# Bottled Water and Packaging Waste: Policy Options and Instruments for Ontario

by

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## Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## Abstract

Ontarians are producing more waste per capita than previous generations and consuming more bottled water. Using the product policy quadrangle developed by Oosternhuis (1996), the research examines four components of Ontario bottled water packaging policy— policy objectives, policy instruments, product groups and actors. Interviews with Ontario experts reveal stakeholder communication and Extended Producer Responsibility can promote packaging minimization. There was no agreement about whether Ontario has a waste policy framework to support bottled water waste reduction, reuse and recycling. Stakeholders did agree that a policy framework can help to promote packaging minimization. The discussion will examine the following: various concepts to support zero waste, eco-labelling, policy objectives, enforcement, use of language, focus on financial obligations, deposit-return systems, refillable containers, bottle standardization, waste minimization, how waste is measured, an evaluation of the waste hierarchy, reporting waste reduction and reuse, learning from history and alternative methods of encouraging the consumption of municipal water. The research recommends these changes be implemented with the development of the new *Waste Diversion Act*. The research recommends that Ontario implement Integrated Product Policy and Extended Producer Responsibility to support packaging minimization.

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## List of Abbreviations

C&D Waste.....Construction and Demolition Waste
CCME.....Canadian Council of Ministers of the Environment
CSR.....Corporate Social Responsibility
DGXI.....
.....Directorate-General of the Environment, Nuclear Safety, and Protection (European Union)
EPR.....Extended Producer Responsibility
HDPE.....High Density Polyethylene
IC&I.....Waste Industrial, Commercial and Institutional Waste
IOW.....Institution for Ecological Economy Research
IPP.....Integrated Product Policy
LCA.....Life Cycle Assessment
LDPE..... Low density polyethylene
MOE.....Ministry of Environment (Ontario Provincial)
NGO.....Non-Governmental Organization
ODRP.....Ontario Deposit Return Program
PC.....Polycarbonates
PET.....PolyEthylene Terephthalate
POEMS.....Product Oriented Environmental Management Systems
PP..... Polypropylene
PS..... Polystyrene
PVC.....PolyVinyl Chloride
SETAC..... Society of Environmental Toxicology and Chemistry
SPI.....Society for Plastics Industry
UNDP.....United Nations Development Program
*WDA*.....*Waste Diversion Act*
WDO.....Waste Diversion Ontario
WOBO.....World Bottle

# 1.0 Chapter One: Introduction

## *1.1 Introduction*

The effects of human behaviour on the environment are a matter of deep concern, and include air and water pollution, soil erosion, deforestation, endangered species, climate change and landfills nearing capacity (Bocking, 2004; Tammemagi, 1999; Mitchell, 2004; McAllister, 2004). These occurrences affect the earth, the current human populations, and future generations (Mitchell, 2004). Canadians are becoming aware of their unsustainable practices and some want to make changes — unsustainable residential waste generation is just one of many areas requiring attention (Five Winds International, 2008, The Conference Board of Canada, 2008). Since 2006, media and consumers have had a renewed interest in sustainable products with exceptional environmental and social performances (Five Winds, International, 2008, Clarke, 2005, CBC. 2008). This heightened awareness among stakeholders provides an excellent opportunity to promote substantial change towards sustainable bottled water packaging.

## *1.2 Background*

The Oxford English Dictionary defines waste as a "material or manufactured articles so damaged as to be useless or unsaleable" (OED, III, 11. a, 2009). Materials are often considered waste if they are perceived as having no further value (Roberts, 2004). Roberts suggests that a typical evaluation of waste is a subjective determination of value, and not a scientifically calculated evaluation. It is possible that there is no perceived value or further use for a material or product, when in fact, there are many other potential uses. Waste is often defined as a term with a negative connotation, whereas in fact, waste does not always lead to environmental problems or represent human excess. Waste becomes a problem when too much of a particular product is being released at a faster rate than the environment can naturally break it down and absorb it (Roberts, 2004).

As a society, Ontarians are producing more waste per capita than previous generations (Maclaren, 2004; MOE, 2004). The statistics indicate that Canada's residential waste increased by three percent between 2004 and 2006 (Statistics Canada, 2008). During the same period, Canada's population increased by 1.9% (Statistics Canada, 2009). Residential waste is being

produced at faster rates than Canadian population is increasing, thus Canadians are producing more waste. In addition, the composition of municipal waste also seems to be changing. There are increasing amounts of plastics, paper and non-ferrous metals like aluminum, and a decrease of glass and ferrous metals like steel. In the United States between 1960 and 2000, plastics increased dramatically from 0.4% to 10.7% (Maclaren, 2004). Waste has become more difficult to manage than in the past, because of the increase in types of waste that are currently being produced (Barr, 2003). Food packaging is of particular concern. The Ontario Ministry of Environment in 2004 reported that packaging represented approximately 25% of weight of municipal solid waste, and "makes up a considerably higher percentage by volume" (MOE, pp 28, 2004).

Food and beverage packaging serve many important functions in modern society; promoting product protection, safety, hygiene, reducing spoilage, increasing transportability and convenience, and communicating pertinent information and brands (CCME, 2009—1). Packaging has many useful functions, but it remains a by-product with a temporary utility (MOE, 2004). It is not the primary reason that consumers purchase a product,[1] making it a relatively easier target for improvement. If a packaging function can be met in alternative ways, then the packaging can be changed. Given potential benefits to the environment, packaging waste can usefully be re-evaluated (McKerlie *et al.*, 2006).

The practice of bottling water has been occurring at small scale for centuries in Europe and China[2] (Nestle Waters Canada, 2009; Robertson, 2006). Bottled water consumption has steadily been on the rise for the past two decades[3] (Robertson, 2006; Rothwell, 2008). It is estimated that bottled water consumption rose in Canada from 820 million litres of bottled water consumed in 2000 to 1.5 billion litres consumed in 2003 (Rothwell, 2008). Statistics Canada estimates that in 2006, almost 3 in 10 households exclusively consumed bottled water at home (Rothwell, 2008). This estimate does not account for bottled water consumed outside the home,

[1] Packaging may provide an incentive to buy a product over another, but it is not the primary reason the product is purchased. Consumers do not buy a plastic bottle that happens to contain water; they buy water that comes in a plastic bottle.

[2] In fact, it is estimated that since 10,000 BC, individuals have been collecting water in primitive containers or pouches for later consumption (Nestle Waters Canada, 2009). The oldest Canadian water bottle company, Montclair, has been producing bottled water for over 125 years (Nestle Waters Canada, 2009).

[3] Most recent statistics are from the 2006 Statistics Canada census, and were conducted before the current movement away from bottled water came into full effect.

which is likely higher because mobility is an important factor in bottled water consumption (Kingston, 2007).

### *1.3 Purpose Statement*

The purpose of this research is to examine and evaluate the range of policy options to promote sustainable consumption of bottled water. Water bottle packaging provides an interesting case study because of stakeholder interest in the product (Council of Canadians, 2009; Clarke, 2005; CBC, 2007; Kingston, 2007; Polaris Institute, 2009) and the diversity of available methods to supply water (municipal taps, reusable containers, refillable containers, and large and small single-use containers). The research takes a comprehensive approach and analyzes bottled water packaging from the perspective of the Ontario provincial government. The study examines problems associated with packaging, and makes recommendations for sustainable alternatives based on a range of management options. The findings and recommendations suggest how provincial policy instruments can influence production, packaging and disposal to promote source reduction and waste minimization with respect to bottled water.

### *1.4 Research Questions*

What options should the Ontario provincial government consider to promote source reduction[4] and waste minimization[5] of bottled water packaging?

1. What actors are involved in promoting bottled water packaging minimization? What are their roles?
2. What theories and principles could support bottled water packaging reduction and minimization?
3. What tools (specifically related to waste management) are available to the Ontario provincial government to support waste minimization of bottled water packaging?

[4] The Ontario Ministry of Environment describes source reduction as "the redesign of products and processes so that less material is used to achieve the same function" (MOE, p.3, 2004). For example, using source reduction can create a package that uses less material but is comparable in protection. This package could be designed to be smaller, possibly reusable, and easy to disassemble for recycling, and contain no toxic chemical damaging to human health or the environment (McKerlie, 2005).

[5] Waste minimization is the reduction, reuse, and other diversion of waste that effectively minimizes the materials or resources entering a landfill (Phillips, *et al.*, 2001; Maclaren, 2004).

4. What policy instruments are available to the Ontario provincial government to support waste minimization of bottled water packaging?

This research examines non-carbonated bottled water and its post-consumer packaging waste. Post-consumer packaging refers to any packaging that is acquired by a consumer of bottled water. Packaging necessary to get bottle to grocery store shelves is not considered in this study. In the case of bottled water, post-consumer packaging refers largely to the plastic or glass container that holds the water. This container can be either a single-use or refillable container with contents no more than 30 litres. When bottled water is sold in bulk packs of 12 or 24, post-consumer packaging can also include the cardboard that keeps the bottled water together and the plastic that surrounds the cardboard. In addition, this research does not address mineral[6] water, distilled water,[7] carbonated water or sparkling water[8]. It does include both spring water[9] and purified[10] bottled water.

[6] Mineral water is classified as such if it contains more than 500mg/L of dissolved solids (Health Canada, 2007) and "is defined by its constant level and relative proportions of mineral and trace elements at the point of emergence from the source" (Nestle Waters, pp 1, 2009). Minerals must naturally be occurring in the water, and cannot be added. Water is classified as "natural mineral water" if water is collected under proper circumstances that can ensure bacteriological purity (Health Canada, 2007).

[7] Water that has undergone the distillation process with an electrical conductivity of10μS/cm or less and dissolved solids concentration less than 10mg/L (Health Canada, 2007).

[8] Sparkling water must contain naturally occurring carbon dioxide at the same levels as it appears at the source. Sparkling water can often meet other criteria's noted above, and so be classified as Sparkling spring water or sparkling mineral water (Nestle Waters, 2009). Perrier is one example of a sparkling water. Sparkling water is not a part of this study.

[9] Spring water is water flows naturally to the earth's surface from an underground formation that is geologically and physically protected underground source. To be classified as spring water, the water must be collected at the earth's surface at a spring of borehole. Water can be helped to the surface using mechanical processes, but this must not interfere with the quality and properties in the water. These properties must remain the same as the water that flows naturally to the surface, and must contain less than 500mg/L of dissolved solids. Spring water that requires no treatment to remove microbiological components is classified as "natural spring water"; water requiring treatment is classified as "spring water" (Health Canada, 2007; Nestle Waters, 2009). One example of bottled spring water is Evian.

[10] The source of purified water is not relevant. The water could come from an aquifer, well, spring, or municipal water system, among other sources. The water treatment process is the essential step that permits water to be classified as purified water. Treatments can include processes such as deionization, distillation and reverse osmosis. These processes remove all bacteria from the water and dissolved solids must be under 10mg/L (Health Canada, 2007; Nestle Waters, 2009). Examples of purified water include Coco-cola's Dasani and PepsiCo's Aquafina.

### *1.5 Thesis Rationale*

Academics and stakeholders agree that waste is a significant issue in Ontario that needs to be addressed (Carter-Whitney, 2007; Five Winds International, 2008; MOE, 2004; Morawski, 2005; Tammemagi, 1999). Excessive or unnecessary packaging is one area that can easily help to reduce waste entering landfills. A number of factors make bottled water packaging an interesting case study for a study on packaging reduction policy. Significant amounts of bottled water packaging goes directly to landfill, as recycling rates for bottled water are not high (Cressy, 2009). In addition, Canadians are consuming increased amounts of bottled water—the average consumption of bottled water doubled from 28.4 litres in 1998 to 66 litres by 2006 (AAFC, 2009; Rothwell, 2008; Kingston, 2007). Bottled water has been a focus of public attention, resulting in information and discussion. Bottled water is a valuable case study because there are a number of diversion options available to help reduce material entering landfills. These options can be implemented by multiple stakeholders (including consumers). Previous academic research has focused on consumer behaviour for purchasing bottled water (Ferrier, 2001; Doria, 2006). This research attempts to discuss bottled water from a different point of view—thorough examination of all available options to promote waste minimization of bottled water packaging.

### *1.6 Assumptions*

There are a number of assumptions embedded in the research questions. The first assumption suggests that source reduction and waste minimization are positive and necessary strategies for managing waste. The optimal solution is to rethink the creation of waste (Tammemagi, 1999).

A second assumption in this paper suggests that packaging decisions should consider environment, social and economic interests (Hessing, *et al*., 2005). This is a common environmental framework, and has been rigorously reviewed (Gray and Milne, 2002; Hessing, *et al*., 2005; Raar, 2002; Willard, 2002).

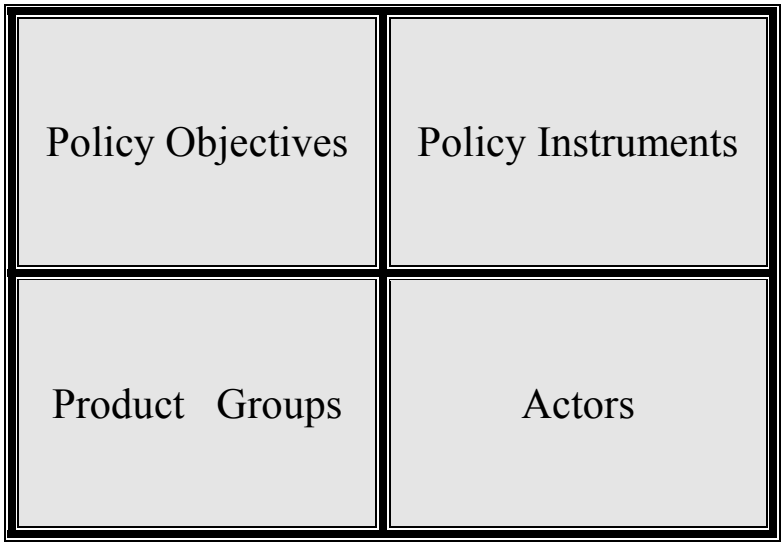
Finally, the research assumes that stakeholders are willing to make changes to their practices, to a greater or lesser extent based on the particular stakeholder. It is assumed that

citizens value the environment, and that they are willing and able to change personal behaviours (Laroche *et al.*, 2001).

### *1.7 Framework*

This research fits within the broad framework provided by industrial ecology. Industrial Ecology attempts to maximize industrial cycle efficiency by reducing the use of materials at each step of the process from harvesting virgin material to managing a product's final disposal (Socolow et al., 1997). The conceptual framework for this research fits under this category, specifically examining the interconnectivity of four major elements of sustainable product policy: product groups, actors, policy objectives and policy instruments (Kielkiewicz-Young, 2000)[11]. The quadrangle does not suggest preferential importance within the four quadrants, but simply suggests that all four areas are essential when evaluating packaging policy (see Figure 1). The literature review will discuss each of the four quadrants in depth (See Chapter 2).

*Figure 1: The Product Policy Quadrangle*




(Kielkiewicz-Young, 2000)

[11] The conceptual framework was originally created by Oosternhuis, *et al.* (1996), and later modified by Aleksandra Kielkiewicz-Young.

**Policy Objectives** are the established purposes or goals of policy. Objectives must be clearly defined in order to develop implementation strategies (Hessing *et al*., 2005). Objectives can range from promoting particular parts of the waste hierarchy to aiding municipalities economically, to developing innovative new packaging designs.

**Policy Instruments** are policy tools used to achieve policy objectives. These may include economic incentives, regulatory and contractual measures, applied by the government, industry and, other stakeholders (Platt and Rowe, 2002; Kielkiewicz- Young, 1999).

**Actors** are individuals or groups of stakeholders who have a direct or indirect interaction with the particular product and/or its packaging. Major stakeholders include: industry, both international and national; various levels of government, with a particular emphasis on municipal governments that manage bottled water waste collection; non-governmental organizations; and the citizens of Ontario, specifically the consumers who purchase bottled water (Morawski, 2006); Kielkiewicz-Young, 2000).

**Product Groups** are the physical characteristics of the packaging container. This can represent both the types of materials used (Plastics, Glass, and Cardboard), and the function that container provides (single-use or refillable) (Kielkiewicz-Young, 2000).

