand, thermoplastics are widely used for packaging, because these materials can be easily and cheaply converted into an endless array of shapes. Thermoplastics commonly used in packaging include, polyethylene (LDPE and HDPE), polypropylene (PP), polystyrene (PS), polyethylene terephthalate (PET), and polyvinyl chloride (PVC). Appendix A summarizes the characteristics and common packaging end-uses of each of these plastics.

2.4.2 The Popularity of Plastic Packaging

The rise in the popularity of plastic food packaging can be contributed to a number of factors. First, family structures and dynamics have changed. There has been an increase in the number of single-parent households; a reduction in the size of families (fewer children); a growing number of women in the workplace; an increase in the number of senior citizens and a rise in the number of single-person households (Jenkins & Harrington, 1991; Curlee & Das, 1991; Wolf & Feldman, 1991). As a result, fewer people have time to spend on food preparation and more individuals are cooking just for themselves. This has led to demand for food products which can be prepared easily, in limited time, with modest culinary skills. The versatility and durability of plastic make it ideal to meet consumers' evolving needs.

Second, consumers' concerns over product safety and tampering have led manufacturers to increase the number of layers and protective seals on their goods. Plastics, which are often used in film form, suit this demand (Wolf & Feldman, 1991).

Third, technological advances have significantly changed packaging over the last twenty years. The advent of the microwave oven led to a dramatic increase in demand for plastic films and containers (Wolf & Feldman, 1991). Advancements in polymer science and plastics

engineering have expanded the use of this commodity. Package engineers have combined traditional packaging materials, such as metal and paper, with plastics to create convenient, lightweight packaging materials (e.g. aseptic juice boxes, made of combination of metal, foil and paper). Composite plastics, which combine multiple layers of different resins, have allowed plastics to be used in new applications. For example, squeezable bottles for condiments are generally composite plastics made of various layers of commodity plastics, engineered resins (e.g. oxygen barriers) and adhesives.

Finally, plastics are favoured by many packaging designers for their versatility, durability and low cost (Stevens, 2002). Plastics can be processed in a number of different ways to form sheets and films, and foam, semi-rigid and rigid containers. Pigments and dyes can be added to resins to yield opaque coloured material or transparent coloured film. Additives, such as plasticizers and heat stabilizers can be added to improve the characteristics of plastics and allow designers to create the ideal package.

2.4.3 Attributes of Plastic Packaging

Plastic has a number of advantages over other packaging materials:

- *Low density.* Plastic has a lower density than metal or glass. The result is lower costs to producers for transport and increased convenience for consumers.
- *Shatter resistant.* Plastic is safer during shipping because it will not shatter like glass, thus reducing product waste and decreasing safety hazards.
- *Extremely Versatile.* Plastic can be made into film or shaped into containers. Additives can be incorporated to improve the characteristics of resins. Plastics can be combined with other packaging materials to provide a new packaging system with superior performance characteristics.

- *Reusable and recyclable.* Plastic is durable and can be reused. It is also feasible to recycle many plastic packages.
- *Environmental durability.* Plastics are resistant to most environmental conditions (except UV radiation), unlike paper, which is readily degraded when exposed to such conditions.

(Bhat, 1996; Jenkins & Harrington, 1991)

Plastics have a number of characteristics which make them environmentally unattractive.

Plastic resin is a product of fossil fuels. Manufacturing short-lived products, such as packaging, from natural gas and oil is viewed by many as an inefficient use of valuable, non-renewable resources.

Natural gas and oil exploration and excavation disrupts wildlife habitats (e.g. roads, noise, influx of workers), mars the landscape, and results in subsidence in the extraction region. The consequences of off-shore drilling accidents, such as leaks and blowouts, can be devastating, eradicating fish and bird populations and contaminating miles of beach. The transportation of fossil fuels from excavation sites to refineries can also lead to significant environmental damage, including oil spills, pipeline leaks, and explosions (Chiras, 1994).

Refineries are responsible for breaking down oil and gas into its constituents. These facilities require significant quantities of energy and are major contributors of air and water pollutants (Chiras, 1994). The conversion of petrochemicals into resins and plastic products produces toxic emissions and effluents, and generates large quantities of waste materials. For example, the production of one tonne of low-density polyethylene (LDPE), which is considered a relatively environmentally benign plastic in comparison to poly-vinyl chloride or polystyrene, results in sixty-two to ninety-two pounds of organic pollutants (NRDF, 1997). Many of the additives used in plastics to modify or enhance mechanical, physical or chemical characteristics, such as pigments, inks, dyes, plasticizers and heat stabilizers, contain toxic substances, including arsenic,

lead, cadmium and endocrine disruptors (e.g. phthalates and nonylphenol) (Industry Canada, 2001b; Porro & Mueller, 1993).

Technically, most plastic packaging can be recycled. However, the infrastructure for physically recycling plastics and the markets for secondary materials are underdeveloped. Secondary plastics have limited end-uses. Recycled materials cannot be used for food contact applications; recycled plastics are typically used to produce construction supplies and vehicle parts. Each time materials are recycled, their strength and weight is decreased and they cannot be used in products which require as rigorous use as the original. The result is a spiraling down effect as each successive recycling further reduces the quality of the plastic and diminishes the possible end-uses.

2.4.4 Canadian Plastic Packaging Industry

The Canadian plastics packaging industry involves a number of players including:

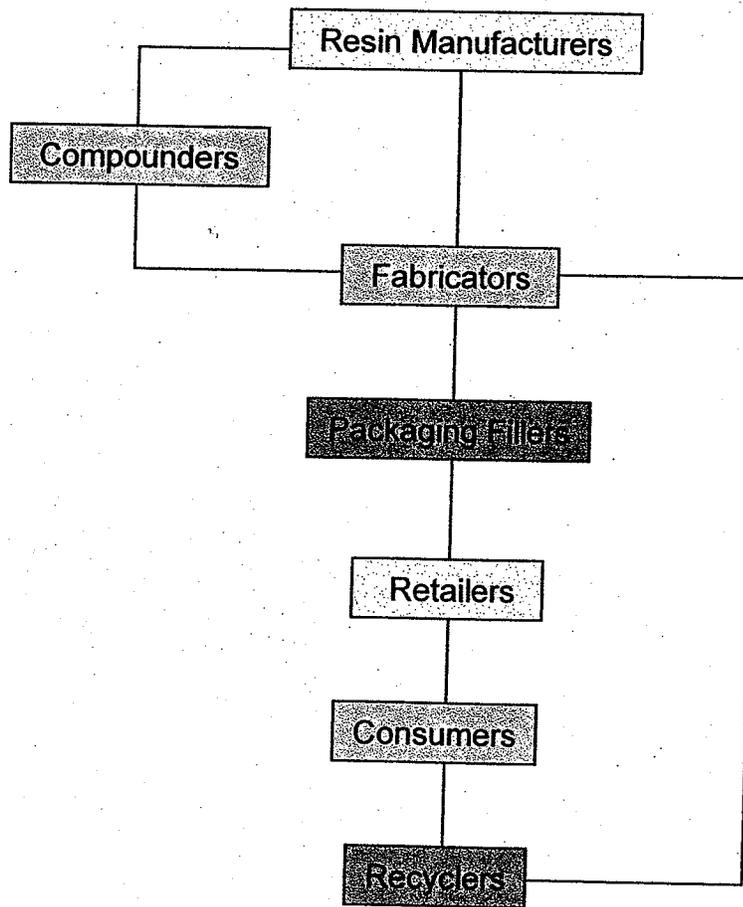
- *Resin producers* convert fossil fuels into resins. Major Canadian resin producers include, Petromont, Royal Group, AT Plastics and NOVA Chemicals. A number of international resin manufacturers also have plants in Canada including, Dow Chemicals, Imperial Oil, KoSa, Eastman Chemical and Basell (OECD, 2002; Industry Canada, 2001b).
- *Compounders* incorporate additives into resins. Major compounders operating in Canada include Aclo, Albis, Colortech, Geon, and Wedtech. Synthetic resin producers and compounders, in 1999, employed over 8500 Canadians (110 establishments) and produce over \$6.0 billion in shipments (OECD, 2002).
- *Packaging fabricators* convert resins into packaging. Typically these manufacturers purchase resin, in the form of powder, emulsions, pellets or flakes, from resin producers or compounders. The package producer may create the packaging or the

packaging user (filler) may design the moulds and select the plastics resins.

Canadian plastic packaging producers and/or suppliers include, Amcor-Twinpack, Plastics Works Inc., Plastiques Micron Inc., Polyainers Inc, Kay Containers Ltd. and Truefoam Limited (OECD, 2002).

- *Packaging fillers* fill packaging purchased from fabricators with their product. Packaging users include: food and beverage processors, producers of beauty and hygiene products, fast food restaurants and cleaning product manufacturers.

Figure 2.2: The Canadian Plastic Packaging Industry



2.5 Coping with Plastic Packaging

2.5.1 Source Reduction

Source reduction, commonly accepted as the most effective way to decrease our ecological impact, involves reducing the amount (volume and weight) or the toxicity of materials entering the waste stream ("Packaging", 1994; Porro & Mueller, 1993). This technique is a proactive means of dealing with packaging waste, rather than reactive like recycling, incineration and landfilling methods. Producers engaged in source reduction activities are not only creating less waste material, they are also reducing the amount of pollution produced and energy consumed as a result of the extraction and processing of raw materials.

Common methods employed by packaging manufacturers to reduce the amount and toxicity of plastic packaging materials include:

- lightweighting (reducing the volume and/or weight),
- use of non-toxic additives,
- use of concentrates,
- reformulating or redesigning products to eliminate or reduce packaging required,
- use of more durable, reusable plastics,
- eliminating unnecessary packaging,
- packaging products in larger containers, and
- converting to bulk dispensing systems.

(Porro & Mueller, 1993)

Unfortunately, despite source reductions placement at the pinnacle of the waste management hierarchy, it is the least used refuse minimization technique. Reduction is difficult to measure and manufacturers rarely receive recognition for their efforts from governments or consumers ("Packaging", 1994). Canadian manufacturers have little financial incentive to engage in source

reduction. In fact, there are a number of factors which make source reduction unattractive to producers, some of which may include:

- devoting funds to research and development to examine ways to alter product or packaging design,
- developing and delivering consumer education programs to promote the benefits of their revised product or packaging,
- finding and cultivating relationships with new suppliers, and
- assuming the risk that consumers may not respond to their new product or packaging.

While producers involved in source reduction must incur additional costs and bear financial risk¹, manufacturers using recyclable packaging receive credit from both governments and consumers for being environmentally friendly, while municipalities and taxpayers foot the bill for recycling.

Over the years, recycling has gathered significant political and public support. This can work against source reduction, as some of the most lightweight packaging materials on the market are composed of multiple materials or composites plastics, and cannot be recycled. The question becomes which is environmental better – lightweight, compact packages which can only be incinerated or landfilled *or* heavier, more bulkier packages which can be recycled?

It is important to note that reduction is not always the best ecological option. Source reduction is not necessarily environmentally superior if lightweighting consumes more energy or compromises the performance of the package. More raw materials and energy go into manufacturing products, than packaging. If the product is damaged or spoils because it was packaged improperly, more natural resources are wasted in comparison to the small amount of packaging material conserved.

¹ In the long run the producer would likely save on both material costs and transportation costs as a result of reducing the weight and volume of their packages.

2.5.2 Reuse

Refilling or reusing existing plastic bottles, containers and tubs is an effective way to minimize the consumption of virgin materials, conserve energy, reduce the expulsion of pollutants, decrease the waste entering landfills and lower manufacturing costs (Porro & Mueller, 1993).

The three common packaging reuse systems are as follows:

1. Consumers return used packaging to the retailers, recycling depots or reverse vending machines. The packaging is then collected by the producer who washes and refills the bottles. Take-back programs and deposit-refund programs can be used to encourage participation in reuse.
2. Packaging is sold to an intermediary that washes containers and sells them to a producer to refill.
3. Producers sell concentrated versions of their product in smaller, lightweight packaging. Consumers dilute the concentrate with water in a reusable bottle.

(Porro & Mueller, 1993)

Reusable systems are only beneficial if they use less energy than their non-refillable counterparts. The amount of energy reusable containers consume is dependant on the proximity of the refilling plants to collection facilities and the number of times the packaging is reused. Because these packages must withstand multiple uses, fillings and trips between the producer and consumer, reusable containers tend to be thicker and heavier than non-recyclables. As a result they require more resin and energy to produce, and consume more fuel during transport (Alexander, 1993). Therefore less energy is consumed when the distance between the retailer and plant is minimized and the container is reused the maximum number of times feasible.

There are several disadvantages to reusable packaging systems. First, reuse systems are not appropriate for all products. Packaging contamination and hygiene concerns often limit the

ability to reuse many food packages. Second, the initial cost of converting to reusable containers is significant. Using reusable bottles requires producers to invest in washing, specialized filling and waste water treatment equipment (Alexander, 1993). However, in the long term, there is the potential for substantial savings (reduced energy and raw material consumption). Third, many retailers are not interested in selling refillable containers. Under most refillable programs, grocery and convenience stores become the point of return for bottles and containers. This means retailers must have enough storage space to house returns, pay for additional staff hours to sort and stack refillables, and take additional precautionary measures to ensure conditions remain sanitary. Many retailers are unwilling to bear the costs and hassles of refillable programs.

2.5.3 Recycling

Plastics can be recycled in a number of ways:

1. *Primary Recycling* (Pre-consumer Recycling) involves converting homogenous, uncontaminated plastic waste material into resin or pellets. Primary recycling conserves the most energy of all recycling processes and yields a product with comparable properties to that of the original (Wolf & Feldman, 1991). This form of recycling is predominantly used by industry to recycle plastic scraps remaining after manufacturing (Wolf & Feldman, 1991; Stevens, 2002).
2. *Secondary Recycling* (Mechanical Recycling) involves converting plastic waste material, typically post-consumer, into new plastic products (Wolf & Feldman, 1991). For sanitary reasons, food products cannot be composed of secondary materials. Most recycled plastic converted via this method is used in construction materials and automobiles.
3. *Tertiary Recycling* (Chemical Recycling) involves chemically breaking down plastics to produce fuel which can be used to generate energy or manufacture chemicals (Wolf & Feldman, 1991; Charles, 1997). Processes such as pyrolysis, glycolysis, and hydrolysis

are techniques used to chemically recycle plastics (American Plastics Council, 1999).

Tertiary methods are very expensive and not widely used.

4. *Quaternary Recycling* (Energy Recovery) involves recovering the energy stored in waste plastics through incineration. Highly contaminated, low quality and non-recyclable plastic waste are best suited for waste-to-energy processes (Coghlan, 1994). For the purposes of this study, when the term recycling is used, it does not include energy recovery processes.

The process of converting fossil fuels into resins represents the greatest energy expenditure in the fabrication process. Using recycled plastics in products, rather than virgin resins, can save between 85 and 90-percent of the energy used in the production of plastics goods (Wolf & Feldman, 1991). Furthermore, recycling reduces the quantity of packaging materials entering landfills and reduces reliance on virgin inputs.

While there are many benefits to recycling, it is not as effective as source reduction and reuse at addressing environmental problems. Recycling degrades the polymer structure, reducing the mass, strength and integrity of resins. As a result, recycled plastics generally are used only in products which are less demanding than the original. If products made of secondary inputs are themselves recycled, the quality will be degraded even further, until eventually it is unusable. For example, after three recyclings the impact strength of polystyrene is reduced by over 34% and its mass is reduced by 27% (Stevens, 2002).

At this time, it is not economically or technologically feasible to recycle all packaging materials. Packaging of mixed resins (e.g. some squeezable condiment bottles) and mixed materials (e.g. aseptic juice boxes) is difficult to recycle into new products.

Currently, the recycling of plastic packaging is fairly limited. A successful plastic recycling market, like any market, requires both supply and demand. Most Canadian municipalities are responsible for operating collection and sorting programs. Collected waste materials typically are

sold to reprocessors who convert them into a useable form (e.g. pellets, flakes) for use in their own facilities or for sale to plastic fabricators. The extent of municipal recycling initiatives is dependent on availability of funds and the demand by reprocessors for various plastic waste products. Plastics are one of the most expensive waste materials to collect and sort because they are bulky, lightweight and have a low resale value (Porro & Mueller, 1993).

At this time, plastic processors demand for secondary materials is weak. The price of recycled resin is higher than virgin, the quality of recycled plastics is inconsistent, consumer demand for recycled products is low, and no legislation exist to encourage producers to use recycled materials (Morawski, 2000; Newcorn, 1997). In order for recycled plastics to be competitive with virgin resins, a dependable supply of sorted waste plastics and investments in recycling technology is required. Unfortunately, industry is reluctant to invest in recycling infrastructure until the supply of recyclables is steady, while municipalities are leery of expanding collection and sorting programs without a reliable demand.

2.6 Chapter Summary

Canadians generate an estimated 21 million tonnes of solid waste annually, making Canada one of the top five nations in terms of waste production per capita. Plastics comprise approximately 2 million tonnes (11-percent) of this waste (Chua, 2001). As one of the fastest growing material commodities, this percentage will undoubtedly rise unless measures are taken to increase plastic reduction, reuse and recycling.

Packaging is the largest market for plastics, and food preservation is the most common end-use for plastic packaging. Plastics, in many ways, are superior to other packaging materials at preventing spoilage, extending the shelf life of products, and improving consumer convenience. Plastic is versatile, lightweight, shatter resistant and relatively inexpensive. Unfortunately, plastics are far behind many other packaging materials in terms of recovery and recycling.

Currently Canadian plastic packaging manufacturers and fillers have little motivation to improve the environmental characteristics of their packaging. The introduction of packaging stewardship policies and programs may provide the incentive necessary to reduce the amount and toxicity of plastic packages, prompt the development of plastic bottle and container reuse programs, and expand the quantity and types of plastics recycled in this nation.

Chapter Three - Methodology

This chapter outlines the research methods followed in order to achieve the established objectives of this endeavour. The study was divided into four parts: (1) a review of the current literature; (2) an examination of packaging stewardship policies and programs; (3) a case study of plastic food packaging producers and fillers; and (4) a workshop held with representatives from government, industry and non-government organizations. The data gathered from these activities was used to develop a model for packaging stewardship for the province of Manitoba.

3.1 Literature Review

In order to satisfy the objectives of this study, a review of the relevant literature was undertaken. Literature relating to packaging stewardship was examined, with a focus on information concerning the roles of industry, government and consumers under EPR programs; the techniques for implementing stewardship; and the challenges associated with adopting EPR policies and programs. Texts, articles and studies related to plastic packaging were also reviewed. The specific areas explored included: the rising popularity of plastic packaging; the structure of the Canadian plastic packaging industry; and methods for coping with plastic waste.

Current literature on extended producer responsibility and plastic packaging was collected through a variety of sources including, the University of Manitoba libraries, Manitoba Conservation's Pollution Prevention Branch, Canadian Council of Ministers of the Environment (CCME), Organisation for Economic Cooperation and Development (OECD) and a variety of government and NGO websites. A summary of the literature reviewed can be found in Chapter 2 – *Plastic Packaging Stewardship*.

3.2 Packaging Stewardship Policies and Programs

3.2.1 International Packaging Stewardship Policies and Programs

A number of prominent international approaches to packaging stewardship were examined, in particular the regulated approach of several European countries (German, Austria and Sweden) and the government-initiated voluntary program instituted in Australia.

In the mid-1990s, the European Parliament adopted the Directive on Packaging and Packaging Waste, a policy which required each EU member state to develop a system to reduce the environmental impact of packaging and to ensure adequate recycling levels were achieved. A 1998 review of EU nations' recovery and recycling rates found that four nations stood above the rest with respect to the collection and treatment of plastic packaging – Germany, Austria, Sweden and Belgium (Commission of the European Communities, 2001a). The packaging stewardship initiatives developed by these countries successfully reduced the amount of packaging on the market, increased the quantity of recovered and recycled materials, and led to the advancement of sorting and recycling technology (Fishbein, 1998; Hanisch, 2000). In order to gain insight into how Germany, Austria and Sweden achieved their world dominance in the area of plastic packaging waste management, a research trip to Europe was undertaken. The purpose of the trip was to interview producer responsibility organization representatives, members of industry, academics, and government officials in order to identify the key elements responsible for the success of their programs. Chapter 4 provides a summary of the literature and interview data collected on the German, Austrian and Swedish regulations and packaging stewardship management systems. The strengths and shortcomings of each approach are discussed and recommendations for the development of a packaging stewardship model for this province are presented.

Australia has taken a very different approach to packaging stewardship in comparison to the highly regulated and structured European packaging ordinances. This nation has developed a

flexible, voluntary style of packaging EPR. In order to gain a better understanding of the Australian system, a thorough review of the available literature and related policies was undertaken, and a telephone interview was held with a representative of the National Packaging Covenant Council. Chapter 4 includes a summary of the Australian approach to enhancing packaging and reducing waste, a discussion of the successes and problems they have encountered, and concludes with the key elements of their approach which could be incorporated into the Manitoba packaging stewardship model.

3.2.2 Canadian Packaging Waste Management Approaches

The regulations and packaging waste management programs of four Canadian provinces were reviewed, summarized and analyzed. Chapter 5 begins with an examination of the existing legislative framework and system for managing plastic packaging waste in Manitoba. The Waste Reduction and Prevention Act, Multi-material Stewardship Regulation, and available literature regarding plastic packaging recycling and the role of the Manitoba Product Stewardship Corporation (MPSC) were reviewed and assessed. In addition, informal interviews were held to gather data on the current status of the provincial recycling programs, proposed future developments, and the overall need for packaging stewardship for plastics. These interviews were conducted with municipal recycling program directors, representatives of the Manitoba Product Stewardship Corporation, and Jim Ferguson of Manitoba Conservation, Pollution Prevention Branch.

Chapter 5 also examines the municipal solid waste systems adopted in Ontario, British Columbia and Nova Scotia. Each of these provinces has taken a unique approach to managing packaging waste which proved valuable in the development of a packaging stewardship model for Manitoba. Ontario is in the process of establishing a new Blue Box system, which obligates producers to financially contribute and to participate in research and communications efforts.

British Columbia has recently released an *Industry Product Stewardship Business Plan* which outlines how the province intendeds to embark upon a full-scale EPR programs for a number of designated waste streams. In the late 1990s, Nova Scotia introduced stringent landfills bans, and more recently has begun to develop a number of regulatory and voluntary stewardship agreements for various waste materials, including a voluntary packaging stewardship agreement with provincial milk processors. Each of these provincial systems were summarized, the strengths and weaknesses were analyzed and the key components of each program were identified. Reviews were based on a study of available literature and provincial policies, and interviews with government and waste management system representatives. The chapter concludes with an examination of the essential program elements to be included in the Manitoba stewardship model.

3.3 Case Study

It was deemed essential to discuss the matter of packaging waste management with the stakeholders who would be most impacted by an EPR approach, namely packaging manufacturers and fillers. Due to the array of end-uses for plastic packaging and the vast number of manufacturers and fillers of plastic packaging, a case study approach was adopted. This study focused on plastic packaging used in food preservation, and involved Manitoba food producers, Canadian plastic food packaging manufacturers and associated trade groups and non-government organizations.

3.3.1 Case Study Procedure

The case study was divided into two parts. Part one involved telephone and in-person interviews with Manitoban food producers and Canadian plastic food packaging manufacturers. Part two consisted of telephone interviews with provincial and national trade associations and

non-government organizations. The standard set of survey questions for Manitoba food producers, Canadian plastic manufacturers, and trade associations/NGOs can be found in Appendices B, C and D respectively.

The interview process was adaptive. The questionnaires served only as a reference to guide interviews and not all questions were necessarily posed to the interviewees. If it was evident that the participant knew very little about the area under discussion, the researcher elected to omit certain questions. In areas where the interviewee had greater knowledge, additional questions were asked.

All interviews were carried out over a two-month period (February 12, 2003 to April 11, 2003). To ensure the privacy of participants only the researcher had access to interview data; all responses were kept anonymous and no names appeared on the survey forms. Once the interview data was transcribed, it was coded and analyzed using the qualitative data analysis program Atlas/ti. Chapter 6 contains a summary of the results of this case study.

3.3.2 Manitoba Food Producers and Canadian Plastic Food Packaging Manufacturers

Twenty food producers in Manitoba were contacted regarding this study, of which ten consented to an interview. Sixteen plastic food packaging manufactures from across Canada were contacted for interviews, of which three agreed to participate. The purpose of the interviews was to:

- determine the environmental characteristics and potential ecological impact of their packaging;
- identify the factors influencing packaging design and/or selection;
- assess what voluntarily action the organization had taken to reduce the environmental impact of their packaging; and

- gain an understanding of their concerns and opinions regarding the concept of packaging stewardship.

3.3.3 Provincial and National Trade Associations and Non-government Organizations

Provincial and national trade associations and non-government organizations involved in promoting packaging, plastics, packaged products or extended producer responsibility were interviewed for the purpose of determining their views on packaging stewardship policies and programs. The surveys were designed to explore their opinions on the need for EPR, their concerns regarding this concept, and the roles they envisioned for the key players (government, producers and consumers).

3.4 Options for Plastic Packaging Stewardship Workshop

In further recognition of the importance of stakeholder input, a half-day workshop was held with government, industry and non-government organizations to evaluate a proposed model for plastic packaging stewardship in the province. The initial draft model reviewed at the workshop was based upon an analysis of the packaging stewardship policies and programs and the case study findings. The feedback gathered from workshop participants was used to develop the final *Packaging Stewardship Model for Manitoba*.

The workshop was a joint undertaking of the Natural Resource Institute and Manitoba Conservation, with both organizations playing a role in the planning and funding of the session. Two weeks prior to the event, over 60 invitations were faxed to representatives from industry (trade associations, packaging manufacturers and packaging fillers), government (federal, provincial and municipal), non-government organizations (environmental and consumer groups), and provincial recyclers/haulers. Fifteen guests attended the workshop.

The four hour session, facilitated by Sheldon McLeod of SL McLeod Consulting, was divided into two sections (Appendix E). The first half of the afternoon consisted of a review of provincial, national and international approaches to the management of packaging waste. The workshop began with a brief presentation from Jim Ferguson, Policy Analyst, Pollution Prevention, Manitoba Conservation. He discussed the current situation in Manitoba for waste management and packaging diversion, and the Province's plan to review waste reduction and prevention strategies in the near future. Barry Friesen, Solid Waste-Resource Manager, Nova Scotia Environment and Labour, presented a summary of the success Nova Scotia had with reducing waste and the tools the province used to stimulate diversion. Finally, the data gathered for this study, regarding the policies and programs adopted in Germany, Sweden, Austria, and Australia, was presented. This section was concluded with a question and discussion period.

The second half of the session was devoted to presenting and discussing a potential model for packaging stewardship in the province of Manitoba. The attendees were requested to share their questions, opinions and concerns regarding the proposed model. Chapter 7 contains a summary of the feedback provided by workshop participants.

3.5 Packaging Stewardship Model for Manitoba

The culmination of this research is a model for packaging stewardship in Manitoba. Chapter 7 presents the roles and responsibilities of the key players – the provincial government, industry, municipalities, the WRAP Council¹, consumers, other provincial governments and the federal government. The literature review, policy and program analysis, case study, and workshop were all conducted for the purpose of developing this model. The model is intended to provide a framework to assist the Province as it embarks upon discussions of waste management and stewardship in Manitoba.

¹ The Waste Reduction and Prevention (WRAP) Council is a proposed non-government organization responsible for engaging in research and increasing awareness of waste reduction and prevention issues in Manitoba.

Chapter 4 - Packaging Stewardship Policies & Programs

Many nations have taken great strides to reduce the environmental impact of their packaging, launching ambitious and progressive packaging stewardship initiatives. In order to develop a successful model for stewardship in Manitoba, it is essential to review the achievements and setbacks experienced by these nations. To achieve this end, a review of a number of international packaging stewardship initiatives was performed.

The need for government intervention and regulation is a topic of continual debate in the field of natural resource management. Many industry representatives assert that voluntary initiatives can deliver the same ecological benefits as regulated programs at a fraction of the cost, and the flexibility afforded by voluntary action permits producers to develop innovative approaches to sustainability. However, critics point out that voluntary programs lack the credibility of regulations. Many voluntary initiatives have vague or ineffectual objectives; poor or non-existent public reporting practices; lack authority to enforce targets; attract free-riders; and typically fail to obtain third party review of their progress (Gibson & Lynes, 1998). For the purposes of this study it was thought important to examine both government-regulated and voluntary approaches to packaging stewardship.

This chapter summarizes the legislated packaging waste management systems of Germany, Austria and Sweden, and the government-led voluntary packaging stewardship program in Australia. The system of each nation is described and analyzed for its strengths and shortcomings. The data presented in this chapter is based upon a review of the regulations, policies, and available literature, as well as interviews with key government representatives, waste management system officials, academics and industry members.

Regulatory Approaches to Packaging Stewardship

4.1 European Union Approach to Packaging Stewardship

4.1.1 *EU Directive on Packaging and Packaging Waste (94/62/EC)*

The European Union is leading the world in the development and implementation of packaging stewardship legislation. The first EU directive related to packaging waste was implemented in the early 1980s. The policy was limited in scope, targeting only beverage containers, and met with little success. In 1991, Germany introduced the Packaging Ordinance, which was described by one author as “the most prescriptive and demanding piece of environmental legislation passed in any European government with regard to packaging waste” (Bailey, 1999, p. 562). Several other Member States followed suit, including Sweden and Austria, introducing significant reforms to the handling of packaging and packaging waste within their borders. Such legislative action was viewed as an impediment to free trade within the Union. The Commission of the European Communities was requested to intervene. The Commission had two options: contest the legality of these policies or develop their own legislation which would create continuity and reduce trade barriers amongst Member States. Harmonization legislation was viewed as the most prudent course of action considering the waste management problems in many of the EU nations. The legislation sought to harmonize existing packaging waste policies and required Member States without packaging legislation to adopt similar laws (Bailey, 1999; Jordan, Gonser, Radermaker, & Jorgensen, 2001).

Targets

The EU Directive on Packaging and Packaging Waste was introduced in 1994 to reduce the negative environmental effects resulting from packaging and packaging waste. Reduction, reuse and recycling are equally promoted through this regulation, however because of the difficulty in measuring and monitoring reduction and reuse, targets were only created for the recovery,

recycling and heavy metal content of packaging waste (Table 4.1). Each EU Member State is expected to establish a system to ensure these targets are met.

Table 4.1: EU Directive on Packaging and Packaging Waste Targets

Recovery Target	50-65% by weight
Recycling Target	25-45% by weight Minimum of 15% by weight per material type
Heavy Metal Content†	100 ppm by weight

† Refers to the maximum concentration level of lead, cadmium, mercury and hexavalent chromium a package and its components may contain.

Flexibility

While the Directive seeks to harmonize national policies, those involved in its creation also recognized the value in a flexible process for implementation. The method Member States take to achieve these targets has been left to their discretion, thereby allowing them to tailor the Directive to their existing legal and administrative structure and to take into account their unique experiences with recycling. As a result there is great deal of variation amongst the waste management systems of each of the EU nations.

- *Legal Foundation.* The majority of nations have implemented mandatory regulations to ensure targets are met, while The Netherlands and Denmark have introduced voluntary agreements between industry and government. Some nations have separate legislation for handling beverage packaging; typically this is a holdover from their previous management system.
- *National Targets.* National targets vary significantly amongst Member States. In order to accommodate the needs of all Members provisions were made for certain nations to adjust the recovery and recycling targets. For example, any nation wishing to exceed the recovery and recycling targets was permitted as long as they had the capacity to treat

packaging and the Commission was assured increased targets would not distort the internal market. On the other hand, Greece, Ireland and Portugal, due to their geography and limited packaging consumption, were allowed a longer period of time to implement the Directive targets. In addition, Belgium, Finland, Spain and The Netherlands have gone beyond the requirements of 94/62EC, introducing targets for the prevention and reduction of packaging. Similarly, Germany, Portugal, Denmark and Finland have established targets for packaging reuse.

- *Complementary Legislation.* A number of Member States have adopted legislation which supports the objectives of their national packaging legislation, including landfill restrictions and eco-taxes.
- *Compliance Systems.* Each EU nation, with the exception of Denmark, has allowed industry to form organizations to help companies comply with their responsibilities. The majority have adopted "Green Dot Systems" (see PRO Europe section below for a discussion of the "Green Dot System").
- *Concept of Shared Responsibility.* While all Member States have obligated industry to partake in the management of packaging waste, there is variation in the amount and type of responsibility placed on companies. In some nations, industry has been delegated full responsibility for the collection, sorting, and recovery of packaging waste, while in other countries this responsibility is shared amongst industry and local governments.
- *Collection Systems.* Curbside and depot collection systems are permitted under the legislation, and most participants have a combination of the two systems. Not all the EU nations have been successful in establishing a nation-wide system for collecting packaging waste. Remote, rural areas and difficult topography has prevented the development of cost-efficient national collection schemes in a number of the participating countries.

- *System financing.* The means for financing collection, sorting, recovery and communication vary from nation to nation. There are three basic financing schemes employed in the EU: (1) levy based on weight, volume and material type; (2) levy per unit of packaging; and (3) registration fee based on annual turnover.
- *Monitoring.* The bodies responsible for monitoring, the stage at which monitoring is carried out and the party obligated to carry out data collection and reporting differ in each Member State.

In a recent report, *European Packaging Waste Management Systems: Final Report (2001)*, the Commission summarizes the waste management system of each Member State and the successes they have experienced. This document is available on *EUROPA* - the portal site to the European Union - <http://europa.eu.int>.

Enforcement

The European Union has limited power to interfere with the political matters of EU nations. Although the Commission does not have the right to mandate how nations implement EU legislation, this body does have the authority to ensure that all EU policies are consistently applied. If Member States do not fulfill their obligations under the EU Directive on Packaging and Packaging Waste, the Commission has the right to sue or fine these countries (U. Küppers, October 24, 2002). Several nations have had transgressions which have forced the Commission to take action. Major offences have included, failing to encourage reduction and reuse activities and neglecting to implement legislation by the required deadlines (Bailey, 1999).

Directive Revisions

In the implementation of any environmental policy, the Commission has had to face the challenge of safeguarding the environment while at the same time protecting free trade within the

European Union, often two divergent aspirations. The original intention of the Commission was to set recovery targets at 90-percent and recycling for each material at 60-percent. However, negotiations with EU members resulted in far lower quotas. Not all parties were satisfied with the outcome of the first Directive on packaging waste. One European Parliamentary deputy referred to Directive 94/62/EC as a “mess of ill-assorted, inconsistent compromises” (Bailey, 1999, p. 554). The Directive is currently under review and it is hoped some of these problems can be resolved. The revisions are expected to be completed and implemented this year. The Directive calls for a review every five years, thus these revisions are two years behind schedule. The Commission has recommended a number of changes, including raising the overall recovery and recycling targets and introducing material specific targets (Commission of the European Communities, 2001a). There has also been discussion, although not included in the Commissions proposal, of introducing reuse targets (Sturges, 2000).

4.1.2 *Packaging Recovery Organization Europe s.p.r.l. (PRO Europe)*

PRO EUROPE was founded in 1995 to assist their partner producer responsibility organizations in each of the Member States achieve the objectives of the EU Directive on Packaging and Packaging Waste. This organization provides aid to nations interested in establishing a dual system organization for the collection and recovery of packaging waste. These schemes, also referred to as producer responsibility organizations or compliance systems, are termed *dual system* organizations because they operate parallel to the existing municipal waste management system. A dual system organization is a government-sanctioned, industry-operated organization responsible for collecting and recovering packaging waste on behalf of their industry members. Companies joining these dual systems transfer their obligations under their national packaging and packaging waste legislation to these organizations.

The principal responsibility of PRO EUROPE is to grant permission to government-sanctioned compliance schemes to use the "Der Grune Punkt" (the "Green Dot") trademark. The Green Dot is a financial symbol, not an ecological symbol, which indicates that a monetary contribution has been made by a producer to the national producer responsible organization to support the collection and recovery of its packaging. Only one organization per country is granted the right to use this trademark. PRO EUROPE has developed criteria, which organizations need to meet in order to use the "Green Dot" symbol. The organization must:

- be privately owned and operated;
- fulfill the obligations established under the EU Directive; and
- operate on a non-profit basis (U. Küppers, October 24, 2002).

The role of these dual system organizations is to coordinate the collection and recovery of packaging waste, to educate producers and consumers about the system, and to provide licenses to companies in their nations. A license entitles a company to use the "Green Dot" on its packaging to inform consumers of its participation in the national dual system. In return the producer must pay a fee to the producer responsibility organization to cover the cost of collection, sorting, and recovery of packaging, communication programs and administrative activities.

Although each PRO EUROPE participating organization is permitted to use the "Green Dot" trademark, and is required to communicate this system to the public, there is a great deal of variation between these organizations. These systems differ in the following ways:

- sectors covered (e.g. household, commercial, institutional);
- collection mechanism (e.g. door-to-door, drop-off depots);
- forms of recovery (e.g. mechanical, chemical, feedstock, energy recovery);
- costs incurred (e.g. full financial responsibility, shared responsibility with municipality);
- time frame for implementation (e.g. legislative deadlines for implementation can range from six months to several years); and

- national recovery and recycling targets.

(U. Küppers, October 24, 2002)

In addition to administering the “Green Dot” trademark, PRO EUROPE provides member producer responsibility organizations with opportunities to share their knowledge and experiences. To facilitate these exchange sessions, PRO EUROPE hosts regular meetings, organizes working groups and maintains a website. PRO EUROPE also lobbies the European Parliament and Commission on issues related to the EU Packaging Directive on behalf of their members (DSD, 2002a).

Austria, Germany, Spain, France, Belgium, Greece, Sweden, Ireland, Portugal, Luxembourg, as well as a number of non-EU Members, including, the Czech Republic, Latvia, Hungary, and Poland belong to PRO EUROPE. Even Canada, through Corporations Supporting Recycling (CSR), is a “Green Dot” partner. CSR has an administrative license, meaning they are responsible for protecting the “Green Dot” trademark in Canada. If a producer, distributor, or importer wishes to lawfully import “Green Dot” packing into our nation, they must have an administrative licensing agreement with CSR (U. Küppers, October 24, 2002).

4.1.3 Plastic Packaging in Europe

As in North America, the packaging sector is the largest consumer of plastic resin in the European Union. Packaging comprises approximately 56-percent of the plastic waste generated in Western Europe. Demand for plastic packaging is on the rise, growing at a rate of 4 to 5-percent yearly. Resin manufactures and converters have anticipated these consumption levels to continue, and perhaps even increase in the future. The highest growth rates are expected for PET for use in beverage containers (Jordan et al., 2001; APME, 2000).