### *1.8 Conclusion*

This chapter has briefly introduced the research topic of bottled water packaging waste within Ontario. Research questions, rationale, and assumptions of the study have been outlined. The Product Policy Quadrangle has been introduced, and is essential to the paper's structure. The innovative nature of the research requires a detailed analysis of each of the four quadrants: Policy Objectives, Policy Instruments, Product Groups and Actors. Considering all quadrants provides a balanced analysis of packaging policy and ensures that no key areas are missed. It is essential to consider all quadrants in order to make informed recommendations on available bottled water waste reduction initiatives.

The paper is divided into six Chapters. The literature review (chapter two) is divided into four sections— each section addresses one quadrant of the quadrangle highlighted in the introductory chapter. The first section provides the context for the research and explains the current situation of bottled water in Ontario. It also provides a detailed explanation of all relevant actors involved in bottled water waste policy. The second section outlines policy objectives, theories and concepts as they relate to Ontario's zero waste objective, the environment, waste management, and packaging. The third section includes the waste hierarchy and types of packaging. The fourth section outlines the policy development cycle and the policy instruments that could help to reduce bottled water waste entering the landfill. Barriers to implementing policy are also addressed. Please see Appendix Three, Appendix Four and Appendix Five for a detailed description of Ontario and Canadian legislation and policy associated and implemented with the Ontario context as it relates to bottled water waste. Chapter three discusses the methods used to conduct the research. Chapter four reports the findings for participant observation and key-informant interviewees. The results from the interviews provide the Ontario context and explore certain issues that have been addressed in the literature review. Chapter five analyzes the results from the interviews and the literature review and makes recommendations for Ontario bottled water packaging policy. Chapter Six provides a brief conclusion to the research.

# 2.0 Chapter Two: Literature Review

The literature review is divided into the four sections following the conceptual framework's four quadrants. The first section will discuss the current situation of bottled water packaging policy and the actors involved in the bottled water discussion. The second section will discuss theories, concepts and principles that represent potential policy objectives for the Ontario provincial government. The third section of the research will discuss the history of packaging policy, and waste tools that can support waste minimization of bottled water. The literature review will conclude with the policy development cycle, and policy tools to support the minimization of bottled water. The details of relevant waste legislation can be found in Appendix Four. The literature review will attempt to provide a detailed description of the four quadrants; the discussion, analysis and evaluation of how these topics interrelate will be found in Chapter Five: Discussion.

## *2.1 Current Situation and Actors*

### 2.1.1 Introduction

This section begins with the current situation of bottled water and the relevant context for discussing packaging policy options. Next, it briefly describes the actors' involved in Ontario packaging policy. The quadrant of Actors is the first of the four quadrants to be discussed.

#### *Current Waste Situation*

> "Despite significant steps in the 1990s to reduce packaging waste and increase recycling efforts, waste levels in Canada have continued to rise. With over 80 per cent of Canadian populations living in urban areas, the costs of waste management and the repercussions related to landfilling these materials often become problems borne by local governments. Canadian municipalities find themselves in a reactionary role, subject to provincial and federal regulatory frameworks, with little leveraging power and no direct tools to influence better product design (McKerlie *et al.*, pp 616, 2006)."

Municipalities across Ontario are running out of place to put waste as landfills near capacity (Carter-Whitney, 2007; Statistics Canada, 2007). Siting landfill locations is becoming

increasingly difficult, as local citizens often protest a prospective landfill's close proximity to their homes[12] (Statistics Canada, 2007; Tammemagi, 1999). Non-residential waste increased by 11 percent between 2004 and 2006 (Statistics Canada, 2008). Canada produced 35 million tonnes of waste in 2006— 22 million tonnes was produced by non-residential sources and 13 million tonnes was produced by residents of Canadian municipalities (Statistics Canada, 2008). As one example, the City of Toronto has resorted to transporting 150 trucks of garbage per day to Michigan (Carter-Whitney, 2007). This practice is unsustainable—it is expensive,[13] environmentally degrading as it creates carbon emissions, and increases truck traffic on roads (Carter-Whitney, 2007). It is widely recognized that action is urgently needed to encourage waste diversion (Carter-Whitney, 2007; MOE, 2004; Morawski, 2005).

### *Current Packaging Situation in Ontario*

Food packaging is of particular concern. In the United States (US), packaging waste makes up 30% by weight and 50% by volume of all municipal solid waste (Imhoff, 2005). Stewardship Ontario estimated that in 2006, Ontario households produced a total of 733,933 tonnes of waste due to packaging material (CCME, 2009—1). Approximately 60% of all US packaging is created for the food and beverage industry. In addition, the global packaging industry is increasing by 4% each year, with an estimated global market share of $500 billion US dollars (Imhoff, 2005).

### *Current Situation with Bottled Water: The Rise of the Bottled Water Industry*

The commodification of Canadian water is a controversial issue. Water is an essential element for the development of western society (Lasserre, 2007). The water found in Canada represents 20 percent of the Earth's freshwater and 7 percent of the total renewable freshwater supply (Statistics Canada, 2009). Canada's renewable freshwater supply is often misinterpreted. Although Canada has significant amounts of renewable fresh water, 60 percent flows in northern areas and is inaccessible to the 85 percent of the Canadian population that resides near the

[12] This reaction from citizens is also known as Not In My Backyard or NIMBY (Tammemagi, 1999).

[13] In 2006, total local waste expenditures in Canada cost approximately $2.0 billion dollars (Statistics Canada, 2008).

southern border (Government of Canada, 2005). The distribution of drinking water has traditionally been the government's responsibility, as water was deemed a human right or universal service that everyone should have access to (Bakker, 2007). Municipalities are not selling water; they are providing a service (Clarke, 2005). Any costs associated with municipal water distribution are service costs. Municipalities are not-for-profit organizations and are often subsidized (Clarke, 2005; Bakker, 2007). Private corporations selling bottled water are intended to profit by selling a Canadian natural resource (Clarke, 2005). Clarke argues that: "unlike other resource production processes, where raw materials like timber, minerals, and oil are transformed into new products, bottled water is different. Bottled water is about 'turning water into water'. Herein lies the scam inherent in the bottled water industry..." (Clarke, pp 39, 2005).

Bottled water companies are not significant water takers relative to other industries. The Ministry of Environment estimates that bottled water accounted for 0.0015 percent of the water-taking from Ontario in 2007 (Canadian Bottled Water Association, 2009). To compare, the entire Ontario bottled water industry in one year uses the equivalent of what 10 golf courses would use for the same duration (Canadian Bottled Water Association, 2009). The question remains, should Ontario permit water to be removed from the water basin, where it naturally occurs, to support the bottled water industry?

Bottled water has recently come under public scrutiny (Kingston, 2007). Bottled water consumption has been on the rise in part because of public concerns regarding municipal tap water (Robertson, 2006). There are concerns that municipal tap water is no longer safe due to declining infrastructure and an overworked underfunded system. Incidents like those taking place in Walkerton, Ontario in 2000 have contributed to fears that municipal water supplies are potentially contaminated[14] (Kreutzwiser and de Loë, 2004).

A number of prominent groups and individuals have raised questions about bottled water consumption including The Polaris Institute, Maude Barlow and the Council of Canadians, David Suzuki (Council of Canadians, 2009; Clarke, 2005; CBC, 2007; Polaris Institute, 2009). In conjunction with these campaigns, citizens and communities have been taking action to reduce their bottled water consumption (Polaris Institute, 2009). In the past years, there have been a

[14]In May 2000, 7 people died and more than 2,300 became ill when Walkerton's municipal drinking water was contaminated with Escherichia coli 0157:h7 and Campylobacter jejuni. A provincial inquiry found that the incident could have been prevented; the plant operator intentionally mislead provincial authorities (Kreutzwiser and de Loë, 2004).

number of bans on bottled water. The United Church of Canada has voted to discourage the privatization of water by promoting tap water consumption instead of the purchase of bottled water (CBC News, 2007). Seventeen Canadian municipalities from five provinces have banned bottled water in their municipal facilities. In December 2008, the City of Toronto banned bottled water in its municipal facility; the City of Toronto is the largest city to implement a bottled water ban. An additional 45 municipalities across Canada have plans for restrictions on bottled water (Polaris Institute, 2009).

Banning bottled water in municipal facilities will help to reduce bottled water waste entering landfills. The latest Statistics Canada 2006 Census found that 97% of Canadians with access to recycling services recycle some of their household waste (Statistics Canada, 2008—2). Yet even with such high participation rates, recyclable material is still entering landfills. Waste Diversion Ontario's 2007 Residential GAP[15] report suggests that Ontario is diverting 39.23% of its residential waste (WDO, 2009). Although PET is relatively[16] expensive to recycle (as are most plastics), there is a market for PET[17] (Morawski, 2005).

Reporting of recycling rates for plastic water bottles differs greatly. In Toronto, it is estimated that only half the containers consumed within the city limits are actually being recycled (Lem, 2008). Each year, an estimated 65 million empty plastic bottles are being transported to Michigan for final disposal (Lem, 2008). The Polaris Institute estimates that between 40 and 80% of all plastic water bottles are not recycled (Cressy, 2009). It is estimated that in Ontario just 50% of all PET bottles[18] are recycled (Morawski, 2005). All available statistics suggest that bottled water packaging is unnecessarily entering landfills.

Clarke, from the Polaris Institute, has developed a number of social and environmental concerns associated with bottled water. First, bottled water prices are being marked much higher than that of tap water. Water can sometimes be sold for hundreds of times the cost of tap water for the same thing—$H_2O$. This raises issues of social inequity. Bottled water industries often do not identify the exact location of their water source on the bottle. There are many concerns about what is defined as spring water, why it is being transported to other locations, and who owns the water (Clarke, 2005).

[15] Generally Accepted Principles.
[16] See further discussion on page 102.
[17] PET bottles are often remade into other items such as yarn (Stewardship Ontario, 2009).
[18] PET Bottles include more than just single-use water bottles.

The water filtration process is also an issue. The bottled water industry sells water at much higher rates because it is allegedly different from tap water, having been filtered an additional time. Yet, this filtration does not make a dramatic difference to quality. Many consumers purchase bottled water because they think it is safer. This is a myth about bottled water. According to Clarke, the testing associated with tap water is much higher than that for bottled water. In addition, industry is effectively brainwashing its consumers with false concerns and marketing schemes. Industry uses terms like "pure" and "glacial" water to convince consumers to drink their product. These terms wrongly influence and misguide consumers according to at least one researcher (Clarke, 2005). Clarke states:

> "After all, the industry's main competitors continue to be municipal water utilities. And much of the market and advertising for bottled water is designed to wean the majority of people off tap water by undermining their confidence in public utilities The numbers show that the bottled water industry's market strategies have been successful" (Clarke, pp 78. 2005).

### 2.1.2 Actors

Actors or stakeholders are all the individuals, groups, or corporations that are directly or indirectly affected by or involved with a particular issue (Oxford English Dictionary, 2009). Traditionally, stakeholders are often viewed as third parties with a financial interest (Benn and Dunphy, 2007). The particular stakeholders involved in an issue will differ depending on the subject.

Stakeholder theory suggests that successful organizations satisfy corporate 'shareholders' (Freeman, 1984). Ecocentric academics suggest that the term stakeholders should also include the entire ecosystem and environment (Benn and Dunphy, 2007). Benn and Dunphy argue that since the environment cannot voice its opinions, industry and society must consider the best interests of the environment (2007). One common explanation for lack of change in product packaging is that one group of stakeholders may hold other stakeholders responsible for inaction. For example, industry has a tendency "to blame the consumer for packaging waste and litter issues" (Lewis, pp 46, 2005).

Stakeholder interaction theories attempt to address power imbalances. For example, some commentators expressed concerns that industry and large corporations have too much power because of globalization. With the rise of corporate power, they express concern about corresponding losses of sovereignty for nation-states, and consequently for their citizens (Benn

and Dunphy, 2007). Stakeholder interaction concepts suggest that globalization requires a new form of governance, which represents all actors influenced in the system. These include community groups, various levels of government and industry. The creation of inter-organizational relationships between stakeholders becomes possible in contexts of reciprocal communication and transparent processes (Benn and Dunphy, 2007). Embedded stakeholder relationships are described by advocates as the most beneficial to all parties, and are characterized in a number of ways. Benn and Dunphy (2007, p. 22) suggest that: "Interorganizational relationships are more likely to be embedded if the multiple stakeholder arrangement includes community-based networks and that the inclusion of these networks facilitates the development of new practices useful in the management of environmental risks".

When considering methods to encourage source reduction and waste minimization of bottled water packaging, there are a number or relevant stakeholders. These stakeholders include Government (Federal, Provincial, and Municipal), Bottled Water Industry, Consumers, Citizens and Interest Groups (Environmental, Social, Industry and Municipal). Stakeholders involved in the discussion around bottled water include municipal governments, interest groups (environmental, social equity, industry and municipal), consumers and local citizens. It should be noted that although this research focuses on the provincial government as a key actor, the research design considers all stakeholders. The balance of this section discusses relevant stakeholders as they relate to bottled water packaging policy.

***Federal Government***

The federal government is a body of elected and un-elected civil servants with the responsibility to represent the people of Canada and govern affairs as set out by the *Constitution Act* of 1867 (Mitchell, *et al.*, 2004). The federal government is the central or national government that has jurisdiction over areas described in Section 91 and 92 of the *Constitution Act* (McAllister, 2004). Waste Management is largely designated under provincial jurisdiction, with a number of exceptions. The federal government has jurisdiction over waste issues related to interprovincial and international borders (Statistics Canada, 2005). In addition, the federal government is responsible for "regulating the movement of hazardous waste and promoting and

developing national standards and initiatives for waste prevention and management" (Statistics Canada, pp 21, 2005). Environment Canada and specifically the Waste Reduction and Management division is responsible for waste related issues (Environment Canada, 2009).

***Provincial Government***

The provincial government is also a body of elected and un-elected civil servants with the responsibility to represent the people of Ontario and govern the affairs in Ontario as set out by the Constitution. The constitution designated the provincial government responsible for most issues relating to waste management (Mitchell, *et al.*, 2004). The provincial government, and primarily the Ministry of the Environment (MOE) is "the regulator, responsible for setting and enforcing standards, issuing approvals, and promoting waste diversion" (MOE, pp 11, 2004). The specific unit in the MOE responsible for waste issues is the Waste Policy Branch (MOE, 2005). The provincial government is currently reviewing the *WDA* (see page 136 for current *WDA*), an *Act* that directly affects minimization of bottled water packaging waste. Corresponding with the five-year review of the *WDA*, a waste policy diversion discussion paper was released in 2008; it outlines the current responsibilities of the provincial government:

> "1) Set and enforce rules, regulations and policies for waste diversion and disposal under the Environmental Protection Act, Environmental Assessment Act and *Waste Diversion Act*.
> 2) Issue certificates of approval for waste disposal sites and waste haulers to ensure waste is properly managed.
> 3) Work with municipalities and private sector to facilitate waste diversion and the disposal of residual waste.
> 4) Establish and update expectations and guidance for *Waste Diversion Act*ivities in the province in response to emerging challenges and opportunities.
> 5) Publicly promote the 3Rs.
> 6) Work with Waste Diversion Ontario through an operating agreement that defines roles and responsibilities operating relations.
> 7) Provide representation on Waste Diversion Ontario's Board of Directors" (MOE, pp 37, 2008).

### *Municipal Government*

The municipal government is a body of elected and un-elected civil servants with the responsibility to represent the people of their municipal jurisdiction and govern the affairs as set out by the provincial government. Municipal governments are responsible for the collection and partial financing of blue-box programs[19]. They are fully responsible for waste disposal, and all development of waste disposal facilities. The 2008 Ontario waste discussion paper also highlights that municipalities are responsible for "implementing voluntary diversion or reduction programs, where possible and reasonable" (MOE, pp 38, 2008). The municipal government has no tools to directly influence packaging design (McKerlie *et al.*, 2006).