The majority of packaging in Western Europe is used for household packaging (73-percent), while the remainder is used for distribution packaging (27-percent). The primary end-use for

plastic packaging, as in Canada, is food preservation. Over half of all of plastic packaging in the waste stream is used for safeguarding food products (Jordan et al., 2001).

The highest annual plastic packaging recovery rates in the EU are achieved by Denmark. In 1997, this nation recovered 98-percent of plastic packaging waste; however, only 8-percent of this material was recycled, the remaining 90-percent was incinerated (waste-to-energy) (Jordan et al., 2001). Germany is the EU member nation with the highest plastic packaging recycling rates. In 2001, the Dual System Deutschland, Germany's producer responsibility organization for sales packaging, reported a recycling rate of 87-percent for its licensed plastic packaging (DSD, 2002b). Other nations reporting recycling rates above the EU Packaging and Packaging Waste Directive targets include Sweden, Austria, and Belgium¹. The remainder of this section will review the successful regulations and systems implemented in three of these nations, Germany, Austria and Sweden.

4.2 Germany

The origins of extended producer responsibility can be traced to the German Packaging Ordinance. In the late 1980s Germany was facing a landfill crisis – the nation had limited landfill capacity, the amount of waste being generated was on the rise, and public opposition to solid waste sites was mounting. It was clear a new approach to waste management needed to be developed. Dr. Klaus Töpfer, then Minister of the Environment, proposed expanding the role of producers to include the collection and treatment of the post-consumer waste generated by their products. Packaging, which composed one third of the waste stream, and as a highly visible product, was already the focus of public concern, was the first product targeted for stewardship.

¹ It should be noted that each nation uses different methods for calculating recovery and recycling rates. Therefore, it is difficult to directly compare these numbers between nations. It is even challenging to compare the figures within a nation. Different organization will using different calculation and reporting techniques, and even the same organization may employ a different method from year to year. Unfortunately, recovery and recycling rates are not often accompanied with an explanation as to how they were determined.

The goals of Töpfer's first stewardship initiative went beyond simply slowing the flow of materials into German landfills. The regulation was viewed as the initial step towards the development of a sustainable economy. The Ordinance was intended to provide an incentive to producers to design eco-friendly products, to limit consumption of virgin materials and energy, and to reduce pollution caused by resource extraction and manufacturing (Fishbein, 1998). The German government has since applied the concept of extended producer responsibility to a number of other waste streams, including electronics, tires and end-of-life vehicles.

4.2.1 German Packaging Ordinance

The German Packaging Ordinance was introduced in June of 1991 and revised in 1998. The Ordinance requires producers to take-back and treat post-consumer packaging in an environmentally sound manner. The German law is not only applicable to secondary (grouped) and primary (sales) packaging, which is the focus of this study, but also to transportation packaging. The Ordinance requires producers to develop their own collection and recovery programs or allows them to transfer the physical responsibility for packaging waste to an industry organized collection and treatment system. Many producers have favored the latter and have joined the privately operated, non-profit *Duales System Deutschland (DSD)*.

The purpose of the Ordinance is "to avoid or reduce the environmental impacts of waste arising from packaging" (Federal Government of Germany, 1998, p. 2). This policy recognizes and enforces the waste management hierarchy. Its primary goal is to prevent the creation of packaging waste, followed by the encouragement of reusable packaging systems and then the promotion of recycling. The 1998 version of the Packaging Ordinance also recognizes energy recovery as an option for waste management, although the last treatment option in the hierarchy. This regulation sets targets for reuse, recycling and heavy-metal content, but provides producers a great deal of latitude in determining the best means to achieve these objectives.

Reduction

Primary (Sales) Packaging. The primary tool for reducing sales packaging has been placing the financial responsibility for packaging recovery on producers. Members of the national producer responsibility organization pay levies to the corporation to manage their physical responsibilities. The dual system's fees are based on the actual costs of collection, sorting and recovery, and are charged on the basis of the weight, volume and composition of the packaging. Thus, producers can reduce their levies by reducing the weight or volume of their packaging, or converting to a packaging material that can be recycled efficiently. As a result of Germany's EPR legislation and the efforts for DSD, "[p]ieces of packaging have become smaller and lighter... [and] contrary to the international trend, the quantity of packaging waste has dropped significantly in Germany" (DSD, 2001b, p.6). Between 1991 and 1997 Germany reduced packaging waste by 1.4 million tonnes or 13-percent (OECD, 2001; Morawski, 2001). The initial reduction rates for primary packaging after the introduction of the regulation were significant, however these figures have now leveled off. One of the reasons sales packaging reduction rates have plateaued is that, for many products, reduction has been optimized. In these cases, further reductions would likely lead to product damage or spoilage.

Secondary (Grouped) Packaging. Secondary packaging - packaging used to group products, hinder theft or advertise the product - was deemed unnecessary by the German government. In an effort to eliminate this type of packaging the government placed responsibility for managing grouped packaging waste on retailers. The regulation requires retailers to either remove secondary packaging upon sale to the consumer or establish an on-site collection system where consumers can bring back secondary packaging at no charge. Once collected, retailers are obligated to reuse or recycle the secondary packaging. The Ordinance does not provide the option of establishing a dual system for secondary packaging. This policy has led to a significant reduction in the amount of grouped packaging found in consumer products. Since the

implementation of the Ordinance an estimated 90-percent of secondary packaging has been removed from the German market (Jordan et al., 2001). Individual retailers did not want the responsibility for this type of packaging, and thus have placed pressure on their suppliers to reduce or eliminate this form of packaging (T. Schmid, October 23, 2002).

Heavy Metal Concentrations. The Ordinance, in accordance with the EU Packaging Directive, requires producers to reduce the toxicity of their packaging. Packaging, or packaging components which contain concentrations of heavy metals (lead, cadmium, mercury, or hexavalent chromium) of more than 100 parts per million may not be sold on the German market.

Reuse

When the Packaging Ordinance was implemented, Germany had a sound reuse system for beverage containers. In order to protect this system the German government included sections 8 and 9 in the original Packaging Ordinance (T. Schmid, October 23, 2002; U. Küppers, October 24, 2002). Section 8 states that all suppliers of one-way beverage containers must charge consumers a deposit. Section 9 allows an exemption for producers who are members of an industry organized collection system. In other words, beverage fillers and importers who are members of DSD, the German compliance system, do not have to charge a deposit on their containers. However, this section has a condition – the exemption is only applicable if a 72-percent reuse rate is maintained. If the beverage industry does not uphold this reuse level, it may no longer partake in a third party collection system and must begin charging a deposit.

Not all sectors of the industry were able to maintain this level of reuse, and as of January 1, 2003, Germany has adopted a mandatory deposit-refund system for beer, carbonated beverages

and mineral water^{2,3}. If these sectors can re-establish a reuse level of 72-percent, this decision will be reversed.

When it was realized a deposit-refund system for beverage containers was to be implemented there was significant opposition from producers, distributors and retailers. Arguments against the system included:

- *Costly Transition.* The German government projected that changing to the new scheme would require a billion Euro investment in reverse vending machines to collect containers and an estimated 135-million Euro (\$204 million CAD⁴) annually to maintain the system (German Federal Environmental Ministry, 2002).
- *Revenue Loss for DSD.* DSD would be losing 250-million Euro (\$378-million CAD³) in licensing fees per year as a result of the beverage sectors forced withdrawal from the program (U. Küppers, October 24, 2002)⁵. From a plastics perspective, PET beverage bottles are extremely easy to recycle and the recycled material has value, and thus can be sold on the market. The loss of this material would mean an increase in the costs of recycling plastics in Germany (J. Jansen, October 30, 2002).
- *Impacts Unknown.* Impacts of such an initiative were unknown and likely far reaching, impacting consumers, retailers, fillers and waste companies (K. Bredenbroecker, October 31, 2002).
- *National Clearing Center.* Converting to a deposit-refund system would be a very complex process, requiring the establishment of a national clearing center responsible for

² Wine and fruit juice producers have been able to maintain a 72-percent reuse level and therefore may still partake in DSD.

³ As of January 1, 2003 a deposit of 0.25 EURO is now charged on all one-way beverage containers of 1.5 litres or less, and 0.50 EURO is levied on one-way beverage containers larger than 1.5 litres. Retailers are responsible for accepting containers and providing the refund. Retailers may return the used packaging to fillers or distributors who are responsible for ensuring the containers are reused or recycled.

⁴ Conversion based upon currency rates as of November 8, 2003.

⁵ More recent estimates of the loss to DSD as a result of the beverage deposit refund program is in excess of 300million EURO/per year (U. Küppers, December 29, 2003).

managing a common collection scheme and centralizing finances (K. Bredembroecker, October 31, 2002).

- *Control and Command Approach.* Mandatory deposit-refund program went against the principles of a free economy (K. Bredembroecker, October 31, 2002).

Industry, in an attempt to block the introduction of a deposit-refund scheme, took the matter to the German courts, arguing that the Packaging Ordinance did not have the proper legal authority to implement such a drastic policy. The courts however, ruled in favour of the Ordinance. Much effort was put into fighting against this clause in the Ordinance, at the expense of preparing for its implementation. The beverage industry is now rushing to create a national clearing center, which is expected to be in place by the fourth quarter of 2003 (German Federal Environmental Ministry, 2002).

The German government believes that the new deposit-refund system will yield a number of environmental benefits. First, the system is set up to charge a greater levy on recyclable containers (0.25 to 0.50 Euro) than on reusable bottles (0.08 Euro). In the past, some consumers were deterred from purchasing reusable containers because they were viewed as more expensive. It is expected that consumers will now be more inclined to choose reusable over one-way containers (German Federal Environmental Ministry, 2002). Similarly, it is hoped that producers wishing to eliminate the deposit-refund program will work hard to re-establish the reuse system. Second, deposit-refund initiatives have been proven to increase the recovery levels for materials. It is anticipated that this system will not only increase the number of containers collected from consumers but also, because the bottles will not be mixed with all other lightweight packaging materials, the recycling stream will be cleaner. Cleaner recycling streams lead to easier sorting, an increase in mechanical recycling and higher quality recycled materials (T. Schmid, October 23, 2002). Third, the system is expected to decrease littering and reverse the growing "throw-

away” mentality. Finally, from an economic perspective this new initiative is expected to spur job creation in fields of recycling and reuse (German Federal Environmental Ministry, 2002).

Recycling

The rates established by the EU Packaging Directive for recovery (65-percent by weight) and recycling (45% by weight) have been adopted by the German Packaging Ordinance for secondary and transportation packaging. However, the Ordinance has set separate recycling targets for sales packaging, targets which far exceed those of the EU Directive. Germany’s recycling quotas for primary packaging are amongst the most ambitious in the world.

Table 4.2: German Packaging Ordinance Minimum Recycling Targets for Sales Packaging

Packaging Material	1999 Recycling Target (% by weight)
Glass	75 %
Tinplate	70 %
Aluminum	60 %
Paper, cardboard	70 %
Plastic	60 % †
Composites	60 %

† Of the 60% recycled plastic, 60% must be mechanical recycled, and the other 40% may be recovered via mechanical recycling, feedstock recycling or energy recovery processes.

4.2.2 *Duales System Deutschland*

In 1990, in anticipation of the introduction of the Packaging Ordinance, a group of retailers and producers joined together to form a privately operated non-profit organization to manage their new responsibilities – the *Duales System Deutschland*. DSD, on behalf of its members, assumes responsibility for arranging for the collection and recycling of used sales packaging from

households, institutions and small businesses⁶. DSD does not own any trucks, plants or equipment. Their role is to *organize* the management of sales packaging waste in accordance with the Packaging Ordinance. They collect fees from licensees (member producers) that are used to pay the contractors responsible for collection, sorting and recycling.

Licensees are entitled to place the organization's trademark – Grüne Punkt (Green Dot) - on their packaging. The "Green Dot", as mentioned previously, is a financial symbol which indicates that the producer has paid a fee to DSD to cover the costs of collecting and recycling their package. The fees levied by DSD are based on the actual costs of collection, sorting and recycling and are charged on the basis of packaging volume, weight and composition (Appendix F). The "Green Dot" enables consumers to identify products which are a part of the DSD system and easily separate them for non-DSD packaging for collection.

Deutsche Gesellschaft für Kunststoffrecycling mBH

Prior to the introduction of the Packaging Ordinance, Germany had a limited plastic recycling capacity. When the Ordinance came into effect DSD was overwhelmed by the quantities of plastic packaging returned by consumers. A substantial amount of this unprocessed packaging was exported for treatment to Asia (primarily China), Eastern Europe and other EU Member Nations. Doubts arose as to the environmental benefits of transporting waste to other nations for processing, and many questioned the legality of some of the recycling practices of these other countries (Bailey, 1999; Jordan et al., 2001). As a result of these problems, packaging producers decided to form their own recycling guarantors (independent of DSD). A separate entity for each major packaging material type was created. Each organization was tasked with establishing recycling capacity within Germany and acting as a guarantor for materials collected by the dual system. Deutsche Gesellschaft für Kunststoffrecycling mBH (DKR) was created to be the sole

⁶ DSD is the only organization involved in the collection of sales packaging from the municipal solid waste stream. However, a number of separate compliance schemes have been formed by manufacturers and waste management companies to manage commercial and industrial packaging.

guarantor for the recycling of plastic sales packaging collected and sorted by DSD. The responsibilities of DKR include:

- Ensuring a reliable recycling system for plastic sales packaging;
- Improving the efficiency and effectiveness of plastic recycling;
- Maintaining an acceptable balance between the ecological and economical concerns; and
- Assisting the marketing efforts of products composed of recycled plastic.

DKR has been successful in increasing the recycling capabilities of the nation. In 1993, 75-percent of plastic packaging waste was exported for treatment, while in 1998 only 7-percent was exported to EU States and Japan. To ensure no illegal recycling practices are being undertaken, DKR requires all its contractors to undergo a certification process by an independent auditor and forbids contractors from sub-contracting plastic waste recycling (Jordan et al., 2001). This organization has also done a great deal to promote and develop capacity for mechanical recycling of plastics in Germany. Despite its many successes, DKR is still struggling with high plastic waste management costs. It is hoped that contract negotiations with recycling partners in the upcoming year will allow the organization to reduce some of its expenses.

4.2.3 Successes of the German Packaging Waste Management Approach

Increased Awareness

The Packaging Ordinance and DSD have increased both producers' and consumers' awareness of the environmental impact of packaging. As a result, many producers in Germany have taken steps to alter the design of their packaging in order to reduce the amount of material per package or to enhance their recyclability, and consumer participation in recycling has risen significantly (T. Schmid, October 23, 2002).

Reduction

Placing full responsibility on producers accomplished the goal of reducing the quantity of packaging in the marketplace. It is estimated that between 1991 and 1999 the annual consumption of packaging in Germany was reduced by 14-percent, or an average of 13.1 kilograms per person a year (DSD, 2002). This success was attributed to manufacturers' reducing the amount of material in their packaging, eliminating unnecessary packaging and selling concentrated versions of their products (Fishbein, 1998). The DSD levy system, which is based on the weight, volume and composition of the packaging, is also believed to have contributed significantly to this reduction. Under this system heavier, larger packages are charged a higher levy than lightweight compact packages, thereby encouraging producers to reduce the size and weight of their packaging. According to one DSD study, between 1991 and 1995 packaging licensed under the Green Dot decreased by 14-percent, while the total packaging for all of Germany only decreased by 7-percent (Fishbein, 1998).

Recycling

The Packaging Ordinance and DSD System have led to significant increases in the quantity of packaging materials collected and recycled (Appendix G). The German system has also led to an increase in material recycling capacity. High recycling targets have spurred the development of new recycling facilities and advancements in sorting and recycling technology – which, in turn, have reduced the overall costs of recycling and increased the amount of materials which can be processed (T. Schmid, October 23, 2002). The system has also led to a shift away from difficult to recycle packages, such as composites, to more recycle friendly designs and materials (Fishbein, 1998). “The Dual System and DKR have proven that recycling of even difficult materials is technically feasible and economically and ecologically reasonable” (J. Jansen, January 19, 2003).

Environmental Relief

As intended, source reduction and increased packaging recycling have had a positive impact on the environment. Less waste being incinerated or landfilled has meant a reduction in greenhouse gas emissions, while lower packaging production figures has led to reductions in energy consumption, lower CO₂ rates and a decrease in raw material use (DSD, 2002b).

Positive Example

The Packaging Ordinance and DSD have paved the way for significant changes in the treatment of waste. The German system is an excellent example of a successful EPR program, providing a framework for stewardship initiatives for other products (e.g. vehicles, electronics, batteries, tires) and encouragement and guidance for other nations seeking to improve their resource management strategies (T. Schmid, October 23, 2002).

4.2.4 Shortcomings of the German Packaging Waste Management Approach

High Cost

The major shortcoming of the current German packaging waste system is the high cost. In 2001, the system cost \$1.88 billion Euros (\$2.83 CAD³), or \$356 Euro (\$538CAD³) per tonne of recycled material (DSD, 2001b). The reasons for such high costs include:

- *Timeframe for Implementation.* The timeframe for implementing DSD's collection and recycling system was very short. Contracts had to be quickly established with collectors, sorters and recyclers and recycling infrastructure needed to be established. Some materials, such as plastics, had little to no existing recycling capacity. In order to encourage investment in recycling infrastructure and technology, DSD had to lock into long-term contracts (five to ten years) and provide subsidies to plastic recyclers to assist in creating the necessary facilities and equipment. Plastics subsidies accounted for 12-

percent of DSD costs in 1999 (Jordan et al., 2001). Many of the long-term contracts are coming up for negotiation in the next year or two. New contracts will be limited to a three-year period and subsidies to these recyclers will be slowly phased out.

- *Nation-wide Program.* The Packaging Ordinance requires the national PRO to establish a system which serves the entire Germany population. Such a mandate means DSD must provide collection services to over 80 million people, including those living in remote and difficult to access rural areas.
- *High Targets.* The high recovery and recycling targets set in the German Ordinance for sales packaging have placed significant economic burden on DSD. First, producers have had to invest in establishing processing facilities and advancing recycling technology in order to meet these targets. Second, high recovery and recycling quotas forced DSD to accept almost any contract being offered to them for collection and recycling (Bailey, 1999). As a result not all contracts made the best financial sense for the organization. As mentioned earlier, many contracts are coming up for re-negotiation in 2004, which will provide an opportunity for DSD to reduce its costs. Third, high targets for plastic packaging has led to DSD having to collect and recycle small, heterogeneous materials which are difficult and costly to recover. Arguments have been made that to reduce costs all small plastic packaging should be subject to waste-to-energy recovery rather than being recycled. This proposal is currently being reviewed by the federal government.
- *Lack of Competition.* Some have argued that DSD functions as a monopoly, and as a result its costs are higher than if there were competing agencies involved in the collection and recovery of municipal packaging waste in Germany.
- *Free-riders.* The first version of the Packaging Ordinance did not create recycling targets or documentation requirements for manufacturers and distributors choosing not to participate in DSD (i.e. self-compliers). Some manufacturers benefited from this

oversight in the legislation, choosing not to join DSD, but also not to create their own collection system. The financial impact on DSD was severe, as the company ended up collecting and recycling a great deal of packaging material for which no licensing fee was paid. The revised version of the Ordinance has corrected this loophole. Self-compliers are now subject to the same targets and reporting requirements as DSD, and must have their program certified by an independent auditor to prove compliance (Jordan et al., 2001). Improvements to the regulation, as well as prosecution of free-riders, has significantly reduced, although not eliminated, this problem (Bailey, 1999).

One of DSD's main goals is to continually reduce its licensing fees. Investment in improving sorting technology - reducing the labour component and increasing the quality of recyclable materials - and encouraging the development of improved recycling techniques has allowed this organization to significantly lower waste management costs. In 1995, the organizations costs were 4.1 billion DM (\$3.18 CAD³), while in 1999 their costs had been lowered to 3.7 billion DM (\$2.87 CAD³), a decrease of 9.8-percent. It has also been estimated that DSD will be able to decrease costs by another 20-percent as a result of tendering new contracts for waste management in 2004 (Jordan et al., 2001).

Monopolistic Nature

DSD is the only compliance system in Germany for the collection and recovery of sales packaging⁷. As a result the organization has come under fire from the German federal government and the European Parliament for acting as a monopoly. However, it was in fact the Packaging Ordinance that indirectly allowed for DSD to gain such a position of power. According to the regulation, in order to receive governmental authorization, a compliance scheme

⁷ Concerns over DSD's monopolistic nature led the German Federal Cartel Office to restrict this organization's activities to sales packaging in order to prevent DSD from entering the transportation packaging market (Jordan et al., 2001).

must serve the entire nation. To date, only DSD has been able to successfully fulfill this requirement (Jordan et al., 2001).

Producers and waste management companies have complained about DSD's monopolistic status. Some producers have felt pressured into joining this compliance scheme and resent being subjected to DSD's high costs. While a number of waste management organizations believe they could provide similar services to DSD, within a particular region, at significantly lower cost, they cannot due to the restriction in the legislation. These issues are currently in dispute in the European and German courts.

Competition has begun to arise from self-compliers. Several small systems have developed for the collection and recovery of packaging from specific sectors (e.g. hospitals, chemist shops) and for particular types of packaging (e.g. service packaging from retailers). Because these systems have a narrow scope they have been able to offer their services at much lower rates. DSD, in response to this new trend, declared a reduction in levies for commercial clients (Jordan et al., 2001).

4.3 Austria

Austria in the early 1990s was also being threatened by a landfill crisis. As in Germany, landfill space was depleting rapidly, production of packaging waste was rising, and public resistance to the development of new landfill sites was escalating. While Austria was examining its various options for counteracting this problem, Germany introduced the Packaging Ordinance. The Austrian federal government approved of the extended producer responsibility model for the management of packaging waste. Using the German Ordinance as a guideline the Austrian Packaging Regulation was assented in the fall of 1993 (C. Keri, November 7, 2002).

4.3.1 Austrian Packaging Regulation (648/1996)

The Austrian Packaging Regulation came into effect in October 1993 and was amended in December 1996 to comply with the EU Packaging Directive. Under the Regulation producers and distributors of packaging in Austria must:

- Establish a collection system or participate in an approved PRO;
- Reuse or recover packaging in an environmentally acceptable manner;
- Achieve government established recycling targets; and
- Submit regular reports to the federal government detailing the outcome of collection and recovery efforts.

Reduction and Reuse

Having based their legislation on the German model, the Packaging Regulation encourages reduction in the same manner as Germany. Full financial, physical and informational responsibility is placed on producers with the intent of encouraging them to design their packaging with less material. The Austrian policy also requires retailers to accept secondary packaging if a consumer chooses to leave it behind at the time of purchase. If a consumer opts to retain the package, it is then treated as sales packaging and becomes apart of an approved compliance system or the producer's own scheme. The aim is to reduce the amount of unnecessary packaging in the marketplace. The Regulation, in accordance with the EU law, also places restrictions on the amount of heavy metals permitted in packaging and packaging components.

Up until last year, Austria had in place a reuse target of 80-percent for all beverage containers. Unfortunately, this quota was retracted after a legal dispute with the Province of Vienna, which argued its jurisdiction was not properly consulted on the level of the reuse quota and insufficient data was collected to support the feasibility of this target. The federal

government is currently debating developing new targets and has given some consideration to a deposit-refund system, although it has reservations about the costs of such schemes (C. Keri, November 7, 2002).

Recycling

The Austrian Packaging Regulation establishes different collection requirements and recycling targets for producers belonging to the industry-organized compliance system (e.g. ARA system) and for those producers collecting and recycling their own products⁸. Non-system members are responsible for collecting all of the packaging they place on the Austrian market. If the producer falls short and only collects between 90-percent and 50-percent of its packaging, it is required to participate in the ARA system with respect to the difference between the actual collection and 90-percent. If the producer is collecting less than 50-percent of the packaging it puts into circulation, it must partake in the ARA system in respect of the difference between what it is collecting and 100-percent. This provision was added to help prevent free riders. For example, if a producer only collects 50-percent of its packaging, there is a high probability that a portion of the uncollected materials will end-up in the ARA system without the company financially contributing to the scheme (Jordan et al., 2001).

Table 4.3 displays the minimum recycling targets for producers who have chosen not to partake in an approved collection and recovery system, such as ARA. The established targets for ARA are less rigorous than those for non-members, with an overall recycling quota of 25-percent and a minimum recycling target of 15-percent per packaging material. These targets are the equivalent to the European Union's Packaging Directive minimum recovery and recycling targets.

⁸ Although not stated in the literature or during interviews, it is assumed these different requirements have been established in order to encourage producers to become members of the ARA system. When the majority of producers belong to a single organization responsible for fulfilling stewardship responsibilities matters of enforcement, monitoring and reporting are greatly simplified, easing the task of the responsible governmental agency.

Table 4.3: Austrian Recycling Targets for Self-Compliers

Packaging Material	Minimum Recycling Target
Paper, paperboard	90%
Glass	93%
Metal	95%
Plastic	40%
Beverage Composite	40%
Other composites	15%

A second regulation, the *Packaging Objectives Ordinance (649/96)*, establishes targets for the recovery of packaging from beverage containers (Table 4.4). These targets are based on the amount sold on the Austrian market and may be met through refilling, recycling or energy recovery processes.

Table 4.4: Austrian Beverage Container Recovery Targets (2000)

Beverage Containers	Minimum Recovery Target
Mineral, table and soda water	96%
Beer	94%
Alcohol free refreshments	83%
Juices	80%
Milk and liquid milk products	80%
Wine	80%
Champagne and spirits	80%

4.3.2 ARA System

The ARA System is a government-approved, industry-established scheme for the collection and recovery of both household and commercial packaging waste throughout Austria⁹. The system is made up of Alstoff Recycling Austria AG (ARA), eight companies which specialize in collecting, sorting and recycling specific packaging materials and numerous waste collection companies and associations. Thus, plastic packaging waste in Austria is managed by three separate organizations – ARA, ARGEV and ÖKK.

ARA is an industry-established organization tasked with coordinating and financing the collection and recovery of packaging waste from households and industry. Its mandate is to fulfill licensees' legal obligations under the Packaging Regulation and achieve Austrian recycling targets in the most cost-effective and efficient manner. Since its inception in 1993, ARA has recovered more than 5 million tonnes of post-consumer packaging and established partnership agreements with over 13,000 licensees (C. Mayer, November 7, 2002). As the head of the ARA System this organization is responsible for drawing up licensing agreements, collecting fees, reporting ARA system activities to the government and promoting the system to both producers and consumers. ARA packaging levies are based on the actual cost to collect and recovery individual packaging materials, and are applied on the basis of packaging volume and weight (Appendix F). Collected fees are distributed amongst the various branches of the system to cover the costs of licensing activities, collection and maintenance of collection sites, sorting, and transportation and transfer of materials to recyclers. ARA, like DSD, is a member of PRO EUROPE, meaning ARA participants are permitted to place the "Green Dot" symbol on their packaging.

⁹ ARA is not the only compliance system in Austria. The Austrian Packaging Regulation allows for the establishment of multiple producer responsibility organizations (Jordan et al., 2001). The criteria set by this Regulation is less stringent than that of the German Packaging Ordinance, eliminating the difficulties faced in Germany with the monopolistic nature of the DSD.

Table 4.5: ARA Recycling Targets and Rates 2001

	Target	Recycling Rate
Paper/Board/Cardboard	75%	92%
Glass	75%	95%
Tinplate/Aluminium	65%	65%
Plastic	30%	33%
Composite Materials	15%	25%

ARGEV is the company responsible for organizing the collection and sorting of plastic packaging, as well as metal, wood, textiles and ceramics, from both households and industry. While the only company involved in collecting these materials from households, there are three other organizations that partake in the collection from industry. Like DSD, ARGEV does not own vehicles, equipment or plants for collection and sorting, rather they contract private companies or municipalities to conduct these activities. Once materials are collected and sorted they are transferred to recycling guarantors.

ÖKK is charged with ensuring plastic packaging is recycled or otherwise recovered. This company transports sorted plastic packaging waste from sorting plants for final treatment, arranges contracts with recycling companies, and participates in the development of new processing and recycling technology for plastics.

4.3.3 Successes of the Austrian Packaging Waste Management Approach

There have been a number of positive outcomes as a result of the Packaging Regulation. The amount of material per package has decreased and a growing amount of materials are being collected - both of which have contributed to a reduction in the amount of waste being transported to landfills. Forcing industry to explore alternatives to landfilling has led to significant advances in automatic sorting and recycling technology—reducing the long term costs of recycling and improving the quality of recycled materials.

Interviewees have attributed Austria's success with packaging reduction and recycling to three main factors:

- *Early introduction of legislation.* Austria first implemented the Packaging Regulation in 1993, several years earlier than many of the other European Union nations (E. Kerbl, November 5, 2002; C. Keri, November 7, 2002).
- *Broad, accessible collection base.* The Packaging Ordinance is applicable to both household and industrial packaging waste, as well as all forms of packaging (i.e. primary, secondary and tertiary). The collection system is nation-wide and accessible to the majority of the population (C. Keri, November 7, 2002).
- *Public support.* Austrians have a different attitude towards the environment in comparison to some of the other nations in the EU. Recycling is not a new concept for Austrians. The nation began glass recycling over 25 years ago and paper recycling 20 years ago. Austrians see a value in protecting the environment beyond the financial incentives (E. Kerbl, November 5, 2002; C. Keri, November 7, 2002).

4.3.4 Shortcomings of the Austrian Packaging Waste Management Approach

Non-Packaging Waste

Plastic collection bins are regularly contaminated with non-packaging waste. At one point in time up to 40-percent of plastic collected was not packaging material. Poor communication with the public was deemed to be one of the main contributors to this problem. ARA and AGREV are now in the process of working with municipalities to improve consumer education programs. Collection schemes in each locality are unique and therefore individual municipalities must organize communication efforts. ARA has taken steps to contract regional governments as waste management consultants – including them in communication campaigns and special local projects (e.g. school programs). In addition, ARA is now adding to its collection contracts with

municipalities a clause stating that if more than 20-percent of material collected is non-packaging, ARA will charge the municipality a fee (C. Mayer, November 7, 2002).

Another recommendation for reducing the collection of non-packaging waste has been to switch to bottle only collection bins. An 'all bottles' program would be simpler to communicate to consumers and the material collected would be easier to sort and treat. The remaining packaging materials could be transferred to waste-to-energy plants (C. Mayer, November 7, 2002). Another, quite opposite approach, has also been suggested. Some would like to see the collection expanded to include all plastic products, not just packaging. Supporters of this option state Austria already has a collection, sorting and recycling program in place for plastic packaging, why not use this capacity for all plastic products (E. Kerbl, November 5, 2002). Those opposed to this proposal have declared that broadening the Regulation to encompass other product streams would be far too complicated (C. Mayer, November 7, 2002).

Rise in One-Way PET Containers

There has been a significant increase in the amount of single-use PET bottles on the Austrian market. Five years ago all beverages were packaged in reusable glass bottles. The original shift was to reusable PET bottles, however now the market is flooded with one-way PET containers. The government has not yet determined the best way to deal with this problem. It has given some consideration to implementing a deposit-refund program but are concerned about the cost of such a system (C. Keri, November 7, 2002).

Industry Apathy

One of the goals of the regulation is to encourage producers to design their products with the environment in mind. However, manufacturers have not responded in the manner government had hoped. The initial impact of placing financial responsibility on producers for waste

management of packaging did minimize the amount of packaging on the market. Unfortunately, the packaging waste management fees have become a regular cost of doing business. Fees are incorporated into the selling price of the product and consumers are willing to pay the cost. Although many producers complain about having to fund the collection and treatment of their products, they are not actively exploring options for improving the design of their products in order to reduce these costs. If consumers are willing to pay, producers will continue to manufacture such products (E. Kerbl, November 5, 2002; C. Keri, November 7, 2002). ARA's low plastic fees and the ready acceptance of energy recovery may have contributed to industry's apathetic attitudes.

4.4 Sweden

In 1994, prior to joining the European Union, Sweden introduced its first extended producer responsibility legislation –the Ordinance on Producers' Responsibility for Packaging. Inspired by Germany's sweeping waste management reforms, Swedish politicians were eager to emulate their success. Unlike Germany, Sweden did not have a landfill capacity problem. The nation had ample landfill space, an expansive waste-to-energy system and strong reusable market. Thus the decision to implement packaging stewardship was not motivated out of a need to reduce the solid waste entering landfills. Like many other industrialized nations a significant portion of Sweden's MSW stream was comprised of packaging, a great deal of which the government deemed unnecessary. The nation was also suffering from growing problems with litter, the majority of which was packaging (G. Fredrickson, October 16, 2002; L. Jacobsson, October 16, 2002). Both the public and the government were concerned about these negative trends and EPR was viewed as a tool which could help the nation improve its resource management and waste treatment.

Packaging Stewardship Regulations and Compliance Systems

The various requirements of the EU Packaging Directive were implemented into Swedish law through several different federal regulations. Two separate regulations set obligations for users and producers of plastic packaging – the *Ordinance on Producers' Responsibility for Packaging* and the *Act on Certain Beverage Containers*.

4.4.1 Ordinance on Producers' Responsibility for Packaging (SFS 1997: 185)

Like the German Packaging Ordinance and the Austrian Packaging Regulation, Sweden's packaging stewardship law places full responsibility for the management of post-consumer packaging waste on producers. The goal of the ordinance is to “render the production of certain products more environmentally sustainable and to increase recovery rates in Sweden” (Swedish Ministry of the Environment, 2000, p.1). The ordinance applies to tertiary, secondary and primary packaging with the exception of aluminum beverage cans and PET beverage bottles which are managed by a separate Act. Producers' obligations include:

- *Collection.* Producers are responsible for establishing an accessible collection system for packaging materials. Municipal authorities must be consulted on matters related to the design and implementation of the collection system.
- *Waste Treatment.* Collected packaging waste must be treated in an ecologically sound manner. The Ordinance stresses a preference for reuse over other disposal methods (i.e. recycling, energy recovery and composting).
- *Communication.* Producers must communicate to consumers how the collection system works (e.g. eligible materials, proper sorting techniques, location of collection depots).
- *Reporting.* Producers are responsible for compiling and submitting annual reports to the Swedish Environmental Protection Agency regarding the outcome of their collection and waste treatment activities.

- *Recovery and Recycling Targets.* Producers must ensure recovery and recycling targets are achieved (Table 4.6).

The regulation also establishes responsibilities for households. Residents are obliged to separate packaging from other household waste and return it to the producer via the established collection system. While the regulation establishes a duty for households there is no means of enforcement detailed in the Ordinance.

Swedish Packaging Waste Management Compliance System

Although the regulation does not expressly state producers may form a third party organization to manage their responsibilities, the Swedish government has allowed them to do so. Swedish producers have developed a relatively complex packaging waste management system. When the Ordinance was first introduced, producers from each of the major packaging material sectors formed their own independent organization to manage their obligations - Plastkretsen (plastic), MetallKretsen (metal), Returwell (corrugated board), Svensk GlasÅtervinning (glass), and Svensk Kartongåtervinning (paper and cardboard).

In order to improve services and reduce duplication of administrative duties, the material companies, with the exception of Svensk GlasÅtervinning, agreed to create two joint subsidiaries to handle material collection and fees. Reparegistreret AB (REPA) is the subsidiary organization responsible for attracting new licensees, establishing licensee contracts, collecting stewardship fees, managing relations with members, and dispersing fees back to the material companies (see Appendix F for a list of material fees).

Forpackningsinsamlingen (FPI) is delegated the task of establishing, monitoring and maintaining common collection sites for packaging waste. FPI is also in charge of public relations and communications activities for the material companies. This organization is involved in designing and delivering advertisement campaigns and consumer education programs,

maintaining good relations with municipalities, and lobbying government on packaging waste issues.

Each individual material company is then responsible for setting stewardship levies for its material, establishing contracts with entrepreneurs for the pick-up and sorting of their packaging, and arranging for the recycling or energy recovery of sorted materials. Thus, Plastkretsen is responsible for ensuring plastic packaging is transported from common collection sites to sorting plants, and then to recyclers.

The Swedish EPA has estimated that the material companies represent approximately 93-percent of packaging in the country¹⁰. Several large companies, such as IKEA and McDonalds, are not members of REPA, choosing instead to coordinate their own packaging return system and report directly to the EPA (L. Jacobsson, October 16, 2002).

4.4.2 Act on Certain Beverage Containers (SFS 1991: 336)

Prior to the introduction of the Ordinance on packaging waste, Sweden had adopted legislation to ensure the proper management of used beverage containers. The Act requiring producers to recycle aluminum cans was implemented in 1982, while a similar act for PET beverage bottles was adopted in 1991. The Act requires any filler or importer of PET beverage containers to obtain a handling license prior to selling their product on the Swedish market. A condition of the handling license is that producers partake in a deposit-refund system for the reuse or recycle of post-consumer bottles. The Ordinance deems that 90-percent of all PET bottles on the Swedish market must be collected and recycled¹¹.

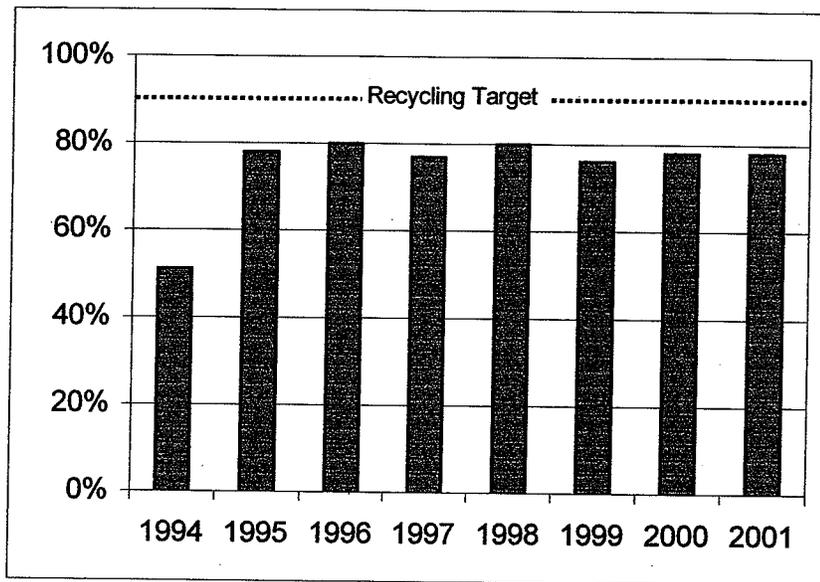
¹⁰ The agency has determined it would be too costly to ensure 100-percent compliance, and thus is quite satisfied with the number of producers participating (L. Jacobsson, October 16, 2002).

¹¹ Recycling targets for PET beverage bottle are found in the Ordinance on Producers' Responsibility for Packaging.

Returpack-PET

Returpack-PET, founded in 1994, is responsible for the deposit-refund system for PET bottles in Sweden. A deposit of 1 SEK (17-cents CAD) for bottles 1-litre or less and 2 SEK (35-cents CAD) for bottles over 1-litre must be paid on approved bottles. Fillers and importers who are members of Returpack place specialized barcodes on their containers. These barcodes allow consumers to return bottles to reverse vending machines, which will refund their deposit. The barcodes guarantee that only approved bottles (i.e. bottles belonging to Returpack members) are provided with a refund and ensure the waste stream is not contaminated by other plastics (only PET bottles are approved). The introduction of Returpack had a significant impact on PET bottle recycling levels, with rates rising from 51-percent in 1994 to 78-percent in 1995. However, the deposit-refund system has not been able to exceed its initial success. Annual recycling rates over the last eight years have ranged from 76 and 80-percent, far below the recycling target set by the Packaging Ordinance (Figure 4.1). Reasons suggested for not being able to achieve this target include, changing consumer demands (in particular amongst the youth) and increased beer and soft drink imports (L. Jacobsson, December 8, 2003).

Figure 4.1: Recycling Rates for PET Beverage Bottles in Sweden



4.4.3 Successes of the Swedish Packaging Waste Management Approach

Sweden's packaging ordinance and the accompanying compliance system have successfully increased the collection and recovery of packaging waste. The majority of targets set in the Ordinance, which are higher than the standards set in the EU packaging directive, have been achieved (Table 4.6).

Transferring responsibility for recycling from municipalities to producers has been cited, by some, as another benefit of this initiative. In Sweden there is little incentive for municipalities to engage in recycling activities. Local governments typically own incinerators and waste-to-energy facilities. The infrastructure for these plants requires significant financial investments and a steady flow of waste materials is required to maintain a cost-efficient facility. As a result, some believe there is no motivation for local governments to become involved in recycling when they have existing infrastructure to deal with residential waste. Others believe recycling is beyond the expertise of municipal governments. Producers have the greatest understanding of the manufacturing process and market forces. It is this experience and knowledge which is needed to

establish and maintain recycling infrastructure and technology. Since producers have assumed responsibility for packaging in Sweden, recycling capacity has increased and a stable recycling system has been firmly established.

Table 4.6: REPA Recycling Targets and Rates 2000-2001

	2001		2000	
	Recycling Target	Recycling Rate	Recycling Target	Recycling Rate
Corrugated Board	65%	85%	65%	84%
Paper/Paperboard	40% ¹	41% ²	30% ¹	41%
Glass	70%	84%	70%	86%
Metal (steel and aluminium)	70%	63%	50%	63%
Aluminium beverage cans ³	90%	86%	90%	86%
Plastic	30% ⁴	16% ⁵	30% ⁴	37% ⁶
PET beverage containers ³	90%	78%	90%	78%

¹ The Packaging Ordinance sets a recovery rate of 70-percent for cardboard, paper and paperboard packaging of which 40-percent must be recycled.

² In 2001, 0.7% of paper and paperboard packaging was recovered through waste to energy processes.

³ Sweden has separate deposit-refund legislation beverage containers. The deposit refund system is administered by a company called Returpack.

⁴ The Packaging Ordinance sets a recovery rate of 70-percent for plastic packaging of which 30-percent must be recycled.

⁵ In 2001, REPA achieved a 70% recovery rate for plastics, with 15.5% recycled and 54.5% energy recovery.

⁶ In 2000, REPA achieved a 95% recovery rate for plastics, with 37% recycled and 58% energy recovery.

(DSD, 2002a; DSD 2001a)

4.4.4 Shortcomings of the Swedish Packaging Waste Management Approach

Collection System

Collection in Sweden is conducted primarily through drop-off sites. Collection points have not been properly maintained. Complaints include rodent infestation, overflowing bins, and litter in and around sites (G. Fredrickson, October 16, 2002; L. Jacobsson, October 16, 2002). Two reasons have been cited for these problems. First, the regulation concentrates too much on targets and fails to establish acceptable service delivery standards (G. Fredrickson, October 16, 2002). Second, the public has not fully accepted or understood the separate collection system for packaging. The roles and responsibilities of key players are not clear to the general population

who often complain to municipalities about poor collection site conditions, rather than FPI. The public also has difficulty distinguishing products that are eligible for collection and those which were not (G. Fredrickson, October 16, 2002; L. Jacobsson, October 16, 2002; W. Wiquist, November 6, 2002).

Municipalities Dissatisfaction

Municipalities, for numerous reasons, were dissatisfied with the packaging collection system established by producers. First, recycling was viewed as a natural component of the waste management system. Prior to the introduction of EPR, Swedish municipalities were actively involved in the recycling of paper and glass. Second, the packaging regulation cut municipalities collection services significantly, resulting in job losses and increased user fees. Third, one municipal representative stated the success of the packaging recycling system was the result of subsidizations provided by local governments. In many regions, municipal governments, despite a lack of compensation, continued to play a role in operating and maintaining collection programs, including communicating the system to the public, acting as a liaison between residents and the compliance system, maintaining collection sites and ensuring collected materials were pre-sorted (W. Wiquist, November 6, 2002).

While, local governments acknowledged the material companies are more adept at organizing the recycling of waste packaging, they believe they are better able to handle the collection procedures. In order to rectify the situation, local governments in Sweden joined together to lobby the federal government to regain the responsibility for the collection of waste materials. A bill to this effect was voted on and accepted by the Parliament in October of 2003 (L, Jacobsson, December 8, 2003). While the fundamental principles of EPR were not altered, municipalities will now be more involved in the planning process and the collection system, and assume responsibility for communicating with the public on all matters related to recycling and waste

management. In addition the new bill requires the establishment and attainment of collection service goals (W. Wiqvist, December 17, 2003).

4.5 Key Components of the Regulatory Approaches Reviewed

4.5.1 *Essential Elements*

System Commonalities

The three European nations that have had the greatest success with diverting plastic packaging from landfills have achieved these ends by placing full responsibility – physical, financial and informational – on producers. In Denmark, the federal government has retained full control over waste management, the United Kingdom has established a complex system of credits and shared responsibility, and the Netherlands has instituted a voluntary covenant between industry and government. None of these methods have proven as effective at reaching recovery and recycling targets as full extended producer responsibility.

The packaging waste management systems of these three nations have a number of other commonalities which are linked to their success. Each system:

- requires producers to take-back packaging and ensure it is treated in an environmentally friendly sound manner;
- applies to sales, grouped and transportation packaging;
- sets high plastic packaging recovery targets (Table 4.7);
- allows for the formation of similarly styled industry-operated PROs;
- incorporates additional measures to encourage waste reduction and diversion (i.e. landfill bans and user-pay collection systems); and
- includes separate policies designed to increase the recovery and recycling of beverage containers.

Table 4.7: Plastic Recovery and Recycling Rates

European Union	
Recovery	50-65%
Recycling	25-45% (minimum 15% per material)
Germany	
Plastic packaging	60% recycled (60% of which must be mechanically recycled)
Austria Packaging	
Plastic packaging	40% recycled
Water Bottles	96% recycled
Non-alcoholic drink bottles	83% recycled
Sweden	
Plastic packaging	70% recovered (30% of which must be recycled)
PET beverage bottles	90% recycled

The fee structure established by the producer responsibility organizations in each of these three nations is also linked to their success in managing packaging waste. All three PROs base their levies on the actual cost to manage packaging waste and are charged on the basis of the weight, volume and material type. This levy system has led to reductions in packaging materials, increased recyclability of packaging, and the internalization of waste management costs.

Individual System Features

Secondary Packaging

Germany and Austria have had significant success with reducing the amount of secondary packaging on the marketplace by delegating retailers as the party responsible for collecting and treating this form of packaging. Retailers in turn have placed pressure on manufacturers to eliminate or reduce grouped packaging.

Mechanical Recycling

From both an ecological and economic standpoint, mechanically recycling plastic packaging has been found to be the ideal recycling option (J. Jansen, January 19, 2003). In recognition of this fact, the German government, in the 1998 version of the Packaging Ordinance, inserted a requirement that, of the 60-percent of plastic packaging that must be recovered, 60-percent must be mechanically recycled (i.e. 36-percent of all plastic packaging). The remaining 40-percent may be mechanically recycled, feedstock recycled or subject to energy-recovery processes. Thus, Germany's sole guarantor of plastic packaging from households, has been working diligently to increase the nation's mechanical recycling capabilities. In 1997, roughly 40-percent of plastic packages were recycled via mechanical means, while the remainder were subjected to feedstock processes. By 2001, 51-percent of plastic packaging was being mechanically recycled, and only 49-percent feedstock recycled (J. Jansen, October 30, 2002).

Austrian Beverage Container Recycling Rates

While Germany and Sweden have both required industry to establish a deposit-refund system for beverage containers, Austria has taken a different approach to managing this waste stream, developing high recovery rates for specific beverage containers (Table 4.4). The targets, while ensuring high recovery and recycling levels for beverage bottles, avoid a number of the negative aspects of deposit-refund programs identified by industry, such as costly infrastructure and complex administrative systems.

4.5.2 System Shortcomings to be Avoided

Declining Reuse System

Unfortunately, not one of the countries reviewed has been able to protect their reusable beverage container market. In the mid-1990s, the majority of the beverages available for sale in

Europe were packaged in reusable glass containers. Today, the dominant trend is to use one-way PET bottles rather than reusable plastic or glass containers. The beverage industry has cited changing consumer demands as the reason for declining reuse levels. The public wants products that are convenient - easy-to-handle, lightweight plastic containers meet this desire. While changing social configurations, such as the rise in the number of small families and single-person households, has led to a decline in the need for large beverage containers and an increase in the popularity of single-serve plastic bottles (Bredenbrocker, October 31, 2002).

All three countries reviewed have separate policies for the management of beverage packaging, none of which have been successful at reversing this trend. The German Packaging Ordinance included the unique 'deposit-refund system' clause specifically to safeguard the reusable beverage system. However, the threat of an industry-operated, deposit-refund program did not slow the growth of the PET market. Now Germany has a deposit-refund system for the management of beverage containers, but no means to encourage or compel producers to use reusable bottles. Thus the deposit-refund program simply serves to ensure a high collection rate for beverage containers, which was already being achieved through the DSD. Similarly, Sweden's Returpack has only a recycling target (90%), which they have not been able to achieve, and no reuse quotas. Austria has created high recovery rates for beverage containers, however, the regulation permits these targets to be achieved through reuse, recycling or energy recovery. Unfortunately, industry has consistently opted for the recycling and waste-to-energy alternatives, rather than reuse. The federal government is currently debating how to handle the rise in PET bottles and the decline in reusable containers.

A number of other European Union member nations have gone beyond the Packaging and Packaging Waste Directive's requirements and adopted methods to encourage reduction and reuse. For instance, the Netherlands, Belgium, Spain and Finland have placed restrictions on the quantity and/or weight of packaging and packaging waste produced annually. Belgium, the

Netherlands and Spain also require targeted businesses to submit prevention plans to national environmental agencies. Meanwhile, Denmark and Portugal have developed reuse targets for beverage containers.

The waste management hierarchy places the greatest emphasis on reduction and reuse because engagement in these activities has proven to yield the greatest environmental gains. Policy-makers must ensure that packaging stewardship regulations contain targets, and other regulatory tools, to encourage and promote reduction and reuse, in addition to recycling.

Ready Acceptance of Waste-to-Energy Recovery

Waste-to-energy recovery is a readily accepted practice throughout most of Europe. Since the early 1960s, Sweden has been incinerating waste to provide energy for municipal heat and electricity. This recovery method is supported by a federal government regulation which prohibits landfilling of combustible waste materials. Energy recovery is an especially popular practice for meeting plastic packaging recovery targets. The Swedish Packaging Ordinance stipulates producers must achieve a 70-percent recovery rate for plastic packaging, but only 30-percent of this goal must be met through recycling. In 2001, 16-percent of plastic packaging on the Swedish market was recycled, while 55-percent was processed via waste-to-energy processes (DSD, 2001a).

Austria has also accepted waste-to-energy recovery as an option for diverting waste from landfills. In 1998, 46-percent of the plastic packaging recovered in Austria was incinerated for energy recovery purposes (Jordan et al., 2001).

The original Packaging Ordinance did not recognize waste-to-energy as an acceptable method for treating packaging waste or meeting national targets. However, in 1998 the Ordinance was revised and such practices are now permitted. Despite the change in the regulation, Germany is not actively incinerating plastic packaging. DKR is still functioning under long-term contracts

signed prior to the 1998 regulatory amendment. Therefore, all the available quantities of plastic packaging collected by DSD is being forwarded to recycling partners who engage in mechanical or feedstock recycling. When these contracts come up for negotiations next year, DKR stated it is not certain what role energy recovery will play. The guarantor did report that their organization is in the process of investigating the possibility of recovering the residual matter remaining after sorting through waste-to-energy processes.

While significant advances have been made in incineration technology, allowing for the reduction of toxin emissions, energy recovery is still not an environmentally favourable option for reducing waste. This sentiment was best expressed by Dr. Paul Connett, an advocate of incineration alternatives, "those who have been preoccupied with making incineration safe have lavished their engineering ingenuity on the wrong question. Society's task is not to perfect the destruction of our waste, but to find ways to avoid making it" (1998, p. 2).

Recycling conserves more energy than incineration generates. The energy required to manufacture a product, in particular extracting and converting natural resources into raw materials, is far greater than that which can be gained through burning. Reuse and recycling activities reduce dependence on virgin materials, and avoid the energy consuming, pollution generating processing and manufacturing stages of a product's life-cycle. Incineration destroys a product, requiring another be made to replace it (Connett, 1998).

Many trade associations and members of industry embrace the concept of "Integrated Waste Management". This approach is based on the belief that there are 5Rs of waste management – reduce, reuse, recycle, recovery (waste-to-energy) and retain (landfill) (EPIC, 1999). While promoting the commonly accepted reduce, reuse and recycle, these groups also encourage incineration and landfilling to achieve a balance between economic and environmental concerns. This stance stresses that materials that cannot be easily recycled, can still be useful for the energy they store. Environmental advocates disagree with this position, highlighting the fact that due to

the enormous financial investment required to build and maintain energy-recovery facilities, communities with incinerators typically do not have the funds available to support good reduction, reuse and recycling programs. In addition, incinerators create a demand for waste. In order to be financially viable, investors must maximize the use of these plants, and, with a life span of 20 to 25 years, a great deal of waste is required, diverting materials from reuse and recycling (T. Lindhqvist, October 17, 2002; Connett, 1998).

Focus on end-of-life.

The packaging stewardship policies of Germany, Austria, and Sweden focus on the end-of-life treatment of packaging. While these programs have led to a reduction in the amount of packaging on the market, such changes were made in order to avoid additional fees, not because the regulation directly targeted packaging design, production or distribution processes. A new approach, *Integrated Product Policy (IPP)*, which is currently being investigated by the European Commission, is a broad concept that “seeks to reduce the life cycle environmental impacts of products from the mining of raw materials to production, distribution, used and waste management” (Commission of the European Communities, 2001b, p. 5). IPP involves encouraging *producers* to design greener products and *consumers* to purchase eco-friendly goods.

IPP encompasses a variety of instruments, used concurrently, to encourage the design of environmentally sound products, the implementation of cleaner production processes and the development of green procurement policies. These tools influence the management of products throughout the life cycle – during resource extraction, design, manufacturing, distribution, use, and final disposal. Instruments to achieve these ends include: economic tools, extended producer responsibility, eco-labels, environmental declarations, green procurement, dissemination of product information and green-design guidelines (Commission of the European Communities,

2001b). It will be imperative for nations considering revising their approach to product and waste management to follow the development of the concept of integrated product policy.

Flat Plastic Levies

Ease of recycling, quality of secondary materials, and availability of end-markets varies significantly between plastics types. Despite the fact that plastic is not a homogeneous packaging material category, under the systems reviewed, all plastic packaging is subject to the same levy. The result is, plastics for which sorting/recycling technology has been developed and sustainable markets have been established, such as PET and HDPE, are subsidizing the cost of managing other plastic packaging. If the point of legislation is to correct market failures, and discourage the use of materials that are difficult to recycle, or no viable market exists, then fees should accurately reflect the true cost of collecting and recycling such materials. While individual levies for each plastic type may cause significant administrative hassles, establishing two sets of levies, one for plastics that are being recovered and recycled with ease (lower levy), and another for difficult to treat plastics (higher levy), may reduce the use of these complex resins or spur development of recycling technology and capacity for them.

Small Plastic Packaging.

Austria and Germany both have gone far beyond the EU Packaging Directive's quotas, instituting ambitious plastic packaging recycling targets. While industry has successfully achieved these recycling rates, producers have complained the costs of collecting and sorting the breadth of plastic packaging, required to meet the quota, is prohibitive. Plastic packaging in Germany amounts to 11-percent of the packaging recycled annually by DSD, but equates to roughly half of PRO's yearly costs (Jordan et al., 2001).

Small plastic packaging, which is comprised of a variety of different plastic types and tends to be highly contaminated, makes up about 60-percent of the plastic packaging waste. This segment is very costly to separate and exceedingly difficult to recycle. One proposal, supported by many in industry and local government, is to focus solely on plastic packaging that is simple to collect and recycle, such as bottles and large pieces of wrap. Small plastic packaging would be collected with general municipal waste and subject to energy recovery processes. It is estimated that such a plan would save DSD an estimated 1 billion DM (\$7.8 million CAD³) annually (Jordan et al., 2001).

Government and environmental representatives do not agree this is the ideal option. From an economic standpoint, a considerable amount of private sector funds have gone into developing facilities and technology to sort and recycle plastics, investments that would be lost if there were a considerable reduction in the quantity of plastic packaging being collected. Furthermore, such a concept would be extremely difficult to communicate to the public and likely would set back previous environmental awareness efforts (Jordan et al., 2001). Finally, the greatest drawback of this proposal is that it goes against the basic premises and objectives of extended producer responsibility. Reducing the cost of processing difficult to recycle materials removes any incentive for producers to improve the design of their products, and may even encourage the use of these types of packages (T. Schmid, October 23, 2002).

Voluntary Approaches to Packaging Stewardship

4.6 Australia

Like many other nations, Australia has encountered a number of dynamic social and economic forces in recent years, which have compelled them to reconsider their policies and programs for managing waste. After much negotiation and deliberation, Australia settled upon a

voluntary approach to packaging stewardship¹². In 1999, two national policies were introduced to oversee the management of the environmental impact of packaging and packaging waste - the National Packaging Covenant and the National Environmental Protection Measure (NEPM) for Used Packaging. Under this system, any brand-owner choosing to participate in the National Packaging Covenant (voluntary agreement) is exempt from the NEPM for Used Packaging, a measure resembling European packaging ordinances, which requires producers to take back and treat their packaging in an ecologically-sound fashion.

4.6.1 *National Packaging Covenant*

The National Packaging Covenant is a voluntary government-industry agreement based on the principles of shared responsibility and product stewardship. Upon signing the Covenant, all participants agree to take responsibility for the ecological effects associated with the activities of their organization. The intent of this multi-party agreement is to:

- reduce the environmental impact of packaging throughout its lifecycle;
- encourage the closed-loop approach to production; and
- develop a financially stable and sustainable collection and recycling system.

Key features of the National Packaging Covenant, which distinguish it from many other packaging stewardship policies, are as follows:

- *Self-regulated.* Each of the signatories sets its own commitments and monitors its own progress.
- *Non-Prescriptive.* The agreement does not instruct signatories on how to fulfill their obligations. It allows each company to determine the best course of action dependent on its place in the packaging supply chain and the capabilities of the organization. The

¹² It should be noted that there are a variety of different arrangements for voluntary initiatives, ranging from industry-initiated to government-negotiated programs. Australia's voluntary agreement reflects the latter, a covenant devised in cooperation with government and industry.

Covenant establishes several areas of responsibility, deemed to be necessary for the management of packaging waste (design, production, distribution, disposal, research, market development, education, and labelling). Participants must address how they will fulfill their obligations in these areas; however, they are provided with great latitude in the approach they take to meet these responsibilities.

- *Collaborative Approach.* Signatories of the Covenant span the entire packaging supply chain (raw material suppliers, packaging manufacturers, packaging fillers, retailers and trade associations) and all levels of government (Commonwealth, State/Territorial and local). The Covenant Council encourages industry signatories to develop Action Plans in cooperation with others in the packaging supply chain or others within the same sector. Government signatories are also encouraged to cooperate to develop joint action plans. For example, several local governments within a region may submit a common waste management strategy.
- *Lifecycle Approach.* The Covenant encourages the participation of all companies involved in the supply chain – raw materials suppliers, packaging manufacturers, packaging fillers, distributors, retailers, institutions, restaurants - to ensure each is contributing to reducing the environmental impact of packaging. As a result the focus of the Covenant goes beyond just recycling, and promotes action be taken at all stages of design, production, distribution, use and disposal to reduce the environmental impact of packaging and packaging waste.

Action Plans

The Covenant is open to industry and trade associations, as well as local, state/territorial and federal governments. Organizations opting to join this agreement are responsible for developing an Action Plan which describes what measures will be taken by the signatory to minimize the

environmental impact of packaging and when these commitments will be fulfilled. Plans should include performance indicators and baseline data in order to measure the successes of each action undertaken.

The areas of obligation differ between industry and government signatories. Industry members are expected to develop a plan detailing how their organization will (when appropriate for their business):

- minimize the environmental impact of their package's design, production, distribution and disposal;
- conduct research into reducing the ecological effects of their packaging;
- engage in developing and enhancing markets for recycled materials; and
- disseminate information and properly label products in an effort to help the public make informed purchasing decisions.

They must also indicate how they will promote the Covenant, apply Covenant principles to their operations and make a financial contribution to community recycling programs. Local government signatories must address how they will: implement best practices for curbside recycling programs, adopt a user pay system based on volume or weight (if appropriate), and develop green purchasing policies. Action plans submitted by Commonwealth, State and Territory governments must describe how these organizations will: adopt NEPM for Used Packaging, participate in market development activities for secondary materials, engage in community education programs, support curbside recycling efforts and develop green procurement strategies (ANZECC, 1999; NEPC, 1999).

A number of safeguards have been put in place to ensure signatories do not neglect Covenant commitments, and to compel all participants to strive for continual improvement.

(a) *Public Documents*. Once registered and approved by the Covenant Council all Action Plans are made public. Thus, plans may be compared and critiqued by Covenant

members and interested parties (e.g. environmental groups, consumers, investors, etc.), placing pressure on signatories to make a true commitment to the goals of the Covenant.

(b) *Annual Reporting.* Signatories are responsible for reporting to the Covenant Council, on an annual basis, the progress they have made towards their Action Plan commitments.

These reports compare signatories' achievements to their plan objectives, set new performance targets and timelines, and identify any problems encountered when implementing Action Plan activities.

(c) *Compliance Audits.* All signatories must maintain accurate records of their actions taken under the Covenant. Audits of a participant's fulfillment of Covenant obligations and Action Plan commitments may be performed on a random basis, after a complaint by a third party or if the Council deems it necessary.

(d) *Action Plan Reviews.* On an annual basis the Covenant Council randomly selects a series of Action Plans for a detailed review. The purpose of such reviews is to assure the plan addresses all pertinent areas of the Covenant and ensure commitments are reasonable for the organization, considering its size, placement in the supply chain and capabilities.

Reviews may also be instigated by a third party complaint or if the Council believes a review is warranted.

A signatory will be given notice if the Council has determined the organization's compliance audit was unsatisfactory; the signatory has not taken reasonable measures to fulfill their Action Plan commitments; or the participant's plan is deemed insufficient after an Action Plan Review.

The signatory will be provided an opportunity to appeal the decision or to rectify the situation. If the member fails the appeal or chooses not to revise their approach, the organization's name will be removed from the Covenant and they will be subject to the National Environmental Protection Measure for Used Packaging (ANZECC, 1999; B. Butt, May 1, 2003).

4.6.2 National Environmental Protection Measure for Used Packaging

The National Environmental Protection Measure for Used Packaging has been termed the “complementary regulatory safety net” to the National Packaging Covenant (AIG, 2002). Any brand-owner choosing not to participate in the Covenant, or failing to meet the standards of this agreement, must comply with the obligations laid out in the NEPM for Used Packaging. Therefore, this measure ensures that producers who opt to become signatories of the Covenant are not at a disadvantage in the marketplace.

Under NEPM for Used Packaging brand-owners who are not Covenant members must:

- Establish a reliable system for recovering the used packaging from their products;
- Ensure collected packaging is processed and treated in an ecological sound manner (i.e. reused, recycled or energy recovered);
- Inform consumers as to how to properly return used packaging; and
- Report annually to their State/Territorial governments the amount of packaging they have placed on the market and how they have fulfilled the above obligations.

The purpose of the measure is threefold. First, this policy aspires to prevent ‘free-riders’, or those not wishing to obligate themselves to the commitments of the Covenant and yet benefiting from the efforts of Covenant members. By placing financial, physical and informational responsibility for used packaging on these non-Covenant companies, NEPM ensures that Covenant signatories are not at a competitive disadvantage (AIG, 2002). Second, due to the inflexibility and burdensome requirements of this regulation, companies are persuaded to join the Covenant. Third, the measure serves as an enforcement mechanism for the Covenant. If a company fails to meet its Covenant obligations it will be subject to the more onerous requirements of NEPM for Used Packaging.

The measure itself is not the regulation which establishes or enforces producer responsibilities. It only creates a framework for State/Territorial governments to follow when

developing legislation for their jurisdiction. Its purpose is to ensure that a uniform set of responsibilities for non-Covenant members exists throughout Australia.

4.6.3 Successes of the Australian Covenant/NEPM System

Voluntary Approach

Many industry Covenant members have cited the greatest achievement of the National Packaging Covenant is that it avoids the draconian nature of the European approach to packaging waste management. The Covenant was designed to give flexibility to signatories. It provides a framework which allows companies to reduce the environmental impact of their packaging without compromising their competitiveness, stifling their creativity or diminishing the safety of their products. The Covenant recognizes that not all participants will be able to contribute in the same manner. Its flexibility allows signatories to choose the most effective actions for their organization based on their place in the supply chain, their capacity and their product offering (PCA, nd; Williams, 2003; B. Butt, May 1, 2003).

Flexibility is also beneficial to governments and environmental groups. Under this approach industry does not have the option of inaction. If a company is unable to convert to a different packaging material or lightweight its products, there are many other options for improving the environmental performance of its packaging. For example, it may engage in research, develop educational programs, participate in the development of a new market for secondary materials, or contribute to curbside recycling.

Another benefit of the voluntary approach is the drive for continual improvement. Often under a legislative regime industry will only go as far as the law requires. The Covenant pushes companies to continually enhance their commitments and raise the standards for packaging design, production, distribution and disposal. Through annual reports, Action Plan Reviews, and

public access to Action Plans, companies are compelled to search for new ways to improve the ecological friendliness of packaging and packaging production.

Shared Responsibility and Product Stewardship

The National Packaging Covenant is based upon the principle that, if an organization benefits from the manufacturing of a product, that organization must play a role in minimizing the environmental impact of that product. To that end Covenant signatories range the entire packaging supply chain. The benefits of this approach include:

- *Supply Chain Collaboration.* The Covenant has encouraged different organizations within the supply chain to work together to improve environmental performance of packaging. For example, the extended polystyrene (EPS) produce box manufacturer joined together with EPS raw materials suppliers to develop an Action Plan. By working together they have been able to create a national recycling system for EPS in Australia. (PCA, nd; B. Butt, May 1, 2003)
- *Focus Broader than Recycling.* The Covenant takes into account the entire lifecycle of packaging. Creators of this policy believed emphasis on the end-of-life and take-back programs would have a limited impact on the overall effect of packaging on the environment. Thus unlike many other packaging regulations which tend to focus on the recycling, this agreement encourages action throughout the life spectrum (i.e. design, production, distribution, use, and disposal of the package) (B. Butt, May 1, 2003).
- *Senior Management Involvement.* There has been a cultural shift in many companies participating in the Covenant towards a greater recognition and acceptance of industry's responsibility for the environment. Ecological issues are now matters being discussed and planned for by senior managers and board of director members (PCA, nd).

- *Significant Participation.* As of July 2003, there were 639 members of the National Packaging Covenant - 600 companies, 17 industry associations, 8 senior governments and 14 local governments/waste boards (PCA, 2003).

4.6.4 Shortcomings of the Australian Covenant/NEPM System

Limited Scope

The Covenant is limited to Blue Box materials (consumer packaging and household paper waste), excluding all packaging used for commercial and transportation purposes. The European system goes beyond Blue Box Waste and places responsibility on producers to manage all forms of packaging.

Lack of Support

The National Packaging Covenant is not fully supported by industry or all local and state governments. Some companies expressed feeling intimidated into signing the agreement; while others stated, although they were signatories, they were not committed to the Covenant, rather they were simply 'going through the motions' (Williams, 2003). Many local governments are opposed to the agreement. By October 2000, over a year after the Covenant was implemented, only a third of local governments had registered. And to this date not one local government in New South Wales has signed the agreement¹³.

Although all but one State/Territorial government, the Northern Territory, has registered not all have shown true support for the Covenant. Some have been slow in implementing the complementary regulation to the Covenant – NEPM for Used Packaging. Furthermore, while all participating governments agreed not to adopt any additional measures regarding packaging and packaging waste, not all have abided by this commitment (Williams, 2003).

¹³ Sydney, Newcastle and Wollongong are the major cities located in NSW.

Weak Action Plans

Despite public access to plans and Action Plan Reviews, some Action Plans are weak and do not demonstrate an actual commitment on the part of the registering organization. According to a representative from the Covenant Council, this body recognizes that some plans are lacking. In the last six months the Council has raised its standards for Action Plans (Williams, 2003; B. Butt, May 1, 2003).

Performance Measures

One of the most significant problems with the National Packaging Covenant is there are no universal performance indicators to measure the progress of this scheme. The Covenant/NEPM system was implemented in the summer of 1999, and yet no steps have been taken to determine whether this approach to reducing the environmental impacts of packaging is effective and efficient.

4.6.5 Key Components of the Voluntary Approach Reviewed

Municipalities Role

Under the Australian stewardship model, responsibility for waste management remains in the hands of municipalities. The private sector has the aptitude and experience to run efficient and financially sustainable business enterprises, and thus is more capable of developing and operating a successful recycling system. Industry has the ability to conduct research and develop new technologies for reusing and recycling packaging waste, as well as the resources and expertise to expand the country's recycling capacity and end-markets.

In order for packaging stewardship to be successful producers must play a primary role in recycling packaging materials. When industry is compelled to assume direct responsibility, it is

in their best interest to improve their product development and manufacturing processes, as it eases their waste management burden.

Life Cycle Approach

The goal of EPR is to reduce environmental impact throughout the lifecycle. In order to make a true ecological difference it is imperative that all parties in the packaging chain reassess their products and operations in light of their ecological effect. Australia's approach to packaging and packaging waste engages a wider range of participants than the three European models examined. The National Packaging Covenant does not focus solely on brand-owners or importers, but encourages raw material suppliers, packaging manufacturers, distributors, retailers and trade associations to participate in reducing the negative effects of packaging on the environment. However, while all participants in the packaging chain should be held accountable for the impact their activities have on the environment, due to the range of companies involved and the breadth of packaging on the marketplace, it is necessary for one group to assume direct responsibility for waste diversion.

Flexible Approach

The National Packaging Covenant recognizes each company has unique capabilities and excels in different fields. The Covenant provides flexibility to producers to determine the ideal means for their company to reduce their ecological impact; such an approach permits organizations to use their expertise and creativity to develop new packaging solutions, while not placing the firm at a competitive disadvantage. Industry is appreciative of the flexible approach taken by the Australian government and hundreds of companies have become members of the National Packaging Covenant.

The ideologies and goals of industry differ significantly from that of government, and company's action and decisions often do not take the environment and the common good into consideration. Industry's primary objective is profit, and firms will design action plans to ensure this end is achieved. Allowing the private sector to determine what environmental actions it will or will not take could cause potential difficulties in achieving the goals of packaging stewardship. Companies will likely select activities which require the least financial, administrative and time obligations, such as public education and basic research. It is questionable how many firms would voluntarily revise their manufacturing operations, redesign their packaging or develop a new market for recyclables. Yet it is in fact these activities which are crucial to improving packaging and reducing waste.

Senior governments must assume a lead role in the development of an overall strategy and vision; define specific goals, objectives and targets; and clearly identify the roles and responsibilities of each stakeholder. Having industry design a significant portion of the packaging waste management system, without clear objectives and targets, will lead to a discontinuity and difficulties in ensuring the achievement of program goals.

Performance Measures

No steps have yet been taken to measure and evaluate the success of this program. Although some of the features of this approach are compelling, it is not known whether the goals of the Covenant or NEPM Regulation have been achieved. Performance indicators and regular evaluations allow packaging stewardship policymakers to enhance successful elements, correct problems and learn how to develop similar initiatives for other products or waste streams.

4.7 Direction for the Manitoba Packaging Stewardship Model

4.7.1 *Voluntary or Mandatory Approach?*

After reviewing the policy and program components, as well as the successes and shortcomings of the European regulatory approach and the Australian voluntary approach, it was determined that a regulatory-style of packaging stewardship would be most appropriate for Manitoba. The provincial government is responsible for safeguarding the environment. While corporations are increasingly engaging in voluntary environmental initiatives, very few do so in order to preserve or protect the environment. The motivation behind the expansion of their corporate responsibility includes improving their public image, reducing costs, avoiding government regulation or increasing their market share. Their reasons for implementing voluntary programs shape the goals and objectives, the merit of their environmental pledges and their commitment to fulfilling their promises. In order to assure packaging stewardship programs reflect the good of the public; achieve the goals they were established to accomplish; create a level playing field for all producers; and ensure transparency and public accountability, such initiatives must be regulated by senior governments.

Furthermore, there is no quantitative data available to show whether the approach taken in Australia has been effective at reducing the environmental impact of packaging. There is, however, ample evidence as to the success of the German, Austrian and Swedish approaches. All three have been able to significantly reduce the amount of packaging on the market, decrease the quantity of material used in packaging, and increase the amount of packaging recycled.

4.7.2 *Essential Elements*

The review of the regulatory systems of Germany, Austria and Sweden led to the identification of a number of essential elements required to ensure a successful stewardship model in Manitoba. The following key components were identified:

- Mandatory producer and retailer take-back obligations

- Broad definition of packaging (sales, grouped, and transportation packaging from all source)
- Quantitative targets:
 - Recovery and recycling targets
 - Beverage containers recycling targets
 - Plastic packaging mechanical recycling targets
- Allow for the formation of a producer responsibility organization
- Levy system based on actual costs and charged on the basis of weight, volume and material type
- Regulatory support mechanisms (e.g. landfill bans and user pay systems)
- Further research into managing plastic packaging (e.g. enhancing reuse systems, managing small plastic packaging, decreasing reliance on virgin resin, expanding end-markets)
- Restrictions on the use of waste-to-energy process to meet recovery targets

Despite a preference for the regulatory approach over the voluntary, there were positive elements of the Australian system. One of the greatest benefits of the National Packaging Covenant is its all-encompassing nature. All members of the packaging supply chain are encouraged to join, which ensures the focus of the program reaches beyond post-consumer waste management and promotes collaboration amongst supply chain members to create more extensive and effective action plans for reducing the environmental impact of packaging. While it would be very complicated to incorporate these elements into a regulatory framework, in addition to implementing packaging stewardship legislation, the Manitoba government could develop voluntary stewardship agreements with other members of the packaging supply chain not covered under the legislation (e.g. material suppliers, packaging manufacturers, distributors and retailers). Agreements with material suppliers and packaging manufacturers could help ensure raw materials

and production processes were environmentally sound. While, agreements with retailers could place pressure on suppliers to manufacture greener products, help encourage consumers to purchase eco-friendly packaging, and ensure consumers have access to ecologically sound goods. Such agreements would allow Manitoba to take advantage of some of the benefits of the voluntary approach, while still ensuring one group is responsible for properly managing packaging waste.

Chapter 5 – Canadian Packaging Waste Management Systems

The debate over the management of packaging waste is not new to Canadian policy-makers. In the late 1980s, motivated by rising municipal costs and public concern over the proliferation of post-consumer packaging waste, the provinces and federal government, through the Canadian Council of Ministers of the Environment (CCME), began to explore different options for reducing and diverting discarded packaging. Initial discussions included: minimum recycled content law, waste taxes, government and industry green procurement programs, packaging standardization, deposit-refund systems, toxic material bans, and uniform provincial recycling programs (Morawski, 1999).

However, the conclusion was a decision by the parties to develop a voluntary approach to packaging stewardship. The CCME established the National Packaging Task Force, a multi-stakeholder committee comprised of industry, government, consumers and environmental organizations. The group was asked to develop a voluntary initiative to reduce the total packaging waste in Canada by 50-percent by the year 2000. After consultations across the country, the task force produced the National Packaging Protocol (NaPP), which contained a set of policies intended to guide industry through the process of improving the environmental characteristics of their packaging and reducing packaging waste.

The protocol was adopted in 1990, and by 1996 the waste diversion target¹ of 50-percent had been met. The data showed these gains were achieved primarily through reductions to transportation packaging, but little progress had been made in terms of reducing post-consumer packaging. Shortly after the publication of the 1996 Milestone Report the task force was dissolved due to lack of funds and the early achievement of the protocol's sole goal.

Many questioned the accomplishments of the protocol. Its failure to reduce post-consumer packaging, one of the factors motivating the development of the initiative, frustrated many; as did

¹ This target could be achieved through reuse, recycling or incineration.

the protocol's weak environmental commitment. The early disbandment of the Task Force demonstrated that Canadian governments had little aspiration to move beyond the set target and push for further reductions and environmental improvements.

Since NaPP, the federal government has made no moves towards the development of a national packaging directive. Realizing packaging stewardship was now in their hands, the provinces began to develop their own policies and programs. This chapter reviews the waste management approaches of four Canadian provinces, each of which has developed a very different strategy for diverting packaging materials. The chapter begins with a review of the existing regulatory framework and recycling system of Manitoba, and proceeds with a thorough analysis of the waste management strategies and systems of Ontario, British Columbia and Nova Scotia. Each system is summarized, the successes and shortcomings of each approach are discussed, and the key components of interest for the Manitoba model are identified.