Since each municipality manages recycling differently, waste recycling differs dramatically between municipal jurisdictions across Ontario. Latest Waste Diversion Ontario (WDO) statistics from 2007 suggest that municipalities are recycling and consequently diverting between 1% and 83 % of their waste from landfill (WDO, 2009). In the most recent Stewardship Ontario 2008 annual report, Stewardship Ontario reported that Ontario residents were diverting 63% of their recyclable residential waste (Stewardship Ontario, 2009)[20]. Regulation 101/94 requires municipalities of 5,000 or more people to have a recycling program in place (see page 130). Rural municipalities with low populations and remote communities across the province tend to have lower recycling diversion rates (WDO, 2009).

### *Industry*

Industry is made up of private corporations that produce products or services for profit, that cater to the public need. Industry includes manufacturers, producers, haulers, transporters, retailers and all other groups associated with the production and sale of a product. Within the bottled water industry, there are different types of bottled water manufacturers (Clarke, 2005). There are refillable bottled water corporations like Canadian Springs, and single-use bottled water corporations like Nestle Waters. Corporations also manufacture different types of water page 4).

[19] All municipalities with a population over 5,000 people are required to collect certain materials to be diverted from landfill through recycling. This system is described in detail on page 114, under Environmental Protection Act, Regulation 101/94.

[20] It should be noted that the 63 diversion rate only represents municipal recyclable materials. As a result, this does not meet the 2008 goal of 60% diversion of waste across the province.

Producers in Ontario are responsible for 50% of the costs of with recycling their packaging. They are not currently responsible for any package that goes to landfill. The 2008 Ontario waste diversion discussion paper highlights that producers and stewards are responsible for minimizing "the life cycle impacts (i.e. environmental footprint) of products and their packaging" (MOE, pp 38, 2008).

Industry is an extremely important actor for Canadian environmental issues. Industry's decisions can greatly affect resource use and produce pollution. Industry's creativity, innovation and drive can also contribute to reduced resource consumption and waste reduction (Rowlands, 2004). Rowlands states "it is because of their great potential for both environmental damage and environmental improvement that they are critical players in resource and environmental management in Canada." (Rowlands, pp 71, 2004 in Mitchell, 2004).

***Waste Diversion Ontario***

Waste Diversion Ontario (WDO) is the organization designed and established by the *Waste Diversion Act*. This organization is responsible for developing all diversion programs for designated waste, like the blue box program plan. Part of the WDO's role is to research, monitor and develops education programs. WDO works together with Stewardship Ontario, the industry funding organization (MOE, 2008).

***Stewardship Ontario***

Stewardship Ontario is the industry funding organization responsible for organizing and implementing the financial components for waste initiatives. Together with Waste Diversion Ontario, Stewardship Ontario oversees program development, and monitors waste diversion rates. In addition, they are also responsible for research and education (MOE, 2008).

***Consumers***

Consumers are individual citizens who purchase and consume an identified product. Water consumption habits are often influenced by: taste, safety of water, concerns associated

with personal health, mobility, status symbol[21], and convenience (Kingston, 2007; Kreutzwiser and de Loë, 2004, Robertson, 2006).

### *Citizens*

Citizens are all individuals that legally live or work within a jurisdictional boundary. They may or may not consume bottled water. The 2008 waste diversion discussion paper suggests that the public must "help reduce the amount of waste generated through purchasing choices" and "engage in waste reduction through reuse, waste prevention, and through diversion programs" (MOE, pp 39, 2008). Waste diversion is highly dependent on the attitudes and behaviours present in individual households (Barr, 2003).

### *Interest Groups*

Interest groups, often referred to as citizens' groups or non-governmental organizations, are groups where citizens or corporations assemble because of a shared interest in a particular topic (McAllister, 2004). The Polaris Institute, the Recycling Council of Ontario, Refreshments Canada, and the Product Policy Institute are all examples of interest groups associated with bottled water packaging.

### 2.1.3 Conclusion

Ontario is struggling to manage waste produced by various stakeholders. As described in this section, packaging minimization rates could be improved (MOE, 2008). This section has discussed the roles of various stakeholders; there is an unusual stakeholder dynamic for waste management packaging diversion. Municipal governments have been charged with the responsibility to divert waste, yet, the provincial government has the power to legislate policy changes (*WDA*, 2002). The *WDA* requires industry to be responsible for 50 percent of the costs associated with recycling their products, and requires municipalities to pay for the other 50% (*WDA*, 2002). Municipalities are also required to pay for all material that is not recycled, including any bottle that ends up in the landfill (*WDA*, 2002). Since industry only pays for

[21] Around 2005, bottled water was often considered to be a status symbol or fashion statement. By 2007, this attitude towards bottled water was transitioning towards a fashion faux-pas (Kingston, 2007)

material that is recycled and the recycling rate for bottled water is low, municipalities are paying for the packaging pollution instead of industry (McKerlie *et al.*, 2006; MOE, 2008). It is evident that producers are not responsible for the entire cost associated with their product. However, there is clearly a problematic dynamic between the producers and consumers of waste, and the individual who are currently required to pay for the pollution created by bottled water packaging.

The section has also demonstrated that all of the above stakeholders have the power to promote waste minimization of bottled water packaging. Some of the identified stakeholders can effect waste minimization at larger scales— including the provincial government and industry. Consumers and citizens are likely to affect packaging minimization at a smaller, personal scale (Robertson, 2006). Stakeholders, such as environmental advocacy groups, have the power to effect packaging minimization through lobbying and education. Municipalities have the power to effect diversion and recycling rates, but not full minimization (McKerlie *et al.*, 2006). In addition, the primary objective is likely to differ dramatically between stakeholders— this may cause conflict when developing a new *WDA*. Given the different roles of these stakeholders, it will be important to conduct interviews with as many groups as possible. Next, the research will examine the theories and principles that could support bottled water packaging waste minimization.

## *2.2 Objectives, Theories, Concepts and Principles*

### 2.2.1 Introduction

The Oxford English Dictionary defines an objective as "a thing aimed at or sought; a target, goal or end" (OED, p.p. 1, 2009). A policy objective is the development of a policy to achieve the chosen goal. This is an enormously broad subject area, subjective to the influences of various actors (Smith, *et al.,* 2008). Hypothetically, any desire could be a policy objective— for Ontario to double its waste production or for Ontario to reduce it. To describe every possible packaging objective would be time-consuming, tedious and irrelevant. The topics discussed in this section represent some of the major influences for Ontario packaging waste minimization. These topics could all be classified as objectives Ontario may wish to meet, and all topics could compliment the zero-waste goal that has been developed the 2008 Ontario waste policy

discussion paper (see page 141). The section will examine theories[22] and concepts[23] including: governance, sustainability, triple bottom line, cradle to cradle, precautionary principle, proximity principle, design for the environment, polluter pays principle. Finally the section introduces a tool that Ontario is currently examining for packaging policy – Extended Producer Responsibility and what they might consider examining further— Integrated Product Policy. Chapter Five: Discussion will attempt to link the topics together, and show how they can influence and encourage waste packaging minimization.

### 2.2.2 Industrial Ecology

Industrial Ecology (IE) is a complex systems approach to monitoring and evaluating materials and energy as they flow through and out of human-created systems, providing a comprehensive perspective on human industry, and its relationship with the natural environment (Erkman and Ramaswany in Green and Randles, 2006; Green and Randles, 2006). Similarly to industrial ecology, the product policy quadrangle supports a thorough examination of packaging policy by considering each of the four quadrants and examining various influences of waste production from a number of different perspectives. Both the product policy quadrangle and industrial ecology attempts to maximize the efficiency of the industrial cycle and minimize ecological impacts, by reducing the use of materials at each step of the process— from harvesting virgin material to a product's final disposal (Socolow et al., 1997). Industrial Ecology often focuses on technological solutions to address historically unsustainable industrial systems (Erkman and Ramaswany in Green and Randles, 2006). Erkman and Ramaswany suggest that Industrial Ecology most often attempts to improve: "optimizing the use of resources; closing material loops and minimizing emissions, dematerializing activities, [and] reducing and eliminating the dependence on non-renewable sources of energy" (in Green and Randles, p.p. 32, 2006).

[22] For the purpose of this research, "a theory is an account of the world which goes beyond what we can see and measure. It embraces a set of interrelated definitions and relationships that organizes our concepts of and understanding of the empirical world in a systematic way" (Scott and Marshall, p 1, 2009).
[23] For the purpose of this research, a concept is "the terminological means by which social scientists seek to analyze social phenomena, to classify the objects of the observed world, impart meaning through explanation to these phenomena, and formulate higher-level propositions on the basis of these observations" (Scott and Marshall, pp1, 2009).

### 2.2.3 Governance

There is no consistent definition of governance in academic literature (Mitchell, 2004; Steiner *et al.*, 2003). Governance suggests a non-hierarchical system to making decisions through empowerment and engagement of community members, in order to determine what is best for the entire society (Scheer and Rubik, 2006). Governance decisions call for the participation of all stakeholders: including community members, local business, interest groups and government officials (McAllister, 2004). The Commission on Global Governance provides an excellent definition:

> "Governance is the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest" (Commission on Global Governance, pp 2-3, 1995, in Speth and Hass, pp 3, 2006).

By requiring involvement of community members, governance empowers and unites the people towards collective action, and creates a powerful movement to work towards a mutually understood positive future.

Governance is a term that is used at a variety of political and institutional levels. It can refer to both formal and informal structures— from global governance to local community governance (Scheer and Rubik, 2006; Speth and Haas, 2006). Government is a formal political structure with an elected body of officials who represent the views of the people (McAllister, 2004). Governance is a much less formal term, addressing how interest groups participate to promote local action (McAllister, 2004). Both systems develop policy to promote change. Water governance encourages stakeholder participation in water management topics that results in increased accountability, reduced contamination of drinking water, and better water allocation (de Loë, 2008; de Loë, 2009). Given the great number of stakeholders actively involved in bottled water management (see page 13), governance is clearly being implemented.

### 2.2.4 Sustainability, Triple Bottom Line and Design for Environment

In 1987, the World Commission on Environment and Development published the Brundtland Report, which defined and popularized sustainable development, defining it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, pp 8, 1987). A large number of governments across the world quickly adopted the groundbreaking concept of sustainable development (Gibson *et al.*, 2005). Sustainability has since become an important factor in assessing impacts on the environment. The United Nations Development Program (UNDP) has defined Environmental Sustainability as "achieving sustainable development patterns and preserving the productive capacity of natural ecosystems for future generations" (Speth and Haas, p 5, 2006). The UNDP definition recognizes the intricate balance between social, economic, and environmental factors (Gibson *et al.*, 2005). It has also been suggested that historically, while governments applied the concept of sustainability to legislation, little has been done to implement change (Gibson *et al.*, 2005). Sustainability is inherently complex due to the interdependencies and complicated stakeholder relationships, and thus, can be difficult to implement (Gibson *et al.*, 2005).

Triple Bottom Line suggests that all decisions must consider Economics, Equity and Ecology. Government and industry have found that while triple bottom line is excellent in theory, it can be difficult to balance ecology, equity and economics equally. Often, this results in instances where one of the three bottom lines is favoured (McDonough and Braungart, 2002). Industry favours economics; environmental lobby groups often favour the environment.

Design for the environment promotes pro-active behaviour to design products, packaging and services while considering any environmental implications associated with their use or disposal. Design for the environment tends to be a corporate lead initiative. Ian Rowlands defines design for the environment as "… an explicit procedure for reconsidering the design of a company's products—is yet another way in which some corporate leaders are pushing boundaries and exploring new management techniques" (Rowlands, pp 71 in Mitchell, 2004).

All three of these concepts emphasize environmental protection. Design for the environment focuses on the environmental aspects of sustainability, whereas sustainability and triple bottom line looks more broadly at three important areas. Industry or the provincial

government can implement any of these concepts; since design for the environment is implemented at the design level. Industry is most likely to effectively implement this concept.

### 2.2.5 Cradle to cradle, Cradle to grave and Life Cycle Analysis

Cradle to cradle and cradle to grave recognize that our world's material flow is a closed loop system; practically no waste leaves the earth. For example, our products come from material that is already on the earth. Once the product is no longer of use to a consumer, it will be recycled or discarded. All material remains on the earth— no material exits the system— consequently the system is described as a closed loop (McDonough and Braungart, 2002).

This theoretical position argues "to eliminate the concept of waste means to design things— products, packaging, and systems— from the very beginning on the understanding that waste does not exist" (McDonough and Braungart, pp 104, 2002). Cradle to grave was the original term. It suggested that society must think about the waste associated with a product from harvesting the material at the "cradle" of its life, throughout the entire lifecycle, to its 'grave", the final disposal. Cradle to cradle, keeps the same principles— that society must consider the environmental impacts through the entire life of a product. However, it suggests a product should not be disposed in a landfill (McDonough and Braungart, 2002). Instead, the product material should be used again, thus beginning the cycle at the 'cradle' again. For example, paper bags can be used, and when they are no longer usable, they can be composted. As compost, the paper enriches the soil, which helps to grow other plants to continue this cycle.

Life-cycle analysis (LCA) looks at environmental impacts associated with a product from cradle to grave (Rowlands, 2004; Sonnenveld, 2000). This environmental evaluation tool provides quantitative results, allowing for comparisons between different products. Rowland's definition of an LCA describes it as "a system-orientated approach for estimating the resource use and environmental impact of a product throughout all the stages of its life cycle (from production through to disposal)" (Rowlands, p71, 2004). LCA provides an assessment for any product that includes the production, processing and any impacts associated with the product during its use. This will include a description of the energy and materials used, as well as any waste entering the environment (solid, liquid or gas) (Sonnenveld, 2000). The Society of Environmental Toxicology and Chemistry (SETAC) and most notably the ISO 14000 by the International Standardization Organization have developed LCA methodologies. LCA factors in

environmental impacts and does not consider either social or economic impacts in its assessment (Sonneveld, 2000). LCA does not take into account eliminating waste through prevention (Ekvall, 2007). LCA's embedded assumptions are a disadvantage, but they are necessary to allow LCA tools to measure products quantifiably (Ekvall, 2007). Overall, an LCA is an important tool because it proposes systematic evaluations of the entire environmental impact of a product in a method that is measurable and comparable across products and systems.

### 2.2.6 Precautionary Principle, Proximity Principle and Polluter Pays Principle

The precautionary principle is based on the premise that the environment is inherently complex in nature and easily irreparably damaged. As a result, it is important to protect the environment and make decisions on the side of caution (Dearden and Mitchell, 2005). The Rio Declaration outlines this concept: Principle 15 states "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (United Nations Publication, 1992). As a result, the precautionary principle demands active environmental protection during instances of scientific uncertainty. The precautionary principle does not rely on hypothetical technological solutions to solve environmental degradation that other technology happens to create accidentally. In cases where environmental protection cannot be ensured, the precautionary principle suggests that development should not proceed (Dearden and Mitchell, 2005).

The proximity principle suggests that waste should be managed at the point of creation, or as near to the point of creation as possible. Thus, waste should be managed at a regional level in an environmentally friendly and economically feasible manner (Barr, 2002). The proximity principle suggests that transporting waste is environmental unfriendly, and so it must be managed locally (EEA, 2008).

Polluter pay principle is an economic incentive for waste producers to promote waste reduction whenever possible. Generally, these economic incentives are placed on waste producers by policy instruments, which encourage the internalization of external waste costs. Adding an economic policy instrument effectively shifts the natural balance and encourages industry to be more efficient by shifting their business to reduce waste (Roberts, 2004).

The precautionary principle is the broadest of the three principles, and applies to many subjects including waste. The proximity principle and the polluter pay principle are specifically applicable to waste management (including packaging). These principles can be implemented by the Ontario provincial government[24] to help set the attitude for how waste is managed— the precautionary principle (attitude to manage waste with caution and avoid environmental degradation), the proximity principle (attitude that waste must always be managed locally), the polluter pay principle (the polluter of waste must always be responsible for final disposal). Extended Producer responsibility (EPR) falls under the category of polluter pays.