5.1 Manitoba

Manitoba was a Canadian pioneer in the field of packaging stewardship. It was the first province to implement legislation which placed responsibility on producers to support community recycling programs, and the first to introduce a multi-material system. However, environmental, economic and legislative developments over the last decade have led to the need to reassess Manitoba's approach to managing packaging waste. With revisions to the waste management system, this province has an opportunity to once again advance the principle of packaging stewardship and set an example for other Canadian provinces to emulate.

5.1.1 *Waste Reduction and Prevention Act*

The Waste Reduction and Prevention (WRAP) Act of Manitoba received assent in March of 1990. The purpose of the Act is to "reduce and prevent the production and disposal of waste in

the province consistent with the principles of sustainable development” (Legislative Assembly of Manitoba, 1990, p. 3). The Act sets up a regulatory framework to encourage the development and implementation of waste reduction and prevention programs, and the creation and execution of public education campaigns regarding the negative impact of waste generation. Programs established under this Act are funded by WRAP levies, which are fees paid by the stewards of designated products. The WRAP Act allows for the development of Industry Operated WRAP Funds. Non-profit organizations, operating independently of provincial authorities, are established to maintain these funds. These organizations are responsible for managing the collected levies to administer and pay for:

- the design and implementation of waste reduction and prevention programs;
- the creation and delivery of educational material;
- cost related to recycling designated materials;
- research and development initiatives; and
- marketing goods manufactured from recycling materials.

Currently there are three regulations under the WRAP Act, each of which establishes waste reduction and prevention programs for different designated waste materials – Multi-material Stewardship Regulation (39/95); Used Oil, Oil Filter and Containers Stewardship Regulation (86/97); and Tire Stewardship Regulation (33/95). A fourth regulation is currently under development for household hazardous waste.

The Pollution Prevention Branch of Manitoba Conservation is responsible for administering and enforcing the WRAP Act and the regulations under the Act. Violations of these policies are subject to penalties, which may include a \$250,000 fine, imprisonment (one-year), and/or the forfeiture of profits resulting from the violation.

5.1.2 Multi-Material Stewardship (Interim Measures) Regulation (39/95)

The Multi-Material Stewardship Regulation establishes the Manitoba Product Stewardship Corporation (MPSC). This organization is responsible for administering the Multi-Material WRAP Fund, instituting waste reduction and prevention programs for designated waste, and providing effective and efficient waste management programs for selected materials. MPSC is run by a board of directors made up of representatives from industry, municipalities and non-government organizations. The Regulation delegates to MPSC the authority to establish WRAP programs for the following designated materials:

- beverage containers
- packaging of pre-packaged goods
- in-store packaging
- advertising materials
- telephone books
- newspapers
- magazines

The corporation funds its various programs through a 2-cent WRAP levy collected from stewards of beverage containers sold in the province. Stewards are defined in the Regulation as “the first person in Manitoba who in the course of business supplies beverages in containers to another person” (Legislative Assembly of Manitoba, 1995, p.4). To ensure WRAP levies are collected and remitted to MPSC, any person wanting to sell ready-to-serve beverages in Manitoba must apply for and receive a licence from the corporation. In 2001-2002, there were seventy-nine licenced beverage stewards in the province and MPSC collected approximately \$7.0 million in WRAP levies (MPSC, 2002a).

The Regulation permits MPSC to create by-laws necessary to deliver programs and requires the organization to establish a business plan outlining how it will accomplish the goals and objectives of the Regulation. The corporation’s business plan must be approved by the Minister of Conservation prior to implementation.

5.1.3 Manitoba Product Stewardship Corporation (MPSC)

The Manitoba Product Stewardship Corporation was founded in January 1995 for the purpose of “encourag[ing] the expansion of convenient and efficient recycling services across Manitoba” (MPSC, n.d., p.1). MPSC has been very successful in achieving this end. As of the 2001 year-end, 173 Manitoban communities had recycling programs, which equates to 92-percent of the provincial population. Currently, 56-percent of eligible materials are recovered through these residential programs (MPSC, 2003a) (Appendix H).

The majority of the funds collected from levies on beverage container sales are used to support residential recycling programs. MPSC’s funding formula involves establishing a per tonne recycling cost for municipalities, of which the corporation will pay 80-percent. Last year, MPSC provided \$5.8 million in direct financial support to participating municipalities (MPSC, 2002). In addition to their financial contributions, the corporation provides residential recycling programs with promotional and educational materials, helping local governments and recyclers to inform residents about their programs and to encourage their participation. MPSC also supplies technical support to municipal programs, including: offering direct assistance, conducting surveys, holding regional meetings and facilitating informational and training workshops.

5.1.4 Recycling Plastic Waste in Manitoba

A study conducted in 1999, *Waste Plastic in Manitoba: Key Factors in Sustainable Plastics Diversion*, estimated Manitoba generated an average of 69,100 tonnes of plastic waste annually (Table 5.1).

Table 5.1: Plastic Waste Generated Annually in Manitoba

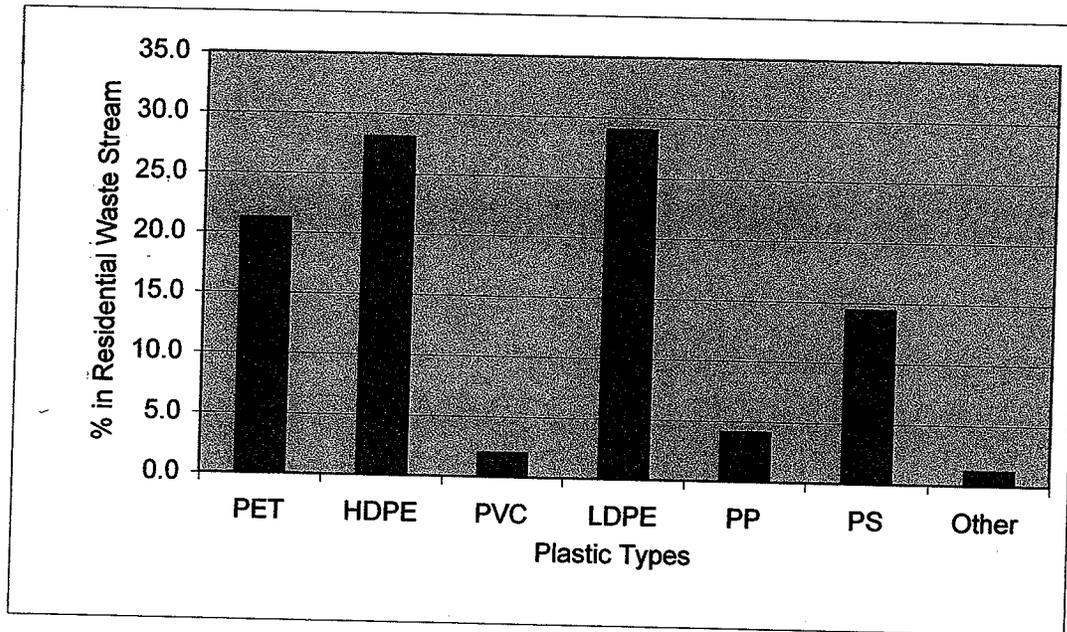
Source	Tonnes Generated Annually†	Percentage of Total Plastic Waste
Residential	22,100	32%
Industrial, Commercial and Institutional	36,000	52%
Auto Shredder	11,000	16%
Total Plastic Waste	69,100	

† These figures include both durable and non-durable plastic waste.

Manitoba Product Stewardship Corporation focuses primarily on waste generated by the residential sector. A recent MPSC report, *New Guide to Plastic Recycling in Manitoba*, stated that plastic packaging comprises 5.9-percent of the residential waste stream. Figure 5.1 displays the breakdown of plastic packaging waste generated by Manitoba households (MPSC, 2003b).

Since the inception of the programs, PET (#1) and HDPE (#2) have been eligible for MPSC funding. Both of these materials are relatively simple for residents to identify, easy to sort and have a well-established, stable end-market. During the 2001-2002 year, 44-percent of PET and 25-percent of HDPE packaging waste in the province was recycled (MPSC, 2003a). After a year long test study, the corporation's board of directors voted in favour of expanded funding to also include LDPE (#4) plastic containers and lids, PP (#5) plastic containers, and 'Other' (#7) plastic containers. As of November 1, 2002, municipalities choosing to include these items in their program can apply for financial support for collection and recycling. However, not all local governments have yet opted to include these containers in their recycling schemes, including several of Manitoba's larger urban centers. Winnipeg and Thompson have not incorporated these newly funded plastics in their program, and Brandon's recycling system accepts PP (#5), but does not collect LDPE or 'Other' plastic packaging.

Figure 5.1: Types of Plastic Packaging in the Manitoba Residential Waste Stream



Due to the relatively small quantity of plastic waste generated in the province and the limited number of plastic manufacturers in Manitoba, very little post-consumer plastic waste is being recycled within our borders. The majority of PET and HDPE collected from households is shipped to the United States to be recycled into new products, including textiles and piping. The majority of the newly funded #4, #5 and #7 plastics are being recycled by a Manitoba-based company manufacturing curb-stops and posts.

Recycling of industrial commercial and institutional (IC&I) waste is the responsibility of the organizations generating the material. The figures available on the amounts of IC&I waste being collected and treated in Manitoba are limited. However, one study estimated that recycling levels for this sector were as low as 500 tonnes annually, which equates to approximately 1.3-percent of the plastic waste produced by these businesses and institutes (Earthbound Environmental Inc., 1999).

5.1.5 Strengths of the Manitoba Multi-Material Stewardship Approach

Increased Community Awareness and Participation in Recycling

Since the implementation of the Multi-Material Stewardship Regulation and the launch of MPSC, the amount of materials collected and recycled in this province has increased threefold – from only 15,600 tonnes in 1995/96 to nearly 44,000 tonnes in 2001/02 (MPSC, 2002a). Over 90-percent of Manitoba's population now has access to recycling, and rural and urban recycling is on the rise. In the last year, rural recovery is up 10-percent, while recycling in Northern Manitoba increased 144-percent. Manitobans now recycle 56-percent of materials eligible for MPSC funding (MPSC, 2003a).

Dedicated Fund

Levies collected on beverage containers are placed into a dedicated fund used to support promotion, education and recycling. Under many other programs, money collected for recycling initiatives is placed into government's general revenue. In such situations, funds are not always available for recycling programs when needed.

Financial Support for Municipal Programs

Without MPSC's funding, most Manitoba municipalities would not be able to run their current recycling programs. It would not be financially feasible to collect the breadth of materials currently possible, particularly those materials with little to no redemption value, such as glass, tetrapaks and most plastics.

5.1.6 Shortcomings of the Manitoba Multi-Material Stewardship Approach

Focus on Recycling

Despite an acceptance of the equality of reduction, reuse and recycling activities when striving for sustainable development, the primary focus of the Multi-Material Stewardship Regulation and MPSC has been recycling. The current levy system does not encourage reduction or reuse, the Regulation sets no clear objectives or targets for reduction and reuse, and the main focus of MPSC's activities is multi-material recycling.

WRAP Levy

Externality Cost Not Internalized. Although the Multi-Material Stewardship Regulation states the WRAP levy is a stewardship fee, the majority of Manitoba beverage stewards pass this charge onto consumers by adding the WRAP levy to the bills of the retailers they supply. The retailers, in turn, add the 2-cent levy to the customer's bill (Sinclair, 2000). A number of disadvantages arise from the fact that the levy is not being incorporated into the cost of the product, including:

- ***Consumers view the levy as a tax-grab.*** Consumers do not see the levy as a responsibility industry has avoided, but as another government tax. Because producers have not incorporated the 2-cent fee into the price of their product, the public has misconstrued the nature of the levy.
- ***The correct signal is not being sent to producers.*** If the cost of the levy is not being borne by the producer, there is no financial incentive for behaviour change (e.g. improve the design and reconsider the composition of their packages to reduce their environmental impact) (Sinclair, 2000).

No Financial Incentive for Producers to Alter Packaging Design. In order for EPR programs to be effective, there must be an incentive for producers who support and work to achieve the goals

of the program. When a single levy is charged on all packaging, regardless of the design, material type or recyclability, there is no financial incentive for producers to change their practices (OECD, 2001). The three European models examined based their packaging levies on mass, volume and material type. The Duale System Deutschland's fee structure has led to significant changes in packaging in Germany – changes which respect the hierarchy of elimination, reduction, reuse and recycle (Sinclair, 2000; Fishbein, 1998). “Due to differences in licence fees for different materials and the fees themselves, changes in the packaging market can be seen. Packaging [has] become lighter and smaller...Useless packaging [has] disappeared” (OECD, 2001, p. 156). Fees related to volume, weight and composition provide an incentive for producers to improve the design, reconsider the materials used in their packaging and explore means to increase the recyclability. Such initiatives also motivate producers to create refillable packaging in order to reduce or eliminate their waste management costs.

Incorrect Price Signal. The correct signal is not being sent to consumers to purchase products with green packaging when an environmental levy is uniformly applied to all beverage containers regardless of their potential impact on the ecosystem. If the cost were internalized and based on the mass and composition of the package, consumers would see a price difference for products which contained more material or were difficult to recycle, providing an incentive to choose more benign containers.

Not a True EPR Program. WRAP levies are considered an advanced disposal fee (ADF), which are charges on products paid at the point of sale to cover the costs of collection and treatment (OECD, 2001). According to the Organisation for Economic Co-Operation and Development (OECD), an ADF applied without conditions for producer involvement in the physical management of the waste, as is the case with WRAP levies, does not constitute an EPR program

(2001). An extended producer responsibility program requires producers to take full or partial responsibility for the physical and/or financial management of the waste generated by their products. In the case of the Multi-Material Stewardship program, consumers are typically responsible for paying for the cost of waste management, and the municipalities are responsible for the physical management of the waste. The producers are not taking responsibility for any component of managing their products at the post-consumer stage of the lifecycle.

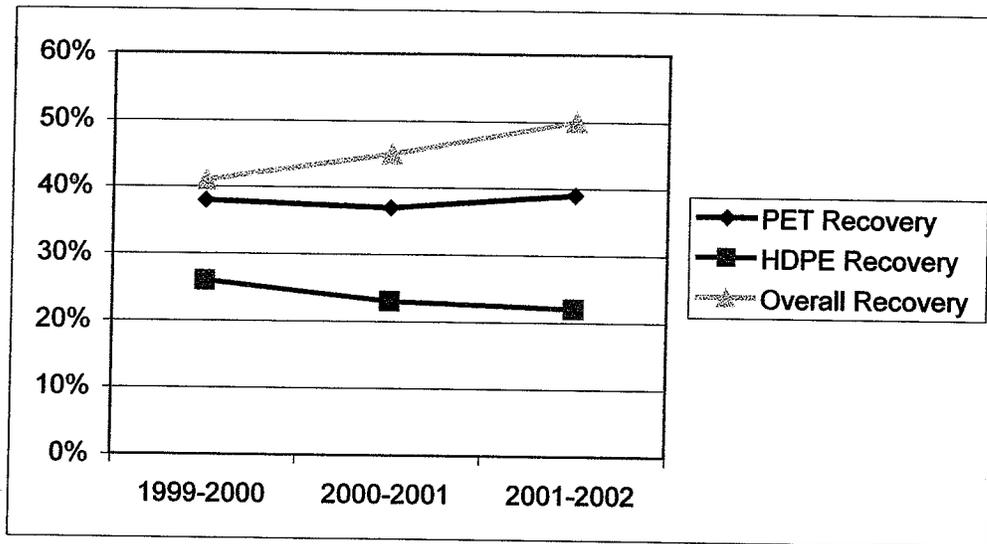
Beverage Containers. WRAP levies are paid on one product group (beverage containers) and yet are used to fund the collection, sorting and treatment of a variety of unrelated products. The current levy system places an unfair burden on stewards and consumers of ready-to-serve beverages to pay for the recycling of all the materials designated under the Regulation. A levy applied only to beverages provides no incentives to producers of other designated materials to redesign or change the composition of their goods, since their products are not subject to this environmental charge.

The majority of Canadian provinces continue to fund a large portion of their recycling programs via beverage container levies (i.e. beverage container handling chargers, half-back deposits, or unredeemed deposits). Ontario is in the process of revising their recycling scheme and funding formula. Their new funding proposal, which places levies on all materials classified as potential Blue Box waste, is currently being considered by the provincial government. If approved, Ontario would be the first province in Canada to place individual levies on items eligible for residential recycling.

Plastic Recycling

Stagnant Recovery Rate. Although the overall recycling rate has been steadily rising since the introduction of the Multi-Material Stewardship Regulation, plastic recycling has not kept pace. Since 1999, plastic recycling in Manitoba has remained relatively stagnant (Figure 5.2).

Figure 5.2: Manitoba's Plastic Recovery Rates Versus the Overall Recovery Rate



(MPSC, 2002a, MPSC, 2001)

Stable End-Markets. Currently a single Manitoba firm is responsible for recycling the majority of LPDE, PP and 'Other' plastic containers collected in the province. The MPSC board expanded the number of plastic types eligible for funding based upon the success of this company. If this market were to collapse, it is not known what would be done with these recently approved plastics. It is important for MPSC to attempt to diversify the recycling options for these materials.

Differences Between Municipal Programs

Under the current regulatory approach, municipalities have the option of participating in the MPSC system. Each municipality is provided the flexibility to design its recycling program in a manner it deems fit for its community. This has resulted in significant differences between regions in the province. There are also differences in the level of commitment and enthusiasm of local governments for these initiatives. The 'dump and burn' mentality is deeply ingrained in some regions and as a result, recycling programs have been neglected or poorly managed.

Recycling must be treated as a business, and some Manitoban jurisdictions have not been able to make the transition to viewing waste as an economic opportunity.

High Collection and Processing Costs in Rural Manitoba

Collection costs in rural Manitoba are higher due to the small population and distances between collection points, processing facilities and recyclers. Processing costs in rural areas also tend to be higher. The majority of material processing facilities in rural communities are small, with only four plants processing more than a 1000 tonnes of material annually. Technologically advanced processing equipment is extremely expensive and must process high volumes of material to be considered cost-effective. Small communities have neither the money nor the supply of recyclable material to support such equipment and tend to rely heavily on manual labour. As a result, their processing costs tend to be higher than the urban centers in the province (Earthbound Environmental Inc., 1999).

Low Cost to Throw out Garbage

A large segment of Manitoba's population does not pay directly for garbage collection, nor is there a restriction placed on the number of bags collected weekly. The majority of municipalities in the province include the cost of waste collection, sorting and treatment in municipal taxes. As a result, there is little incentive for residents to engage in reduction, reuse and recycling activities, or to reconsider the products and packaging they purchase and use.

The cost of using landfills in Manitoba is extremely cheap, with tipping fees ranging from \$0 to \$40/tonne (Earthbound Environmental Inc., 1999). Although it is recognized that these fees may not reflect true costs, landfill operators in the province are not required to use full-cost accounting principles. Due to relatively low property costs and the abundance of available land in Manitoba, it is not expected these fees will increase in the near future. Unfortunately, low

landfill costs do not induce municipalities or private sector users to explore waste diversion alternatives (Earthbound Environmental Inc., 1999).

Industry Knowledge

Interviews conducted with food producers and packaging manufacturers showed they had a distinct lack of knowledge when it came to environmental issues related to packaging.

Unfortunately, the large majority of packaging fillers do not consider the environment when designing or selecting packaging for their products. In fact, most were unaware of their own packaging's ecological characteristics – i.e. whether it was recyclable, was composed of recycled-content, or contained any toxic materials (e.g. cadmium, mercury, lead, hexavalent chromium). Nor could they identify the environmental benefits or problems with the plastic packaging materials they used. In addition, the majority of food producers interviewed were not fully aware of how the program in Manitoba functioned or what materials were eligible for recycling in this province.

5.1.7 Summary

Despite the many benefits of packaging stewardship, and the government's recognition of EPR as a valuable policy tool for managing resources and waste, no Canadian province has yet implemented a full scale EPR program for packaging. Interviews with government and NGO representatives revealed the primary reason provinces have not moved forward with stewardship is the lack of drivers to spur on the development of these policies and programs. Under the current Manitoba regime, money is available to support recycling initiatives and a reasonable percentage of packaging is being collected and treated. The province has sufficient landfill capacity and landfill costs are low. Because the existing system is 'working', government, consumers and industry are relatively satisfied, and no group is pushing for change. However,

the benefits of instituting full-scale EPR extend beyond financing blue box programs and ensuring landfill space is preserved. These initiatives have been found to reduce the weight, volume and amount of packaging on the market, encourage the development of cleaner production processes, increase recovery and recycling rates, improve the markets for secondary materials, and provide new economic opportunities. It is hoped that increased awareness of the many benefits of extended producer responsibility will inspire the provincial government to move forth with packaging stewardship.

5.2 Ontario

In November 1999, in hopes of improving the sustainability of Ontario's municipal recycling programs, a voluntary, one-year agreement was signed between industry, municipalities, and the province creating the Waste Diversion Ontario (WDO). Its mandate was to increase diversion, support municipalities and improve the efficiency of the Blue Box program. In 2002, the Ontario government passed the Waste Diversion Act, which established the WDO as a permanent organization. Ontario stakeholders supporting this new approach believe the activities of the WDO will assure a fair waste diversion strategy, reduce the financial burden of local governments and help achieve the province's 50-percent waste reduction target (Government of Ontario, 2001).

5.2.1 Waste Diversion Act

The Waste Diversion Act establishes Waste Diversion Ontario as a permanent non-profit, non-government organization whose mandate is to establish, execute and finance waste diversion programs for designated wastes. A board of directors made up of participants from industry and municipal governments guide the activities of WDO. This association is responsible for:

- creating and managing waste diversion programs;

- monitoring the value and success of waste diversion programs;
- communicating and promoting waste diversion strategies to the public;
- ensuring programs do not unfairly impact the competitiveness of provincial businesses; and
- resolving disputes among stakeholders (i.e. municipalities, industry funding organizations, and stewards).

Each waste diversion program is designed to target a specific type of waste designated by government regulations (e.g. organic waste, oil, solvents, paint, tires and blue box materials). Waste diversion programs may include plans to: reduce, reuse and recycle designated wastes; conduct research into methods for increasing diversion; design and deliver public education strategies related to the designated waste; and create and market products from recycled waste materials.

To assist WDO in its duties, the board establishes and incorporates industry funding organizations (IFOs) to help create and deliver waste diversion programs. IFOs are delegated the authority to identify stewards for the designated waste and to set steward fees to be paid to the organization. Stewards are the groups with a commercial connection to the waste or to a product which generates waste. The fees collected are used for funding the waste diversion program and various costs related to the implementation of the Act. Stewards may be exempt from paying fees if they present an alternate plan to the WDO for waste diversion which is as effective, or more effective, than the current waste diversion program (Legislative Assembly of Ontario, 2001a; Government of Ontario, 2001).

5.2.2 Stewardship Ontario

Established in the fall of 2002, Stewardship Ontario was the first IFO to be incorporated by Waste Diversion Ontario. This organization has been delegated the task of developing and

implementing a waste diversion program for Ontario's Blue Box materials. On February 28, 2003, Stewardship Ontario submitted a plan to the provincial Ministry of the Environment, and is now awaiting ministerial approval prior to implementation.

5.2.3 Blue Box Program Plan (BBPP)

The Blue Box concept originated in Ontario in the mid-1980s. The program began as an industry-government (provincial and municipal) project, with each party contributing one third of the start-up costs. The program was very popular, and by the end of the 1990s, 94-percent of households in the province had access to blue bins. However, the intent was that once up and running, the system would be self-sufficient (Stewardship Ontario, 2003a). Unfortunately, the program has not been able to achieve this end and has required continual financial support.

While the province has recognized the value of extended producer responsibility, it also would like to retain as much of the original Blue Box Program as possible (personal communication, August 8, 2003). Thus, under the Ontario model, industry has been delegated with partial financial responsibility for the costs of managing packaging and paper waste, while municipalities have retained partial financial responsibility, physical responsibility and informational responsibility for blue box waste.

Ensuring the Ontario Blue Box Program is financially stable is the primary goal of the Blue Box Program Plan (BBPP). Stewardship Ontario has proposed achieving this end through improving recovery of blue box materials, enhancing the efficiency of municipal collection and recycling activities, and expanding market opportunities for secondary materials.

Stewardship Ontario's plan identifies stewards as brand owners, first importers or franchisors of goods which create blue box waste². Blue box materials encompass printed-paper and

² The plan exempts stewards with sales under \$2 million annually. The purpose of the exemption is to reduce the administrative burden on small companies, as well as Stewardship Ontario. It is estimated that 30,000 to 34,000 companies will be eligible for this exemption, which equates to between 2 and 5-percent of blue box materials produced in Ontario. Stewards with sales over \$2 million may also be exempt if their

consumer packaging waste generated by the residential sector. Packaging under this plan is defined as “all products made of paper, glass, metal, plastics, textiles or any combination thereof to be used for the containment, protection, handling, delivery and presentation of goods from raw materials to processed goods, from the producers to the use of consumers” (Stewardship Ontario, 2003b, p.1). In terms of plastic packaging, the plan goes beyond the plastic materials generally accepted in municipal recycling programs. All plastic packaging generated by households, including materials without a stable market, such as polyethylene films and bags, PVC containers, polystyrene trays, multi-layer and laminated packaging, are included in the plan. This does not mean that all these packages will be eligible for collection by municipal programs, it simply means that stewards of these products will have to pay a fee to Stewardship Ontario. Over time, this IFO plans to expand the products accepted from municipal collection and improve the end-markets for these waste materials.

According to the BBPP, stewards are responsible for providing 50-percent of municipal blue box waste management costs. This will be accomplished by brand-owners/importers paying annual levies to Stewardship Ontario. Fees are based on the weight and material type of packaging or printed material a steward places on the Ontario market for that year.

As detailed in the BBPP, Stewardship Ontario is responsible for undertaking the following activities:

Setting, Collecting and Distributing Stewardship Fees

After much data collection, calculations and consultations, Stewardship Ontario has developed a methodology for determining stewardship fees and a model for distributing funds to municipalities.

products generate less than 15 tonnes of blue box materials a year. The purpose of this second exemption is to avoid penalizing stewards which sell high-priced products but generate small quantities of packaging (e.g. jewellery, crystal).

The material levies for the first year of operation have been determined (Table 5.2). These fees were calculated on the basis of three factors:

- *Recovery Rate* (40-percent weighting). Higher recovery rates equate with higher costs. To ensure stewards of readily recovered materials were not penalized, Stewardship Ontario incorporated a comparison of these rates into their fee calculation.
- *Cost of Recycling Commodity* (40-percent weighting). Another key component of the fee calculation is the actual costs to collect and recycle each material (i.e. glass, paper, plastic, metal, plastics). Materials which are easy to recycle and for which a stable market exists tend to cost less to recycle. Selecting packaging materials which can be readily recycled is one way stewards can reduce their fees.
- *Equalization* (20-percent weighting). The final factor taken into consideration when calculating stewardship fees was equalization. Achieving overall recovery and diversion targets is the responsibility of all stewards, however not all materials are being recycled at the same rate. Stewardship Ontario determined there was a need to reassign some of the costs from material being recycled at higher rates to those with lower recycling rates. Some of the Blue Box materials have been included in Ontario recycling programs for many years and therefore account for much of the recycling costs. Items more recently incorporated into these programs, with lower recovery levels, do not require the same funds. It is believed this factor will provide financial incentives to companies to produce materials with lower recycling rates to promote recovery and recycling of their materials. Without equalization, materials with lower recovery rates would have lower costs, thereby encouraging lower recovery rates and companies to switch to materials which are not readily recycled.

Table 5.2: Stewardship Ontario First Year Packaging Levies

Material Type	Annual Levy (cents/kg)
Paper	4.728
Plastic	6.692
Steel	3.633
Aluminum	- 5.465
Glass – non-alcoholic contents (flint)	3.723
Glass – non-alcoholic contents (coloured)	4.016

In order to ensure stewards which have chosen not to operate their own collection and recycling program partake in BBPP, Stewardship Ontario will charge interest (3-percent) and penalties (10-percent) to any steward that is tardy or neglects to submit its annual fees by the required date.

Waste Diversion Targets

Stewardship Ontario is responsible for setting waste diversion targets to be achieved by municipalities. The overall recovery target established for 2003 is 45-percent. For 2004, the organization intends to review this target and set material specific targets.

Market Development

In accordance with the BBPP, Stewardship Ontario plans to develop markets for blue box materials through:

- *Promoting green procurement.* Stewardship Ontario is proposing the creation of a joint government-industry green procurement program. The organization intends to spend the coming year preparing a business plan for this endeavor.

- *Prepare an annual Mass Balance Report.* Such a report will detail the quantity of material available for recycling and identify markets within, and outside of, Ontario for blue box materials. The Mass Balance Report will assist Stewardship Ontario to identify areas needing further market development.
- *Developing material specific market development plans.* With the assistance of municipalities, Stewardship Ontario will identify materials which are lagging in terms of recovery and recycling levels, and develop unique plans to improve the quality and quantity of recyclate and help find or develop market opportunities for these materials.

Education and Awareness

Stewardship Ontario will use its funds and administrative capabilities to lend support to municipalities' promotional and public education activities concerning local Blue Box Programs. The organization will also assist stewards in coordinating their existing communication efforts related to waste diversion. As an IFO, Stewardship Ontario will also participate in all education and awareness campaigns launched by Waste Diversion Ontario.

Efficiency and Effectiveness Fund

Ten-percent of the fees collected from Blue Box stewards will be directed towards improving the efficiency and effectiveness of municipal recycling programs. The goal of the fund is to increase the amount of blue box material being diverted from landfills in the most economically sound manner. Municipalities may apply for financial assistance from the fund to partially support improving their local systems (e.g. research and development studies, new technologies, local market development initiatives). Stewardship Ontario will also use the funds to direct special projects.

5.2.4 Key Components of the Ontario System

Self-Compliance Option

The Waste Diversion Act provides Ontario brand-owners and importers with the option of fulfilling their legal obligations by joining Stewardship Ontario, or by developing its own diversion plan. If a producer chooses to develop its own self-compliance system, and the WDO board approves its system, the company is exempt from participating in the Stewardship Ontario program. Having an alternative to the IFO provides companies with an opportunity to be innovative and develop other approaches to managing its obligations which may be more efficient at targeting its particular product. Self-compliance also permits stewards who are opposed to the IFO system another option and prevents Stewardship Ontario from becoming a monopoly. If each province gave producers the option of developing their own approach, national and international companies may be encouraged to join together to create a uniform, nation-wide system for the management of packaging waste.

Targets

Targets are a fundamental feature in all successful EPR program. Measurable objectives are necessary to develop strategies, measure success, and improve performance. Stewardship Ontario has established an overall recovery rate of Blue Box materials by municipalities, and has intentions of setting material specific recovery targets. In the future, the organization may also consider setting recycling rates.

Waste Diversion Ontario

Waste Diversion Ontario acts as a coordinating body for all stewardship programs in Ontario. Each IFO establishes its own program dedicated to one designated material. These programs recognize the uniqueness of products and its special waste collection and diversion requirements.

Waste Diversion Ontario works with each IFO to help design its programs and serves as a strategic planner for stewardship and waste diversion in Ontario. It is valuable to have one agency that considers the 'big picture' and ensures all programs are working towards the same objectives.

However, many stakeholders have questioned the value of the WDO. The Waste Diversion Ontario's board of directors is made up of industry members representing the different products/waste streams designated by the Waste Diversion Act. These representatives have very different interests and concerns, and little interest in the issues faced by other sectors on the board (G. Zecchini, June 26, 2003).

Focus on Recycling

The declared intent of this legislation is to promote the reduction, reuse and recycling of municipal waste; however, it appears the current government is focusing more attention on the issue of recycling. When introducing the bill to the legislature, Elizabeth Witmer, then Minister of the Environment, stated "this legislation firmly establishes a partnership between industry and the municipalities and lays out the framework for a *recycling system* that will serve this province for years to come" [italics added] (Legislative Assembly of Ontario, 2001b). Unfortunately, according to Environment Canada "...previous evidence demonstrates that blue box programs do not have significant impacts on the elements of a product's life-cycle beyond the point of waste disposal." (Environment Canada, nd). Thus, although this Act has the potential to encourage producers to carefully consider materials and designs for their products, and incorporate the costs of refuse management into the final costs of their products, it appears the true intent of this of this Act is to compel industry to pay a share of municipalities' recycling costs. It is unlikely the Waste Diversion Act will address the fundamental problem with municipal waste in this country

which is the mismanagement of valuable resources. In order to attend to these issues, the government must respect the 3Rs hierarchy that emphasizes reduction and reuse before recycling.

Industry's Control

Ontario's Waste Diversion Act places significant control over waste management decisions in the hands of industry. The research has identified two main problems with this approach.

Divergent Goals. Stewardship Ontario is tasked with setting the recovery targets to be achieved by municipal governments and determining the materials to be collected by local Blue Box programs. While recovery targets are a positive attribute of the BBPP, should industry be setting performance standards for local governments? Under Ontario's new approach, municipal recycling operators are not only accountable to their municipal councils, but also to Stewardship Ontario. The public and private sector often have conflicting ideals and goals. Industry's aspiration is to make a profit, while government is responsible for safeguarding the public good. This is why under most packaging stewardship models senior government assumes responsibility for strategic planning and setting program goals, objectives and targets, while industry is obligated to determine the best way to achieve the established outcomes.

Economically Based. The Blue Box Program Plan is based on achieving economic objectives, not environmental. The program is designed to minimize costs and ensure a level playing field. The initiative fails to encourage cleaner production, design for the environment, or reduction and reuse activities. While economic factors play a fundamental role in packaging stewardship programs, stewardship involves producers taking responsibility for the *environmental impact* over the product's lifecycle.

Partial Financial Responsibility

The Blue Box Program Plan has delegated producers with partial financial responsibility for the treatment of their packaging. Municipalities will be provided assistance in managing the financial burden of waste management; however, the other benefits of full-scale EPR program will not be achieved. Producers' very limited role and responsibility in the management of waste will unlikely spur the advances in sorting/recycling technology, and the reductions in primary and secondary packaging achieved in Austria, Sweden and Germany.

Municipalities Maintaining Control Over Sorting and Recycling

In Ontario, municipalities have retained responsibility for collecting, sorting and recycling blue box materials. Having each municipality conduct their own sorting, recycling and promotional/educational activities is inefficient. Innovative processing and recycling technologies require significant capital investment, and high volumes, to be cost-effective, which most rural municipalities cannot support (Earthbound Environmental Inc., 1999). There are many benefits to having one organization assume responsibility for processing packaging waste, developing innovative end-uses for secondary materials and finding new markets for recycle. A single group handling these duties reduces the duplication of administrative and marketing activities, improves economies of scale, enhances bargaining position with recyclers (larger quantity of material), pools financial resources allowing for research and investment into processing/recycling technology, and concentrates the province's experts in the field of waste diversion and recycling.

5.3 British Columbia

Since the early 1990s, in recognition of the need to reduce environmental pollution and financial burden on local governments, British Columbia has been trying to incorporate elements

of extended producer responsibility into its waste management programs and policies. The 'first generation' of product stewardship initiatives – tires and lead-acid batteries – were government-led programs funded by eco-taxes paid by consumers, with minimal to no industry involvement. While these efforts were a step in the right direction, they did not fulfill the requirements of EPR. The 'second generation' of product stewardship programs – household hazardous waste and beverage containers – placed responsibility for developing and implementing initiatives on industry. These programs also placed greater emphasis on consumer education and awareness in the hope of altering negative consumption patterns and emphasizing green products and packaging. The aim of such initiatives is actually to reduce the amount of materials recovered, because as consumers make wiser purchasing decision, less waste will be generated (Environment Management Board, 2003).

The British Columbia government has recognized the value of industry-led product stewardship, and plans to expand this approach to resource conservation and waste management to other products and waste streams. To facilitate the further development and enhancement of EPR, the province has developed a business plan detailing their strategy for the future. It is this recently released document and the Beverage Container Stewardship Program, both of which address the management of plastic packaging, which will be reviewed for the purpose of advancing the *Manitoba Packaging Stewardship Model*.

5.3.1 Industry Product Stewardship Business Plan

In September 2002, the Ministry of Water, Land and Air Protection concluded a thorough evaluation of the concept of product stewardship and the role it will play in future policy development decisions in the area of waste management. The *British Columbia Industry Product Stewardship Business Plan 2002/2003 –2004/2005* discusses the direction product stewardship will take in the provinces over the next two years. The business plan seeks to create a framework

for EPR programs in British Columbia, and includes a vision, principles, roles, and policy model for extended producer responsibility.

Vision & Principles

The B.C. provincial government regards product stewardship as a concept in which “end-of-life products and packaging are managed under environmentally sound and effective waste management systems that are financed and operated by producers and users, rather than by general taxpayers” (p. 3).

In order to achieve this vision, the Ministry has identified what they deem to be the fundamental principles of a successful product stewardship strategy. These include:

- (1) Producers and user are responsible for waste management;
- (2) EPR policies must create a level playing field for producers and users;
- (3) Stewardship initiatives must be result-oriented rather than prescriptive; and
- (4) Program development and implementation must be transparent and producers must be accountable to government and consumers.

Roles & Responsibilities

The business plan clearly defines the key roles of each of the major stakeholder. Under this strategy, the provincial government is responsible for strategic planning, which involves defining outcomes, monitoring progress, enforcing the regulation, and approving industry plans for stewardship. Industry is obligated to: design, implement and monitor product stewardship programs; achieve the outcomes defined by the Province; compile program achievement reports for consumers and the province; and organize education/awareness campaigns targeted at consumers and others in the product chain. Municipal governments are expected to cooperate with industry, providing land and zoning for collection sites. Local governments may also choose

to bid for collection contracts. Finally, consumers are required to use products properly, provide funding for stewardship programs through product purchases, and return products and packaging after use.

British Columbia's plan to place full responsibility on producers and importers to manage their products at the end of their useful life is akin to Germany, Sweden and Austria's packaging stewardship regulations. Under this model, municipalities would no longer play a role in the collection and management of designated materials, unless they bid for and received a collection contract, in which case they would be paid for their services.

Results-Oriented Approach

Traditionally, waste management policies in B.C. have followed the command-and-control approach. However, these programs have proven ineffective at reducing the amount of waste and encouraging reuse and recycling. The Province recently commissioned a study of "Stewardship Options: A Review of Service Delivery Models". This study highly recommended the Ministry change its approach – implementing result-based policies rather than prescriptive regulations.

Results-based regulations focus on the achievement of defined outcomes, allowing industry to determine the best way to reach those targets. Implementing such policies will require the government, in cooperation with stakeholders, to set clear and measurable program objectives based on the waste management hierarchy and goals of the regulation. Industry will then be responsible for devising the ideal means to achieve these outcomes. Industry will also be obliged to monitor and report their accomplishments to the government and other concerned stakeholders. The government will then assess the results of industry activities and identify whether changes need to be made. The process is cyclical and emphasizes continual improvement. Results are carefully monitored and action is taken to either enhance successful initiatives or adjust for problems when objectives are not met.