These principles could be implemented concurrently with any of the concepts discussed above—governance, sustainability, and cradle to cradle. For example, the Ontario provincial government could decide to emphasize governance, cradle to cradle and the proximity principle. A system with these influences would likely emphasize extensive stakeholder participation in the decision making process. With many of the industrial ecology influences associated with cradle to cradle, the developed program would consider improvements to the system throughout the entire process. Together stakeholders would implement these necessary changes from production to final disposal. All waste and recyclable material would be managed locally (due to the proximity principle's influence).

### 2.2.7 Extended Producer Responsibility

Extended Producer Responsibility, more commonly known as EPR, requires industry to take full responsibility for all waste associated with their product (Maclaren, 2002). EPR was first developed in 1990 by Thomas Lindhqvist of Lund University (Lewis, 2005). Lindhqvist defines EPR as:

> "…an environmental protection strategy to reach an environmental objective of a decreased environmental impact of a product, by making the manufacturer of a product responsible for the entire lifecycle of the product and especially for the take-back, recycling and final disposal of the product" (Lindhqvist, 1992 in Lewis, pp 48, 2005).

EPR has since developed— it complements the "Cradle to grave" concept, so the industry is responsible for waste from the beginning of the cycle to post-consumer disposal (Maclaren,

[24] Among other stakeholders.

2002). This creates a distinct holistic examination of the product's entire system, as opposed to a regulatory framework that solely controls the end of the pipeline effluent and emissions (Li and Geiser, 2005). EPR is motivated by a variety of factors: a scarcity of natural resources, environmentally degrading production and disposal actions, costly waste disposal wrongfully burdening municipal governments, the possible to promote alternative consumer purchasing habits (Maclaren, 2002). EPR can result in a number of behaviours.

*Table 1: Potential Results of EPR*

| Potential Results of EPR |
|---|
| Reduce material, resources and energy use |
| Eliminating the use of toxic chemicals in the product |
| Increasing recyclable and recycled content |
| Streamlining and improving the efficiency of transportation systems and product processes |
| Extending the use life of the product |
| Increasing opportunities for recovery and re-use of the product at end-of-life |
| Creating new forms of product delivery such as leasing/product services |

(McKerlie *et al.*, pp 617, 2006)

Overall, the objective of EPR is to inspire corporations to become involved and responsible for the environmental implications associated with their product. EPR results in the internalization of environmental costs, and allows industry to promote Design for the Environment (McKerlie *et al.*, 2006). The internalization of environmental costs will ultimately be reflected in the price of a product. This provides consumers with incentives to purchase products that are less environmentally damaging, because they will cost less money (McKerlie *et al.*, 2006). EPR motivates industry to take action and minimize the environmental impacts associated with their product.

One example of a voluntary EPR initiative is Loblaws' cloth bag initiative described in detail in Environmental Taxes and Charges (see page 48). Voluntary EPR initiatives are becoming increasingly common as Canadian citizens express their desire for corporate social responsibility (Laroche, *et al.*, 2001; CBC, 2009). McKerlie *et al.* (2006) argue that EPR should be implemented in Canadian policy: "until the true environmental and social costs of Canada's "disposable society' are accurately reflected in product pricing and these principles are more comprehensively integrated into policies and programs, efforts to encourage pollution prevention practices will continue to be met with limited results" (pp 617-618, 2006).

### 2.2.8 Integrated Product Policy

Policies about products and their effects on the environment emerged as a concern in the 1970s (Rubik and Scholl, 2002). The term Integrated Product Policy (now to be referred to as IPP) was originally popularized in the report "European Commission: DGXI Integrated Product Policy" by Ernst and Young in March of 1998. Ernst and Young describe IPP as "public policy which explicitly aims to modify and improve the environmental performance of product systems" (pp 9, 1998). Most of the founding principles remain the same, although the concept has since been discussed and developed to provide detail and clarity.

In 2006, Scheer and Rubik published "Governance of Integrated Product Policy: In Search of Sustainable Product and Consumption", which successfully filled some of the last gaps in IPP. IPP has been successfully applied in a number of nations, including, Netherlands, Denmark and Finland (Rubik and Scholl, 2002).

IPP is an approach that attempts to reduce the environmental impacts associated with a product through its entire lifecycle (Sundkvist and Finnveden, 2007). The word "integrated" in IPP is very important. "Integrated" considers the whole lifecycle of a product from cradle to grave (Rubik and Scholl, 2002). It refers to the importance of co-operation between stakeholders, and the application of a diverse range of policy instruments to meet its goals. "Product" refers to both physical material goods, and services (Rubik and Scholl, 2002). As a result, IPP does allow for a movement towards service based consumption. "Policy" attempts to facilitate environmentally beneficial stakeholder actions at the beginning of the pipe-line, rather than managing a situation after it has occurred (Rubik and Scholl, 2002).

IPP is an important concept because it attempts to address and remedy an environmental problem, and prevents problematic policy solutions that only shifted the environmental problem from one medium to another (Ernst and Young, 1998).

*Table 2: Traditional Environmental Policy vs. Integrated Product Policy*

| | **'Traditional' environmental policy** | **'Modern' environmental policy** |
|---|---|---|
| Political guideline | Control of risks and damages | Sustainability |
| Main policy principle | Command and control | Push and pull |
| Responsible actors | Government | Society ('shared responsibility') |

| Type of policy | Confrontation | Co-operation |
|---|---|---|
| Issues | Separation of issues, single issues | Integration of issues, system issues |
| Behaviour principle | Reactive behavior | (Pro)active behaviour |
| Regulation principle | Government regulation, government control | Self-regulation, self-control, self-organisation |

(Scheer and Rubik, 2006; from by Oosterhuis *et al*. 1996:219)

From this table, one can see that the new environmental policy, later to be called integrated product policy, represents a governance ideology. Instead of a command and control system run by the government, there is a movement towards more negotiation where the entire society shares the responsibility (Scheer and Rubik, 2006). The new system moves away from managing perspective solutions, and looks at the entire sustainability of the system in a proactive manner.

In addition, IPP uses a toolbox of policy instruments to promote and facilitate sustainable product consumption (Sundkvist and Finnveden, 2007; Rubik and Scholl, 2002). The policy instruments are applicable to both the supply side (product development) and demand (product consumption) (Sundkvist and Finnveden, 2007). The Centre for Sustainable Design developed a toolbox of options that represent an IPP ideology:

*Table 3: IPP Supply-side and Demand-side Toolbox of Options*

| **Supply-side** | **Demand-side** |
|---|---|
| Prohibitions/phase outs (voluntary/regulatory) | Consumers Information: |
| Product performance requirements | -Ecolabels |
| Take back | -Product profiles |
| Grants/subsidies for eco-production development | -Product guidelines |
| Eco-design competitions and/or awards | -Information centres |
| Environmental Management Systems (EMS)/ Product-oriented environmental management systems (POEMS) | Indirect taxation |
| Standardisation | Public purchasing |
| Information and reporting | Deposit-refund schemes |
| Voluntary agreements | |

(The Centre for Sustainable Design, pp 4-5, 2001)

The toolbox represents a governance approach to environmental management and looks at what tools and what actors can influence the entire lifecycle of a product to promote sustainability.

Within the system of governance, each actor has a set of tools that can be used to reduce a product's environmental impact.

A number of problems have been identified with IPP. First, the formulation of IPP's conceptual strategy is easier to discuss in a theoretical setting than in its practical application and implementation in environmental policy (Rubik, 2006).

Words like holistic, integrated approach, and sustainable consumption, are often used to describe IPP. Few individuals would disagree with these theoretical ideals. Rubik and Scholl suggest that most IPP policy documents are vague and "they contain but a few characteristics and precise elements, namely IPP-objectives, specific principles, intended instruments, priorities and emphasis and some more concrete activities and measures" (Rubik and Scholl, pp 512, 2002). Theoretically, suggesting that one needs stakeholder involvement is easy, the facilitation necessary to encourage individuals to participate is much more difficult.

These are critical issues with IPP, but do not undermine IPP's validity as an excellent policy framework. Like the term "sustainability", it is still an excellent ideal, there needs to be further effort to act on theory and move into implementation in nation states. Further efforts must be concentrated in establishing clear implementation strategies that have been successful in other regions. IPP efforts are currently being implemented in the European Union.

### 2.2.9 Conclusion

Section two describes a number of theories, concepts and principles that could help to support bottled water packaging waste minimization. Most of these topics complement each other to promote waste minimization of packaging. Industrial ecology has clearly influenced topics including: cradle to cradle, design for the environment, polluter pays, proximity principle, EPR, LCA and IPP. All these topics attempt to maximize efficiency within in a complex, human-created system. The production of bottled water is divided so the producers of waste are not responsible for packaging waste management. The implementation and use of these concepts maybe able to help re-organize the system, and encourage packaging sustainability. For example, industry implementing design for the environment could help to encourage packaging that is easier to manage after it is used. Industrial ecology, in combination with the quadrangle can help to identify and solve these types of problems in the system.

As demonstrated above, some of these concepts have similar objectives. For example design for the environment, cradle to cradle, sustainability and the triple-bottom line all encourage environmental sustainability. Given similarities with environmentally focus concepts, the Ontario government find it redundant to implement all four of these topics. Similarly, the discussed principles (Precautionary, Polluter Pays, and Proximity) could be implemented with a sustainability focus. The principles are different enough that they could be implemented together. The tools discussed— EPR and IPP— could both be implemented with a zero waste policy objective. The discussion section will examine how IPP and EPR could be implemented together in Ontario. Strong Ontario stakeholder involvement has already resulted in governance (see Actor involvement on page 13). Next, section three introduces waste methods, concepts and tools that help to promote bottled water packaging minimization.

## *2.3 Product Groups*

Section three introduces the waste hierarchy: redesign and source reduction, reuse, recycling, landfilling and incineration. Types of packaging containers, bottled water packaging material, and historical methods for promoting waste minimization are discussed. Each of these areas represents a waste method to support packaging minimization of bottled water.

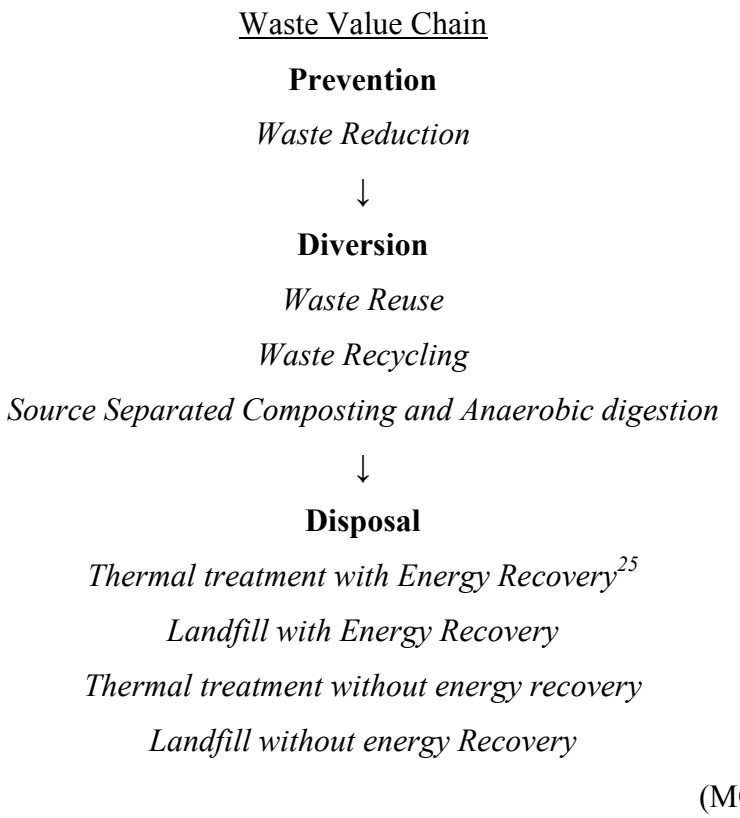
### 2.3.1 Waste Management Theory

#### *Waste Hierarchy*

The waste hierarchy is a system that helps to determine methods of managing waste. At the top of the hierarchy are methods like redesign and reduce, which have been designated as optimal methods of managing waste. As one continues down the hierarchy, the options become progressively less environmentally desirable (Barr, 2003).

There are various versions of the waste hierarchy. The hierarchy shown below has been proposed by the Ontario provincial government in the 2008 "Towards a Zero waste Future: Review of Ontario's *Waste Diversion Act*, 2002" (MOE, 2008).

*Figure 2: The Waste Value Chain*




(MOE, 2008)

### *Redesign and Source Reduction*

The Ontario Ministry of Environment describes source reduction as "the redesign of products and processes so that less material is used to achieve the same function" (MOE, p.3, 2004). For example, using source reduction can create a package that uses less material but is comparable in protection. This package could be designed to be smaller, possibly reusable, and easy to disassemble for recycling, and contain no toxic chemical damaging to human health of the environment (McKerlie, 2005). The MOE explains, "By encouraging source reduction, waste diversion reduces the costs of doing business. For example, manufacturers can save on the use of packaging their products" as well as final disposal (MOE, p. 3, 2004).

There are a number of ways to promote source reduction of bottled water. Municipal tap water is readily available in Ontario and is typically of a good quality[26]. Consuming municipal water does not produce packaging waste, representing one approach to waste reduction. Source

[25] There is debate about whether thermal treatment with energy recovery should be above or below the landfill option (Tammemagi, 1999).
[26] See page 23.

reduction is also being practiced within the bottled water industry. For example, in the past 5 years, Nestles Waters has reduced the amount of plastic in their packaging by 20%. Their 500mL bottle now contains 12.4 grams of plastic, which is approximately 30% lower than a typical 500mL single use container produced by other water bottling companies (Nestle Waters, 2009). In the case of source reduction, consumers are not required to alter their behavioural practices dramatically (Forester and Skinner, 1992).

### *Reuse*

The next step in the hierarchy is reuse. A product should be reused as often as possible before it continues through the cycle. Products should be designed to be reused many times. Many products made today are designed for reuse— household pots, clothing and toothbrush. Sometimes a product's packaging is also reused, like Ontario's 341 mL refillable beer bottle system (the bottles are reused an average of 12-15 times). Products that are currently not being reused include the single-use water bottles that are one focus of this research (Mitchell, 2004; The Beer Store, 2008).

Municipal water can be put in personal refillable containers (refillable bottles, glasses, mugs) and provides options for reuse. There are also refillable options within the bottled water industry. Canadian Springs, for example, offers 18.5L refillable container (Canadian Springs, 2009). Plastic single-use water bottles can also be recycled in many locations. In 2008, Ontario's municipalities diverted 22.1% of all plastic produced (Waste Diversion Ontario, 2008).

### *Recycle*

Recycling is a process that converts waste into a form that can be used again. Examples of materials that can be recycled include metals, plastics and fibres. Recyclable material is commonly collected by a municipal blue box or deposit-return system (Robertson, 2006; Tammemagi, 1999).

### *Landfill*

A landfill is a method of disposing waste once the other methods of waste diversion have been exhausted. Waste that cannot be diverted in some other method is sent to a secure location where it is compacted and buried with other waste. Landfills have a secure liner to prevent waste from leaking into the soil and water. Modern landfills have a methane collection system; the methane can be burned and used as energy. There are different methods of handling non-hazardous, hazardous and radioactive waste before final landfill disposal (Maclaren, 2004; Tammemagi, 1999).

### *Incineration*

Incineration is a process that burns waste that cannot be diverted through the three Rs. There are 7 large scale incinerators designed for municipal waste treatment in Canada (A.J. Chandler & Associates Ltd., 2007)[27]. Incineration requires a steady stream of garbage in order to continue running (Sheppard, 2006). Incineration is popular in Europe, and is less commonly used in North America due to concerns with cancer-causing dioxins. Clarke argues that "burning plastic bottles releases toxic pollutants—nitrogen, sulphur, and carbon oxides – into the air. Heavy metals are also deposited, in the form of ashes, onto the ground. These pollutants include carbon dioxide, one of the three major emissions linked to global warming and climate change, plus sulphur dioxide and nitrogen oxides, both known to be among the prime causes of acid rain." (Clarke, pp 59, 2005). It is interesting to note that in the recent 2008 Ontario waste diversion discussion paper the provincial government has placed thermal treatment before landfilling in its waste hierarchy.