Using this framework, British Columbia plans to re-evaluate and re-develop existing waste management programs in the province, such as programs for Beverage Containers, Scrap Tires, Used Oil, Used Post-consumer Paint and Lead Acid Batteries. The business plan also addresses the province's intentions to begin reviewing additional products and waste streams for potential stewardship programs, including plastics, packaging, electronics and end-of-life vehicles.

5.3.2 Beverage Container Stewardship Program

In 1970, British Columbia became the first North American jurisdiction to introduce a mandatory deposit-refund program. While a very successful initiative, the *1970 Litter Act* only applied to soft drink and beer containers, and by the 1990s municipal governments were overburdened by the costs of managing containers not included in the law. In the mid-1990s, local governments, in cooperation with several environmental groups and container depot operators, lobbied to have the deposit-refund system expanded to include wine, spirits, juice and water (Environment Management Branch, 2003; Lease, 2000).

In 1997, the British Columbia government replaced the Litter Act with the *Beverage Container Stewardship Program (BCSP) Regulation*. The new policy not only broadened the type of beverages covered, but also placed responsibility for managing the deposit-refund system in the hands of industry. Under the BCSP Regulation, brand-owners of ready-to-serve beverages (excluding milk, milk substitutes, infant formulas and meal replacements) were required to:

- Design and execute a plan for the establishment and management of a provincial deposit-refund system;
- Achieve and maintain an 85-percent minimum recovery rate by 2001;
- Ensure all beverage packaging placed on the provincial market is either refillable or recyclable; and

- Submit an annual report to the provincial government including recovery, refill and recycling rates, as well as related financial statements.

Rather than each individual brand-owner instituting its own system, members of the beverage industry joined and appointed three organizations with the responsibility of fulfilling their regulatory obligations. *Encorp Pacific (Canada)* is responsible for non-alcoholic beverage containers; *Liquor Distribution Branch* is responsible for wine, spirits, cider, coolers and non-refillable beer bottles; and *Brewer Distribution Ltd.* is responsible for refillable glass beer containers and alcohol filled aluminum cans (Lease, 2000; Partridge, 2003).

It is estimated the new BSCP Regulation encompasses 300 million more beverage containers than the former system, and recovers 50-percent more single serve soft drink containers (Lease, 2000). In 2001, the overall recovery rate for beverage containers in the province was 81-percent, with Encorp Pacific recovering 72-percent, Liquor Distribution Branch collecting 88-percent and Brewers Distributors Ltd receiving 93-percent (Partridge, 2003). As a result of this initiative, the province has diverted over 40 million pounds of material from landfills annually and has significantly decreased litter. The Beverage Container Stewardship Program has also led to the creation of new employment opportunities, with an estimated 360 fulltime jobs in container depots, and the development of local recycling facilities (Lease, 2000).

Encorp Pacific

The 2001 recovery rate for plastic beverage containers, both alcoholic and non-alcoholic, was 72-percent (Partridge, 2003). The majority of these bottles and jugs are managed by Encorp Pacific.

Encorp Pacific funds the collection and recycling of non-alcoholic beverage containers through (a) unredeemed deposits³, (b) recycling fees paid by the brand-owners⁴, and (c) revenues generated from the sale of recovered materials. Recycling fees are calculated on a material-by-material basis, and must cover the costs of handling fees paid to retailers and depots, container transportation, sorting, marketing and administration. The amount of unredeemed fees and revenue generated from the sale of that recovered material is also taken into account when setting recycling levies. The fees for plastic beverage containers are as follows:

Container Size	Deposit Value (\$)	Recycling Fees (\$)
Up to 500mL	0.05	0.01
500mL – 1L	0.05	0.02
Greater than 1L	0.20	0.05

5.3.3 Key Components of the British Columbian System

Industry Product Stewardship Business Plan

The framework British Columbia has created for product stewardship has great potential. The results-oriented approach promoted in the business plan is appealing. The provincial government, in their role as strategic planner, develops outcomes and performance measures which correspond to the goals of waste diversion and resource conservation, while industry is provided with the flexibility to determine how to achieve these outcomes in the most cost-effective manner. If responsibility is being given to industry in recognition of its expertise and

³ Using unredeemed deposits to generate revenue for beverage container collection and recycling follows the polluter-pays principle. Rather than the general taxpayer funding the management of beverage containers, the individuals who purchase bottles and do not return them, pay for the system.

⁴ The brand-owner is responsible for paying both the deposit and recycling fee to Encorp Pacific. These fees are passed by the brand-owner to the retailer, who in turn passes the costs onto the consumer. According to the regulation, the deposit fee must be shown separately on the customer's cash register receipt.

influence on the supply chain, then producers must be provided with the greatest latitude to develop innovative and effective means to meet government objectives.

The process B.C. used in the development of this strategy is well documented and could provide a good foundation for other provinces and nations to follow in re-evaluating and enhancing waste management and stewardship in this province. It will also be important to follow the progress made in British Columbia in the coming months to determine whether or not this policy approach will work in practice.

Beverage Container Stewardship Program

Under most deposit-refund systems responsibility, falls on the government and consumers to support the system, and the beverage industry has little to no involvement. However, under the BCSP Regulation, industry has been granted full responsibility for the program (i.e. physical, financial and informational responsibility). Although beverage producers/importers have transferred their physical and information obligations to one of the provincial stewardship organizations, these brand-owners are still responsible for paying a recycling fee for the end-of-life management of their products. Beverage container recycling fees are based on the actual cost to collect and recycle each commodity, unlike many other programs that are funded through taxes paid by the consumer or a portion of the deposit which is retained. The system has achieved high beverage container recovery rates (81-percent), although industry was not able to achieve the provincial target of 85-percent.

There are two shortcomings of the Beverage Container Stewardship Program. First, the mandatory deposit-refund system goes against the goal of results-based policies. The provincial government has set a recovery goal of 85-percent. Industry should be allowed to decide how best to achieve this target, rather than requiring the establishment of a deposit-refund program.

Second, setting a target for recovery rate for beverage containers is an advantageous feature of

this program; however, the regulation could be more effective if material specific targets for recovery, reuse and recycling targets were established and the repercussions for failing to achieve targets were harsher. The current ramifications for not meeting the 85-percent minimum recovery rate include, revising the stewardship plan, increasing the amount of the deposit, improving consumer education and increasing consumer convenience (e.g. increasing the number of depots, extending hours of depot operation). As previously mentioned, beverage container stewards in 2001 only achieved an 81-percent recovery rate. Financial repercussions for failing to meet targets may provide a greater incentive for industry to achieve these ends.

5.4 Nova Scotia

5.4.1 *Solid Waste-Resource Management Strategy*

In 1995, in an effort to alter the way waste was viewed and managed in Nova Scotia, the provincial government introduced the *Solid Waste-Resource Management Strategy*. The aim of the strategy was to confront many of the challenges surrounding waste management, including: “reducing the amount of waste we generate, identifying opportunities for the recovery of valuable resources, encouraging the development and commercialization of new technologies, and taking necessary action to secure a sustainable future...” (Nova Scotia Department of the Environment, 1995, p.2). To achieve this end, policy-makers based the province’s waste-management plan on three basic principles: (i) environmental protection, (ii) efficient use of resources, and (iii) enhancing economic opportunities.

Provincial legislators hoped to achieve four main goals through the implementation of this plan:

- Achieve a 50-percent waste diversion target by the year 2000
- Adopt stricter disposal procedures (i.e. landfill bans and new landfill standards)
- Improve regional cooperation for waste management and diversion

- Take advantage of economic opportunities arising from the use of waste materials (e.g. compost, recycled products, new technology, employment)

As a result of its new approach to waste management, the province of Nova Scotia has achieved its 50-percent waste diversion target. In addition, the province has reduced the number of municipal landfills by 55-percent and developed an efficient collection infrastructure for beverage containers, blue box materials, and organic matter. Nova Scotia's economy has benefited greatly from this initiative – one thousand new jobs have been created and new businesses have emerged (B. Friesen, July 28, 2003; N.S. Department of the Environment, 2001). In addition, pursuit of the strategy has led to an increased awareness of waste management and environmental issues. Nova Scotians are beginning to recognize that sustainable development is an important part of daily life and they can play a role in conserving the environment. The strategy has raised the public's environmental consciousness, paving the way for the introduction of other environmental initiatives, such as the elimination of household pesticides (B. Friesen, July 28, 2003).

The success of the Strategy and corresponding regulation, the *Solid Waste-Resource Management Regulation* (N.S. Reg. 24/2002), relied on the implementation of several key tools:

- *Landfill bans.* Waste which is banned from Nova Scotia landfills includes: beverage containers, LDPE and HDPE packaging, corrugated cardboards, newspaper, glass food containers, tires, oil, lead-acid batteries, steel or tin cans, paint, antifreeze, and organic waste.
- *Deposit-Refund System.* Resource Recovery Fund Board operates a provincial half-back deposit refund program for alcoholic and non-alcoholic beverage containers (excluding milk beverages).
- *Landfill Improvements.* The Strategy seeks to reduce the number of active landfills in the provinces and raise the standards of operational landfills. New restrictions include: a ban

on open burning, higher standards for the design and management of MSW sites and stricter procedures for the operation of incinerators.

- *Industry Stewardship Agreements.* Industry's involvement in waste diversion and management has been deemed a key component to the success of reduction, reuse and recycling in Nova Scotia. The Strategy delegates responsibility to the Resource Recovery Fund Board for negotiating agreements with producers/importers with respect to the end-of-life management of their goods. Since the inception of the Board, agreements have been reached with producers and/or retailers of paint, tires, and sharps (needles). In addition, the Department of Environment has also signed an agreement with the dairy industry in which producers have consented to expanding their involvement in the management of milk containers.
- *Economic Development.* A major goal of the Strategy is to increase the recognition of waste as an economic resource. Creating jobs, producing value-added goods from recycled materials, and developing environmental technologies are integral parts of the Strategy.
- *Regional Cooperation.* To improve economies of scale and reduce waste management and diversion costs, the Strategy divides the province into seven regions. Municipalities in each region must work together to develop a Regional Solid Waste-Resource Management Plan, which addresses how the region will accomplish the provincial waste diversion target of 50-percent.

5.4.2 Resource Recovery Fund Board (RRFB)

The Solid Waste-Resource Management Regulation establishes the RRFB as an industry-run, non-profit organization responsible for overseeing a significant portion of the Strategy. The fund's revenues are generated from the operation of the deposit refund program, donations, and

agreements reached with industry. It is managed by a board of directors comprised of representatives from industry, municipalities and the provincial government.

The RRFB's mandate includes:

- financing municipal diversion programs,
- operating the beverage container deposit refund system,
- establishing and managing industry stewardship programs,
- establishing and promoting value-added products from recycled materials in the provinces, and
- developing and delivery educational and awareness campaigns on composting, reduction, reuse and recycling.

5.4.3 Packaging Waste Management Tools

While many of these tools may be useful for improving the overall management of waste, only a few relate directly to packaging and packaging waste – landfill bans, the half-back deposit refund program and Milk Processors Stewardship Agreement.

Landfill Bans

As a result of the landfill bans, municipalities and businesses were forced to improve their waste management processes. Today, nearly 100-percent of the population in Nova Scotia is provided curbside recycling, and 75-percent has access to curbside composting (N.S. Department of the Environment, 2001).

The success of these bans requires public awareness and support, diligent haulers and landfill operators, and municipalities committed to enforcing the regulation. Contamination and source separation continues to be a challenge, but education and refusal to collect improperly sorted waste have improved this situation. Another problem has been finding sustainable markets for

banned materials. Developing or locating a market for plastics bags has been exceptionally difficult (B. Friesen, July 28, 2003).

Half-back Deposit Refund System

Under the RRFB operated deposit-refund program, a 10-cent deposit is levied on all non-alcoholic beverage bottles⁵. Containers must be returned to an approved EnviroDepot for a refund. Consumers receive a full 10-cent refund for refillable containers and a 5-cent refund for non-reusable bottles. The portion not refunded to the consumer, and all unredeemed deposits, are used to fund the activities of the Resource Recovery Fund Board.

Unfortunately, providing a full-refund for reusables has not increased the use or consumption of these bottles. One provincial government representative believed this was due to the low value (only 5-cents extra) (B. Friesen, July 28, 2003). Poor promotion and communication may also be a contributing factor to low reusable levels. The Solid Waste-Resource Management Regulation was the only document found that stated consumers would receive a 100-percent refund for reusable bottles.

Although the system has not been able to improve reuse levels, it has had significant success with increasing recycling. Through the deposit-refund program, the province has been able to achieve and maintain an 80-percent return rate on beverage bottles, which equals approximately 140-million containers annually (N.S. Department of the Environment, 2001).

Nova Scotia Milk Packaging Stewardship Agreement

In 2000, primarily to avoid being included in the mandatory deposit-refund system, the Atlantic Dairy Council (Nova Scotia Milk Processors' Division) signed a packaging stewardship

⁵ A 20-cent deposit is paid on beer and liquor containers, and a 10-cent refund is provided when the containers are returned to an Enviro-Depot.

agreement with the Nova Scotia provincial government. As industry stewards, Nova Scotian milk producers committed to:

- Providing financial assistance to municipalities to manage milk packaging waste;
- Conducting research into optimizing packaging designs and recycling technology for milk containers;
- Considering the environment when making manufacturing and packaging decisions;
- Incorporating recycled materials into their production processes; and
- Supporting public relations efforts related to recycling and green packaging.

Under this agreement, municipalities retain control over the physical management of milk containers, while milk processors have accepted responsibility for the financial management of the collection, sorting and recycling of milk packaging waste in Nova Scotia. In order to gain a distribution license for milk in the province, a producer must participate in this stewardship contract, or agree to establish its own stewardship program approved by the Nova Scotia Department of Environment (DOE).

The Regional Chairmen's Committee, the organization representing Nova Scotia's seven waste management regions, must submit an annual report to the DOE and the Atlantic Dairy Council (ADC), detailing municipalities' costs and the number of milk containers recycled. The report is reviewed by the DOE and ADC. Once approved, the ADC transfers the fees collected from milk processors to the agent responsible for distributing the funds to the waste management regions.

Under this agreement, provincial milk processors have also consented to advertising waste diversion on the side panels of their containers. The advertising campaigns, which run at least two to three cycles per year, are developed jointly between the DOE and ADC.

While this program has been successful at increasing the involvement of producers and reducing the burden on municipalities, it has not been able to achieve the high recovery rates enjoyed by the deposit-refund system for all other beverage containers.

5.4.4 Key Components of the Nova Scotia System

Landfill Bans

Landfill bans are a key component in the success of Nova Scotia's waste diversion and prevention strategy. Landfill bans prevent secondary materials that have a stable market from being landfilled, provide a steady supply of recyclate for recycling facilities, help ensure hazardous materials are properly treated and promote the wise use of resources (i.e. reduction and reuse). A key benefit of landfills bans is that they target all waste generators – residential, institutional and commercial sectors. The provincial government does not have to create individual policies or programs for different sectors; these bans simultaneously compel both households and industry to participate in waste reduction and diversion activities.

The implementation of landfill bans requires significant commitment on the part of the province, municipalities, haulers and landfill operators. The development of any such bans not only requires the input of all stakeholders, to determine a feasible timetable and identify appropriate materials to ban, but also to ensure all parties are willing to support, promote and enforce the regulation.

Beverage Container Deposit Refund Program

Nova Scotia has had great success in achieving and maintaining a beverage container return rate of 80-percent or higher. While the half-back system is a good way to raise funds for environmental activities, this funding scheme does not send the correct signal to industry or consumers. Industry has no direct involvement in the financing or physical management of

beverage packaging. Consumers pay the “recycling levy” (half the deposit) and the RRFB collects containers and finds end-markets for materials. The levies being collected from consumers are being used to fund a variety of initiatives not related to beverage container reuse or recycling. The levy is a flat charge on all containers and does not reflect size, weight or material type. This does not properly account for the environmental impact associated with that package, does not inspire the beverage industry to reconsider the design of their containers, and does not encourage consumers to purchase eco-friendly products.

Milk Processors Stewardship Agreement

Nova Scotia was one of the first Canadian provinces to place full financial responsibility on an industry sector for the management of its packaging. While a momentous step towards the principles of extended producer responsibility, such a program could be enhanced by also placing physical responsibility for recycling materials in the hands of milk processors. Such action would likely encourage the design of easy-to-recycle packages and encourage the development of new, innovative uses for recycled materials.

The milk agreement has not had the success of the deposit-refund system in terms of high recovery rates. Instituting targets for recovery, reuse and recycling, as well as repercussions for failure to meet these quotas, likely would compel processors to take a more proactive role in encouraging consumer participation and locating end-markets for secondary commodities.

Local Plastic Processing Initiatives

NovaPET is a Nova Scotia based company, partly owned by RRFB, which flakes PET containers collected by municipalities in Nova Scotia, Newfoundland and New Brunswick. The flaked materials are sold to manufacturers throughout Canada and the United States for use in apparel and carpeting. The primary goal of the endeavor is to create jobs in the province.

However, flaking also reduces the volume of PET bottles and increases the amount of material that can be transported at one time, thereby reducing both transportation costs and environmental strain⁶.

Regional Cooperation

The adoption of Nova Scotia's approach to regional cooperation could benefit other provinces by enhancing economies of scale, cost control, and program efficiency. The development of waste management regions could also simplify strategic planning and ease enforcement of regulations.

Performance Measures

Nova Scotia has no targets or measures to chart its progress. The RRFB monitors recovery rates for beverage containers collected through the deposit refund system and records the percentage of waste diverted annually, but does not keep track of the recovery and recycling rates for blue box waste, tires, paint or organic matter. Not being able to compare Nova Scotia's waste management and diversion rates to other programs makes it difficult to ascertain whether its approach is in fact more successful.

The federal government or the CCME should consider setting national standards for measuring and reporting recovery, recycling and waste diversion. National reporting standards would allow the federal government to monitor the success of each province and permit the provinces to directly compare their approach to that of another jurisdiction.

⁶ Ten million pounds of plastic containers are required annually to support such a facility.

5.5 National Challenges

Despite the many differences in waste management programs between regions in Canada, there are several challenges which all provinces face when it comes to the stewardship of plastic packaging.

5.5.1 *Plastic Film*

According to a report by the Environment and Plastics Industry Council, an estimated 40 to 50-percent of plastic packaging waste is plastic film (i.e. bags and wrap). The report approximates that 40-percent of plastic film waste is 'recyclable', while the remaining 60-percent is 'unrecyclable' (EPIC, n.d.). The recyclable portion is comprised of clean polyethylene film from items such as grocery bags, dry-cleaning bags, bread bags, and wrap on products such as paper towel. While the non-recyclable fraction is made up of variety of resins (e.g. vinyl, polypropylene, multi-layer materials) and is highly contaminated as a result of being used for garbage bags, meat and poultry packaging and household wrap.

Unfortunately, little effort has been made in Canada to collect and recycle the clean portion of plastic film waste, or to implement measures to reduce the quantity of the unrecyclable segment⁷. However, many other countries have taken regulatory action to halt the proliferation of plastic bags including, eco-taxes, product design criteria, product bans, and minimum recycled content laws. Ireland has instituted a 0.15 EURO (0.23 CAD) eco-tax for plastic bags, and England and Australia are currently considering similar action. Bangladesh and a number of cities in India have placed outright bans on polyethylene shopping bags, while Taiwan and South Africa have recently introduced bans on the free distribution of plastic bags (Toensmeier, 2003).

⁷ One Western Canadian grocery retailer has voluntarily expanded their responsibility for plastic waste management, providing bins in each of their stores for customers to return plastic grocery bags, even those from other retailers. The bags are sold to a company in the United States who recycles them into 'plastic wood' products (personal communication, March 26, 2003). As this is a voluntary stewardship initiative, the successes and/or problems the program has experienced are not known.

South Africa has also implemented product design restrictions, requiring all plastic bags to be 30 microns or thicker ("South Africa bans plastic bags", 2003). Finally, in California garbage bag manufacturers are required to use 10-percent recycled content in their products (CIWMB, 2002). The plastics industry is adamantly opposed to such taxes and bans being placed on their products, and instead advocates enhancing public education, improving recycling and energy recovery processes, and furthering the development of biodegradable resins (Toensmeier, 2003).

5.5.2 IC&I Packaging Waste

More than half of plastic waste generated is from industrial, commercial and institutional sources (Earthbound Environmental Inc., 1999). European nations have acknowledged that primary and secondary packaging waste from all sources, and transportation packaging, needs to be addressed in legislation. No Canadian province has yet taken steps to play a significant role in the management of IC&I waste or to oblige industry to accept responsibility for this waste.

5.5.3 National Harmonization

Five years ago, Canada was embroiled in a debate as to whether or not to adopt stewardship principles. We have since moved beyond this question. Today, extended producer responsibility is well recognized as a valuable tool for improving the management of products/packaging and advancing lifecycle thinking (D. Bury, April 17, 2003; J. Ferguson, March 13, 2003).

The debate now surrounds the matter of national harmonization of EPR policies and programs. While it is necessary to accommodate regional differences, in order to achieve maximum economic efficiency and environment effectiveness, there needs to be a consistent approach to stewardship across the country. Canada's current stewardship initiatives consist of a "patchwork of vastly different programs and regulations that lack administrative consistency and create an un-level playing field between jurisdictions" (Morowski, 1999, p. 1). The longer the

issue of harmonization is delayed, the more pronounced the differences between programs will become and each provincial approach will become more ingrained. This will further complicate the development of a standardized approach to packaging stewardship.

5.6 Direction for the Manitoba Packaging Stewardship Model

Each of the three provincial approaches reviewed contains elements that may contribute to a successful packaging stewardship model in the province of Manitoba. Recovery targets, the option for developing a self-compliance system, and a packaging levy system based on actual costs and charged on the basis of packaging weight and material type, are features of the Ontario system which should be adopted in Manitoba. Each of the fundamental principles identified in the B.C. *Industry Product Stewardship Business Plan* are essential to the success of EPR in this province. These principles include: transferring waste management responsibilities to producers and users, securing a level playing field, embracing a result-based approach, and ensuring system transparency and accountability to both government and consumers. The Nova Scotia approach established the importance of an overall waste management strategy, regional cooperation, development of local plastic processing capacity, and landfill bans. The overall national challenges discussed above, point to the need for finding tools to improve the management of plastic films, the value of including IC&I packaging waste in stewardship plans, and the importance of provincial commitment to developing national harmonization.

Chapter 6 – Plastic Food Packaging Case Study

The goal of this project was to develop a model to encourage Manitoba producers to take greater responsibility for the environmental impact of their packaging. Studies on changing behaviour have determined that it is necessary to know and understand one's audience in order to instigate change. Necessary information includes: What do they want or need? What do they know? What are their perceptions? What barriers prevent them from making changes? (King County, 1996). Therefore, in order to motivate producers to reduce their environmental impact, we must understand their current activities and existing products, what changes they would be willing to make, and their impressions of the packaging stewardship concept.

While the focus of this project is exploring and enhancing stewardship of plastic packaging, the wide-range packaging end-uses and the substantial number of plastic packaging fillers and manufacturers makes it necessary to narrow the scope. This case study concentrated on plastic food packaging. Interviews were carried out with food producers, plastic food packaging manufacturers, and non-government organizations related to plastic food packaging. The purpose of the case study was to establish what factors influence a company's packaging design or selection decisions, identify the potential environmental impact of its packaging, and determine its opinions and concerns regarding the concept of packaging stewardship. Stakeholder input was essential to the development of the model for packaging stewardship in this province.

6.1 Part One: Manitoba Food Producers and Canadian Plastic Packaging Manufacturers

6.1.1 Case Study Participants

Manitoba Food Producers

The Manitoban food producers contacted for this project were selected from various trade association and government websites. Twenty companies were contacted. Ten of these organizations agreed to contribute to the project, seven did not respond to voice messages and e-

mails, and three declined an interview. The reasons for not participating in the study included: one producer relied heavily on suppliers to make packaging decisions on the company's behalf, and thus knew very little about their packaging; another company produced only private label products and stated their customers make all packaging decisions; and the last did not have enough time for an interview. Of the twenty contacted, four companies directed interview questions to their head-offices which were outside the province (i.e. packaging decisions were not being made in Manitoba). Unfortunately, only one company with a head-office in another part of the country consented to an interview.

Food producers participating in this study represented a large range of products and plastic types. Food products included: bread, poultry, baked goods, deli items, snack foods, beverages, cooking oil and condiments. Packaging included: HPDE and LDPE wrap and bags, PET re-sealable bags, polystyrene trays, PET bottles, multi-layer ovenable containers, and PVC, LDPE and HDPE containers and jars.

Canadian Plastic Packaging Manufacturers

Only a few plastic packaging manufacturers have head-offices or production facilities in Manitoba. Therefore, plastic packaging producers from across Canada were selected to participate in this project. Sixteen packaging manufacturers were contacted. Three agreed to participate in the study, seven did not respond to voice-messages or e-mails, and six declined an interview. One representative stated he was too cynical and did not wish to be interviewed, while another recommended contacting BFI. One company required a copy of the interview questions prior to consenting to an interview. After senior management reviewed the survey, the corporation's environmental liaison e-mailed that the firm was not willing to participate in the study, citing "the survey clearly reflects a preconceived negative attitude towards packaging and the results could be highly subjective" and "almost all of the questions could be taken in the

context of trying to gather ammunition to promote refillable containers over one way, larger size containers rather than smaller, banning colorants and heavy metals and justifying an ecotax or green dot fees" (personal communication, April 9, 2003).

The three firms agreeing to participate in the study manufactured a variety of packaging types, including meat trays, dairy containers, wrap (cheese, meat, frozen food) and stand-up pouches. The types of plastics employed in their products spanned from commonly used PET, PS, PVC, LDPE and HDPE to nylon and multi-layer materials containing moisture and oxygen barriers.

Case Study Findings

The survey questions, designed to explore industry's views on EPR and their commitment to environmental activities, were divided into three basic categories. The first group of questions posed to participating organizations were directly related to their packaging. The purpose was to gather basic information on the packaging their company produced or used, determine what factors influenced their packaging design or selection decisions, and assess the company's knowledge of the environmental characteristics and potential impact of their packages. The second set of questions sought to identify the actions companies had taken to improve the environmental friendliness of their packaging. These questions probed into the areas of reduction, reuse, and recycling. The final set of questions explored the company's views on extended producer responsibility, asking each to discuss their concerns about the concept and the roles producers and consumers should play in the management of packaging waste.

6.1.2 Packaging Design and Selection Criteria

Food Producers

The reasons food producers cited for choosing plastic materials for their packaging included¹:

- *Cost.* Plastic is cheaper than packaging products in glass.
- *Material Characteristics.* Plastic have unique characteristics, such as heat-sealability and high puncture resistance, which make them desirable for some packaging end-uses.
- *Product requirements.* In order to maintain freshness, some products require special barriers to provide protection against light, heat, and oxygen. Plastics can be engineered to meet these requirements.
- *Easy to transport.* Plastic is lightweight and shatter resistant making it simpler to ship than glass packaging.
- *Industry Standard.* The industry as a whole uses plastic for packaging. A company risks losing its competitive advantage if they choose packaging that goes against the industry norm.
- *Consumer Demand.* The consuming public demands their goods be packaged in plastic. One firm supplies their products to both the North American and European markets. In Europe their goods are packaged in glass containers, while in North American they use predominately plastic containers.

Two of the producers interviewed designed and produced their own packaging, two of the firms worked with suppliers to design their packaging, four companies purchased standardized products, and the remaining two purchased a combination of tailored and standardized items. The primary influences on design or packaging selection, included: costs, equipment requirements, function, visual appeal, consumer demand, industry standards, and food and health regulations. Only one out of the ten companies interviewed stated that recyclability of the package was a

¹ Please note these reasons are grouped by theme and not by individual responses.

consideration in its selection procedures, although a minimal one, following suitability for the product and cost. None of the food producers consulted had ever conducted a life-cycle analysis of their packages.

Packaging Manufacturers

All the packaging manufacturers interviewed worked directly with customers to design packaging to suit their unique needs. Their main considerations when designing packaging include cost, function, food safety and consumer demand. The environment was not a consideration for any of the packaging producers interviewed. One respondent believed that if consumer demand for eco-friendly packaging increased, or if producing green packaging provided a financial savings, then more manufacturers would reconsider their design and production processes.

6.1.3 Environmental Impact

Food Producers

Aside from the factors influencing packaging design, the majority of questions under the section entitled 'Environmental Impact', were not posed to the participating food producers. It was evident early in the interview process that many of these processors had given very little, if any, consideration to the environmental characteristics or ecological impact of their packaging. The only comments recorded for this section related to resource use and landfilling. Two producers stated they believed too much packaging waste was being sent to landfills. These respondents also agreed that the natural resources being used to make other types of packaging was excessive: however, the amount used to produce their own packaging was reasonable. Another manufacturer did not feel that too many resources were being used for packaging and did

not consider himself qualified to answer whether or not too much packaging waste was going into landfills.

Packaging Manufacturers

All three of the plastic manufacturers consulted had given consideration to the impact plastic packaging had on the environment. One larger, international firm had an active research and development department that sought to improve the environmental characteristics of its packaging, exploring issues such as recyclability and degradability. Another manufacturer was working with a university in the United States on environmental matters related to packaging, and was member of a plastic industry association involved in investigating ecological issues for plastics.

The third corporation had improved the production and distribution of their products, but had taken few steps to improve the end-of-life management of their packaging. Each of their plants had an environmental committee engaged in activities such as reducing solvent emissions, recycling production waste, and improving transportation packaging (e.g. durable, recyclable). The company's spokesperson also stated that food products, in general, were poorly packaged, especially in comparison to other products on the market, such as cosmetics. Food producers' and retailers' low margins require them to keep their costs as low as possible, and reducing packaging is one way to ensure expenditures are minimized.

6.1.4 Reduction, Reuse and Recycling

Food Producers

Reduction. Three of the participants stated they had taken steps to reduce the weight and volume of their packaging, and any further reductions would compromise packaging function. One of

these processors had recently assumed responsibility for blowing² their own containers, enabling them to use up to 5 grams less plastic resin than their supplier. Another company is in the process of conducting a multi-year review of all their packaging products in an effort to optimize reduction.

Two of the producers interviewed operated their own retail stores. Both stated that they had been able to achieve in-store packaging reductions. In their retail outlet, one producer sold goods in bulk and offered a discount to consumer who provided their own bags. The other placed quotas on the amount of packaging that could be used in each of their stores.

Another two interviewees, although aware that their products were lighter/thinner than similar packages on the market, stated they had not selected these materials for this reason. Finally, two other manufacturers shared that they had not taken steps to reduce the weight or volume of their packaging.

Reuse. Not one of the firms interviewed used refillable packaging for their consumer products. A few supplied restaurants and institutions, and for these customers, they used bulk-sized reusable containers. The reasons cited for not using reusable glass containers included:

- Glass is too costly,
- Glass is heavy and difficult to work with,
- Converting to a reusable system is cost prohibitive,
- Competitive issue (reusable containers not industry norm),
- Safety issues (shatter), and
- No consumer demand for reusable, glass packaging.

² Molten resin is injected into a closed mould. The resin, which has been forced into the shape of a tube, is subjected to compressed gases which blow the tube into the shape of the mould encasing it. This technique is ideal for forming hollow products, and is used by the packaging industry to create bottles (American Plastic Council, nd; Stevens, 2003).

One producer also stated that reusable plastic containers were very expensive, and the margins for most food products were too narrow to use costly packaging materials. A number felt that although their company was not refilling the packaging, their materials were designed in a manner in which consumers could reuse them. One interviewee expressed that perhaps their organization could do more to encourage consumers to reuse the company's packaging within their homes.

Recycling. Due to time constraints and lack of knowledge, many of the questions in the 'Recycling' category were not posed to all the study participants. Half of the producers consulted did not know if technology existed to sort and recycle their containers. One producer stated, although he knew their packaging could be recycled, he did not know if it was being recycled in Manitoba.

When asked if their packaging contained any recycled content, two admitted they did not know. Three stated their packaging did contain pre-consumer recycled materials. Two of these produced their own packaging and would use recycled production scrap in their products. Another explained that due to food and safety regulations their packaging contained only virgin materials.

Only two interviewees were asked if they could improve the recyclability of their packaging. One responded that their product could not be made more recyclable – their packaging was 'as good as it gets'. The other stated the company had optimized their packaging recyclability as much as possible, without compromising product quality.

Degradability. None of the food producers consulted used degradable plastic packaging.

Packaging Manufacturers

Reduction. All three producers had taken steps to reduce the weight and volume of their packaging. All three also provided assistance to their customers to ensure the proper size of packaging was selected for their end-use. One firm even offered technical support to customers to ensure filling equipment was correctly used.

Reuse. One of the companies consulted produced dishwasher safe containers. Their facility did not accept or reuse these materials, but a label did appear on the packaging to inform consumers the product could be washed safely and encouraged them to reuse these containers in their homes. The other two manufacturers produced only one-way packaging.

Recycling. All of the companies interviewed recycled waste created during the production process, either internally (i.e. pre-consumer recycled material) or through recyclers. Two manufacturers accepted returns of damaged or unacceptable packaging from their customers and assumed responsibility for recycling this material.

All the producers consulted stated the technology to sort and recycle their packaging existed. One firm, producing composite plastic packaging, said although their materials could not be mechanically recycled, they could be processed into plastic lumber products or treated by means of waste-to-energy procedures. Another shared that the technology existed to sort and recycle polystyrene, but it was very expensive.

When asked if their packaging could be made more recyclable one manufacturer reported their packaging was as recyclable as a product could be, while another felt their packages could not be made any more recyclable without compromising the package's functionality and the company's competitive edge.

Degradability. Two of the organizations interviewed were in the process of researching the development and use of degradable plastic packaging materials. Although exploring the area, one firm had concerns regarding the practicality of this form of packaging, considering that when landfilled, the material would not be exposed to the elements required to break it down. Furthermore, at this time, there is no consumer demand for such packaging.

6.1.5 Packaging Stewardship

Food Producers

Only one of the food producers interviewed, a company involved in supplying products to the European Union, understood the concept of packaging stewardship. Three others were aware of the concept, but did not fully understand it, while the remaining six had never heard the term. One respondent did not see the difference between extended producer responsibility and the current WRAP/MPSC system.

Once provided with brief explanation of packaging stewardship, interviewees were asked to share their impressions of the concept. Several of the producers believed certain actions would have to be taken prior to implementing such an initiative, such as instituting an education and awareness program, advancing recycling technologies, and developing markets for recyclables. Two others were eager to see a deposit-refund system for beverage containers. One producer, a beverage filler, stated that the administrative framework for such a program was already in place due to the WRAP levy collection system. Deposit-refund would increase the amount of bottles being collected and recycled in the provinces. Both respondents agreed that retailers should not be responsible for accepting returns, rather this duty should be placed on return depots.

Packaging Manufacturers

Two of the manufacturers interviewed had heard of packaging stewardship, but did not fully understand the concept, while the third was not familiar with the term.

6.1.6 Concerns About Packaging Stewardship

Food Producers

The food producers interviewed expressed the following concerns regarding the concept of EPR³:

- *Level Playing Field.* Responsibility must be placed equally on all packaging materials types (i.e. glass, plastic, paper, and metal), as well as both locally produced and imported products.
- *Cost.* Expanding producers' obligations for packaging would increase the cost of doing business.
- *Equipment Changes.* New restrictions on packaging may require investments into new equipment (e.g. machinery for washing and refilling containers or equipment alterations to account for less resin).
- *Joint Responsibility.* A number of interviewees agreed manufacturers did have a role to play in reducing the impact of packaging on the environment. However, they did not believe they should be forced to take on full responsibility for this task; rather, it should be shared amongst industry, government and consumers.
- *Centralized Authority.* One producer felt that for EPR to work, there would need to be one centralized authority to collect fees and organize packaging waste management.
- *Technology and Markets.* In order for EPR to be successful, the food producers interviewed stated that recycling technology and viable markets need to be developed first.

³ Please note these concerns are grouped by theme and not by individual responses.

- *Consistent Government Policy.* One producer was frustrated by the conflicting mandates of different government departments, stating that food and healthy safety standards often conflict with designing environmentally friendly packaging.

Packaging Manufacturers

The packaging manufacturers interviewed shared a number of the same concerns as the food producers. The assurance of a level playing field was a top priority. If the legislation is not applied uniformly, one material type may be given an unfair competitive advantage. If instituted, EPR policies must affect all packaged products and packaging materials equally, and encompass both locally produced and imported goods. All of the packaging manufacturers interviewed sold their products across the nation, and one stressed the need for a national program to ensure a consistent approach throughout the country. The same producer also expressed concern about the ability of Canadian firms' to compete on the international market if they are subject to legislative constraints not facing the companies they compete against.

Another packaging producer was uncertain as to the abilities of all local communities to process plastics, stating that often these materials had to be transported elsewhere for recycling, which called into question the costs effectiveness and environmental soundness of such activities. Finally, if a full EPR system was implemented in Manitoba, one of the manufacturers believed that some fillers would move their facilities out of the province.

6.1.7 Producer's Role

Food Producers

There was a wide variety of responses to the question of food producers' role in the management of packaging waste. Two interviewees felt that producers should assume more responsibility. One of these producers declared that companies should be conducting more

research and development into improving the environmental characteristics of packaging. The other affirmative respondent stated his corporation had already taken action to expand their role, and was involved in a voluntary take-back and recycling program for retail bags.

Another manufacturer responded that if it was economically viable (i.e. there was an economic incentive) producers might increase their involvement. Another two stated they did not know how they could increase their involvement. One of these respondents remarked that his industry was very responsible, his packages were recyclable, and he did not see what more his company could possibly do. While the other interviewee, representing a company which purchased standardized packaging, did not know what action their company could take. He felt they might be able to do more to encourage recycling, such as placing a sign on or near their packaging recommending the consumer recycle.

Two other producers believed that waste management should be a shared responsibility, another two were uncertain as to whose responsibility it should be, while the last stated emphatically that it was the responsibility of the government, not producers.

Packaging Manufacturers

There were a variety of responses for this question from packaging manufacturers as well. The first stated "no one in industry would willing want to increase their environmental burden"; however, most companies would be willing to adopt technology to produce environmentally friendly packaging if it became available and provided economic savings. The second packaging manufacturer consulted believed that manufacturers should be playing a greater role in waste management. Their company had already extended their obligations by engaging in research and development initiatives. Their R&D department was responsible for enhancing the characteristics of their products, including their environmental friendliness (e.g. developing biodegradable packaging materials and improving the recyclability of their packaging).

The third interviewee responded that their company would be willing to increase their involvement in education and awareness in order to improve the public's understanding of the importance of packaging, however they had no plans to change their packaging design. This manufacturer stated that the technology to manufacture green packaging exists and European manufacturers selling similar packaging are employing such techniques. However, consumers in this nation are not requesting eco-friendly packaging and the North American regulatory framework does not place any restrictions on packaging development. As long as consumers demand their current packaging, and the legislative system allows for its production and sale, their company will continue to provide their existing packaging.

6.1.8 Consumer's Role

Food Producers

There was a mixed response from food producers on the role of consumers in the management of packaging waste. A number of the interviewees viewed consumers and taxpayers as the same group and thus did not see a need to transfer responsibility from the taxpayer for packaging waste collection and treatment to the consumer of the products and generators of the waste. Two of those consulted stated that education and awareness programs were required to increase consumer participation in recycling, while another felt the only way to motivate consumers to recycle was to "hit them in the pocket book".

Packaging Manufacturers

All of the packaging manufacturers interviewed agreed that consumers should be playing a greater role in the management of packaging at the end of its useful life. Consumers dictate what manufacturers produce and sell, and therefore, must take responsibility for demanding friendlier products and packaging. If there were significant public demand for ecologically sound goods,

manufacturers would alter their packaging to accommodate this desire. One manufacturer believed that demand is directly related to awareness, and most consumers do not give much thought to the packaging surrounding the product they are purchasing.

Consumers also have a role to play in recycling packaging. One interviewee stated the only way to ensure consumer participation in recycling is to institute a user pay system. It was felt, once again, if you 'hit them in the pocket book', consumers were more apt to engage in recycling activities.

6.2 Part Two: Trade Associations and Non-government Organizations

6.2.1 Case Study Participants

Trade Associations

The trade associations contacted for this study represented food and beverage producers, plastic product manufacturers and packaging companies. Four key industry associations were approached to take part in this study. Three agreed to cooperate, while the fourth would not commit to an interview.

Non-government Organizations

Provincial and national non-government organizations representing the environment and the public (consumers and taxpayers) were asked to take part in this case study. Five NGOs were contacted, of which four consented to an interview, while the fifth did not respond to requests to discuss packaging stewardship. Only three of the interviews yielded useful information for the purpose of this case study.

Case Study Findings

Questions posed to trade associations and non-government organizations focused on three main areas related to packaging stewardship: the need for EPR regulations, concerns about stewardship and the roles of the key players (producers, consumers and government).

6.2.2 Need for Packaging Stewardship

Trade Associations

One association interviewed stated that voluntary approaches were preferred by producers, and their industry had already done a great deal to reduce, reuse and recycle packaging without government regulations. She believed that while it might be necessary to legislate targets, it should be left up to industry to determine how to achieve these quotas.

Another respondent did not believe that packaging production presented an eminent danger to our natural resources. He did agree however, that the distribution of food relied heavily on packaging and food processors were responsible for a significant portion of the flexible packaging on the market. The final interviewee, did not think packaging consumed too many resources, but rather conserved resources and reduced waste (i.e. reduced product spoilage). This latter association stated that a large percentage of food packaging would never be able to be reused or recycled. This is not viewed as a problem however, as their organization promotes the integrated approach to waste management, which supports waste-to-energy recovery for materials with a high calorific value. This group believes that more needs to be done to encourage this form of waste diversion.

Non-government Organizations

One environmental advocacy group stated there was an absolute need for EPR initiatives, and mandatory programs tend to be the most effective and efficient approaches to recovering waste.

The main problem with voluntary initiatives is that most companies did not understand the benefits of reducing waste, and therefore did not engage in stewardship activities. Another group believed allowing market forces to dictate waste recovery and recycling activities was not working, and there was a need for legislative framework. The final association consulted, saw the wisdom in having producers put more thought into the design of their packaging. While, this interviewee was not sure if too many resources were being used to manufacturer packaging, she was certain there were more prudent uses for our resources and packaging which used less material or could be reused was beneficial. This respondent also believed that there was a great deal of packaging going into landfills.

6.2.3 Packaging Stewardship

Trade Associations

Each of the trade associations had a different opinion of extended producer responsibility. One group stated they would support a system which targeted all packaging equally (i.e. level playing field). However, they were not sure if the EU model of packaging stewardship would be transferable to Canada. The costly nature of this approach, as well as our smaller population and larger geographical area, caused them to doubt whether the same system could be implemented here. This group also had concerns about the cost effectiveness and efficiencies of programs if industry was expected to contribute to systems operated by municipalities.

Another association believed that “product stewardship is a shared responsibility in which all stakeholders in the product chain have unique responsibilities”. This organization developed its own model of product stewardship, a voluntary approach that encompasses a range of players, from raw materials suppliers to consumers. According to this group, if a EU style of stewardship were be to introduced in Manitoba, the costs of goods would increase and the role of other players in the product chain, necessary for the functioning of their model of stewardship, would decrease.

The final industry group interviewed, felt the current system was working, and there was no need for change. They could not understand why flexible packaging was being targeted. This group's concerns about EPR focused primarily around the costs of the system. Food manufacturers in Western Canada have little bargaining power with retailers. The association believed if stewardship were introduced, food producers would be forced to bear the increased costs, because retailers would not permit the costs to be passed on to them. They stated that if such a policy were passed in Manitoba, subsidies might need to be provided to provincial food producers.

Non-Government Organizations

All three organizations interviewed supported the concept of packaging stewardship. Responsibility needs to be placed on both producers and consumers, as each have a vital role to play. One group favoured visible levies, stating such levies ensure consumers understand what they are paying for and increase accountability of waste management systems. Another organization was concerned about how the system would be implemented. According to this group, if stewardship is to be successful several elements are required, including enforcement mechanisms, consumer education campaigns, and stakeholder's participation. This group also believed EPR policies could not be successfully implemented on a provincial scale, and any packaging stewardship initiative must be a national effort.

6.2.4 Role of Key Players

Trade Association

Producer's Role. According to one participant, in order to remain competitive, manufacturers must: ensure products are not over-packaged, monitor internal production waste and take steps to prevent product spoilage. This respondent thought producers should assume a greater role in

packaging recycling, but the cost of waste management should be shared with others in the product chain. Another recommended that producers should participate in packaging waste management “when it makes sense”, and suggest they may want to consider forming partnerships with other stakeholders. The last respondent, representing the plastics industry, did not feel plastics manufacturers should be obligated to engage in waste management, stating that “plastic processors only make what the users of packaging ask for”.

Consumer’s Role. All three agreed consumers played an essential role in diverting packaging waste; however, they did not elaborate on the type of responsibilities.

Government’s Role. One believed government was responsible for setting economically feasible and reasonable targets, and ensuring a level playing field. This respondent also stated that municipal governments were obligated to provide an efficient collection system for packaging waste.

Another interviewee believed governments were responsible for developing policies related to the public good; however, the respondent did not wish to see the government assume primary responsibility for guiding EPR initiatives, but rather would see a multi-disciplinary task force of manufacturers, retailers and consumers. The final participant felt government was responsible for facilitating programs, assuring a level playing field, engaging in education, and reporting to the public the achievements of EPR efforts.

Non-Government Organization

Producer’s Role. The non-government organizations agreed producers should be assuming greater responsibility for packaging waste management. If a company sells a product it should be financially and legally obligated to ensure the product is properly managed at the end-of-life.

Compelling industry to finance waste management creates a commercial disadvantage to

companies over-packaging their goods and require many producers to alter the design of their packaging.

Consumer's Role. All participants were adamant that consumers had a crucial role to play in packaging stewardship initiatives. In addition to sorting and returning packaging waste for recycling, consumers have a number of other obligations. There needs to be a shift in financial responsibility from taxpayers to consumers. Consumers must also begin to demand friendlier products and packaging from manufacturers, and make well-informed, environmentally sound purchasing decisions.

Government's Role. According to one interviewee, the role of government is to safeguard the public interest, and resource exploitation and landfills are not in the best interest of the public. All three agreed the government must develop a legislative and regulatory framework for EPR. It is government's responsibility to push this concept forward, for it has been proven that only a few progressive companies will voluntarily assume responsibility for the environmental impact of their products. Government must also monitor the progress of stewardship initiatives and ensure these efforts are transparent and accountable. One respondent stressed the need for targets and incentives/disincentives to be encompassed in the legislation. Another believed that public education must also be a top priority for governments.

6.3 Interpretation

For the majority of industry representatives interviewed, this was their first encounter with the concept of packaging stewardship. Unfortunately, despite the letter sent to participants defining the term and the explanations provided during the interview, many never did fully comprehend the concept. This case study also found that environmental matters were not a consideration in manufacturers' packaging design or selection decisions. Most of the producers were not aware of the ecological characteristics of their packaging, or the potential impact they

may have on the environment. In fact, many of the respondents seemed to feel that packaging waste management was not their concern or within their control. They cited a number of factors that they felt were beyond their scope of influence, and that prevented them from greening their packaging, including:

- *Food health and safety regulations.* Food health and safety concerns often conflict with design for the environment and sound waste treatment. For example, the nature of some products, such as poultry, restricts the reuse or recycling of its packaging.
- *Consumer demand.* Industry simply provides what the consuming public demands. North American consumers are not requesting, nor are they willing to pay, the higher cost for green products and packaging.
- *Equipment requirements.* Equipment configuration often dictates the required thickness or weight of raw materials, making light-weighting packaging challenging and costly.
- *Available materials and products.* Food producers purchasing standardized products have little control over the type of packaging available to them.
- *Industry standards.* To drastically alter packaging design or composition, going against industry norms, would place a company at a competitive disadvantage. For example, it is an industry standard to sell water in plastic bottles. If a water bottler were to convert to a reusable PET or glass bottle system it would risk losing its market share.
- *Function top priority.* The function of the packaging takes precedent over other characteristics. Many food products require special packaging features to ensure their integrity; features which tend to inhibit reduction, reuse and recycling (e.g. light, moisture and oxygen barriers).
- *How?* A few producers were open to the concept of greening their operations and improving their product, but had no idea how to do so.

A few of the international companies interviewed stated they did feel producers had some responsibility for reducing the negative environmental impact of packaging. Activities they will be willing to engage in would be (i) research and development and (ii) education and awareness. Research and development would be a regular part of their existing business, while education and awareness not only could be used to ensure consumers were better informed, but also as a corporate marketing tool. While these are imperative activities to support stewardship initiatives, these activities in themselves, do not constitute EPR, which requires participation in the financial and physical management of waste.

6.4 Direction for the Manitoba Packaging Stewardship Model

The results of this case study show that Manitoba food producers have no plans to voluntarily expand their responsibility for packaging and packaging waste. Therefore, it must become the responsibility of the provincial government to push forth packaging stewardship, and develop legislation which establishes new roles and responsibilities for all players in the product chain. This case study also demonstrated the dire need for industry education regarding environmental issues related to packaging and packaging waste. If producers are expected to take action to improve the environmental integrity of their design, production, distribution and disposal processes, they must be fully aware of the importance and need for such change.

A common reason cited by food producers and manufacturers for not designing or selecting green packaging, was a lack of consumer demand. Further research is needed to determine how to motivate consumers to purchase and demand friendly packaging. Cost and lack of expertise were also mentioned as reasons for not engaging in design for the environment. If Manitoba proceeds with the development of packaging stewardship legislation, assistance to small and medium sized companies wishing to improve the environmental characteristics of their goods will be needed.

Many interviewees felt improving recycling technology and capacity, and developing stable markets for recyclable materials were prerequisites to a full-scale EPR program. Phasing in producers' stewardship responsibilities over a period of time and providing incentives for using recycled content, investing in recycling technology and establishing end-markets may help the province to meet these needs.

Chapter 7 – Packaging Stewardship Model for Manitoba

The purpose of this study was to develop a model to guide the implementation of packaging stewardship in the province of Manitoba. The data gathered through the literature review, the analysis of national and international packaging waste management approaches, and the case study interviews were blended together to develop a model for the stewardship of packaging. This chapter describes the development of this stewardship model, summarizes the feedback provided by participants of the *Options for Plastic Packaging Stewardship Workshop*, and presents the final version of the *Packaging Stewardship Model for Manitoba*. It is hoped the model will stimulate discussion and provide guidance to Manitoba policy makers, industry leaders, local governments and non-government organizations as they proceed with deliberations on the topic of extended producer responsibility and waste management in the province.

7.1 Development of the Packaging Stewardship Model for Manitoba

While the focus of this project was to investigate options for enhancing the stewardship of *plastic packaging*, the final product of this thesis is a model for overall packaging stewardship. In order to ensure a level playing field for all packaging manufactures and fillers, and to maximize the benefits of this initiative, it was determined that the stewardship framework should encompass all packaging materials and types, not just plastics.

7.1.1 Regulatory or Voluntary Approach

The first step in the development of this model was deciding whether to take a regulatory or a voluntary approach to packaging stewardship. It was determined that a regulatory model would be most appropriate. As discussed in Chapter 4, under voluntary initiatives producers are responsible for developing the vision of stewardship, defining their own roles and responsibilities, and measuring their own progress. Industry's goal is to make a profit, which does not always

coincide with safeguarding our natural resources. It is the government's responsibility to protect the public good. Regulation is necessary if government wants to ensure program goals and objectives are established to properly guide the use and disposal of resources, and efforts are taken to ensure these goals and objectives are achieved. While there were favourable aspects of the Australian National Covenant, there was no evidence that this approach has been effective at reducing the environmental impact of packaging and packaging waste. The regulatory approach was further supported by the data collected from interviews with industry stakeholders, which indicated that Canadian producers have no plans to voluntarily broaden their environmental responsibilities. If it is the desire of the province to improve the design, production and waste management procedures for packaging, the government must legally obligate producers to expand their role.

7.1.2 Key Participants

The next step in developing the model was determining the key players required for a packaging stewardship program. Literature and policy reviews helped to identify the provincial government, industry, municipal governments, a research/communications group, consumers, other provincial governments and the federal government as the primary organizations whose participation is needed to implement stewardship.

7.1.3 Essential Elements for Packaging Stewardship

The third step was to ascertain the key components necessary for a successful packaging stewardship regulation and supporting program. The review of packaging initiatives and interviews with key stakeholders established the essential elements. A packaging stewardship program should:

- Require brand owners and importers to take-back post-consumer packaging waste;
- Encompass sales, group and transportation packaging from households, businesses, and institutions;
- Provide producers with the option of forming a PRO or developing their own packaging waste management system;
- Adopt a levy system in which fees are based on actual costs and are charged according to packaging weight, volume and material type;
- Establish targets for packaging reduction, reuse and recycling;
- Encourage continual improvement;
- Be based upon a results-oriented approach;
- Incorporate voluntary initiatives;
- Create a level playing field for producers;
- Ensure the system is transparent and accountable to the public;
- Require the development of consumer, and industry, education and awareness initiatives;
- Promote research into and development of improved packaging design, cleaner production processes, and enhanced waste treatment technology;
- Facilitate the development of new products and markets for recycled materials;
- Encourage participants to develop green procurement policies;
- Promote regional cooperation to achieve waste prevention and diversion goals; and
- Include support mechanisms, such as landfill taxes, landfill bans and user-pay collection systems.

7.1.4 Stakeholder Feedback

A decade ago, governments followed a top-down approach to environmental management. Today, however, the benefits of stakeholder participation in resource policy development are well accepted. Involving those impacted by new regulation and programs in the development process increases support, improves relations among key players, stimulates novel solutions and helps establish a mutual understanding of the problem and a shared vision for a plan of action.

In recognition of the value of stakeholder input, a key component of this research project was seeking feedback from key stakeholders on the draft model for packaging stewardship in this province. The initial draft version was presented to industry, government and environmental community representatives at the *Options for Plastic Packaging Stewardship Workshop* held on June 26, 2003. Workshop participants were asked to share their comments, concerns and questions, in order to enhance and strengthen the model. Their feedback, as well as additional materials gathered after the development of this initial model, was used to create the final version of the packaging stewardship model.

7.2 Draft Packaging Stewardship Model

The development of the draft model involved carefully considering how each of the key players could contribute to the successful implementation of a regulatory stewardship program. In establishing the roles for each, the essential elements outlined above were addressed. The resulting draft packaging stewardship model that was provided to participants at the Options for Plastic Packaging Stewardship Workshop was as follows:

Packaging Stewardship Model for Manitoba

**Options for Plastic Packaging Stewardship Workshop
June 26, 2003**

Lisa Quinn, Natural Resource Institute – University of Manitoba

The following packaging stewardship model was developed based on research conducted as a part of a Natural Resource Institute Masters thesis. The framework is being presented at this workshop for the purposes of discussion and further refinement. The final model proposed in the thesis will provide a framework for the provincial government and other stakeholders to consider as they move forward with the development of product stewardship programs and policies in Manitoba/Canada.

The responsibilities and key components of the proposed Packaging Stewardship Model are as follows:

Provincial Waste Reduction and Prevention Strategy

- The strategy would set clear waste reduction and prevention goals and objectives linked to the Manitoba Sustainable Development Principles and Extended Producer Responsibility principles.
- The strategy would clearly define the roles and responsibilities of all key players.
- Continuous improvement would be an integral part of strategy. It would allow for lessons to be learned, improvements to be made, and targets to be adjusted.
- All stakeholders would be involved in the development process.
- Such a strategy would include all waste (packaging, organic matter, chemical and hazardous materials, used tires, end-of-life vehicles, electronics and residual solid waste) from all sources (households, institutions, industry and commercial sectors).
- Tools which would be used in this strategy include: stewardship initiatives; composting programs; increased standards for landfills; regional cooperation for waste diversion; diversion, reuse and recycling targets; landfill bans; eco-taxes; education and promotional campaigns

Legislation and Regulation Revision

The new regulation would:

- Create industry obligations for sorting and recycling packaging materials
- Set parameters for the development of an industry-operated producer responsibility organization (PRO). Producers and distributors would be required to join the PRO or create their own program to manage their packaging waste.
- Require packaging levies be based on the cost to collect, sort and recycle packaging waste, and charged on the basis of mass, volume and material type.
- Require levies be placed on all packaging materials.
- Establish a different levy system for reusable containers (i.e. packaging used 5 times or more)
- Require the cost of levies be internalized by producers/distributors (not be allowed to be passed on directly to consumers by way of add-on tax at cash register)
- Establish reduction, reuse and recycling targets (overall and material specific), as well as penalties for failure to meet these targets.
- Industry-government agreements would need to be established for materials other than packaging currently being collected by municipal recycling programs (i.e. paper products).

Consumer Education

- Support communication and promotional efforts of MPSC and municipalities.

Support Activities

- Create incentives for improving recycling technology, using recycled content or developing new products with enhanced environmentally friendly properties (tax incentives, grants)
- Develop a packaging stewardship program for transportation and commercial packaging waste.
- Establish landfill ban for hazardous, recyclable or compostable materials.
- Explore options for reducing plastic bag consumption and disposal (e.g. taxes, bans, design restrictions).
- In cooperation with MPSC, establish Product Stewardship agreements with other members of the packaging supply chain (materials suppliers, packaging manufacturers, distributors, retailers).
- Continue to work with Federal government and other provincial governments to develop a harmonized approach to product stewardship in Canada.

Green Procurement Policy

- Using the Province's Green Procurement policy as an example – establish a voluntary agreement between municipal governments and industry to work towards green procurement

Voluntary Green Procurement Agreement

- Voluntary agreement between provincial government, local governments, industry and NGOs to engage in green procurement practices.
- Purpose: To increase awareness of and participation in green purchasing and to provide a promotional tool to companies and governments engaged in green procurement activities.
- Organizations would submit their green procurement policy to the Voluntary Green Procurement Agreement Council. If the policy meets the Agreements standards, the organization would be permitted to become a party to the Agreement and their procurement policy would be made publicly available. Member organization would be required to report annual to the Council as to their achievements towards green procurement.

Industry

Under this model industry would be responsible for:

- Financing municipal collection of packaging waste
- Sorting and recycling packaging materials collected by municipalities
- Ensuring provincial targets for diversion, reuse and recycling are met
- Internalizing the cost of end-of-life management for their packaging
- Establishing a Producer Responsibility Organization or set up a self-compliance system

Producer Responsibility Organization

An industry-organized PRO would be responsible for conducting the following activities on behalf of its members:

- Collecting packaging levies
- Paying MPSC for the cost of municipal collection of packaging waste
- Sorting and recycling collected packaging waste
- Ensuring provincial recycling targets are met
- Researching new sorting and recycling techniques and equipment
- Helping develop new recycling opportunities and markets in or closer to Manitoba
- Informing consumers about the system
- Reporting to the provincial government how funds are being used, amount of packaging introduced to the market, amount of packaging recycled, what types of products are being manufactured from recycled products, other activities of the organizations (e.g. market developments, communication efforts, research and development activities).

Self-Compliance Option

- Producers and distributors have the option of creating their own diversion program if they do not want to participate in the PRO.
- Producers choosing to comply with the legislation on their own would be responsible for collecting, sorting and treating packaging; meeting provincial targets; informing consumers; and reporting to the provincial government.

Green Procurement Policy

- Agree to engage in green procurement (Voluntary Green Procurement Agreement)

Municipal Government

Collection

- Municipalities will retain control over packaging collection and may be contracted by industry to sort the materials. They will continue to receive funding from MPSC to cover the cost of collection, however this funding will be linked to Best Practices Guidelines.

Municipal Collection & Waste Diversion Best Practices Guidelines

- Assist MPSC with the development of Best Practices Guidelines to ensure municipalities are running waste diversion and collection programs in the most efficient and effective manner.
- Implement Best Practice Guidelines.

User Pay System/Limited Bags

- Once a sustainable waste diversion system is in place municipalities should begin to limit the number of bags which can be collected or convert to a user pay system.

Green Procurement Policy

- Agree to engage in green procurement (Voluntary Green Procurement Agreement)

Landfill Taxes & Bans

- *Environmental Taxes.* The cost of using Manitoba landfills must be raised in order to discourage their use. Landfill tax revenue would go into a dedicated fund to improve the environmental performance of provincial landfills (e.g. methane collection) and diversion activities (e.g. composting programs/sites, construction and demolition debris programs)
- *Landfill Bans.* Hazardous, recyclable or compostable waste materials would be ban from landfills.

Consumer Education

- Communicate to residents the nature and details of collection and diversion programs.

Manitoba Product Stewardship Corporation

Support Municipal Collection Efforts

Distribute Funds to Municipalities for Collection Programs

- Distribute funds collected by PRO to municipalities to pay for collection programs.

Municipal Collection & Waste Diversion Best Practices Guidelines

- Develop Best Practice Guidelines for municipalities and create a new funding formula linked to the implementation of these Guidelines.

Promote Reduction, Reuse & Recycling

Industry Liaisons

- *R&D assistance:* Assist companies to green their designs/specifications, production processes, operations and distribution (e.g. lifecycle analysis, internal waste audits, design for environment). Research how other companies have reduced their packaging, created reuse systems, or otherwise reduced the environmental impact of their products in order to develop a 'Guide for the Design of Eco-friendly Packaging' and a 'Green-Packaging Buyers Guide'.
- *Promotional assistance:* newsletter promoting companies who have made green efforts, awards program for greener companies

Consumer Education

- Design and deliver overall waste reduction (source reduction, reuse and recycling) campaign to consumers
- In conjunction with consumers' and environmental groups – mount an educational campaign to inform consumers how to look for environmentally friendly packaging (what to buy and what to demand from brand owners)
- Assist municipalities in developing promotional and informational campaigns regarding collection of packaging waste and other materials

Product Stewardship Initiatives

- In cooperation with the provincial government, establish Product Stewardship agreements with other members of the packaging supply chain (materials suppliers, packaging manufacturers, distributors, retailers)
Example: Establish an agreement with major retail chains in the Province to create a program which promotes environmentally friendly products within their retail outlets (e.g. products with recycled content, reusable or refillable, reduced packaging, recyclable, etc.)

Research

- Continually research the activities of other jurisdictions nationally and internationally in regards to initiatives related to waste reduction and prevention.

Green Procurement Policy

- Agree to engage in green procurement (Voluntary Green Procurement Agreement)

Consumers

- Pay for packaging waste management through product price
- Engage in reduction, reuse and recycling activities
- Demand friendlier products
- Make wiser purchasing decisions

Federal & Other Provincial Governments

- Each province should agree to have an alternative to their provincial program for managing packaging waste which allows industry to develop their own initiative. Such a provision may encourage producers to join together to develop their own consistent nation-wide program.
- Federal government should develop maximum levels for heavy metal content in packaging and packaging components.

7.3 Feedback from the Options for Plastic Packaging Stewardship Workshop

The *Options for Plastic Packaging Stewardship Workshop* was held on Thursday, June 26, 2003. The event was sponsored jointly by the Natural Resource Institute and Manitoba Conservation. The purpose of the workshop was twofold:

- To share with participants the data collected through the literature review and interviews about the packaging stewardship policies and programs in Germany, Austria, Sweden and Australia; and
- To receive feedback from participants on a draft model for packaging stewardship in Manitoba.

Fifteen guests representing industry, government, non-government organizations, and provincial recyclers/haulers were in attendance for the *Options for Plastics Packaging Stewardship Workshop* (Table 7.1).

Table 7.1: Organizations Represented at the Plastic Packaging Stewardship Workshop

Manitoba Conservation
Canadian Council of the Ministers of the Environment
City of Selkirk
Resource Conservation Manitoba
International Institute for Sustainable Development
Manitoba Product Stewardship Corporation
Waste Diversion Ontario
Refreshments Canada
Environment and Plastics Industry Council
Topsyn Flexible Packaging Ltd.
Pembina Valley Containers

Half of the session was dedicated to discussing the packaging stewardship initiatives of other jurisdictions. A guest speaker from Nova Scotia was invited to share with the audience the success their province has had with waste management and the tools used to achieve these ends. Data was also shared on the findings of the literature review and interviews for Germany, Austria, Sweden and Australia. The second half of the afternoon was dedicated to presenting and refining the proposed packaging stewardship model. Given the time available, only key elements of the

model were presented and discussed. A handout was provided to the attendees which outlined the full packaging stewardship framework and described features not discussed during the session (7.2 Draft Packaging Stewardship Model).

The following section details the segments of the model that were presented to the workshop audience for their evaluation and a summary of the ensuing discussion.

7.3.1 Provincial Government

Attendees were asked to comment on the following provincial government responsibilities:

Legislation and Regulation Revision

- Establish industry obligations for sorting and recycling post-consumer packaging waste
- Require levies be based on weight and material type
- Require levies be internalized
- Set reuse and recycling targets

Organizational Structure for Provincial Stewardship Programs

The question arose as to who would be responsible for overseeing all the provincial stewardship programs. Would the province institute a similar system as in Ontario, where each designated material is managed through a separate program, but all report to one overseeing, industry-organized board of directors? Or would Manitoba Conservation (Pollution Prevention) continue to serve as the strategic planner and director of all stewardship initiatives?

A representative of Waste Diversion Ontario was present at the workshop and informed the group that there were problems with the hierarchical structure implemented in Ontario. WDO is the body responsible for directing and overseeing the plans and activities of industry funded organizations. The organization's board of directors is made up of stakeholders representing a variety of products/waste streams. The interests and concerns of these parties are divergent and often conflicting, and the majority of members have little regard for the issues faced by the other

industry sectors on the board. Thus, many people are beginning to question the need and value of the WDO.

Full Financial Responsibility

Representatives of industry were opposed to assuming full financial responsibility for inefficient municipal collection systems. Producers' resentment may be eased if financial responsibility is phased in gradually, and a system is developed to ensure municipalities' operating costs are reasonable.

Internalization of Levies

Opinions were mixed on whether or not levies should be internalized. A provincial government representative stated that this framework would increase the number of stewards, thereby reducing the cost of levies, and added that if stewardship fees are a fraction of a cent, they should be internalized. Another attendee believed consumers would want to see the levy. One industry representative was concerned that if producers were forced to internalize the costs of levies, retailers would place pressure on producers to not pass along the fee, and producers choosing to bear the cost would gain a competitive advantage. This spokesperson recommended that stewards should not be required to internalize the costs, but that such a decision should be left up to individual companies.

Reuse and Recycling Targets

A few of the workshop participants expressed concern over provincial targets. One believed hard numbers could lead us astray from the actual purpose and goals of packaging stewardship. It was suggested the province might want to consider establishing qualitative objectives rather than quotas. However, other participants were supportive of numerical targets, stating that targets are

easy to communicate and readily understood by the public, and reduction, reuse and recycling activities have proven to yield environmental benefits. Despite the success of the 3R concept, one attendee felt it was important to conduct an environmental impact assessment of the potential effects of reuse and recycling rates prior to setting and implementing such measures.

7.3.2 Industry

Participants were asked to share their opinions on the following proposed industry responsibilities:

- Fund municipal collection
- Sort and recycle packaging waste
- Ensure provincial targets are met
- Report progress to government
- Inform consumers about the system

Delinking Collection from Sorting and Recycling

Many of the workshop participants had concerns about separating responsibility for collection from sorting and recycling. Processors must have some control over the quality of materials they are receiving for sorting and recycling. To reduce quality control issues a set of best practice guidelines needs to be developed to direct collection, and a good relationship must exist between processors and collectors. Industry is also apprehensive about being responsible for funding inefficient municipal programs. An industry representative stated stewards would be willing to pay a *reasonable* cost for collection. A system to determine the average collection costs, based on the size of the community, should be developed to help assure producers costs as rational and justified.

One participant, while supportive of a mechanism to help control municipal costs, was concerned about prescribing how communities operate their programs. Many local governments

have developed innovative approaches to waste diversion and management which suit their regional needs. If guidelines are too narrow and rigid, municipal innovation may be quashed.

Informing Consumers

One industry participant felt consumers were the most important player in any stewardship scheme. As such, consumers need not only be well informed about the system, they also need to be energized in order to support and participate in the program. Communication efforts would need to fulfill the dual purpose of educating and inspiring.

One government representative was concerned producers might only promote their point of view, and recommended that industry information should be balanced with government messages. Another government participant believed it was essential that a variety of the players in the chain, not just stewards, participate in education.

7.3.3 Municipalities

Workshop participants were requested to express their views on the following municipal obligations:

- Collect Packaging Waste
- User Pay System
- Landfill Taxes and Bans

Only one municipal representative was able to attend the workshop. Unfortunately, this individual was unable to stay for the entire session, which meant no local government spokesperson was present for the discussion of municipal governments' role in packaging stewardship. It would have been beneficial to have received feedback from communities as to whether or not they wished to retain control over collection of packaging waste and other designated materials.

Several workshop participants supported the use of a mix of waste diversion tools at the municipal level (e.g. landfill bans and user pay programs). A hauler/recycler from the Pembina Valley region verified that landfill bans and user-pay systems were working well in their area. Barry Friesen (Nova Scotia) also confirmed the success of landfill bans. As their provincial bans expanded to encompass more products, municipal collection rates increased. However, he also stressed that bans required a high level of commitment and were very complex to enforce.

Finally, the question was raised as to whether or not the provincial government had the authority to impose bans on private landfills. Government representatives agreed that such action could be taken.

7.3.4 Manitoba Product Stewardship Corporation

The following MPSC duties were presented to workshop attendees for discussion:

- Support municipal collection
- Promote waste reduction and prevention Industry Liaison
 - Consumer Education
 - Research
 - Voluntary Stewardship Agreements

Retaining the name of an existing organization (Manitoba Product Stewardship Corporation) for this new entity caused some confusion for a number of the workshop participants. Questions and comments that arose included:

- Within this model, the role of MPSC is the most uncertain.
- MPSC would need to be totally restructured. How would this occur?
- The existing MPSC already performs a number of the duties being proposed for the PRO (e.g. collection of levies and reporting the provincial government) and the “new MPSC”

(e.g. support municipal recycling efforts and consumer education). Could the role of PRO and “new MPSC” be fulfilled by the existing MPSC?

- Do you envision the “new MPSC” as performing their listed duties for all waste materials or just for packaging?
- The model may be clearer if the existing MPSC was ignored.

7.3.5 General Comments on the Model

The general comments received from the participants regarding the overall packaging stewardship model proposed at this session included:

- What are the objectives of the packaging stewardship initiative? Objectives should be determined first, and then a program should be designed.
- The waste reduction and prevention goals will vary between different packaging materials. Can one PRO manage all material types?
- The model seems to concentrate primarily on recycling. The proposed system lacks mechanisms for innovation and requires more focus on the entire lifecycle of packaging, not just the disposal phase.
- The model should be linked to the principles of sustainable development.
- Any proposed plan must take into account the quality and quantity of materials available. Innovative technology requires an adequate supply of acceptable material.

7.3.6 Workshop Limitations

There were two main limitations to the findings summarized in this chapter:

- Due to time constraints, not all of the elements of the model could be discussed, and the components that were presented could only be debated for a limited period of time.

- Not all the key players identified in the model were represented at the workshop. Only one packaging manufacturer was in attendance and was unable to stay for the entire session. No packing fillers or trade association representing fillers were present. One municipal representative invited was in attendance, but could not stay for the discussion of the model.

7.4 Packaging Stewardship Model Revisions

7.4.1 Revisions Based Upon Workshop Feedback

Workshop participants provided valuable feedback to strengthen the proposed framework for packaging stewardship in this province. Their questions pointed out areas that required further development and their criticisms identified roles and responsibilities that needed to be revised. The following is a list of items raised by workshop participants, and a discussion of the impact these comments had on the revised version of the model.

Organizational Structure for Provincial Stewardship Programs

Under this model, the provincial government would assume responsibility for the strategic planning of all stewardship programs and would take a lead role in the enforcement of regulatory obligations. Another body might be created to coordinate and administer stewardship programs; however, this is beyond the scope of this model.

Waste Reduction and Prevention (WRAP) Council

The initial model, presented at the *Options for Plastic Packaging Stewardship Workshop*, included the Manitoba Product Stewardship Corporation. Using an existing organization caused some confusion and concern. As it exists currently, MPSC fulfills some of the responsibilities of an industry PRO and some of the duties of the “new MPSC”. In order to clarify the distinction

between these two organizations, and avoid dictating the evolution of MPSC, the revised model proposes an organization called the Waste Reduction and Prevention Council.

The Waste Reduction and Prevention (WRAP) Council is envisioned as a non-government research and communications organization, dedicated to improving waste reduction and prevention in Manitoba. This organization is recommended in order to overcome the fundamental flaw of the PRO system identified during interviews and research in Europe. A PRO is a business entity that exists to recycle used packaging. These organizations require a steady stream of recyclable materials in order to operate; therefore there is no benefit for a PRO to encourage or to research means of enhancing packaging design. Packaging reduction and reuse would detract from recycling and reduce the business of a PRO.

One of the key objectives of the Manitoba packaging stewardship initiative would be to promote the waste management hierarchy of reduction, reuse and recycling. In order to avoid a dominant focus on recycling, this model has included an additional organization with a mandate to promote packaging reduction and reuse, as well as recycling. The WRAP Council would be responsible for encouraging engagement in the 3Rs for all sectors – industry, municipalities and the general public. The WRAP Council's mandate would apply to all waste, not just packaging. It is envisioned that the Council would be responsible for assisting municipalities to develop efficient and effective waste diversion and management plans, as well as engaging in research, assisting the Province with the development of stewardship agreements, and devising promotional/educational campaigns for other designated waste materials.

It was suggested at the workshop that MPSC could fill the role of both the provincial PRO and the WRAP Council. However, the mandate and objectives of these two organizations are too different and even contrasting to be managed simultaneously. As mentioned above, a PRO is a business entity with an agenda to reduce stewardship costs, improve sorting and recycling efficiency, develop markets for recyclate and maintain a certain level of recycling. The WRAP

Council is an environmental advocacy and communications organization. Its mandate is to promote waste diversion (especially reduction and reuse), provide assistance to municipalities and small businesses, and engage in research. While the PRO and the WRAP Council may collaborate on certain projects and issues, the two organizations cannot be operated together if both are to thrive and successfully fulfill their goals.

Full Financial Responsibility

One of industry's greatest concerns is funding municipal collection programs that are improperly managed. Producers do not want to have to internalize the cost of third party inefficiencies. In order to ensure each municipality is running an efficient and effective collection program, the WRAP Council, in conjunction with municipalities and the provincial PRO, would develop a Best Practice Guideline for Waste Diversion and Collection Procedures. The WRAP Council would devise a funding formula in which municipalities, which have implemented the guidelines, would receive full funding, while municipalities, which had not committed to these guidelines, would only receive partial funding. The Council would also be responsible for providing support – technical, promotional and educational – to ensure every municipality was capable of fulfilling the Best Practices Guidelines.

When developing such guidelines it is imperative to recognize the importance of local creativity and innovation in the success of waste diversion programs. Many municipalities in Manitoba have developed unique approaches to waste management which work well in their region. Thus a balance between standardization to ensure efficiency and flexibility to preserve innovation is essential.

Prior to transferring financial obligation for packaging waste management to stewards, the guidelines would have to be developed, and municipalities would have to begin implementation.

Industry would then have some assurance of the costs involved and confidence that the collection system was viable and efficient.

Internalization of Stewardship Fees

Although some of the workshop participants expressed concern over mandating the internalization of stewardship fees, this element of the model was not changed. Including the cost of waste management in the selling price of the product is an essential component of a successful EPR program. The goal of internalizing the levy is to compel producers to account for the cost of waste management when designing their products/packaging. If levies become a part of the regular costs of doing business, as are raw materials and production costs, and not simply treated as an eco-tax to be passed on to consumers, producers will have to take steps to improve their packaging in order to reduce this levy.

Delinking Collection and Sorting

A number of the representatives were concerned with the idea of separating collection from sorting. While the validity and merit of their comments was recognized, for a number of reasons it was decided to maintain the initial model, with municipalities physically collecting packaging waste and industry financing municipal collection activities. First, greater economies of scale and cost savings could be achieved by having all materials (i.e. organic matter, paper products, packaging, and residual waste) collected simultaneously, rather than having independent organizations collecting each waste stream separately. Second, a single collection system is simpler for households to understand and to participate in, leading to high recovery rates for all materials. Third, one group assuming responsibility for waste diversion and prevention strategies (e.g. user-pay systems, enforcing landfill bans, educating the public) would improve administrative efficiency, ease strategic planning and increase the probability of program success.

Finally, a key component of packaging stewardship is recognizing the capabilities of each player in the system, and building upon their experience and strengths. Municipalities have had decades of experience managing waste and have developed well-established systems for collecting refuse. Municipal governments are in the best position to coordinate the retrieval of a variety of materials, and are most familiar with the diversion and collection approaches that work best within their communities.