## 2.3.2 Packaging

Packaging started off using natural materials such as large leaves to wrap goods, or woven containers and pottery. For the past 5000 years, glass and wood have been used for packaging. Later, packaging innovation included the development of tin containers (1823),

[27] These include: Wainwright (MSW feed) (Wainwright, AB), GVRD (Burnaby, BC), Algonquin Power Energy from Waste (Brampton, ON), Trigen (Charlottetown, PE), Centre de traiement des residus urbains (Quebec City, QC), La Régie Intermunicipale de Gestion Rive-Sud (Levis, QB), and MRC des Iles de la Madeleine (Dune-du-Sud, QC) (A.J. Chandler & Associates Ltd., 2007)

paperboard (1900) and various plastics (1907-1994). Each new packaging material innovation provided society with new possibilities[28] (Selke, *et al.*, 2004). Packaging plays a critical role in modern society (Robertson, 2006). Packaging "surrounds, enhances and protects the goods we buy, from processing and manufacturing, through handling and storage, to the final consumer. Without packaging, materials handling would be messy, inefficient and costly exercise..." (Robertson, pp 1, 2006). Additional packaging functions include: containment, protection, preservation, communication, utility and performance (Robertson, 2006).

### *Primary, Secondary, and Tertiary Packaging*

There are three major categories of packaging: primary packaging, secondary packaging and transport or tertiary packaging (Imhoff, 2005). For this research, primary and sometimes secondary packaging will be examined exclusively. Primary packaging is the container in which the food or beverage is contained. Examples of this would be the plastic water bottle, glass honey jar, plastic bag used to hold rice. Secondary packaging is the packaging used to contain multiple packages of primary packaging. Water bottles often come in packs of 24, and the cardboard and plastic used to wrap the plastic water bottles is secondary packaging. The cardboard box and cellophane used to package tea that is individually wrapped could be described as secondary packaging. Finally, transport or tertiary packaging is the container that transports the products (with their primary and secondary packaging) from the location the product is produced to the location where the product is finally sold. Transport or tertiary packaging can include "corrugated cartons, shock-absorbing filler materials, bulk carriers (such as wooden pallets), strapping, shrink-wrapping [and] returnable plastic containers" (Imhoff, pp 11, 2005).

### *Plastics*

Plastic is a lightweight, highly versatile material that is used in approximately 50% of primary food packaging (Robertson, 2006). Plastics are generally made from non-renewable

[28]Plastics developed and used in World War II were essential for insulation of wires for radar and radio equipment and aided the war efforts (Selke *et al*., 2004).

refined crude oil (Imhoff, 2005). In the past 40 years, plastics have replaced packaging previously made from glass or metals (Robertson, 2006). Plastics' light weight has made it an attractive alternative, saving energy and thus costs associated with transportation (Selke, et al., 2004).

Bottled water is packaged almost exclusively in plastics (Robertson, 2006). Common container sizes include: 330 mL single-use container, 355 ml single-use container, 500 mL single-use container, 710 mL single-use container, 1 L single-use container, 1.5 L single-use container, 3L single-use container, 4L single-use container, 10 L single-use container, 18.5 L refillable, (Aquafina, 2009; Canadian Springs, 2009; Nestle Waters Canada, 2009). There is a trend towards single-use 'smart' packaging that layers a number of types of plastic, making it more difficult and more expensive to recycle (Imhoff, 2005).

### *Polyethylene Terephthalate (PET)*

Most container packaging is made from PET (Robertson, 2006). Antioxidant additives are used to process plastics and prevent water from containing undesirable tastes or odours (Robertson, 2006). During processing, the melt temperature must be carefully monitored to ensure minimum production of acetaldehyde, which can cause a fruity aroma that alters the water's taste (Robertson, 2006).

### *Refillable Containers*

Refillable containers can be packaged in a number of different types of materials. At optimal rinsing conditions, it is not possible ensure all bacteria is removed from container. Glass is the best material for removing bacteria, following from that: PET, PC[29], PP and PVC are equal and lastly HDPE. As a result, Robertson recommends the use of ozonation (Robertson, 2006).

Canadian Springs is a bottled water company refilling their large format 11 L and 18.5 L containers an average of 55 times. Canadian Springs has found that their 18.5 L refillable container uses 97% less raw materials than a 500 mL single-use container, and 96% less raw materials than a 15 L single-use container. In addition, Canadian Springs found that their

[29] Polycarbonates

reusable 18.5 L containers used considerably less energy, as refillable containers eliminate the need to extract and manufacture as many containers. These refillable containers use 26 times less energy than the single-use alternative on 1000 L bases (500mL or 15L). Overall, an 18.5 L refillable container produces an estimated 36% less greenhouse gas emissions than a 15 L single-use container, and 53% less greenhouse gas emission than a 500mL single-use container (Canadian Springs, 2009—2).

### 2.3.3 The History of Packaging Innovations

#### *Reuse*

In the 1880s, most packaging was reused. If the packaging broke, often, individuals would mend or transform the packaging into another product. There are many ingenious transformations, for example, an old barrel could be turned into a chair. Strasser explains "the reuse of packaging expressed the fundamental principles of household bricolage and the stewardship of materials" (Strasser, pp 66, 1999).

#### *Dual-Use Packaging*

In the early 1900s, when industry began packaging food products, many consumers were not comfortable with the idea of a 'disposal society', where individuals simply discarded perfectly good packaging once the product was consumed (Strasser, 1999). As a result, some industries developed dual-use packaging. For example, a tin filled with tobacco could later be used as a convenient lunch box. Similarly, parchment paper used to wrap butter could later be washed and used for a variety of household needs, including washing dishes. Not only would this provide advertising for the respective company (in this case Paterson Parchment Paper), but, after it had been used for household tasks, it could simply be burned in the fire. Originating around 1910, flour-sack dresses were another innovative marketing strategy that promoted dual-use of packaging. Flour companies, such as the Bemis Company, advertised that the cotton bags used to package their products could later be used as material to make dresses. The Bemis Company even advertised that the cotton bags came in a thousand different material patterns. Flour-sack dresses were particularly popular during the Great Depression, and were promoted until the 1960s (Strasser, 1999).

Dual-use packaging was also used in the beverage container industry when deposit-return systems were ineffective. In the 1960s, Heineken beer was traditionally refilled under a deposit-return system in Holland (Imhoff, 2005). It was not practical to ship refillable containers internationally, so Heineken produced single-use containers for its international market. Without the deposit, these containers often were littered, creating excess pollution. As a result, Heineken Breweries designed the "World Bottle" container or "WOBO", an innovative design that mimicked building material bricks. The bottles were designed to interlock and be stacked, just like regular bricks. 50, 000 WOBO bottles were produced in 1963, but a number of problems eventually forced Alfred Heineken to discontinue the project (Imhoff, 2005). It is unclear what factors lead to the swift demise of the WOBO container, but it is suspected that there was a lack of market acceptance, prohibitive costs and a problematic design. Imhoff suggests that "not even a motivated, influential, corporate leader was able to mitigate the impacts of the packaging of international beverage production through a design innovation" (pp 33, 2005).

### *Disposability*

After the Second World War, the concept of "disposability" became increasing popular in marketing food-packaging products. A variety of factors contributed to this trend. New post-war technology provided innovative, fast and easy-to-use product alternatives that had not previously been available. Disposable products became popular, such as aluminum pot-pie trays, paper napkins and tissues, and aluminum foil. These products reduced workload and prevented the need for hired help. In addition, there was a transition towards multilayer and single-use packaging, often made of plastic. Plastic was a technologically advanced material that was advantageous because it was a lighter, unbreakable packaging alternative to glass or aluminum. A major disadvantage of plastic was that consumers could not repair it, thus broken products were no longer fixed as they traditionally had been. This new attitude towards disposability was widely embraced; recycling and reuse became associated with poverty and a digression from innovation (Strasser, 1999).

### *Barriers to Packaging Reform*

A number of identified barriers deter packaging reforms.

### *Consumer's Perception of Packaging*

Experts suggest that public perception on packaging and packaging materials often can be a more important factor in legislation creation than scientific fact. The public often has misconceptions about plastic, for example, burning polyethylene creates dioxins is incorrect (Selke *et al.*, 2004). In addition, plastics are often perceived as unnatural because they are synthetically produced.

> "It seems that since glass and steel, for example, have been around for a lot longer than plastics, they have somehow become more 'natural' and thus are perceived as more environmentally friendly. …this is not to say that there are not real environmental issues associated with the use of plastic packaging. There are, just as there are real environmental issues associated with any type of use of any material." (Selke *et al.*, pp 397, 2004).

### *Lack of Leadership*

Daniel Imhoff argues "with rare exceptions, corporate leaders pay lip service to environmental issues, acting only when it positively influences the economic bottom line" (pp 38, 2005). Among corporations, there is an increasing movement towards green activities. Wal-Mart has developed a packaging initiative to promote source reduction of waste (Wal-Mart, 2006). Grocery stores are moving to promote re-useable cloth bags (CBC, 2009). These initiatives are all environmentally positive actions, but they are profitable to industry and do not hinder the economic bottom line. Imhoff argues that there must be profound corporate reform to promote sustainable corporate activities (2005).

### *Stakeholder Communication and Collaboration*

Packaging reform is greatly hindered by the lack of collaboration between industry competitors. With co-operative efforts within industries, economies of scale could be created, thus promoting alternative packaging materials and distribution (Imhoff, 2005). Environmentally friendly innovative alternatives often provide a competitive advantage to a particular corporation, so information sharing is not likely to occur. In addition, communication

and collaboration between consumers, manufacturers, suppliers, converters, and municipal recycling facilities can assist with increasing industrial efficiency (Imhoff, 2005).

### *Environmental Material Planning*

The time taken to consume a product compared to the time to produce packaging waste, and the time that this waste will persist in landfills and contribute to problems associated with landfill capacity and leaking is significant (Imhoff, 2005). A PET bottle of water will persist in a landfill for over 1000 years while the plastic slowly decomposes (Design Edge Canada, 2007). Imhoff suggests that often packaging is not designed with the focus on recycling, thus limiting the chances that post-consumed packaging can be transformed into a future product through recycling (Imhoff, 2005).

### *Imbalanced Energy and Water Conservation Movement*

It takes significant amounts of energy to produce the packaging for a product. It takes approximately 1500 times more energy to produce 1 litre of bottled water (1.8MJ/Litre) than 1 litre of municipal water (0.0012MJ/Litre) (Thompson Rivers University, 2009; Hanssen *et al.*, 2007). After production, energy is required to transport the bottled water and process the bottle by recycling or final disposal. It takes approximately 3 litres of water to produce 1 single-use container of bottled water (Pacific Institute, 2008). The energy and water conservation movement needs to consider other wasteful practices, like packaging production (Imhoff, 2005).

### *Problematic Implementation of Metric Standardization*

The metric system has not been implemented in the United States. This has caused problems for standardization, and prevents interchangeable and reusable packaging from being used in the United States and Canada. Different measurement systems, encourages the use of separate locations to package the product. Ideally, packaging is produced closer to the consumers (Imhoff, 2005).

### *Diverse Municipal Collection Systems*

In Ontario, there are a great number of differences between collection facilities across the province. What can be put in the blue box system, and how it must be sorted, all differ greatly depending on the municipality that is managing waste[30] (City of Kingston, 2009; City of Toronto, 2009). This is can contribute to increased confusion about waste disposal and recycling.

### *Excessive Consumption*

Excessive consumption has become a normal consequence of society's fast-paced lifestyle. Citizens are used to products that are convenient, to the detriment of the environment. The human health and ecological sustainability are neglected when excessive consumption is considered to be normal (Imhoff, 2005).

### *Product Contamination and Excessive Packaging*

Concerns associated with bioterrorism, disease and food contamination has resulted in a movement to increase food and beverage packaging to ensure food safety (Imhoff, 2005). Thus, the trend is away from bulk or open food towards products that are heavily packaged to ensure safety (ME).

### *Exporting Waste*

Like any material, waste can be exported at a cost. Since January 2001, Toronto has been shipping its waste to Michigan (CBC, 2001). Exporting waste does not require the local community to take responsibility for their consumptive actions. In addition, it raises equity issues, as regions with economic disparity may become landfills for the economically wealthy regions (Imhoff, 2005).

[30]For example, the City of Toronto has one bin for all recyclable materials picked up each week (City of Toronto, 2009). The City of Kingston has a grey bin (for paper) and a blue bin (for other recyclables); the bins are put out every other week for collection (City of Kingston, 2009).

### 2.3.4 Conclusion

Bottled water packaging waste can be minimized in a number of ways using various levels of the waste hierarchy. The section discussed packaging, reusable packaging, PET and historical waste minimization techniques. All policy objectives and tools discussed in this paper are developed to emphasis different levels of the hierarchy. Section four examines policy instruments that could help to emphasize bottled water packaging minimization.

## *2.4 Policy Instruments*

After determining the policy objectives, policy makers can begin to design and implement change. Policy design typically goes through a cycle to develop waste policy. This section describes the policy cycle and policy instruments, and discusses how these tools have been used in other areas of beverage waste packaging policy.

### 2.4.1 The Policy Cycle

Policy is a government's planned course of action or inaction which is later entrenched in the law with statutes, acts and regulations (McAllister, 2004). There are a number of important stages in the policy development process (McAllister, 2004). The process is often described as a cycle, where policy is continuously changing to correspond with events influencing the region and the values of the people. The beginning of the policy cycle is agenda setting; followed by policy formulation; decision-making; policy implementation; and finally policy evaluation (Hessing *et al*., 2005; McAllister, 2004). Some policy cycles include policy approval and monitoring as additional steps. No matter who describes the policy process, the following basic steps will be taken to design the best policy solution. This policy cycle is a prescriptive description of what should happen in policy development (McAllister, 2004).

#### *Agenda setting*

Agenda setting is the first step in the policy cycle and is arguably one of the most important steps (Hessing *et al.*, 2005, McAllister, 2004). At this stage, issues are identified clearly, characterized, conceptualized so that an array of feasible potential solutions is imaginable (Hessing *et al.*, 2005). Charles Anderson notes that "how we perceive a problem

depends on how we propose to evaluate it" (pp712, 1979). As seen with bottled water, issues requiring government attention can be raised any actor, including community members, interest groups, government and business, among others (Hessing *et al.*, 2005). Agenda setting is a complex process that varies depending on what the issue is, and which stakeholder raised it. Public consultation is an essential component of agenda setting, but, is often inadequate, "despite much lip service paid to public participation, the public is often prevented from actively participating in the policy process or from articulating its grievances in the policy-relevant manner" (McAllister, 2004, Hessing *et al.*, pp 164, 2005).

### *Policy Formulation*

The second stage of policy development, policy formulation, examines and determines the available options to help achieve the government's objectives (Hessing *et al.*, 2005). It is a dynamic process; its description cannot be reduced to one single action or event. The risks, costs, and benefits are all assessed for each potential policy solution. This step does not result in a decision, but it narrows the number of potential solutions by eliminating non-viable options. It also often ranks, and assesses the desirability of final options (Hessing *et al.*, 2005; McAllister, 2004).

### *Decision-Making*

At the decision-making stage, the government chooses whether to adopt a particular policy. The decision can result in either government action or inaction (McAllister, 2004). The policy can be adopted, partially adopted, discarded, or revised (Hessing *et al.*, 2005). There must be multiple options available to compare to each other (Anderson, 1979). The decision-making process is not limited to one stage of the policy cycle, and in fact occurs at a number of stages (Hessing *et al.*, 2005). These include both formal and informal decision-making situations and "range from the enactment of legally binding and sanctioned legislation … [to] informal statements of politicians covered by an increasingly pervasive media" (Hessing *et al.*, pp 195, 2005).

### *Policy Implementation*

A group is designated to implement the policy that has been selected in the decision-making stage (McAllister, 2004). A variety of economic, regulatory and voluntary instruments is used as policy instruments to help successfully implement the policy (Hessing *et al.*, 2005). During the implementation process, there are a number of organizational steps to ensure proper implementation— the allocation of funding and personnel, and the development of procedural rules (Hessing et al., 2005). In addition "this process involves setting and applying rules and regulations, monitoring resource inventories, planning and evaluating projects, allocating permits, assessing compliance with regulations, administering funds, and a variety of related activities" (Hessing *et al.*, pp 215, 2005). Frequently, policy is made law through the enactment of statutes and regulations which then supports the policy and enforces compliance. Economic incentives can be used to speed up the implementation period (Krozer and Nentjes, 2008).