While it is believed that municipalities are the most capable player to collect packaging waste, it is also felt that industry would be most adept at sorting packaging waste. Processing and recycling waste is a business activity, and many municipalities have not been able to alter their traditional approaches to waste management in order to run an economically-sound recycling program. Efficient and effective sorting requires appropriate equipment and an appropriate supply of recyclate. Aside from the larger urban centers, most Manitoba municipalities have neither the capital to invest in processing technology, nor the quantity of material required to run an adequate sorting program. Producers have the skills to run successful business enterprises, and the knowledge, experience and resources to develop efficient sorting plants in Manitoba. In Germany, when industry assumed responsibility for managing waste, great advances were made in terms of technology and procedures for processing packaging materials. It is believed that if industry in this province were obligated to engage in sorting and recycling, the efficiency and effectiveness of these activities would be greatly enhanced.

The primary concerns expressed by workshop participants over separating collection from sorting were related to program efficiency and quality control. Both of these issues could be addressed through the development of best practice guidelines devised by the WRAP Council, municipalities and industry.

7.4.2 Additional Packaging Stewardship Model Revisions

Reflection on the model after the workshop, and additional material gathered after the creation of the initial draft, led to several supplementary recommendations for enhancing the effectiveness of the approach.

Establishing Targets

In addition to setting targets for reduction, reuse and recycling, the province may also want to consider placing limitations on how these targets might be accomplished. Industry's main concern is cost, rather than ensuring packaging is treated in the most environmentally sound manner. Limitations would include: Manitoba stewards not being permitted to export recyclable materials to nations which do not have adequate environmental controls; or to sell recycle to companies in which the seller is not aware how the product will be processed (i.e. may be incinerated); or to export to countries a great distance from Canada. Such activities do not support the goals and objectives of sustainable development. Furthermore, based upon comments of workshop participants, the province may want to consider setting qualitative objectives, in addition to establishing quantitative targets for reduction, reuse and recycling.

Beverage Container Targets

Rather than instituting a mandatory deposit-refund program for beverage containers, it is recommended the provincial government use targets to achieve high recovery rates for this product stream. Deposit-refund programs have achieved great success in terms of increasing the recovery and recycling rates for beverage containers. However, industry has many complaints about the costs and administrative hassles resulting from such systems. Under this model, the provincial government would set recovery and recycling targets equivalent to the rates being achieved in other Canadian jurisdictions (i.e. in the range of 75 to 80 percent). Industry would be

free to fulfill these targets in whatever manner they deemed fit. Setting targets would permit beverage producers and importers to participate in the provincial PRO system, rather than having to establish a separate deposit-refund scheme. It would also ensure that materials which have market value, such as aluminum and PET, would remain a part of the packaging recycling system, helping to keep overall program costs low.

Retailer Obligations

The provincial government should investigate the potential gains that may be made in the area of reduction if retailers were made responsible for accepting and treating secondary packaging. The aim of such a provision would be to eliminate what has been deemed to be unnecessary packaging. If the responsibility is placed in the hands of retailers, this group will place pressure on producers to eliminate this form of packaging.

Litter Abatement

Convenience stores, fast food restaurants, gas stations, shopping centers, parks, and public events should be required to provide recycling bins for packaging and paper waste. Increased access to recycling bins would improve public awareness of packaging recycling, increase recovery rates and reduce litter.

Waste Management Regions

As a part of the overall Waste Reduction and Prevention Strategy, Manitoba should be broken into Waste Management Regions (WMR). Municipalities in each region would collaborate to develop a waste reduction and prevention plan for their area. Working together, municipalities could take advantage of economies of scale for collection, and ease the implementation and monitoring of the Best Practices Guidelines for collection and waste diversion. This proposal is

supported by the final report of the *Regional Waste Management Task Force* (2000), a group established to review the waste management practices in the province and to formulate a series of recommendations for the province on how regional waste management systems could be enhanced. This document recommends, “integrated waste management activities be planned and coordinated on a regional basis” (RWMTF, 2000).

Plastic Research Initiative

Germany, Austria and Sweden have taken great strides over the last decade to improve the eco-friendliness of packaging and enhance packaging waste management within their borders; however, plastic packaging continues to create problems. Issues such as high waste management costs, growing consumption of virgin plastic resin, displacement of the reusable container market, and problems with small plastic packaging still plague even these nations.

Therefore, while packaging stewardship will greatly enhance the management of plastic packaging, as well as all other types of packaging, additional measures will need to be implemented in order to reduced the negative environmental impact of plastic packaging. Implementation of the *Plastic Research Initiative* would be a special undertaking led by the WRAP Council, and supported by provincial governments and plastic producers. Under this initiative, the Council would engage in research into the proper management of plastic waste, including packaging. Research projects would include investigating effective plastic policy and program tools used in other jurisdictions, reviewing current technology employed for reducing, reusing and recycling plastic, exploring innovative end-uses for recycled plastic, assisting in the establishment of local plastic processing facilities, and the development of recycling opportunities for plastic closer to Manitoba. One of their first tasks of the *Plastic Research Initiative* could involve investigating means to reduce the consumption and improve the management of plastic films.

Harmonization of Canadian Packaging Stewardship Initiatives

Although waste management is the jurisdiction of the provincial governments, it is imperative that the federal government play a role in harmonizing stewardship initiatives in order to protect the free trade of goods between provinces and with other nations. In cooperation with the provinces and industry, the federal government should work towards the development of national reduction, reuse and recycling targets. Each province would be obligated to devise its own system to meet these targets. In order to ensure that each province/territory is measuring progress towards the targets in the same manner, the federal government would have to develop standardized measurement and reporting procedures. Uniform means of determining reduction, reuse and recycling levels would allow data from the provinces to be directly compared, for national progress to be measured, and for provincial waste management programs to be improved.

7.5 Packaging Stewardship Model for Manitoba

In recognition of the concerns and issues identified at the workshop, and upon further consideration of the literature, the draft model was revised. The following is the final *Packaging Stewardship Model for Manitoba*:

Packaging Stewardship Model for Manitoba (Final Version)

Provincial Government

Provincial Waste Reduction and Prevention Strategy

An overall vision and plan for waste reduction and prevention in the province, which clearly defines the roles and responsibilities of all key players, is needed prior to developing a packaging waste management system. This strategy should:

- Include all waste (packaging, organic matter, chemical and hazardous materials, used tires, end-of-life vehicles, construction and demolition debris, electronic waste and residual solid waste) from all sources (households, institutions, and businesses).
- Be developed in cooperation with stakeholders, including industry, municipal governments and consumers.
- Be based upon the principles of sustainable development and extended producer responsibility.
- Encourage continuous improvement (i.e. allow for lessons to be learned, improvements to be made, and targets to be adjusted).
- Employ a variety of tools including: stewardship initiatives, composting programs, increased standards for landfills, regional cooperation, quantitative and qualitative targets, landfill bans and taxes, and educational and promotional campaigns.

Packaging Stewardship Regulation

The province must develop a Packaging Stewardship Regulation. Key elements should include:

Industry Obligation

The regulation should create an obligation on the part of packaging brand owners or the first importers into the province to:

- Financially support the collection of packaging waste by municipalities;
- Sort and treat their packaging waste in an environmentally sound manner¹;
- Submit an annual report to the provincial government detailing the amount and type of packaging material placed on the market, and the amount and type sorted and recycled;
- Inform consumers how the systems works, the amount of material recovered annually and the efforts industry has taken to reduce the environmental impact of their packaging; and
- Ensure provincial reduction, reuse and recycling targets are met.

Options for Fulfilling Obligations

Industry should be given the option of:

- Cooperating to form an industry-operated, producer responsibility organization (PRO); or
- Establishing their own system for collecting, sorting and treating packaging waste.

¹ Treatment options must respect the waste management hierarchy which gives priority to reuse and recycling. Landfilling would be permitted only when reuse or recycling is not possible.

Retailer Obligations

- Manitoba retailers should be obligated to accept secondary packaging materials, and should not be permitted to join a producer responsibility organization to fulfill this duty.

Stewardship Levies

The Packaging Stewardship Regulation should require that levies collected by the provincial PRO:

- Reflect the actual cost to collect, sort and treat packaging;
- Be charged on the basis of packaging weight, volume and material type; and
- Be included in the product selling price (i.e. cannot appear separately on the consumer's receipt).

Targets

The provincial packaging stewardship regulation should establish:

- Techniques for determining reasonable reduction, reuse and recycling targets;
- Quantitative and qualitative targets for packaging and packaging waste reduction, reuse and recycling;
- Quantitative targets for the reuse and recycling of beverage containers;
- Mechanisms for monitoring whether or not targets have been achieved;
- Repercussions for failure to achieve targets; and
- Deadlines and procedures for re-evaluating quantitative and qualitative targets.

Support Activities

Stewardship Initiative for Commercial & Transportation Packaging

- The provincial government should devise a strategy and regulation for the management of commercial and transportation packaging waste.
- Industry should be encouraged to create a single PRO to manage residential, commercial and transportation packaging waste, to reduce duplication of duties and take advantage of economies of scale.

Voluntary Stewardship Agreements

- In cooperation with the WRAP Council, the provincial government should establish voluntary stewardship agreements with other members of the packaging supply chain not covered under the legislation (e.g. material suppliers, packaging manufacturers, distributors and retailers).

Landfills Bans

- Packaging waste that is recyclable, compostable or once contained hazardous materials would be banned from provincial landfills.
- An educational campaign targeted at improving the awareness of these parties, as well as residents and businesses, should be initiated by government.
- Penalties for dumping banned materials will need to be developed and strictly enforced.

Landfill Fees

- Fees should be established for the use of public and private landfills. Revenue collected from landfill taxes should go into a dedicated fund to be used to improve the environmental performance of provincial landfills (e.g. methane collection, material sorting) and diversion activities (e.g. composting programs, construction and demolition debris programs).

Consumer Education

- The provincial government should support the communication and promotional efforts of the Waste Reduction and Prevention Council and municipalities.

Plastic Research Initiative

- Support and help guide WRAP Council research related to improving the stewardship of plastics.

Litter Abatement

- Convenience stores, fast food restaurants, gas stations, public parks and public events should be required to provide recycling bins for packaging and paper waste.

Incentives to Improve Recycling

- To help create a viable and sustainable recycling system in Manitoba, the province should create incentives (e.g. tax breaks, subsidies and grants) for organizations investing in activities to improve sorting and recycling technology, developing recycling infrastructure in the province, or establishing new products/markets for recycled materials.

Canadian Harmonization

- The provincial government should continue its efforts to work with the federal government, and other provincial governments, to develop a consistent, harmonized approach to product and packaging stewardship throughout the country.

Voluntary Green Procurement Agreement

- Using the *Green Procurement Guidelines* as a framework, in partnership with local governments, industry and NGOs, the province should establish a Voluntary Green Procurement Agreement.
 - The purpose is to increase awareness of, and participation in, green purchasing, and to provide a promotional tool for companies and governments engaged in green procurement activities.
 - Organizations would submit their green procurement policy to a central committee. If the policy met the Agreement's basic requirements, the organization would be permitted to become a party to the Agreement and its procurement policy would be made publicly available. Member organizations would be required to report annually their achievements towards green procurement.
-

Industry

Industry's general responsibilities should include:

- Financing municipal collection of packaging waste;
- Sorting and recycling packaging waste collected by municipalities;
- Ensuring provincial targets for reduction, reuse and recycling were met;
- Reporting to the provincial government their progress towards regulation objectives; and
- Internalizing the cost of end-of-life management for their packaging.

Producer Responsibility Organization

PRO would be responsible for:

- Collecting packaging levies;
- Refunding municipalities the cost of packaging waste collection (via the WRAP Council);
- Working with the WRAP Council and municipalities to develop Best Practices Guidelines for municipal collection of packaging waste;
- Sorting and recycling packaging waste collected by municipalities;
- Ensuring provincial targets are met;
- Researching new sorting and recycling techniques and equipment;
- Helping to develop new recycling opportunities and markets in or closer to Manitoba;
- Informing consumers about the system; and
- Reporting to the provincial government how funds are being used, the amount of packaging introduced to the market, the amount of packaging recycled, the types of products being manufactured from recycled products, and the other activities of the organizations (e.g. market developments, communication efforts, research and development activities).

Self-Compliance Option

- Producers choosing self-compliance would be required to develop and submit a plan to the provincial government describing how they will fulfill the stewardship obligations. To be approved, a self-compliance system must be simple for consumers, meet provincial targets, and not place an unfair burden on municipalities or other producers.

Green Procurement Policy

- All members of industry should be developing and implementing green purchasing policies. Their participation in the Voluntary Green Procurement Agreement would be strongly encouraged.

Municipal Governments

Collection

- Municipalities would retain control over physically collecting packaging waste, while industry would be responsible for financing municipal collection activities.

Municipal Collection & Waste Diversion Best Practices Guidelines

- Municipalities would assist the WRAP Council and provincial PRO to develop Best Practices Guidelines for Municipal Collection and Waste Diversion. Each municipality would then be responsible for implementing these guidelines.

User Pay System/Limited Bags

- Once a sustainable waste diversion system is in place municipalities, would be expected either to place a limit on the number of bags collected or convert to a user pay system.

Enforce Landfill Bans

- Municipalities, as collectors of packaging waste, would be responsible for assisting the provincial government with the enforcement of landfill bans. Each WMR would be in charge of determining the best way to monitor and enforce these landfill bans for its region.

Consumer Education

- WMR would be responsible for communicating to its residents the nature and details of collection and diversion programs, and encouraging public participation and support for these initiatives.

Green Procurement Policy

- Municipalities would be strongly encouraged to engage in green procurement practices. It is hoped that many would participate in the Voluntary Green Procurement Agreement.

Waste Reduction and Prevention Council

Municipal Support

Distribute Funds to Municipalities for Collection Programs

- WRAP Council would be responsible for distributing funds, collected by the industry PRO, to municipalities to pay for collection programs.

Best Practices Guidelines for Municipal Waste Diversion & Collection Procedures

- WRAP Council, in conjunction with municipalities and the provincial PRO, would develop a Best Practice Guideline for Waste Diversion and Collection Procedures which would be linked to municipal funding.
- The Council would be responsible for providing support – technical, promotional and educational – to ensure every municipality was capable of fulfilling the Best Practices Guidelines.

Promote Reduction, Reuse & Recycling

Industry Support

The WRAP Council would provide assistance to small and medium-sized businesses wanting to improve their packaging. Activities would include:

- Assisting companies to conduct lifecycle analysis of their packaging;
- Helping firms to perform internal waste audits;
- Investigating how companies in other jurisdictions have reduced their packaging, created reuse systems, or otherwise reduced the environmental impact of their products and packaging;
- Publishing a *Guide for the Design of Eco-friendly Packaging* for packaging manufacturers and a *Green-Packaging Buyers Guide* for packaging fillers; and
- Developing an awards program, publishing a newsletter and/or establishing a website announcing the efforts of green companies in Manitoba.

Consumer Awareness & Education

- As a part of the Provincial WRAP Strategy, the Council would engage in promoting waste reduction (source reduction, reuse and recycling) for all waste materials and products.
- The Council would assist municipalities develop advertising and informational campaigns regarding the collection of packaging waste.
- In conjunction with consumer organizations and environmental groups, the WRAP Council would inform consumers of what to look for when purchasing packaged goods and what to demand from brand owners.

Voluntary Product Stewardship Initiatives

- In cooperation with the provincial government, the Council would work to establish voluntary product stewardship agreements with other members of the packaging supply chain (e.g. materials suppliers, packaging manufacturers, distributors, retailers).

Research

- The WRAP Council would continually research the activities of other jurisdictions, nationally and internationally, in regards to waste reduction and prevention. Research activities would be directed by the needs of the provincial government, industry and municipalities.
- Under the *Plastic Research Initiative*, the Council would engage in research related to plastic stewardship.

Green Procurement Policy

- The WRAP Council would be required to develop and implement a green purchasing strategy, and encouraged to join the Voluntary Green Procurement Agreement.
-

Consumers

- Financially contribute to the management of packaging waste through the product price.
- Engage in reduction, reuse and recycling activities.
- Purchase and use environmentally friendly products and packaging.
- Demand friendlier designs, production procedures and disposal methods.

Other Provincial Governments

- Producers or industry sectors, which create a reasonable system for the collection, sorting and recycling of packaging waste, should be able to apply for an exemption from the existing provincial program concerning packaging. Such a provision may motivate producers from across the country to work together to develop their own consistent nation-wide program for packaging.

Federal Government

Harmonized EPR Legislation

- In cooperation with the provinces and industry, the federal government should work towards the development of national reduction, reuse and recycling targets. Each province would be obligated to devise its own system to meet these targets.

National Reporting Standards

- To ensure that each province/territory is measuring progress towards the targets in the same manner, the federal government would have to develop standardized measurement and reporting procedures.

Heavy Metal Content Restrictions

- Canadian federal government should institute maximum levels for heavy metal content in packaging and packaging components.
-

Chapter 8 – Conclusions & Recommendations

8.1 Project Summary

The purpose of this thesis was to explore different EPR options for managing plastic packaging waste in order to develop a model for packaging stewardship in Manitoba. The following three objectives were established to guide the project:

- to review the use of regulatory and voluntary packaging stewardship initiatives used by other jurisdictions to reduce the negative environmental impacts of plastic packaging;
- to assess the potential advantages and disadvantages of adopting the aforementioned initiatives in the province of Manitoba; and
- to gain feedback from industry stakeholders regarding the concept of packaging stewardship, the environmental impact of their packaging, and a proposed model for implementing packaging stewardship in this province.

In order to accomplish these objectives a four-part research strategy was developed. First, a review of the relevant literature on the concept of packaging stewardship and issues related to plastic packaging was conducted. Second, a thorough analysis of the packaging stewardship policies and programs found in other jurisdictions, both internationally (German, Sweden, Austria and Australia) and nationally (Ontario, British Columbia and Nova Scotia), was undertaken. Each analysis involved reviewing the enabling regulation, related reports (e.g. Annual Reports, Program Reviews), and relevant journal articles, as well as conducting interviews with government officials and waste management system representatives.

Third, a case study involving interviews with companies involved in the production or filling of plastic food packaging was carried out. The purpose of the interviews was to determine the environmental characteristics and potential impact of some of the plastic food packaging on the market; to identify the factors influencing packaging design and/or selection; to assess what voluntary action industry has taken to reduce the environmental impact of their packaging; and to

gain a better understanding of industry's opinions and concerns regarding packaging stewardship. Interviews were also held with trade associations and non-government organizations to explore these groups' views on the need for stewardship, their concerns regarding the concept and the roles they envision for the key players (i.e. industry, government, and consumers).

Using the data collected from the literature review, policy and program analysis, and industry interviews, a draft packaging stewardship model was developed. It was determined early in the project design phase that it was imperative to obtain feedback from some stakeholders regarding the proposed model. Therefore, the fourth, and final, step of the study was a workshop held with industry, government (provincial and municipal), and non-government organizations. The draft stewardship model was presented to the participants of the workshop, and each was requested to share their comments and concerns regarding some of the key responsibilities and duties outlined in the model. The information gathered at the workshop, in addition to further reflections on the data collected, was used to enhance and strengthen the final Packaging Stewardship Model for Manitoba.

8.2 Conclusions

8.2.1 Provincial Action

When extended producer responsibility first emerged in the early 1990s, Canadian governments were uncertain about the validity of this concept. Today however, governments in this nation have moved beyond debating the merits of EPR, and now recognize stewardship as a valuable tool for advancing waste reduction and prevention goals, as well as ensuring environmental considerations are incorporated into companies' product development processes.

In spite of the acknowledged benefits of packaging stewardship, a full-scale national EPR program for packaging, such as in Europe, has not been adopted in this country. While the federal government is currently engaged in research regarding stewardship issues and is actively

working with various industry sectors to develop voluntary stewardship programs, they have made it clear that they have no intention of adopting a national law on packaging and packaging waste. This leaves provinces with the sole responsibility of creating and enforcing stewardship in this nation.

Despite the arguments against provincial-led initiatives¹, the review of the waste management systems in Ontario, British Columbia and Nova Scotia found that individual Canadian provinces are in fact moving forward with stewardship initiatives. Ontario has placed responsibility on producers (brand owners and first importers) to partially fund packaging waste diversion programs, to play a role in the development of markets for recycled materials, to provide assistance to municipalities to improve their waste management capabilities, and to engage in communication campaigns targeted at the public. Under British Columbia's new Industry Stewardship Business Plan producers are responsible for designing and implementing product stewardship programs, informing the consumers, and monitoring and reporting the results of their initiatives to the public and government. Nova Scotia has signed an agreement with provincial milk producers, under which this industry sector has agreed to contribute financially to the collection and recycling of their products, engage in research to improve their packaging design, incorporate recycled content in their packaging when possible, and partake in consumer education programs.

Other Canadian provinces not reviewed for this project have also begun to incorporate elements of stewardship into their waste management structures. Prince Edward Island (PEI) has proven that a single province can force changes within their borders. PEI requires that all flavoured carbonated beverages sold in the province be packaged in reusable bottles (Department

¹ Opponents of provincial led EPR programs suggest that the sheer size of the country, coupled with the relatively small population in any one province, makes implementing European-style models impractical. Further, they claim that because of the limited buying power and influence of individual provinces, provincial stewardship regulation would have little or no impact on packaging design or production procedures of national and international companies. Lastly, they note that policing provincial borders would be a daunting undertaking, leaving policy makers with the impossible task of creating a system to monitor what enters or leaves individual provinces.

of Fisheries, Aquaculture and Environment, nd). Despite the province's small population (135,300 residents) national and international brands have opted to comply with the regulation and continue to sell their products in PEI (Statistics Canada, 2002). PEI's return rate for beverage containers is the highest in all of North America at close to 98-percent (Government of PEI, nd). Other provinces are also moving forth with stewardship-based waste management policies. Quebec has begun implementing an approach akin to Ontario, while Alberta and Saskatchewan have adopted stewardship agreements with milk processors similar to Nova Scotia.

Ideally, extended producer responsibility initiatives are implemented at the federal level. However, in the absence of federal law on packaging stewardship, provinces should not negate their responsibilities for the welfare of the environment. It is imperative that each province takes action and develops its own approach to stewardship. It is also essential that the provinces begin to discuss the harmonization of their policies and programs. Some degree of standardization will ease provincial enforcement, reduce producer's costs and administrative tasks, and enhance the environmental gains achieved by these initiatives.

8.2.2 Mandatory Packaging Stewardship

After ascertaining that it was possible for Manitoba to move forth with a stewardship initiative as an individual province, it was determined that a regulatory approach as opposed to a voluntary approach would be most effective. If it is the desire of the province to improve the design, production and waste management procedures for packaging, the Province must legally oblige industry to broaden their environmental responsibilities. This recommendation was supported by the findings of the literature review, policy analysis and case study.

First, the factors that generally motivate industry to take voluntary action on environmental matters do not apply in the case of packaging. One researcher of voluntary environmental initiatives observed:

To date, voluntary take back programs appear to have emerged in circumstances where there are one or several of the following characteristics: 1) a higher risk of improper disposal and associated liability; 2) a high value associated with the discarded product; 3) relatively low-frequency, high value transactions between the manufacturer and consumer; 4) relatively close or ongoing relationship between a manufacturer and consumer; or 5) specialty or high-end products from which environmental or other social goals may enhance customer loyalty (Scarlett, 1998, p. 8).

Packaging does not fall into any of the above categories. Packaging is not generally hazardous to dispose of and has little to no value at the end of its life. Although a package may contain a specialty or high-priced product, the package itself is not the item consumers are investing in, and therefore has minimal influence on the relationship between the producer and consumer. As a result, there are no drivers for manufacturers or fillers to take on greater responsibility for their packaging unless compelled by governmental regulation. Thus despite some of the positive aspects of voluntary stewardship initiatives, their applicability to sectors such as packaging, where EPR is likely to create additional costs for producers rather than generating a profit, is limited.

Second, the visions of industry and government are very different. Industry's mandate is focused on making a profit, while government is responsible for representing and protecting the interest of the public. In the case of environmental matters, these differing goals often conflict. Industry may be willing to engage in activities which will potentially improve their market share, such as public education and product research, however few are willing to make a true

commitment to improving the environment. The National Packaging Protocol (Canada) and the National Packaging Covenant (Australia) simply did not achieve the environmental successes experienced by the Packaging Ordinance (Germany) or Packaging Regulation (Austria). If government wants to ensure stewardship goals properly guide the use and disposal of resources, and efforts are taken to ensure these goals are achieved, regulation is necessary.

Finally, Canadian industry does not have any immediate plans to expand its physical or financial responsibilities for the environmental impacts of packaging and packaging waste. Most of the producers interviewed agreed they would voluntarily improve the environmental characteristics of their packaging if it provided economic savings or if consumers demanded green packaging. Increasing production costs to develop and manufacture a product that goes against industry norms and consumer demand would place a company at a competitive disadvantage, and is, therefore, of little interest to the companies surveyed. As one internationally packaging manufacturer stated, as long as consumers demand their current packaging, and the legislative system allows for its production and sale, they will continue to provide the same packaging.

8.2.3 Packaging Stewardship Model

The purpose of this research initiative was to determine the best course of action for the management of plastic packaging in the province of Manitoba. It was clear fairly early in the research process that in order to attain the greatest environmental benefits, to ensure a level playing field for producers, to take advantage of economies of scale, and to alter the way in which both consumers and industry viewed packaging and its impacts, the recommended model would have to address all packaging on the market, not just plastic packaging. This study also found that the success of the packaging stewardship initiatives reviewed could not be attributed to any one policy tool, but were the result of a variety of integrated tools and approaches working in

tandem. This project identified the following as key components for a successful packaging stewardship model:

- Legislated take-back obligations
- Encompasses waste from households, institutions and businesses
- Includes sale, group and transport packaging
- Provides producers options for fulfilling obligations (i.e. PRO or self-compliance)
- PRO levy system reflective of actual costs
- PRO levies charged on basis of weight, volume and material type
- Reduction, reuse and recycling targets
- Incorporate voluntary initiatives
- User-pay municipal waste collection systems
- Research and development initiatives (e.g. recycling technology and new markets)
- Green procurement programs
- Regional cooperation for waste reduction and prevention
- Landfill taxes and bans
- Consumer and industry education and awareness campaigns

Furthermore, the research conducted for this project identified the need for a variety of players in order to implement a successful stewardship initiative, including all three levels of government, industry, and consumers. In order to overcome a number of the shortcomings of the other systems reviewed, an additional player has also been recommended in the Packaging Stewardship Model – the Waste Reduction and Prevention Council. One of the WRAP Council's key responsibilities would be to ensure Manitoba stewardship programs did not focus solely on recycling. Through educational campaigns and research initiatives the Council would work to encourage government, industry and consumers to re-evaluate their production or purchasing decisions in light of their environmental impact. The WRAP Council would also serve as a liaison between industry, municipalities and the provincial government. A number of the problems encountered in other jurisdictions have stemmed from poor communication between these groups. The Council would serve as neutral organization, ensuring each of these parties

was aware of the needs and limitations of the others, and assisting them to work together to reach the mutual goals of the WRAP Strategy and Packaging Stewardship Regulation (Table 8.1).

Table 8.1: Support Provided by the WRAP Council

Municipal Governments	Producers	Provincial Government
<ul style="list-style-type: none"> • Assist WMR to develop regional waste management plans which respect the 3Rs • Help WMR work with producers to develop Best Practice Guidelines • Provide technical and communicational support to the WMR to improve their ability to meet the Best Practice Guidelines • Ensure municipal needs and capabilities are known and understood by industry and the provincial government 	<ul style="list-style-type: none"> • Research the activities used by producers in other jurisdictions to improve products and packaging • Assist companies to develop plans to improve the design, production and distribution of their products • Help to promote the green activities of Manitoban companies • Ensure producers needs and capabilities are known and understood by municipalities and the provincial government 	<ul style="list-style-type: none"> • Assist the provincial government to establish voluntary stewardship agreements • Help the government to promote reduction, reuse and recycling activities to both industry and consumers • Engage in research into policies and programs used in other jurisdictions to improve the management of products and packaging • Ensure the vision and policies of the provincial government is known and understood by municipalities and industry

8.3 Recommendations

8.3.1 Implementation of the Packaging Stewardship Model for Manitoba

Waste Reduction and Prevention Strategy

The first step in implementing the Packaging Stewardship Model for Manitoba is to devise a new provincial Waste Reduction and Prevention Strategy. Manitoba Conservation has already begun to work towards the development of a holistic plan for the management of waste in the province. In 1998, a multi-stakeholder task force – the Regional Waste Management Task Force (RWMTF) - was established to evaluate ways of improving the waste management system in Manitoba. The objective of the Task Force was to “propose a vision for a province-wide solid waste management system to minimize risk to human health and the environment and support the continued growth of the Manitoba economy” (RWMTF, 2000). In December 1999, the RWMTF

released the Regional Integrated Waste Management Action Plan and Recommendations. The Action Plan addressed a number of recommendations for improving Manitoba's waste management system, including creating a level playing field, improving the waste management facility approval process, coordinating regional solid waste management planning and program delivery, and enhancing waste diversion components. Using this Action Plan and Recommendations, the province should move forward with the development of a formal strategy for the management of all waste in the province.

Packaging Stewardship Advisory Council

Once a holistic plan for the management of waste in the province has been developed, steps can be taken to address the specific requirements of different waste materials, including packaging. While the province will retain ultimate responsibility for the development of a strategic plan for coping with packaging waste, the development of any packaging stewardship plan will require the input of stakeholders. A multi-stakeholder advisory council comprised of brand owners (packaging fillers and first importers into the province), municipal governments, Manitoba Product Stewardship Corporation, consumers and non-government organizations should be established. This Packaging Stewardship Advisory Council would be responsible for further developing the Packaging Stewardship Model for Manitoba, and determining, as a group, the best way to implement the model. Some of the major decisions to be made by the advisory council include:

- The model envisions the formation of two new bodies, an industry PRO and the WRAP Council. How will these two new organizations be established?
- What will be the role of MPSC under this new paradigm? Will MPSC evolve into the provincial PRO or will it become the WRAP Council?

- How will the WRAP Council activities be funded? Since industry, municipal governments and the provincial governments would all be using their services, a joint-funding approach may be appropriate.

Best Practice Guidelines for Municipal Collection and Waste Diversion

The primary concern of industry representatives, speaking at the *Options for Plastic Packaging Workshop*, revolved around assuming financial responsibility for municipal collection programs. Producers did not want to be obliged to fund inefficient municipal systems. It was determined that the development of Best Practice Guidelines for municipal collection and waste diversion programs would alleviate some of the reservations held by industry representatives. Meetings regarding the development of Best Practice Guidelines for Municipal Collection and Waste Diversion will have to be undertaken by representatives from the Waste Management Regions, PRO and WRAP Council prior to the implementation of a packaging stewardship regulation.

Provincial Targets

The provincial government must research the type of targets it will implement, the appropriate level of these targets, a reasonable time frame for achievement and restrictions on how these targets may be achieved. The Province may wish to include the Packaging Stewardship Advisory Council in the development of these targets.

8.3.2 Further Research

As presented in Chapter 4, plastic packaging continues to present challenges to even those nations that have adopted stewardship policies for packaging and packaging waste. Further research is needed to help policy makers identify the appropriate regulatory provisions and

program elements which will help alleviate the negative environmental effects of plastic packaging. Key research areas which need to be addressed include issues such as: how to promote the development of a stable reusable packaging system; means to encourage the use of recycled plastic material; and techniques for coping with small plastic packaging. Policy tools, which may help to resolve some of these issues, include: minimum recycled content regulations, product bans, eco-taxes, product design criteria, and 'all bottles' programs. The packaging stewardship model presented in Chapter 7 accounts for this need, placing the WRAP Council in charge of conducting research into improving the management of plastic.

Further research is also needed to explore the concept of reuse, to determine why the rates of reuse appear to be declining world-wide and to assess what can be done to encourage reuse as a viable alternative to landfilling or incineration. There is much debate as to whether or not reuse is in fact more ecological sound than recycling; such research should attempt to answer this question. If these studies conclude that reuse is of greater environmental benefit than recycling, action should be taken to make the reuse of packaging and other waste products in the province more economically viable and attractive to producers.

Packaging stewardship involves transferring traditional waste management responsibilities from municipalities and taxpayers to producers and consumers. This project focused upon identifying the concerns and issues industry has with the concept of extended producer responsibility. Since consumers also must play a role in order for packaging stewardship initiatives to be successful, further studies should be conducted to identify the opinions and concerns consumer have with the implementation of EPR. In addition, research is also needed to determine ways to motivate consumers to make wiser purchasing decisions and demand environmentally friendly packaging from producers.

8.4 Final Thoughts

The New Deal

The City of Winnipeg, under the leadership of Glenn Murray, is currently exploring shifting their municipal tax base. The plan, referred to as the *New Deal*, is looking to reduce the City's reliance on property and business taxes, and expanding its sources of revenue to include gasoline, liquor, sales, natural gas, electricity and garbage collection taxes. Each of these taxes is related to consumption (user-pay), meaning if consumers reduce their use of these items, they will be able to reduce their tax burden ("A Home Run for Winnipeg?", 2003).

The waste collection tax under consideration involves a levy of one-dollar on each bag of garbage collected. It is hoped that charging consumers for their waste will provide them with an incentive to make wiser purchasing decisions and increase their involvement in reuse and recycling activities. While this initiative would ensure waste management responsibilities were transferred from taxpayers to consumers, it does not address the need for the transfer of responsibility from municipal governments to producers. Municipalities do not have the jurisdiction or clout to implement EPR initiatives, thus it is the responsibility of the provincial government to work with municipalities to coordinate their waste prevention, reduction and diversion mandates and programs. The implementation of the proposed Packaging Stewardship Model would greatly assist local Manitoba governments as they work to improve the economic, social and environmental status of their communities.

Concluding Remarks

When Manitoba first enacted the WRAP Act, the province was considered a Canadian pioneer in the area of packaging waste management. The Multi-Material Stewardship Regulation, which establishes the Manitoba Product Stewardship Corporation, has had significant success in improving Manitoba communities' access to recycling programs and increasing the

amount of recovered materials in the province. Unfortunately, the multi-material stewardship system has several fundamental shortcomings. The program focuses primarily on recycling and has done little to promote the elimination, reduction or reuse of packaging and other designated materials. Further, the policy does not place the appropriate emphasis on producers and their involvement in waste reduction and prevention. Finally, the system has not been able to slow the growth of plastic packaging waste or to attain the plastic packaging reduction, recovery and recycling rates achieved in other jurisdictions.

Great strides have been taken in Manitoba to implement an effective and efficient province-wide recycling program, however a mature stewardship program is still evolving. Steps must be taken to incorporate the fundamental elements of extended producer responsibility into the provincial waste management approach. The concept of packaging stewardship offers benefits beyond reducing municipal recycling costs and extending the lifespan of provincial landfill sites. These initiatives have been found to yield substantial environmental benefits, including: reducing the amount of packaging on the market, lowering energy consumption and greenhouse gas production levels, reducing dependency on virgin materials, and increasing recycling rates. EPR programs have also been associated with many economic advantages, such as instigating the development of new processing and recycling technology, prompting new markets for secondary materials, spurring on new business enterprises (e.g. processing facilities, manufacturing plants); leading to new job opportunities in research, development, collection, processing and recycling, and providing financial savings for companies improving their design, production and distribution processes. The Packaging Stewardship Model proposed in this thesis has the potential to once again make Manitoba a Canadian leader in the area of packaging waste reduction and prevention.

Appendix A - Plastics Used in Packaging

	Plastic Type	Positive Attributes	Negative Attributes	Common Packaging End-uses
#1	Polyethylene Terephthalate (PET)	<p>Transparent, tough and shatter resistant</p> <p>Available in film, fibre and container form</p> <p>Low permeability to carbon dioxide and moisture make PET ideal for bottling carbonated beverages</p> <p>Resistance to high temperatures and microwave transparency make this resin ideal for heatable films and trays</p>	<p>Not resistant to bases</p>	<p>Bottles: soft drinks, water, beer</p> <p>Food Containers: peanut butter, salad dressing, edible oil</p> <p>Food Preparation Containers: boil-in-bags, heatable food trays, heatable films</p> <p>Toiletries: shampoo bottles, mouthwash bottles, facial cleansers</p> <p>Other: detergent bottles</p>
#2	High Density Polyethylene (HDPE)	<p>Harder, stronger, heavier and stiffer than LDPE</p> <p>Available in film or container form</p> <p>Easy to process and mold</p> <p>Resistant to moisture and most chemicals</p> <p>Pigmented HDPE has better stress, crack and chemical resistance than unpigmented</p>	<p>Permeable to gases and not appropriate for end-use applications which require an oxygen or carbon dioxide barrier.</p> <p>Not resistance to aromatic and chlorine based chemicals</p> <p>More expensive than LDPE</p>	<p>Bottles: milk, water, juice, other non-carbonated beverages</p> <p>Food Containers: yogurt, ice cream, margarine, whipped toppings</p> <p>Bags: cereal box liners, snack food packaging, trash bags, grocery bags</p> <p>Other: motor oil containers, liquid-laundry detergent and household cleaners</p>
#3	Polyvinyl Chloride (PVC)	<p>The most versatile of all resins used in packaging</p> <p>One of the least expensive resins</p> <p>PVC film provide a moderate barrier to oxygen making them ideal for packing fresh meats which require some oxygen to remain bright red</p> <p>Resistant to moisture, heat and flame, grease and oil and most chemicals</p> <p>Shiny, tough and strong</p> <p>Easily blended with a wide variety of chemical additives</p> <p>Available in film or container form</p> <p>Available in clear, translucent and opaque forms</p> <p>Resistant to puncturing and kinking</p>	<p>Not resistant to solvents</p> <p>Not resistant to higher temperatures</p> <p>PVC plastics are brittle and unstable unless combine with additives known as plasticizers</p> <p>Higher density than PE or PP</p> <p>Plasticizers evaporate over time, gradually embrittling PVC products</p> <p>Vinyl chloride is a carcinogen</p> <p>The incineration of PVC is alleged to form dioxin</p>	<p>Bottles: water, cooking oil, liquor</p> <p>Toiletries: cosmetics, shampoo bottles, mouthwash, other personal care products</p> <p>Other: fresh meat packaging, "bubble" pack and films</p>

#4	Low Density Polyethylene (LDPE)	<p>Strong, tough and flexible</p> <p>Resistant to moisture and most chemicals</p> <p>Available in film and container form</p> <p>Low melting point makes LDPE ideal for end-use applications where heat sealing is required</p> <p>Easy to process</p>	<p>Permeable to gases and not appropriate for end-use applications which require an oxygen or carbon dioxide barrier</p>	<p>Bottles: squeezable bottles for honey and mustard</p> <p>Bags: bread, frozen-food, garbage, grocery, produce</p> <p>Film: produce and baked goods, shrink and stretch wrap</p> <p>Coatings: milk containers and water-proof and grease-proof coatings for other paperboard packaging</p> <p>Other: flexible lids, dairy tubs, adhesives in multilayer packaging</p>
#5	Polypropylene (PP)	<p>Versatile, tough and stiff</p> <p>Resistant to moisture, grease and oil, and most chemicals</p> <p>Available in film and container form</p> <p>Lowest density of all the resins used in packaging</p> <p>High melting point makes PP ideal for hot-filling applications in which products must cool in the bottle (e.g. ketchup and syrup)</p> <p>PP is ideal for end-use applications in which the product needs to incubated (e.g. yogurt)</p> <p>High tensile strength makes PP ideal for caps and lids</p>	<p>PP tends to be brittle at lower temperatures and must be combine with ethylene to be used in applications which require refrigeration</p> <p>Poor resistance to oxygen</p>	<p>Bottles: ketchup, syrup, medicine</p> <p>Food Containers: margarine, yogurt and other dairy products</p> <p>Other: bottle labels, screw-on caps and lids</p>
#6	Polystyrene (PS)	<p>Transparent and versatile</p> <p>Available in film, as well as foam and rigid container forms</p> <p>PS foams are stiff, lightweight and possess excellent insulative properties</p> <p>PS is easy and inexpensive to process</p>	<p>Low melting point</p> <p>PVC films and foams have extremely poor resistance to gases</p>	<p>Foam Trays and Containers: meat trays, egg cartons, take-out restaurant containers, dehydrated food (e.g. soups)</p> <p>Food Service Applications: clear cups and trays, foam cups and plates, disposable utensils</p> <p>Films: wrap for baked goods, windows in paperboard packaging</p> <p>Other: aspirin bottles, CD jackets, packing materials</p>

(American Plastics Council, 2000; Billatos & Basaly, 1997; Curlee & Das, 1991; Earthbound Environmental Inc., 1999; EPIC, 2001; Jenkins & Harrington, 1991; Porro & Mueller, 1993).