### *Policy Evaluation*

Policy evaluation monitors and evaluates both the processes and the results of the policy cycle (McAllister, 2004). Both policy officials and societal actors act as monitors. Policy evaluation is a crucial component of policy development, and provides critical insight into the successes and failures of the program (Krozer and Nentjes, 2008). Policy evaluations can be developed to highlight only the successes of a program, thus undermining its validity and fundamental purpose. As a result, policy evaluation can both recognize and conceal the true effects of the policy (Hessing *et al.*, 2005).

## 2.4.2 Barriers to Policy Implementation

There are a number of problems associated with the effective implementation of policy at both federal and provincial level. Often, policy objectives are not clearly stated or lack the detail required to meet the objectives (Hessing, *et al.*, 2005). Canada has not implemented an overarching regulation or policy framework to promote sustainable production and consumption (Barber, 2007). Following from this, there is no overarching policy framework relating to packaging waste in particular. The federal government has acknowledged that a policy

framework must be developed to manage sustainable production and consumption (Barber, 2007).

Regulations are developed using baseline data to set targets and standards. If this baseline data is somehow faulty or problematic, it prevents regulations from being properly set and results tend to be skewed. This often occurs because industry's data is designed to monitor economic interests and is not designed for the purposes that would aid in developing the regulation. The standards for evaluating the success or failure of a regulation can also be problematic, as the methods for setting the standard can be designed to influence the outcome (Hessing, *et al.*, 2005).

Due to financial constraints, government often negotiates with industry to develop voluntary agreements. With a negotiated agreement, industry monitors its own process and government does not have to spend valuable resources in monitoring. Hessing *et al.* comment that in a voluntary negotiated agreement, government "appears to be more highly devoted to the maintenance of favourable economic conditions than to the issue of environmental or resource protection and management" (pp 226, 2005). There are also substantial barriers surrounding public participation. It is difficult to involve the public successfully in the policy development process, often policy is changed before the consultation process is complete, and the public have to be interested and willing to participate (McAllister, 2004; Hessing *et al.*, 2005).

Finally, ineffective enforcement is a significant barrier to policy implementation. Effective enforcement is necessary to ensure that the designated individuals are complying with requirements. Without monitoring and enforcement, there are no incentives to comply (Krozer and Nentjes, 2008). This a re-occurring issue in waste management packaging policy. Regulation 340 and 357 are regulations under the *Environmental Protection Act* that required industry to achieve mandated refillable quotas for the soft-drink industry. With the introduction of the Blue Box Program, Regulation 340 and 357 were no longer enforced and consequently refillable rates dropped from 48% of the market share in 1985 to 2% of the market share in 1996 (See page 133) (Zylstra, 2001).

### 2.4.3 Policy Instruments

Policy instruments can be divided into three major categories: economic, regulatory and contractual (Platt and Rowe, 2002). Regulatory policy instruments regulate that certain behaviour must occur at designated increments. Examples of regulatory policy instruments include environmental laws or regulations, bans, quotas, bottle standardization and eco-labelling. Economic policy instruments provide financial incentives to encourage certain desired behaviours among stakeholders. Financial policy instruments include environmental taxes and charges, deposit-return programs, tradable permits, non-compliance fees, subsidies, and the internalization of final disposal costs. Finally, contractual policy instruments are voluntary agreements between industry and government that consent to certain behaviours (Platt and Rowe, 2002). All of these policy instruments can be applied to the case study of bottled water to support waste minimization of packaging. The policy tools can be applied by different actors to support the zero waste policy objectives and the concepts applied to support zero waste (see page 19). Some of these tools will be more successful than others; the discussion will compare and contrast them (see page 81).

### 2.4.4 Regulatory Instruments

#### *Environmental Laws and Regulations*

Laws are sets of clearly defined rules that prescribe by statute and regulations how people are required to act. The law also determines the jurisdictional responsibility among governments (Steiner, *et al.*, 2003). Generally, statutes passed by parliament outline the broad expectations that must be followed. Regulations provide a detailed explanation for how the provisions in an Act will be applied (Steiner, *et al.*, 2003). Please see Appendix Four for a description of relevant regulations.

#### *Bans*

A ban is a regulatory instrument that is typically enacted by a municipal, provincial or federal government. More recently bans have been implemented in the private sector in schools

(University of Winnipeg), churches[31], restaurants and hospitals (Polaris Institute, 2009). A ban prevents the designated material from being sold within the designated areas. Since bans represent 100% restriction on certain products or materials, it is easy to identify non-compliance. As a result, bans are simple to enforce and are easier to implement than a quota. The major disadvantage of a ban is that it removes a consumer's right to purchase that product within the jurisdiction (Platt and Rowe, 2003).

A predominant concern is public drinking fountains have not been adequately maintained, and thus banning bottled water might result in citizens having no access to water. For example, Toronto's Exhibition Place was built with only one water fountain (Moscoe, 2009). Since Toronto has moved to implement a bottled water ban in its municipal facilities, including Exhibition Place, water fountain infrastructure will be required.

***Quotas***

A quota is a regulatory instrument that is typically enacted requiring compliance from individual corporations or an Industry as a whole. It requires the selected group to comply with and achieve a designated percentage of material sold and recycled (Platt and Rowe, 2002). There are a number of disadvantages with implementing quota legislation. Quotas can be difficult to enforce because they do not provide incentives for consumers to purchase them. Industry will often argue that they are attempting to achieve the mandated quota, but consumers are choosing not to purchase it, and thus it is beyond their control. Quotas also provide little incentive for retailers or corporations to meet them without other policy instruments to support and enforce quota regulations. A second disadvantage is that quotas require government monitoring. As a result, quotas are time-consuming and costly for both industry and government.

Quotas can be problematic because sometimes the mandated cause and effect are not always directly linked. Although Industry can influence consumer-purchasing habits, it does not have the power to control it. Whenever possible, it is best to set a quota that the particular mandated individual can directly achieve. A problematic quota is a quota requiring industry to sell a certain percentage of beverages in refillable containers. A corporation does not have the

[31]The United Church has called for its members to stop buying bottled water (Polaris Institute, 2009).

power directly change the percentage of soft drinks sold, but does have the power to change how many bottles are refilled. Refillable quotas are not as extreme as a ban. Quotas do not remove any freedoms from consumers, and accept that there are times when certain products may be more convenient than others are (Platt and Rowe, 2002).

### *Mandatory Stocking Laws*

Mandatory stocking laws regulate that all retailers that stock single use beverages must as well maintain a certain percentage of refillable containers. This can be implemented with a quota system to ensure that consumers are able to purchase the designated container. A mandatory stocking law ensures that consumers have the ability to purchase the mandate type of container from any grocer selling the particular product or beverage (Platt and Rowe, 2002).

### *Bottle Standardization*

Bottle standardization can be a voluntary or regulatory initiative that is used to increase efficiency for a refillable system. A standardized bottled is beneficial because it promote transportation efficiency and reduces greenhouse gas emissions (Imhoff, 2005). Once a beverage is consumed, a standardized bottle is transported the nearest refilling center. Without a standardized bottle, each brand owner must ship their containers back to their refilling center, which often can substantial increase the distance bottles are required to travel. Non-standardized refillable bottles create more work for collection centres as there is more sorting required. Standardized bottles have been used in Ontario's Beer Store (The Beer Store, 2008). The Beer Store has an opt-out policy, so corporations like Steam Whistle can choose to refill their specialized refillable container[32] (Steam Whistle Pilsner, 2009).

### *Eco-labelling*

Eco-labelling can be a regulatory or voluntary initiative where a label is created to classify and communicate a message to consumers (Imhoff, 2005). Usually the message

[32] As a result, Steam Whistle uses 30% more glass during the production of the bottle than a single-use, but their bottles are refilled an average of 35 times (Steam Whistle Pilsner, 2009).

communicates if a product or the product's package has met an environmental certification. Eco-labelling could be as simple as communicating that a package is recyclable, refillable, organic, free trade, or as complex as providing a detailed overview of a product's carbon footprint or LCA (factoring in waste, energy and water, among others). There are many eco-labelling associations; it can be difficult to determine which is the most credible are (Imhoff, 2005). Eco-labelling requires that the product meet certain environmental standards, helping the environment (Hickle, 2007). It also helps to communicate information to consumers and allows them to make informed purchasing decisions. A disadvantage of this tool is that the communicated message is simplified from a complex situation, that complexity is not communicated to consumers. In 1988, Canada created the eco-labelling program Environmental Choice (Levy, 2000). The eco-label has the image of a maple leaf with the outline of three doves in the middle.

### 2.4.5 Economic Instruments

Economic instruments are policy instruments that promote behaviour through economic incentives or disincentives (Thompson, 2002). Economic instruments assure that a financial requirement will encourage the relevant parties to behave as required by the legislation. Economic instruments usually reinforce and support other policy instruments.

#### *Environmental Taxes and Charges*

Environmental taxes and charges, often grouped together by the term levy, are economic policy instruments that can be applied to products to support the environment (Steiner, *et al.*, 2003). There are a number of reasons for using environmental levies. First, to promote environmentally friendly behaviour based on a system that creates incentive or disincentive. Second, to cover the costs associated with maintaining the environmental service. In the case of bottled water, the environmental levy would likely go towards supporting environmental service of recycling. Thirdly, a levy may be created to raise funds for a particular project that requires additional resources (Steiner, *et al.*, 2003). Environmental taxes can be charged in a number of ways. User charges can be implemented to cover the environmental costs associated with particular behaviours. Effluent taxes or emission charges represent the polluter's pay principle:

charges are only paid by the producers of waste. Finally, product taxes or charges are payments required of certain environmentally problematic products when purchased or at final disposal (Steiner, *et al.*, 2003). For example, one month after Loblaws voluntarily put a five cents deposit on single-use plastic bags, Loblaws reported a 75% drop in the use of single-use plastic bags nationwide (CBC News, 2009). An environmental charge that is closely associated with problematic behaviour tends to be more effective (McKenzie-Mohr and Smith, 1999). Environmental taxes or charges are considered highly effective in encouraging certain behaviour (Steiner, *et al.*, 2003). When implementing these charges, the governing body must be careful to implement charges that will create the proper incentives and ideally avoid any misinterpretations that result in unforeseen negative consequences. Whenever possible, McKenzie-Mohr and Smith suggest that incentives that encourage positive behaviour will have lasting results (1999). If behaviour like waste reduction is positively enforced with incentives, individuals will tend to continue recycle. Once an incentive has been implemented to promote an environmentally beneficial behaviour it should not be removed, as this may encourage people to go back to old habits (McKenzie-Mohr and Smith, 1999).

***Deposit-return system***

Deposit-return systems add an additional monetary sum (deposit) to the cost of a product that can be partially or fully returned to the consumer once they bring back the used product (Thompson, 2002). Deposit-return systems provide economic incentives to bring back recyclable material and thus promote environmentally friendly behaviour. They also make consumers responsible for the waste that they generate in line with the polluter pays principle (Steiner, *et al.*, 2003).

Deposit-return systems have been extremely successful in other provinces for container packaging. In 2001-2002, the province of Alberta's deposit-return system recovered 71% of their PET plastic, as opposed to Ontario which only recovered 38% of PET (Morawski, 2005).

Deposit-return systems can be used for both single-use and re-usable packaging. In Ontario, beer and liquor containers are subject to a deposit when purchased; once consumed, all packaging may be returned to the Beer Store for final disposal (The Beer Store, 2008). The Beer

Store has refillable and non-refillable beer containers, and it is estimated that the beer container recovery rate was 93% in 2008 (The Beer Store, 2008).

In addition, a deposit-return system was set up and started in February 2007 for all wine and spirit containers. Within the first year that the system was in place 64% of all containers were being returned. This increased to 70% in the second half of the year (between November 2007 and April 2008). The Beer Store was happy with this recovery rate, and states "… in only a short time, Ontario consumers have embraced a new deposit-return system for recycling their wine, spirit, and non-TBS listed beer containers as demonstrated by the favourable recovery performance for the first year report of the ODRP" (Ontario Deposit Return Program) (The Beer Store, pp 20, 2008).

### *Tradable Permits*

From a waste management perspective, pollution permits are issued and can be traded between relevant stakeholders. A company that produces more than their share of pollution (or waste) must purchase additional permits from other lower waste producing companies. It provides an incentive to increase efficiency and disincentive to produce excessive waste. Ideally, buying other stakeholder's permits should be considered a temporary solution because it is an inefficient and costly solution. High waste producing industries should quickly move to develop innovative solutions to reduce waste production (Steiner, *et al.*, 2003; Thompson, 2002).

### *Non-compliance fees*

Non-compliance fees, also called penalties or fines, require a monetary sum for not complying with the regulatory mandate. They act as an incentive to complying with regulation, and act as a revenue for other environmental initiatives. Setting fees requires careful planning; fees must be high enough to motivate compliance. Compliance fees also require adequate monitoring and are an administrative burden (Steiner, *et al.*, 2003). There are a number of non-compliance fees in the *Waste Diversion Act*.

### *Subsidies*

Subsidies provide monetary assistance to industries for various reasons. They include tax credits, deductions; soft loans, loan guarantees; payment delays, debt forgiveness; tariff barriers, exemptions; and provisions to use public infrastructure. Subsidies can help industry overcome insurmountable situations and ensure employment. They can be given to promote environmentally sustainable development or stimulate growth. Overall, subsidies should only be awarded in situations where the subsidies are the least-costly method to achieving the government's objective (Steiner, *et al.*, 2003).

### *Internalization of Final Disposal Costs*

Traditionally, the costs associated with final disposal of waste have been an external cost that municipalities and consequently taxpayers have paid (Steiner, *et al.*, 2003). Externalizing waste costs effectively create a disconnection between a product's production and its disposals. As a result, product design has not frequently been influenced by end-of-life management concerns (Steiner, *et al.*, 2003). In Ontario alone, there are many examples of externalized costs resulting in the unnecessary creation of problematic packaging. Municipalities have dealt with a range of issues including: products made from multiple materials making it difficult to recycle, a greater diversity of packaging that must be processed, and products made from materials that have no market value so cannot be sold (Region of Peel, 2009). In 2008, the Region of Peel created an educational campaign to inform their citizens of which packaging has no market value and so should be avoided (Region of Peel, 2009).

Consistent with cradle to cradle design principles, if all costs associated with a product are internalized, the industry that is producing the product will factor in end-of-life disposal and make the necessary changes to improve the product's efficiency (Steiner, *et al.*, 2003). Economic instruments like levying a tax can encourage certain behaviours (Steiner, *et al.*, 2003). Ontario is currently considering 100% EPR, requiring industry to be responsible for 100% of the economic costs associated with a product's final disposal.

### 2.4.6 Contractual Policy Instruments

Contractual agreements are contracts created, designed and agreed to by two or more stakeholders. The premise of the contact will vary depending on the nature of the situation, but the relevant stakeholders, usually industry and government, voluntarily agree that certain behaviour will occur. Contractual agreements are voluntary; industry cannot be forced into them. However, contractual agreements are often an attractive alternative to potentially looming restrictive regulatory instruments. A break in a contractual agreement is a contractual breach, rather than an illegal action under regular law. Contractual agreements often provide industry with higher degrees of flexibility than a regulatory policy instrument; this can be both an advantage and a disadvantage depending on the situation. An excellent example of a contractual agreement is the Quebec refillable beer bottle quota that no more than 37.5 percent of all beer containers can be bottled in non-refillable containers. This contractual agreement is between Quebec Brewers, the Quebec Provincial Government, and Recyc-Quebec (Platt and Rowe, 2002).

#### *Voluntary Citizen and Consumer Action*

Leaving excess packaging at the retail location where the product is purchased sends the clear message to producers that consumers will not tolerate excessive packaging on their products. Ontario Premier Dalton McGuinty recommends this practice to Ontario consumers (Toronto Star, 2009). Other countries that encourage this instrument include Germany (Inform, 2009).