Appendix B - Manitoba Food Producers Survey

Basic Packaging Information

What type of plastic(s) are used in your packaging?

What component(s) of your packaging are composed of plastic (container, tub, bottle, lid, film, coating)?

Why have you chosen these particular plastics?

Does your packaging contain more than one material? If yes, which materials?

What types of products are your food packages designed to contain?

Do you produce your packaging yourself?

If not, do you create the specifications for your packaging (or buy standardized packaging)?

Environmental Impact

What would you identify as the environmental benefits of using plastic packaging?

What would you identify as the environmental disadvantages of using plastic packaging?

Do you believe there is a problem with the amount of natural resources being used to make packaging?

Do believe that too much packaging is being sent to landfills?

When designing your packaging do you take into consideration the environmental impact of your packaging?

Has your company taken steps to improve the environmental friendliness of your packaging?

Have you conducted a lifecycle analysis of the environmental impacts of your packaging?
If so, did you act upon the findings of the lifecycle analysis?
If not, have you ever considered conducting a lifecycle analysis of your packaging?

Could steps be taken to improve the environmental friendliness of your packaging? If yes, why have you not yet done so?

Elimination and Reduction

Can packaging weight or volume be reduced by using different packaging materials or container forms?

Does your packaging or its components (i.e. inks, dyes, pigments, stabilizers, solders and adhesives) contain any toxic materials (e.g. arsenic, cadmium, lead, mercury, hexavalent chromium)? If so, could these materials be excluded or reduced?

Reuse/Refilling

Can the package or one of its components be reused as the same item?

If so, is there a system in place to collect and reuse these used packages?
If not, have you conducted study into the advantages and disadvantages of converting to a reusable packaging system?

Recycling

Does the technology exist to sort and recycle your packaging?

If not, is the necessary research being conducted to develop this technology? Is your company involved?

Are recycling systems established for your packaging material in all regions in which the package will be sold or distributed?

If not, is such a recycling system under development? Are you participating?

Could your packaging be more recyclable by: using easily separable components; using a single material type for entire package (e.g. bottle, closure, and label); avoiding coloured or tinted plastics; avoid using toxic materials; consumer instructions (rinsing, sorting); other?

Is there a viable commercial market for these post-consumer recycled packaging materials?

If not, are any projects or programs to increase demand for this recycled material being initiated? Is your company participating?

Does your packaging contain recycled material?

If so, what percentage of the material is recycled?
If so, is there a symbol and statement on the package to inform the consumer recycled materials have been used?
If not, has your company considered using recycled materials?

Degradability

Does your packaging contain biodegradable, photodegradable or chemically degradable plastics?

If so, will the intended disposal system (e.g. landfill, sewage) provide the right environmental conditions for degradation?

Is so, will degradability produce any by-products which are harmful to the environment?

If not, has research been undertaken to evaluate the positive and negative aspects of using degradable materials?

Eco-Labeling

Does your packaging contain any labels to promote a product or packaging feature which is considered environmentally friendly? _____

Is your packaging certified by an eco-labelling program?

If not, have you ever considered seeking such accreditation?

Packaging Stewardship & Related Legislation

Do you believe Manitoba municipalities are doing a good job of collecting and recycling plastic packaging?

Are you familiar with Multi-material Stewardship Regulation? If yes, what is your opinion of this regulation? What would you say were the successes? Shortcomings? Changes?

Do you think changes could be made to improve plastic packaging recovery and recycling in this province? (if so, describe)

Are you familiar with the concept of extend producer responsibility?

If so, what is your opinion of extended producer responsibility?

Do you believe producers should play a larger role (e.g. physical management, financial contribution, education, communication, research) in the management of packaging waste?

If so, what should their responsibility be? If not, why not?

Do you believe consumers should play a larger role in the management of packaging waste?

If so, what should their responsibility be? If not, why not?

Do you sell your product outside of Manitoba? _____

Are you aware of all current and proposed legislation related to packaging stewardship in markets where your package will be sold or distributed?

Will existing or proposed legislation (e.g. mandatory recycled content, material bans, levies, taxes, etc.) in any of the markets you supply affect your packaging design and materials?

Does your company act in an advisory capacity to federal, provincial and/or local governments on environmental matters related to your industry?

Appendix C - Canadian Plastic Packaging Manufacturers Survey

Basic Packaging Information

What type of plastic(s) are used in your packaging?

What component(s) of your packaging are composed of plastic (container, tub, bottle, lid, film, coating)?

Why have you chosen these particular plastics?

Does your packaging contain more than one material? If yes, which materials?

What types of products are your food packages designed to contain?

Do you work together with your customers to design packaging to meet their needs?

Environmental Impact

What would you identify as the environmental benefits of using plastic packaging?

What would you identify as the environmental disadvantages of using plastic packaging?

Do you believe there is a problem with the amount of resources being used to make

Do believe that too much packaging is being sent to landfills?

When designing your packaging do you take into consideration the environmental impact of your packaging?

Has your company taken steps to improve the environmental friendliness of your packaging? (describe)

Have you ever conducted a lifecycle analysis of the environmental impacts of your packaging?
If so, did you act upon the findings of the lifecycle analysis?
If not, have you ever considered conducting a lifecycle analysis of your packaging?

Could steps be taken to improve the environmental friendliness of your packaging?
If yes, why have you not yet done so?

Elimination and Reduction

Can packaging weight or volume be reduced by using different packaging materials or container forms?

Does your packaging or its components (i.e. inks, dyes, pigments, stabilizers, solders and adhesives) contain any toxic materials (e.g. arsenic, cadmium, lead, mercury, hexavalent chromium)? If so, could these materials be excluded or reduced?

Do you assist customers ensure they are packaging their products in appropriately sized containers? Do you assist customers to ensure they are filling packaging to appropriate levels?

Reuse/Refilling

Can the package or one of its components be reused as the same item?

If so, is there a system in place to collect and reuse these used packages?
If not, have you conducted study into the advantages and disadvantages of converting to a reusable packaging system?

Recycling

Does your company recycle the waste material created by the production process?

Do your customers return packaging waste produced during the filling process to you, the package manufacturer, for recycling?

Does the technology exist to sort and recycle your packaging?

If not, is the necessary research being conducted to develop this technology?
Is your company involved?

Could your packaging be more recyclable by: using easily separable components; using a single material type for entire package (e.g. bottle, closure, and label); avoiding coloured or tinted plastics; avoid using toxic materials; consumer instructions (rinsing, sorting); other?

Is there a viable commercial market for these post-consumer recycled packaging materials?

If not, are any programs to increase demand for this recycled material being initiated?
Is your company participating?

Does your packaging contain recycled material?

If so, what percentage of the material is recycled?
If so, is there a symbol/statement on the package to inform the consumer recycled materials have been used?
If not, has your company considered using recycled materials?

Degradability

Does your packaging contain biodegradable, photodegradable or chemically degradable plastics?

If so, will the intended disposal system (e.g. landfill, sewage) provide the right environmental conditions for degradation?

Is so, will degradability produce any by-products which are harmful to the environment?

If not, has research been undertaken to evaluate the positive and negative aspects of using degradable materials?

Eco-Labeling

Does your packaging contain any labels to promote a product or packaging feature which is considered environmentally friendly?

Is your packaging certified by an eco-labelling program?

If not, have you ever considered seeking such accreditation?

Packaging Stewardship & Related Legislation

Are you familiar with the concept of extend producer responsibility?

If so, what is your opinion of extended producer responsibility?

Do you believe producers should play a larger role (e.g. physical management, financial contribution, education, communication, research) in the management of packaging waste?

If so, what should their responsibility be?

If not, why not?

Do you believe consumers should play a larger role in the management of packaging waste?

If so, what should their responsibility be? If not, why not?

Are you aware of all current and proposed legislation in markets where your package will be

Will existing or proposed legislation (e.g. mandatory recycled content, material bans, levies or taxes, etc.) in any of the markets you supply affect your packaging design and materials?

Does your company act in an advisory capacity to federal, provincial and/or local governments on environmental matters related to your industry?

Are you aware of the National Packaging Protocol?

If so, did your organization partake in any activities related to this protocol (e.g. Canadian Code of Preferred Packaging Practices, packaging audits, packaging reduction work plans)?

Appendix D - Trade Association and Non-government Organization Survey

- What is the role of your organization?
- Does your organization see the need for mandatory or voluntary policies/programs to promote the reduction, reuse and recycling of plastic packaging?
- Do you believe there is a problem with the amount of natural resources being used to make packaging?
- Do you believe there is too much packaging going into landfills?
- What is your organizations position on extended producer responsibility (or packaging stewardship) policies and programs?
- What would be your concerns if EPR legislation were to be introduced in Manitoba?
- Do you believe producers should play a larger role (e.g. physical management, financial contribution, education, communication, research) in the management of packaging waste?
- Do you believe that consumers should play a larger role in the management of packaging waste?
- What do you believe should be the role of government – federal, provincial and municipal – in the management of packaging waste?

Options for Plastic Packaging Stewardship Workshop

June 26, 2003

Agenda

12:30 - 1:00 Registration

**1:00 - 1:15 Jim Ferguson, Policy Analyst - Waste Reduction & Prevention,
Manitoba Conservation**

Product Stewardship in Manitoba

**1:15 - 1:50 Barry Friesen, Solid Waste Resource Manager,
Nova Scotia Environment & Labour**

A review of the tools Nova Scotia has adopted to improve the management of plastic packaging (landfill bans, deposit-refund program and industry-government agreements)

1:50 - 2:10 International Plastic Packaging Stewardship Policies & Programs

Lisa Quinn, Natural Resource Institute

2:10 - 2:40 Questions & Discussion

2:40 - 3:00 Coffee Break

3:00 - 3:20 Direction for Plastic Packaging Stewardship in Manitoba

Lisa Quinn, Natural Resource Institute

3:20 - 4:50 Group Discussion

4:50 - 5:00 Workshop Wrap-up

Appendix F - European PRO Stewardship Fees

DSD Stewardship Fees

(as of January 01, 2002)

Weight-related Fees		
	Euro/kg	CAD/kg
Paper/cardboard/carton	0.20	0.31
Glass	0.08	0.12
Tinplate	0.29	0.44
Aluminium and other metals	0.77	1.17
Plastic	1.51	2.30
Composite Cartons (liquid and pastry contents)	0.86	1.32
Other Composites	1.07	1.64
Item Fees		
Volume-Related Fees		
<50mL to 200mL	0.0005 - 0.0030	0.0008 - 0.0046
>200mL to 3L	0.0035 - 0.0046	0.0053 - 0.0070
Greater than 3L	0.0061	0.0093
Area-related Fees		
<150cm ² to 300cm ²	0.0005 - 0.0020	0.0008 - 0.0030
>300cm ² to 1,600cm ²	0.0030	0.0046
Greater than 1,600cm ²	0.0046	0.0070

The weight-related fee is calculated by multiplying the mass of the package by the cost per kilogram. The flat volume or area-related fee is then added to the weight-related value to yield the steward's fee per package.

ARA System Material Fees (Packaging from Household Sector)

(as of January 1, 2002)

	Euro/kg	CAD/kg
Paper, cardboard, board, corrugated board	0.15	0.23
Glass (non-reusable)	0.09	0.13
Aluminium	0.43	0.66
Small ferrous metals (<3L)	0.36	0.55
Small plastics (<1.5m ² or <0.15kg)	0.81	1.23
Composites (excluding beverage containers)	0.75	1.14

REPA System Material Fees

(as of February 2002)

	SEK/kg	CAD/kg
Paper/Cardboard	0.35	0.06
Corrugated Board	0.23	0.04
Glass	0.13	0.02
Metal	1.50	0.25
Metal (steel barrel)	0.06	0.01
Plastic	1.50	0.25

Appendix G - Duales System Deutschland Recycling Rates 1999-2001

	1999			2000			2001		
	Licensed	Recycled	Recycling Rate	Licensed	Recycled	Recycling Rate	Licensed	Recycled	Recycling Rate
Glass	3,080,068	2,708,585	88%	2,934,341	2,664,014	91%	2,677,638	2,499,450	93%
Paper/Cardboard	879,194	1,484,786	169%	902,812	1,505,956	167%	891,723	1,483,941	166%
Plastics	565,054	610,165	108%	611,589	570,304	93%	678,500	589,667	87%
Composites	591,380	390,538	66%	564,441	375,711	67%	563,543	367,915	65%
Tinplate	306,804	322,314	105%	284,291	318,086	112%	276,189	314,347	114%
Aluminium	42,453	37,144	87%	43,489	41,306	95%	40,480	42,621	105%

Appendix H: Manitoba Product Stewardship Corporation Recycling Rates 2001/2002 – 2002/2003

	2002-2003			2001-2002		
	Generated (tonnes)	Recycled (tonnes)	Recycling Rate	Generated (tonnes)	Recycled (tonnes)	Recycling Rate
Newspapers, Magazines, Flyers, Phone Directories	35,651	30,323	85%	35,651	26,957	76%
Corrugated Cardboard	10,722	5,057	47%	10,722	4,496	42%
Glass Containers	13,862	6,129	44%	13,862	5,474	39%
PET Containers	2,744	1,209	44%	2,744	1,078	39%
Aluminium Cans	1,894	648	34%	1,894	631	33%
Metal Cans	6,226	1,884	30%	6,226	1,656	27%
Boxboard	9,683	2,644	27%	9,683	2,281	24%
HDPE Containers	3,881	970	25%	3,881	871	22%
Polycoat & Aseptic Containers	2,117	444	21%	2,117	391	18%
Rigid Plastics	1,645	61	4%	871	7	0%
Total Eligible Materials	88,425	49,367	56%	87,651	43,841	50%

References

- A Home run for Winnipeg?* (2003, October 15). Retrieved November 6, 2003 from www.fcpp.org.
- Alexander, J.H. (1993). *In Defense of Garbage*. Westport, CT: Praeger Publishers.
- American Plastics Council (2000, March). *Plastic Packaging Resins*. Retrieved January 14, 2002, <http://www.plasticsresource.com>.
- American Plastics Council (1999). *Information on advanced recycling technology*. Retrieved December 2, 2002, from www.plasticsresource.com/recycling/recycling_background/bk_advanced.html
- American Plastics Council (no date). *How plastics are made*. Retrieved January 3, 2002, http://www.plasticsresource.com/plastics_101/manufacture/how_plastics_are_made.html
- Association of Plastics Manufacturers in Europe. (2000). *The market – plastic packaging figures*. Retrieved June 11, 2003, from www.apme.org.
- Australian and New Zealand Environment and Conservation Council. (1999). *The National Packaging Covenant*. Retrieved June 21, 2002, from www.ea.gov.au/industry/waste/covenant/index.html
- Australian Industry Group. (2002, June 11). *National Packaging Covenant*. Retrieved April 23, 2003 www.acm.org.au/natpakcov.html.
- Bailey, I. (1999). Flexibility, harmonization and the single market in EU environmental policy: The Packaging Waste Directive. *Journal of Common Market Studies*, 37(4), 549-571.
- Billatos, S.B. & Basaly, N.A. (1997). *Green Technology and Design for the Environment*. Washington, D.C.: Taylor & Francis.
- Bhat, V.N. (1996). *The Green Corporation: The next competitive advantage*. Westport, CT: Quorum Books.
- Breslow, M. (1993). Reducing pollution and disposal costs by taxing materials. *Resource Recycling*, XII(6), 82-86.

- California Integrated Waste Management Board (2002). *Recycled-content trash bag program*. Retrieved June 10, 2003 from www.ciwmb.ca.gov/BuyRecycled/TrashBags/.
- Canadian Council of Ministers of the Environment. (1996, May). *Guiding Principles for Packaging Stewardship*. Winnipeg, Manitoba: CCME.
- Charles, D. (1997). Recycling madness revives obsolete plants. *New Scientist*, 153(2072), 6.
- Chiras, D.D. (1994). *Environmental Science Action for a Sustainable Future*. Redwood City, California: The Benjamin/Cummings Publishing Company Inc.
- Chua, J. (2002). Waste not, want not – Canada’s trash dilemma. *CBC.CA Consumers: Special Report*. Retrieved April 6, 2002, from www.cbc.ca/consumer/indepth/waste/index.html.
- Coghlan, A. (1994, July 2). Can burning plastics be good for the world? *New Scientist*, 143(1932), 20.
- Companies face mish-mash of rules (1995, June 7). *Financial Post Daily*, 8 (71), 16.
- Commission of the European Communities. (2001a). *Proposal for a directive of the European Parliament and of the Council amending Directive 94/62/EC on packaging and packaging waste*. Retrieved May 13, 2002 from europa.eu.int
- Commission of the European Communities. (2001b). *Green Paper on Integrated Product Policy* [COM(2001) 68 final].
- Connett, P. (1998). *Municipal Waste Incineration: A poor solution for the twenty first century*. Paper presented at 4th Annual International Management Conference: Waste-to-Energy. November 24 & 35, 1998. Amsterdam. Retrieved August 12, 2003 from www.no-burn.org/resources/library/Poor_solution.pdf
- Consumer Glass. (1998). Extended producer responsibility (EPR) – Fatal flaws. *Glass Works* 9(3), 2.
- Curlee, T.R. & Das, S. (1991). *Plastic Wastes: Management, Control, Recycling, and Disposal. Pollution Technology Review No. 201*. Park Ridge New Jersey: Noyes Data Corporation.

- Davis, G.A. (1999). *Principles for Application of the Extended Producer Responsibility*. Paper presented at the OECD Workshop on EPR and Waste Minimization in Support for Environmental Stability, May 4-7, 1999.
- Department of Fisheries, Aquaculture and Environment (nd). *Green facts: Refillable containers*. Retrieved August 20, 2003 from www.gov.pe.ca/fae/env/retailerguide.php3.
- Diekmeyer, P. (2001, Autumn). Standards and costs guide municipal environmental purchasing. *Summit: The Business of Public Sector Procurement*, 8-9.
- Duales System Deutschland. (2002a). *Europe Goes Green Dot 2002/2003*. Cologne, Germany: Duales System Deutschland.
- Duales System Deutschland. (2002b). *Annual Report 2001*. Cologne, Germany: Duales System Deutschland.
- Duales System Deutschland. (2001a). *Europe Goes Green Dot 2002/2003*. Cologne, Germany: Duales System Deutschland.
- Duales System Deutschland. (2001b). *Annual Report 2000*. Cologne, Germany: Duales System Deutschland.
- Duales System Deutschland. (2000). *Annual Report 1999*. Cologne, Germany: Duales System Deutschland.
- Duales System Deutschland. (1998). *Annual Report 1997*. Cologne, Germany: Duales System Deutschland.
- Duales System Deutschland. (1995). *Annual Report 1994*. Cologne, Germany: Duales System Deutschland.
- Earthbound Environmental Inc. (1999). *Waste Plastics in Manitoba: Key Factors in Sustainable Plastics Diversion*. Winnipeg, Manitoba: Earthbound Environmental Inc.
- Eco-labelling & trade. (1999). *ACF Briefing Paper*. Retrieved July 13, 2002, from <http://members.iinet.net.au/~jenks/ACFecol.html>.

Environment Canada (2002). *An inventory of waste diversion programs in Canada – Part I: Programs funded in whole or part by industry and consumers. ON Waste Diversion Act.* Retrieved April 5, 2003 from www.ec.gc.ca/epr/inventory/en/index.cfm.

Environment Canada. (2001). *Extended Producer Responsibility & Stewardship: Packaging Stewardship.* Retrieved January 27, 2002 from www.ec.gc.ca/epr/en/stewardship.cfm.

Environment Canada. (1997). *The Role of Economic Instruments in Sustainable Production and Consumption.* Paper prepared for National Conference on Sustainable Consumption and Production.

Environment and Plastics Industry Council. (2001, July). *Special News & Views Report: Different Applications, Different Plastics.* Retrieved January 29, 2002 from www.plastics.ca/epic.

Environment and Plastic Industry Council. (n.d.). *Technical report summary: A fresh look at the options for managing plastic packaging.* Retrieved March 21, 2003 from www.plastics.ca/epic.

Environment and Plastics Industry Council. (1999). *Position Statement: Integrated Solid Waste Management.* Retrieved January 29, 2002 from www.plastics.ca/epic.

Environment Management Branch. (2003, July). *Overview of industry product stewardship in British Columbia.* Retrieved July 30, 2003 from <http://wlapwww.gov.bc.ca/epd/epdpa/ips/index.html>.

European Parliament and Council. (1994). *European Parliament and Council Directive 94/62/EU on packaging and packaging waste.* Brussels, Belgium: Commission of the European Communities.

Federal Government of Germany. (1998). *Ordinance on the Avoidance and Recovery of Packaging Waste (Verpackungsverordnung).* Federal Law Gazette I p. 2379. Bonn, Germany.

Federation of Canadian Municipalities. (2003). *2003 policy statement on environmental issues.* Retrieved November 7, 2003 from www.fcm.ca.

- Fishbein, B.K. (1998). EPR: What does it mean? Where is it headed? [Electronic Version]. *P2: Pollution Prevention Review*, 8, 43-55.
- Friends of the Earth (Sydney). (1998). *Demystifying EPR – Extended Producer Responsibility*. Retrieved May 14, 2002 from http://homepages.tig.com.au/~foesyd/SustainableConsumption/epr_pamphlets/demystifying_epr.html
- Fulmer, M. (2001). *Can consumers trust “eco-labels”?* Retrieved July 13, 2002 from <http://www.purefood.org/Organic/ecolabel1082801.cfm>.
- Gibson, R. & Lynes, J. (1998). Voluntary corporate initiatives for environmental improvement. *Alternatives*, 24(2), 18-19.
- German Federal Environmental Ministry. (2002). *Questions and answers on the “drink can deposit”*. Retrieved January 19, 2003 from www.bmu.de/english.
- Government of Ontario. (2001, June 26). Harris government introduces Waste Diversion Ontario. *Canadian Newswire*. Retrieved February 13, 2003 from www.newswire.ca.
- Government of Prince Edward Island. (nd). *PEI bans the can*. Retrieved August 20, 2003 from www.gov.pe.ca/infopei/Government/GovInfo/Environment_and_Land/Environmental_Protection/Environmental_Update/.
- Hanisch, C. (2000). Is extended producer responsibility effective? *Environmental Science & Technology*, 34(7), 170-175.
- Hershkowitz, A. (1993, June). How garbage could meet its maker. *The Atlantic Monthly*, 108-109.
- Industry Canada. (2001a). *Canadian Plastic Products Industry*. Retrieved December 3, 2001 from <http://strategis.ic.gc.ca/SSG/p101279e.html>.
- Industry Canada. (2001b). *Canadian Synthetic Resin Industry*. Retrieved December 2, 2001 from <http://strategis.ic.gc.ca/SSG/p100264e.html>.
- Institute for Local Self-Reliance. (2000). *Extended Producer Responsibility Tools*. Retrieved March 30, 2002 from www.ilsr.org/recycling/tools.html.

- Jenkins, W.A. & Harrington, J.P. (1991). *Packaging Food with Plastics*. Lancaster, Pennsylvania: Technomic Publishing Company.
- Johnson, E. (2001). Overpackaging: Extended producer responsibility (EPR) in Canada. *CBC.CA Consumers: Marketplace*. Retrieved April 6, 2002 from <http://cbc.ca/consumers/market/files/home/overpackaging/index.html>.
- Jordan, K., Gonser, J., Radermakers, F., & Jorgensen, R. (2001). *European Commission DGXI.E.3: European Packaging Waste Management Systems Final Report*. Retrieved May 23, 2003 from europa.eu.int
- Lease, K. (2000, October 16). Product stewardship in British Columbia. *Facts to Act On*, 39. Washington, DC: Institute for Local Self-Reliance.
- LeGault, M.R. (2002, July 30). Recycling Radicalism. *National Post*, FP11.
- Legislative Assembly of Manitoba. (1995). *Multi-Material Stewardship (Interim Measure) Regulation, Manitoba Regulation 39/45*. Winnipeg, Manitoba.
- Legislative Assembly of Manitoba. (1990). *The Waste Reduction and Prevention Act, Chapter w40*. Winnipeg, Manitoba.
- Legislative Assembly of Ontario. (2001a). *Bill 90 – Waste Diversion Act, 2001*. Retrieved February 13, 2002 from www.ontla.on.ca/library/bills/90372.htm.
- Legislative Assembly of Ontario. (2001b). *First Reading: Bill 90 – Waste Diversion Act, 2001*. Retrieved February 13, 2002 from www.ontla.on.ca/handsard/house_debates/37_parl/Session2/L036A.htm.
- Levenson, H. (1990). Wasting away: Policies to reduce trash toxicity and quantity. *Environment*, 32(2), 10-15, 31-36.
- Manitoba Product Stewardship Corporation. (2003a). *Recovery of MPSC eligible materials*. Retrieved November 10, 2003 from www.mpsc.com.
- Manitoba Product Stewardship Corporation. (2003b, February). *New Guide to Plastic Recycling in Manitoba*. Winnipeg, Manitoba: MPSC.

- Manitoba Product Stewardship Corporation. (2002a). *Annual Report 2001-2002*. Winnipeg, Manitoba: MPSC.
- Manitoba Product Stewardship Corporation. (2002b, October). *Worth every penny: The benefits of MPSC's Multi-Material System*. Winnipeg, Manitoba: MPSC.
- Manitoba Product Stewardship Corporation. (2001). *Annual Report 2000-2001*. Winnipeg, Manitoba: MPSC.
- Manitoba Product Stewardship Corporation. (nd). *About*. Retrieved February 20, 2002 from www.mpsc.com.
- Meyers, H.M. & Lubliner, M.J. (1998). *The Marketer's Guide to Successful Package Design*. Chicago, Illinois: NTC Business Book.
- Ministry of Water, Land and Air Protection. (2003, February 14). *Product Stewardship Regulation Review: A discussion paper*. Retrieved May 1, 2003 from wlapwww.gov.bc.ca/epd/epdpa/ips/reg_review.html.
- Ministry of Water, Land and Air Protection. (2002). *British Columbia industry product stewardship business plan 2002/2003 – 2004/2005*. Retrieved December 6, 2002 from wlapwww.gov.bc.ca/epd/epdpa/ips/reg_review.html.
- Mitchell, B. (2002). *Resource and environmental management*. Harlow, England: Prentice Hall.
- Morawski, C. (2000, Aug/Sept). Where is plastic packaging leading us? *Solid Waste Magazine*. Retrieved November 9, 2003 from www.solidwastemag.ca.
- Morawski, C. (1999, Oct/Nov). Caught NaPPing. *Solid Waste Magazine*. Retrieved January 27, 2002 from www.solidwastemag.com.
- National Environment Protection Council. (1999, July 2). *National Protection Measure: Used Packaging Materials*. Retrieved April 28, 2003 from www.ea.gov.au/industry/waste/covenant/index.html.
- National Packaging Covenant Council. (2000, October). *National Packaging Covenant First Annual Report*. Retrieved January 16, 2003 from www.ea.gov.au/industry/waste/covenant/index.html.

- Natural Resources Defense Fund. (1997). *Too Good To Throw Away: Recycling's Proven Record*. Retrieved July 10, 2002 from <http://www.nrdc.org/cities/recycling/recyc/recyinx.asp>.
- Newcorn, D. (1997, July). *Recycled content: Is the loop broken?* Retrieved November 9, 2003 from www.packworld.com.
- Nova Scotia Milk Packaging Stewardship Agreement. (2000, February 1). Retrieved April 28, 2003 from www.gov.ns.ca.
- Nova Scotia Department of the Environment. (2001). *Status report 2001 of solid waste-resource management in Nova Scotia*. Retrieved May 5, 2003 from www.gov.ns.ca/envi/wasteman.
- Nova Scotia Department of the Environment (1995, October 27). *Nova Scotia – Solid Waste-Resource Management Strategy*. Retrieved April 28, 2003 www.gov.ns.ca/enla/emc/wastman/swms.htm.
- Organisation for Economic Cooperation and Development. (2001). *Extended Producer Responsibility: A Guidance Manual for Governments*. Paris, France: OECD Publications.
- Organisation for Economic Cooperation and Development. (2002). *OECD Canadian Plastics Sector Study*. Retrieved June 24, 2002 from www.oecd.org/pdf/M0002900/M00029237.pdf.
- Our Common Future: The World Commission on Environment and Development. (1987). Bruntland, G. (ed.). Oxford, England: Oxford University Press.
- PAC weary of further government meddling. (2001). *Canadian Packaging*, 54(6), 6.
- Packaging. (1994, February). *Waste Age*, 32-40.
- Packaging Council of Australia.(2003, July). *Signatories to the National Packaging Covenant*. Retrieved August 24, 2003 from www.packcoun.com.au.
- Packaging Council of Australia. (nd). *The National Packaging Covenant and National Environment Protection Measure (NEPM) – An overview*. Retrieved April 30, 2003 www.packcoun.com.au.

- Packaging Stewardship Group. (1994). Appendix A: Harmonizing the Implementation of Packaging Stewardship. In *Principles and Harmonization Issues: Packaging Stewardship in Canada*.
- Partridge, E. (2003). *Beverage Container Stewardship Program Regulation Annual Report by Director, 2001 Reporting Period*. Retrieved July 30, 2003 from <http://wlapwww.gov.bc.ca/epd/epdpa/ips/bev/bev2001.html>, (Available July 30/03).
- Porro, J.D. & Mueller, C. (1993). *The Plastic Waste Primer: A Handbook for Citizens*. New York, NY: Lyons & Burford.
- Province of British Columbia. (1997). *Beverage Container Stewardship Program Regulation, B.C. Reg. 406/97*. Victoria, BC: Queen's Printer.
- Province of Nova Scotia. (2002). *Solid waste-resource management regulation*. N.S. Reg. 24/2002. Retrieved May 1, 2003 from www.gov.ns.ca.
- Regional Waste Management Task Force. (1999). *Final Report of the Manitoba Regional Waste Management Task Force: Regional Integrated Waste Management Action Plan and Recommendations*. Retrieved October 13, 2003 from www.gov.mb.ca/conservation/pollutionprevention.
- Robinson, A.M. (1999). It's easy being green: Environmentalism isn't dead. *Marketing Magazine*, 104(38), 27.
- Robinson, A.M. (1997). PAC flexes industry's muscles on government front. *Canadian Packaging*, 50(9), 44,46.
- Rolfe, C. & Nowlan, L. (1993). *Economic Instruments and the Environment: Selected Legal Issues*. Vancouver, B.C.: West Coast Environmental Law Research Foundation.
- Santoriello, A. & Block, W. (1996). *Externalities and the Environment*. Retrieved February 4, 2002, from www.libertyhaven.com/noneoftheabove/externalities/externalities.shtml.
- Saunders, C. (2001). 7 habits of highly effective nations. *This Magazine*, 34(4), 20-29.

- Scarlett, L. (1998). Waste minimization, resource conservation, and environmental progress: Voluntary models of shared responsibility. *New Environmentalism Speeches*. Retrieved May 14, 2002 from www.newenvironmentalism.org/oecd.
- Sinclair, A.J. (2000). Assuming responsibility for packaging and packaging waste. *Electronic Green Journal*, 12. Retrieved December 20, 2001 from egj.lib.uidaho.edu/egj/12.
- Sinclair, A.J. & Fenton, R.W. (1997). Stewardship for packaging and packaging waste: Key policy elements for sustainability. *Canadian Public Administration*, 40(1), 123-148.
- South Africa bans plastic bags. (2003, May 9). *BBC News: UK Edition*. Retrieved September 20, 2003 from <http://news.bbc.co.uk/1/hi/world/africa/3013419.stm>.
- Statistics Canada.(2002). *Population and dwelling counts for Canada, provinces and territories, 2001 and 1996 Census*. Retrieved January 2, 2004 from www12.statcan.ca/English/census01.
- Stevens, E.S. (2002). *Green Plastics: An Introduction to the New Science of Biodegradable Plastics*. Princeton, New Jersey: Princeton University Press.
- Stewardship Ontario. (2003a). *History of Stewardship Ontario*. Retrieved March 13, 2003 from www.stewardshipontario.ca.
- Stewardship Ontario. (2003b). *Frequently Asked Questions*. Retrieved August 10, 2003 from www.stewardshipontario.ca.
- Stilwel, J.E., Canty, Kopf and Montrone. (1991). *Packaging for the Environment: A Partnership for Progress*. New York, NY: American Management Association.
- Sturges, M. (2000). Environmental legislation for packaging in the next millennium. *Packaging Technology and Science*, 13, 37-42.
- Swedish Ministry of the Environment. (2000, November). *Fact Sheet: Waste management and producer responsibility – goals and results*. Retrieved January 18, 2003 from www.miljo.regeringen.se/se/english/pdf/m2000_17e.pdf.

- Taylor, A., Jaccard, M. & Olewiler, N. (1999). *Environmental tax shift: A discussion paper for British Columbians*. Retrieved January 29, 2002 from <http://www.fin.gov.bc.ca/tbs/Green%20Discussion%20Paper.htm>.
- Thorgersen, J. (1993). *Incentives and Values as Foundations of Recycling of Household Waste: Reactions of financial incentives to recycling in Denmark*. Paper prepared for 5th Annual International Conference of The Society for the Advancement of Socio-Economics, New York, March 25-28, 1993.
- Toensmeier, P.A. (2003, February 1). Litter solution seems to be ban or burgle, but no recycling. *Modern Plastics*. Retrieved September 20, 2003 from www.epi-global.com/EPI/Litter_solution.htm.
- U.S. Environmental Protection Agency. (2002). *Full Cost Accounting*. Retrieved July 25, 2002 from <http://www.epa.gov/epaoswer/non-hw/muncpl/fullcost>.
- Williams, G. (2003, March 3). *A new covenant? Some of the issues*. Retrieved April 30, 2003 from www.packcoun.com.au.
- Wolf, N. & Feldman, E. (1991). *Plastics: America's Packaging Dilemma*. Washington, D.C.: Island Press.
- Wrobel, M.G. (1990). *Environmental problems: Market-based solutions*. Ottawa, ON: Library of Parliament Research Branch.

Interviews

- Bredenbroecker, K. (2002, October 31). Coca-Cola GmbH (Germany). Essen, Germany.
- Bury, D. (2003, April 17). Environment Canada. Ottawa, Ontario.
- Butt, B. (2003, May 1). Environment Australia, Industry Partnership Branch. Canberra, Australia.
- Ferguson, J. (2003, October 9). Manitoba Conservation, Pollution Prevention. Winnipeg, Manitoba.

- Ferguson, J. (2003, March 13). Manitoba Conservation, Pollution Prevention. Winnipeg, Manitoba.
- Fredrickson, G. (2002, October 16). Swedish Federal Government, Ministry of Environment. Stockholm, Sweden.
- Friesen, B. (2003, July 28). Nova Scotia Department of Environment and Labour. Halifax, Nova Scotia.
- Jacobsson, L. (2003, December 8). Swedish Environmental Protection Agency. Stockholm, Sweden.
- Jacobsson, L. (2002, October 16). Swedish Environmental Protection Agency. Stockholm, Sweden.
- Jansen, J.O. (2003, January 19). Deutsche Gesellschaft für Kunststoff-Recycling mbH (DKR). Cologne, Germany.
- Jansen, J.O. (2002, October 30). Deutsche Gesellschaft für Kunststoff-Recycling mbH (DKR). Cologne, Germany.
- Kerbl, E. (2002, November 5). AGREV. Vienna, Austria.
- Keri, C. (2002, November 7). Federal Ministry of Agriculture, Forestry, Environment and Water Management. Vienna, Austria.
- Küppers, U. (2003, December 29). Duales System Deutschland/PRO Europe. Cologne, Germany.
- Küppers, U. (2002, October 24). Duales System Deutschland/PRO Europe. Cologne, Germany.
- Lindhqvist, T. (2002, October 17). International Institute for Industrial Environmental Economics, Lund University. Lund, Sweden.
- Mayer, C. (2002, November 7). Altstoff Recycling Austria AG (ARA). Vienna, Austria.
- Schmid, T. (2002, October 23). Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit. Bonn, Germany.

Wiqvist, W. (2003, December 17). The Swedish Association of Waste Management (Svenska Renhållningsverkföreningen). Malmö, Sweden.

Wiqvist, W. (2002, November 6). The Swedish Association of Waste Management (Svenska Renhållningsverkföreningen). Malmö, Sweden.

Zecchini, G. (2003, June 26). Waste Diversion Ontario. Toronto, Ontario.