### 2.4.7 Conclusion

The final section of the literature review has described the policy cycle (agenda setting, policy formulation, decision-making, policy implementation, and policy evaluation), barriers to policy implementation, and policy instruments (regulatory, economic and contractual). This represents the end of the literature review and the description of the four quadrants of the product policy quadrangle. The research now examines many of the same issues in further depth and specifically from the Ontario context, using the methods: participant observation and key expert interviews.

# 3.0 Chapter Three: Methods

Waste is an inherently complicated subject and many factors can influence waste generation— policy objectives, tools, actors and types of materials. The exploration of Ontario waste management packaging policy and bottled water consumption helps to better understand what influences the system and what areas might help to promote waste minimization. This research is exploratory and uses qualitative methodologies (Yin, 2003). Three methods were used to triangulate responses and check for validity (Yin, 2003). The literature review starts by outlining the fundament influences of bottled water packaging. Participant observation and interviews helps to provide the Ontario context and helps to provide more insight into gaps in the literature. Together, these three methods provide a strong foundation to answer the research question from both theoretical (literature review) and contextually (participant observation and interviews).

## *3.1 Literature Review*

The literature review is an important method for placing research accurately within the body of literature (Frankfort-Nachmias and Nachmias, 2000). As an important exploratory methodology, the literature review has helped to determine where the gaps are in current Ontario waste management packaging policy. Limited linkages between topics from both a theoretical perspective, and as it related to the case study of bottled water, meant that an early finding was that the information on this subject is segregated and not subject to integrated evaluation. The literature reviewed included government documents, journal articles, published books, publications from NGOs and internet sites. To ensure the usefulness of internet sites, their accuracy was rigorously evaluated with Robert Harris' evaluation criteria: credibility, accuracy, reasonableness and support (Harris, 2007).

The literature review followed a methodology to ensure that all relevant sources were included. At the beginning, a broad examination of sources was conducted to determine where the relevant literature was. This overview examined topics including: sustainability, sustainable development, consumption, and policy development. After a very broad overview, the research was able to identify several sub themes that pertained more specifically to the topic of sustainable source reduction of packaging waste including waste hierarchy, design for the

environment, lifecycle analysis and polluter pays principle (Gibson *et al.*, 2005; McDonough and Braungart, 2002; Mitchell, 2004; McKerlie *et al.*, 2006; Barr, 2003). The literature review continued by examining documents related to the case study of bottled water packing. The policy development process was also examined, with particular emphasis on the Ontario context for policy development.

### *3.2 Participant Observation*

Participant observation is a type of direct observation, which the researcher plays a minor role in the event being studied (Yin, 2003). As a method, participant observation has advantages and disadvantages. It allows the researcher to gain access to situations that might not be possible for direct observation, and potentially provides a more accurate portrayal of events because they are perceived from an insider perspective.

Participant observation was used as a method three times during 2008 and 2009 to gain a sense of the general attitudes associated with source reduction of bottled water packaging. Participant observation occurred at the 2008 Toronto Waste Exposition, the Wealth without Waste Forum in Toronto in February 2009, and the Packex Toronto 2009. These events were open to the public. The Toronto Waste Exposition was a large waste management event where government, industry, interest groups, and other organizations could set up a booth to inform the waste management community about their work. The Packex Toronto 2009 was similar to the Waste Exposition, but was more industry focused. The Wealth without Waste Forum was a smaller two-day presentation based event, focused on Extended Producer Responsibility and the management of waste.

Traditionally disadvantage of participant observation is that the required role of a participant at an event may inhibit the researcher's ability to conduct research and provide a full observation of the events (Yin, 2003). This was not an issue for my research. Both events required participants to be observers, and thus my entire time was dedicated to observing the events for the research.

Participant observation was a useful method to gather data about overarching perspectives that currently dominate the waste management industry. These events also provided further context to narrow the research and identify key experts for later contact.

The same methods were used at each of the three events. The researcher systematically went through the entire event scanning for displays related to topics discussed in the literature review. Examples included: water bottles, waste reduction initiatives, eco-labelling, waste hierarchy, reference the renewal of the *Waste Diversion Act*, types of plastics (specifically focusing towards PET), anything related to PET water containers, sustainability, governance, actor's roles in packaging policy development. For a full list, please see literature review. If a display seemed to be related to a topic discussed in the literature review, the display was examined in further depth. Pamphlets were acquired whenever possible. Observations were also noted when there was an absence of information regarding a topic in the literature review. Notes were taken on the relevant displays. The researcher would attend any relevant presentations. These presentations were digitally recorded. Notes were taken on relevant discussions as they related to the literature review. Observations were recorded of how stakeholders interacted with each other, and what messages stakeholder attempted to communicate.

### *3.3 Key Informant Interviews*

Twenty interviews were conducted from March to May 2009; they were held with ten major stakeholders, including private consultants, academics, representatives in the beverage industry, environmental organizations, municipal organizations, industry organizations, consumer advocacy groups, the federal government, provincial government and municipal government. One purpose of the interviews was to determine what key informants believe to be the major problems associated with packaging policy frameworks (specifically bottled packaging) and what policy framework solutions could be implemented to improve the current situation (determining what actions each particular stakeholder could take). The project received ethics approval from the Office of Research at the University of Waterloo.

All interviewees gave permission to be identified as participants[33]. Permission to audio record interviews, and use attributed or non-attributed quotations varied depending on the on the wishes of individual interviewees. Appendix One provides the interviewees names, job

[33] It should be re-emphasized that all interviewees gave their permission to be identified and recognized as participants. Some interviewees have requested that their name does not appear anywhere else in the document except in this section.

description, and codes used to identify some of the interviewees in the results and discussion section.

Interview questions were pre-tested to ensure clarity of interview questions. Telephone interviews occurred when the geographical distance to a stakeholder was prohibitive. The average semi-structured interview lasted approximately 50 minutes. The shortest interview was 20 minutes; longest interview lasted 2 hours 15 minutes.

Audio recordings were numbered and partially transcribed. If an interviewee returned to an earlier question, or addressed an answer to a question before the question was asked, the information was moved into the correct section. The transcriptions were later re-arranged so all the responses that pertained to one interview question where combined together in a new document. The number system was used to distinguish which responses correlated to each interviewee.

From there, the information was coded and analyzed manually. Similar responses were highlighted with the same colour of marker. Each response had a separate color. If there was some question as to whether the response was different enough to deserve a different coding colour, the researcher erred towards having more answers rather than incorrectly clumping different responses together. This information was then analyzed to determine which questions had the greatest diversity of responses, which had the most agreement, and most importantly, what responses had been identified for each question. These calculations were found by dividing the number of individuals with the same response by the total number of individuals who responded to that particular question. The percentages are not statistically relevant, and are only designed to provide a guide for the reader. The total number of responses varied from question to question. Interviewees knew that the case study was bottled water, and were asked to relate their answers to bottled water, when they felt it was appropriate. Any stakeholder who specialized in bottled water (example industry and interest groups) was asked specifically about bottled water, rather than packaging waste.

Interviewees were asked to suggest any other individuals or groups that should be contacted, a process called “snowballing” (Dodd and Abdalla, 2004). Snowballing confirmed that no major experts had been missed, thus ensure the validity of the methodology (Dodd and Abdalla, 2004). Fifteen of the 20 interviewees were identified via snowballing. Forty -one individuals were contacted about potential interviews, 30 replied and 20 were interviewed.

Seven of the individuals who replied gave referrals to other more appropriate contacts. Approximately 75% of the contacted individuals responded to my interview request. Approximately 50% of all those contacted provided an interview.

The numbers of individuals interviewed in each stakeholder group varied. The variation depended on the significance of their expertise, the snowball identification process and willingness to participate. For a number of reasons, some of the identified potential interviewees were unable to participate in the project. The researcher attempted to keep a balanced number of stakeholders interviewed in each group. Private consultants represented twenty-five percent of conducted interviews. This group was particularly valuable to interview because they represented and provided services for various stakeholders. Due to this diverse knowledge, they were often recommended via snowballing. The interview process was considered complete when the snowballing process no longer identified relevant new individuals or groups.

### *3.4 Limitations to the Research*

In the literature review, one of the major limitations of comparing and contrasting waste terminology is lack of clear definitions of all terms. This was also a problem in interview process. Interviewees were given descriptions of terms, yet, at times, it was unclear if they may have used their own interpretations of various terms differently from the description that was provided. "Policy framework", for example, is understood and used in divergent ways in the literature and among stakeholders. Second, the bottled water industry keeps some information confidential. For example, this research had access to estimates of the amount of bottled water consumed across Canada, but not to a definitive number, as this information had not been released by the industry.

Third, although consumers and citizens were identified in the literature review as important stakeholders, their perspectives were not rigorously sought during the interview process. This was mainly because focus of the research was on policy development issues that required in-depth knowledge of waste management decision-making. In addition, it was difficult to find individuals from the consumer/citizen stakeholder group to represent the views of the group accurately. Two groups that represented citizens and consumers were invited. However, the response was poor. Some of the identified NGO groups mentioned in key informant

interview provided information about citizen and consumer attitudes (e.g. the Polaris Institute and the Recycling Council of Ontario).

### *3.5 Conclusion*

The three methods used for the research are a literature review, participant observation and key-informant interviews. The review covers the literature in waste management and environmental policy as it relates to bottled water packaging waste. This in-depth examination lays the foundation for understanding how to encourage waste minimization of bottled water packaging. Key informant interviews help to fill in and expand on areas of the literature that are less clear and provide the Ontario context. Participant Observation supports the literature review and interviews, and provides further insight. Combined, these methods provide a strong understanding about bottled water waste packaging in Ontario.

# 4.0 Chapter Four: Results of Interviews and Observations

Chapter four provides further context for bottled water packaging policy in Ontario. Participant observation was conducted at three events: Canadian Waste and Recycling Exposition, the Packex Toronto and Wealth without Waste Forum. Interviews were conducted with 20 experts to provide more detail on stakeholder relations, policy frameworks, barrier to policy implementation, and recommendations for policy implementation.

## *4.1 Participant Observation*

### 4.1.1 Canadian Waste and Recycling Exposition

During the period October 2008 -- May 2009, I attended three waste management events. The first event was the Canadian Waste and Recycling Exposition held on November 5, 6, 2008. The event was sponsored by: the Association of Municipal Recycling Coordinators, Composting Council of Canada, Federation of Canadian Municipalities, Geosynthetic.net, Municipal Equipment & Operations Association, Municipal Waste Integration Network, Ontario Environmental Industry Association, Ontario Waste Management Association, Recycling Council of Ontario, *Solid Waste & Recycling Magazine* and SWANA – Ontario Chapter. There was both a conference and an exposition, I attended the exposition. The booths were from a number of relevant stakeholders: NGOs, manufacturers of infrastructure to contain, transport and sort waste, municipal interest groups, Environment Canada and trade magazines. The conference was more focussed on waste infrastructure for the management of various materials. There were fewer booths about innovative packaging design. Nova Envirocom, of Sherbrooke Quebec, was an interesting company that produced food and beverage packaging that was compostable. There was a wide range of packaging: from bags to plates to cups, to take-out containers (Nova Envirocom, 2008). At the time of the Expo, they had not developed a compostable water bottle, but they were in the process of developing one[34].

[34]As of July 2009, Nova Envirocom was not advertising compostable single-use bottles for bottled water (Nova Envirocom, 2008).

### 4.1.2 The Packex Toronto 2009

The second exposition was the Packex Toronto 2009. This was a conference focused specifically on packaging, food processing, material handling and logistics. The Wal-Mart Sustainability Conference was held concurrently with Packex. The conference was divided into a number of sections: material handling and logistics, food processing, packaging machinery, converting/prepress/printing, materials, and services. This exposition was much larger than the Canadian Waste and Recycling Exposition. It was interesting to note that there was a packaging design competition. Water bottles had been enrolled in the competition, but it was specifically the label being evaluated rather than the bottle itself. I spent more time in the materials section of the exposition, which seemed to be most relevant to my research topic. I was happy to observe that the environment was a noted factor in the description of the products. From my observations, I did not see any focus on refillable bottles at the conference. There were booths about compostable packaging, and eco-labelling. From my observations, there seemed to be no NGO or interest group booths. One company I spoke with was in the business of developing various types of containers. They explained that they had recently helped a large company shift from a paper container to a number three, fully recyclable plastic container. They suggested it was better for the environment to have a fully recyclable plastic container. I asked what kind of system they had to monitor and evaluate that this was in fact the better option and they said they had no evaluation system.

A second company explained the various methods of labelling a bottle. Apparently industry is moving towards a plastic labelling system the wraps around the entire bottle from top to bottom. This is a concern because it mixes materials (for example a glass bottle, with plastic around it). A company representative reassured me that consumers can easily remove the plastic, and showed me how. Whether consumers have been educated about that is not clear or whether the company had done any studies to see if consumers actually do take off the plastic label. If they do not remove the label, there are likely to be implications for the municipal recycling facilities managing these bottles.

### 4.1.3 Wealth without Waste Forum

The Wealth without Waste Forum was held in February 2009 to discuss Gerretsen's *Waste Diversion Act* proposal to achieve Zero waste. The forum was lead by the Recycling

Council of Ontario and Corporate Policy Group with funding support from the Ontario Ministry of the Environment. Other partners included the University of Toronto, Department of Economics, Faculty of Law and the Centre for the Environment, Blakes Lawyers, OWMA, Nestle Purelife and Solid Waste and Recycling Magazine. Participants included non-governmental organizations, community groups, interest groups, representation from various industry sectors, and municipal, provincial, and federal government officials. Although the majority of the participants were Canadian, international representation included the United States, the United Kingdom, Belgium, Germany, and Sweden. This diverse group of stakeholders promoted interesting and controversial responses to the speakers' presentations.

The forum provided a detailed explanation of the policy mechanism EPR. Both the Canadian and European perspective were discussed in depth. Speakers commented on the successes and failures of EPR case study examples, and made recommendations for Ontario. The forum compared collective extended producer responsibility[35] with individual producer responsibility[36]. Freeloading, historically produced products, and orphan products, were identified areas requiring further clarification in the new *WDA*. In addition, there was discussion about who should be responsible for performing the waste collection services— industry or municipalities. The Wealth without Waste forum provided an in-depth analysis of the waste management system. The forum started with the assumption that extended producer responsibility was the best method to achieve zero waste.

## *4.2 Interviews*

### *Who should be responsible for source reduction of packaging?*

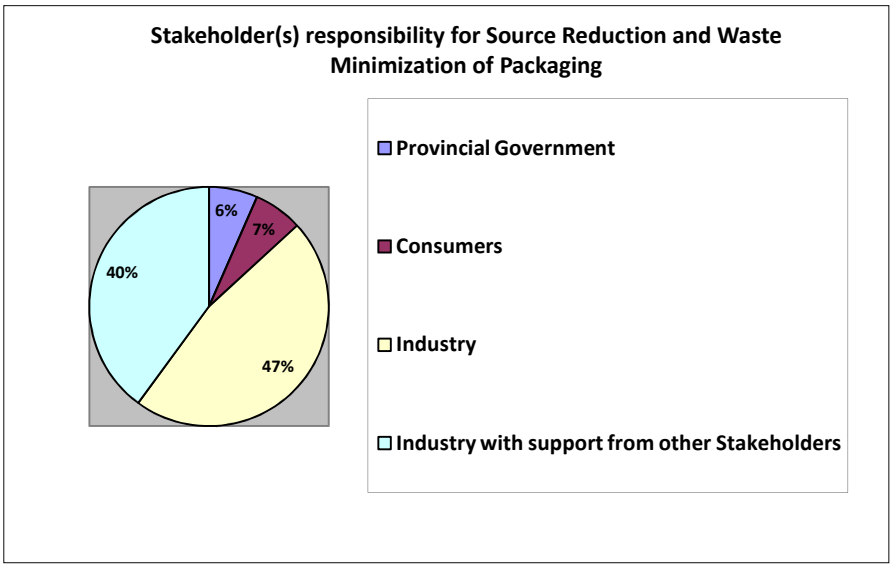
Each interviewee was asked who should be responsible for source reduction of packaging waste (n=15). Forty percent of responses (n=6) named producers/industry/brand owners/first importers/manufacturers as having the primary responsibility, but in addition suggested that various levels of government (federal, provincial and municipal) and consumers all should play a role. CON2[37] states "we can't crack this nut of products without the support of the citizens, government, industry, everybody moving together with a common vision and goal." GOV1

[35] Waste is managed collectively through one organization.
[36] Individual producers manage their specific waste.
[37] See Appendix One for interviewee's codes.

explains that the federal government has no jurisdiction over packaging, and there are larger constitutional issues requiring change than packaging policies.

An additional 47 percent of respondents (n=7) named the producers/industry/brand owners/first importers/manufacturers as the only stakeholder that should be responsible for source reduction of bottled water packaging. Clarissa Morawski (CON4) explains "Industry will always find the cheapest way to achieve their goals, and sometimes certain portions of the population will be mainly impacted by it. It is the responsibility of government policy to ensure that everyone is treated equally." Seven percent (n=1) suggested the provincial government should be responsible, "ultimately it is government's role to protect the public interest and safety". Seven percent (n=1) suggest that consumers should be responsible. Overall, 87 percent of all interviewees (n=13) named producers/industry/brand owners/first importers/manufacturers as being a major player in source reduction of packaging waste.

*Figure 3: Stakeholder(s) responsibility for Source Reduction and Waste Minimization of Packaging*



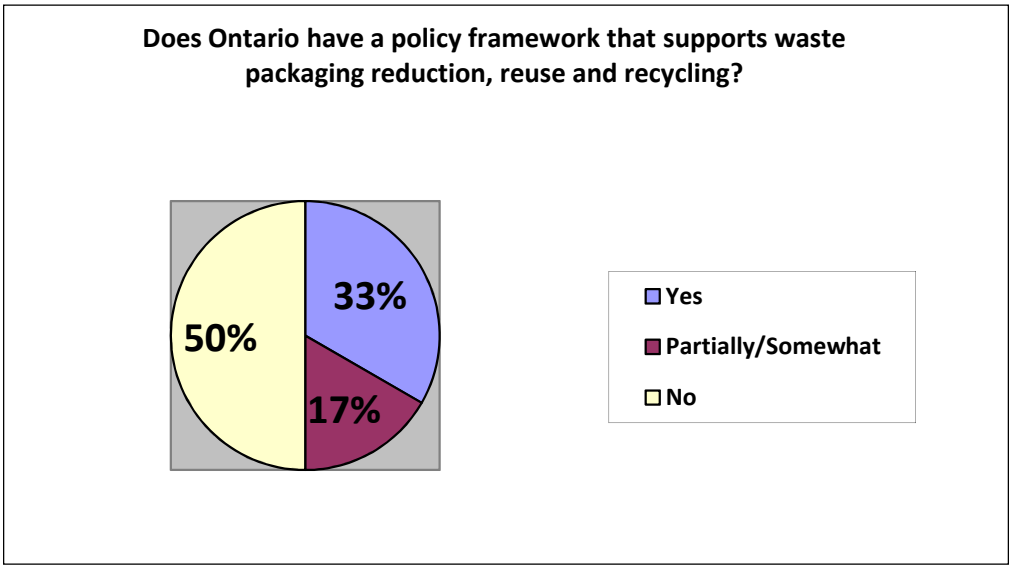
***Does Ontario have a policy framework for waste that supports waste reduction, reuse and recycling?***

The interview questions defined a policy framework as a policy mandate or approach with a developed theoretical basis. The question asked interviewees if, based on their knowledge, Ontario has a policy framework that supports waste packaging reduction, reuse and recycling. This response was slightly more varied (n=18). Fifty percent of interviewees (n=9) felt that Ontario had no policy framework that incorporated waste packaging reduction, reuse and recycling. One interview explained that "the *Waste Diversion Act* does not speak to the nature of the product in the first place, and the design of it, and the responsibility of managing it from the time of design right through to the time of managing it at the end of its lifecycle. It is a huge piece that is missing."

Many of those interviewees (n=4) who suggested Ontario does not have a policy framework did say that Ontario is currently working on developing a framework. One interviewee[38] said Ontario is working hard to develop a policy framework, but it is not in place currently. Seventeen percent (n=3) of interviewees suggested that Ontario has a partial framework or components of a framework that supported packaging reduction, reuse and recycling. Some interviewees (n=6) who suggested that Ontario had a policy framework for packaging, pointed to legislation such as the *WDA* and the *Environmental Protection Act*.

[38] Stakeholder has not been name to maintain anonymity.

*Figure 4: Does Ontario have a policy framework that supports waste packaging reduction, reuse and recycling?*

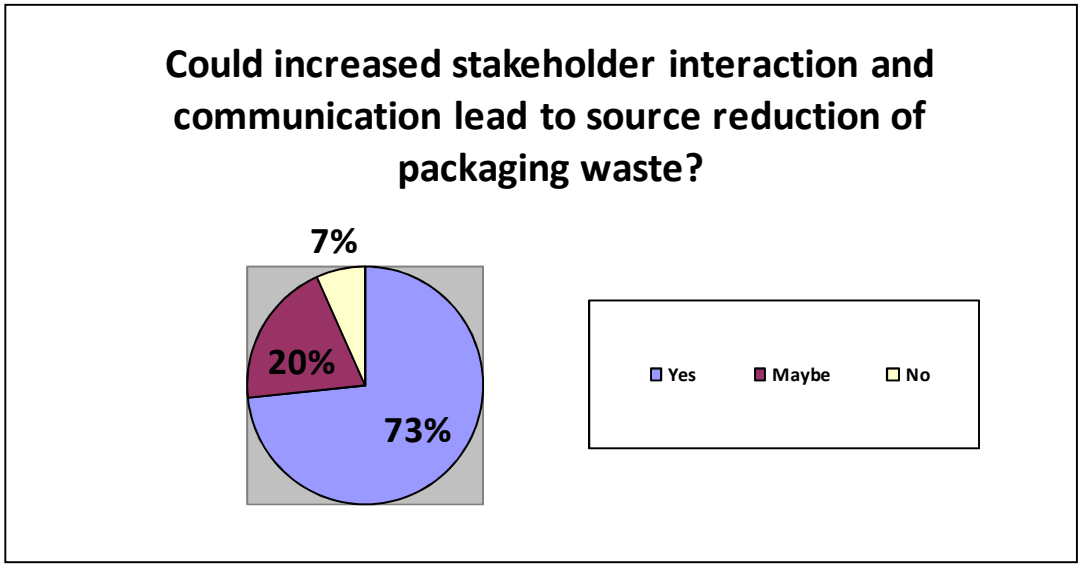



***Stakeholder Interaction and Communication***

Interviewees were asked whether increased stakeholder interaction and communication could lead to source reduction of packaging waste (n=15). Seventy-three percent of interviewees (n=11) responded yes. Twenty percent of interviewees (n=3) suggested stakeholder interaction and communication might or maybe could help lead to source reduction of packaging. One interviewee suggested that stakeholder interaction and communication would not lead to source reduction of packaging, stating "we've been talking for years". Another interviewee[39] who strongly agreed that increased stakeholder interaction and communication was necessary pointed to education as something that fit in this category. Twenty-five percent of stakeholders (n=5) identified education as being a necessary tool to promote behaviour change. One stakeholder explained that educating citizens is essential, "the answer is simple, but it costs money, it involves a vision and it requires a long term commitment".

[39] Stakeholder has not been name to maintain anonymity.

*Figure 5: Could increased stakeholder interaction and communication lead to source reduction of packaging waste?*




***Would a policy framework be a useful for policy development and policy implementation?***

After having established the interviewees' opinions on whether Ontario had a policy framework, this question was designed to confirm that a framework was in fact beneficial (n=17). Eighty-eight percent of interviewees (n=15) agreed that a policy framework would be useful for policy development and policy implementation. CON5 went on to state "yes, I think there is some use for an overarching framework, I think that developing one is difficult and subject to a lot of pushing and pulling by various stakeholders. One should not underestimate the effects of the political economy on the developing policy." GOV2 nicely stated that of course a policy framework is helpful, just as it is helpful to have a roadmap of where you are trying to get. A policy framework is like a map or a set of direction that helps to guide the individuals to that location. Twelve percent of interviewees (n=2) felt they could not answer the question without having seen the framework.

***What results might follow if a jurisdiction does not have a policy framework to support their policy on packaging waste management? What has happened in the case of Ontario?***

The responses for this question were more varied but all described a similar situation. Some stakeholders (n=9) suggested that one might end up with an ad-hoc or scattered system. There is likely to be no long-term goals. Things would likely be managed from a more reactive manner. The system is likely to be less successful and fragmented. As a result, interviewees (n=4) suggested that there would be an effect on how municipalities managed waste— this can be seen with the differing diversion rates across the province. There would be more waste creation, more litter, the promotion of energy intensive products, less diverted waste and consequently the inefficient use of resources (n=5). Please see Appendix Six.

***What are the potential barriers to implementing a policy framework?***

The interviewees were asked what the potential barriers are to implementing a policy framework (n=20). A substantial number of barriers were identified. Ones that discussed below were identified by multiple stakeholders. Twenty percent of interviewees (n=4) suggested that the conflict between designing packaging for international markets but managing waste at a local levels was a barrier to implementing a policy framework. Along with this, a non-harmonized system of managing waste differently across the province (and nation) made it difficult for industry to manage. This also causes confusion for consumers, as municipal collections systems are different across the province. GOV1 suggests "there is a much better chance that the companies are going to take notice if they are having to address packaging in the same way, in a more pro-active waste reduction way, over the whole market of 33 million people as opposed to the Ontario market of 11 or 12 million people." Two stakeholders identified that a lack of quantifiable scientifically accurate information made it difficult to assess packaging. As a result, most packaging decisions were made solely based on economic factors and not the environment. In addition, one stakeholder[40] identified that the recent discussions on the *Waste Diversion Act* were focused as a political discussion, and there was no economic analysis occurring, "certainly, no one is sitting down and doing an economic analysis, it is strictly a political discussion".

[40] Stakeholder has not been name to maintain anonymity.

Ten percent of stakeholders (n=2) identified the current recession as a barrier. GOV3 pointed out that a framework must not hurt business in Ontario. He stated "one thing that we have to be really careful is that we don't disadvantage Ontario business. We really can't create a Utopian Island where everything is very environmentally friendly, but we've created a cost structure that drives business out of the province." Five interviewees (n=1) identified Industry lobbying as a significant barrier to implementing a policy framework. ASSOC1 stated "...if you think of your PET bottle, the cost of it going from 50% to 100% is so minuscule that [Industry] wouldn't be able to translate it into an actual price differential at the counter. It wouldn't even be a penny basically per bottle." Twenty-five percent of interviewees (n=5) also identified that political will was a substantial barrier. Twenty percent of stakeholders (n=4) identified that politics in the implementation process was a significant barrier. See table below for a short list of barriers identified by interviews. See page 145 for all responses.

*Table 4: Short List of Potential Barriers to Implementation*

| | Barriers |
|---|---|
| Whole System | -Recession/Economically difficult times |
| Policy Objectives | -Conflict between Industry managing for international markets, and waste managed at local levels<br>- A new waste management program has the potential to create other Unintended Results |
| Policy Instruments | -Lack of science or analysis to support decision-making on packaging<br>-Economic barriers (economic bottom line drivers)<br>-If no industry is doing it, then there will be no competitive advantage and no motivation to innovate |
| Stakeholders | -Political Will to implement a framework<br>-Politics during implementation create barriers<br><u>Industry:</u><br>-Industry lobbying for some other system |

***In your opinion, what would be the components of an ideal waste framework that promotes source reduction and waste minimization of bottled water packaging?***

The responses to this question were much more varied than the previous questions (n=20). EPR was identified by 65 percent of stakeholders (n=13) as a necessary component of a new waste framework. CON1 explains: "with EPR, the emphasis is usually placed at the brand owner because they represent the point where you get the greatest leverage." CON5 argues that "the packaging that is introduced into the market is the result of the decisions that producers have made to sell and market their products. They should be free to make those decisions, contingent on picking up the full costs of their decision." ASSOC1 explained that if Industry is responsible for packaging waste management and the costs associated with managing a product go up, it will encourage Industry to reconsider what other management options.

Thirty percent of interviewees noted that with the implementation of a deposit return system, the recovery rate on beverage containers would increase (n=6). Thirty percent of stakeholders suggest that recovery targets for packaging materials must be set (n=6). Clarissa Morawski (CON4) adds that these targets must be quantifiable targets set with a minimum service convenience (i.e. targets for specific regions, and materials, etc).

Other identified tools include: education, promoting waste minimization and reduction, policy framework flexibility, true economic and environmental assessment, setting targets, level playing-field, continued lightweight packaging when possible, clarify objectives and any unwritten prices or assumptions, and clear acceptable minimum levels of waste disposal. For a more detailed shortlist, please see the table below. For all identified components of a framework, please see page 148.

*Table 5: Interviewee Identified components of an Ideal Waste Framework*

| | Components of an ideal waste framework |
|---|---|
| Policy Objectives | -Assess societal need for bottled water |
| Policy Instruments | -Public education<br>-Deposit Return system will result in high recovery rates<br>- Ban not sensible<br>-Develop Mix regulations<br>- Create incentives for compliance<br>-Set targets<br>-Recovery Objectives<br>-Look at true environmental implications of policy<br>-Implement EPR<br><u>Other</u><br>- Encourage bottle light weighting<br>-Not purchasing bottled water<br>-Re-invest in public infrastructure<br>-Should consider green procurement (policy you are developing, should also be internalized)<br>-Unwritten principles laid out<br>-Ensure there is a level playing-field among industry players |
| Actors | - All Stakeholders have a role |
| Product Groups | - Source reduction should be first<br>- Packaging should be recyclable, and recycling rate improved<br>-Mandate that bottled water must be not virgin<br>- Refillables with a standardized bottle<br>-Consider using reverse vending machines to increase diversion<br>-Use Ontario's Waste Value chain as a guide for a waste hierarchy |
| Water | -Consider impact on ecosystem<br>-Consider water scarcity<br>- Promoting public water |

In the interview with NGO3, the stakeholder suggested that the current use of bottled water is directly related to three public policies that have unintentionally promoted bottled water market development. These unintended consequences of the policies have had dramatic and long lasting effects that are still plaguing our society today. First, after the Second World War, Canada invested in a public highways system that connected and provided easy accessibility to distant locations. This allowed industry to close down small distribution centers and build large

distribution centers to manufacture products for larger regions. Second, the blue box system, developed in Ontario, was heavily subsidized by government. Industries were not held accountable for the waste they produced, so there was naturally no consideration for excessive waste production. Lastly, public water infrastructure was not properly maintained, and its demise led to a series of incidents like Walkerton (See Page 10). These incidents have resulted in a loss of confidence in the public water system, and have encouraged the consumption of bottled water.

***Integrated Product Policy***

After having identified the components of an ideal waste framework, interviewees were asked whether they were familiar with Integrated Product Policy. For the purposes of these interviews, Integrated Product Policy was described in a short statement that can be found with the interview questions on page 128. The response was mixed (n=20). 50 percent of interviewees (n=10) stated they had not heard of IPP. Twenty percent of interviewees (n=4) claimed they had heard of the term, but did not feel comfortable answering additional questions. Thirty percent of interviewees (n=6) seemed to have a good knowledge of IPP and were comfortable answering follow-up questions. GOV1 explained "waste is a function of affluence and consumption. As incomes go up and consumption levels rise, waste rises. What we have to do is think about how we decouple those things, and that is a big complicated question, of which integrated product policy is part of the answer." IPP was praised for its focus on designed for the environment, holistic examination of entire lifecycle, the ability to be flexible and outlined the nature of the framework. CON2 argues, "I would think the framework needs to be far more developed [in Ontario], and a greater understanding of all the tools and a more holistic approach. I think that there is still a little bit of the end of the pipe working here in the policy framework. I think that with IPP we are looking at the whole product lifecycle, not just the end."

Identified weaknesses of the framework were its broad nature, the potential to be more complicated than necessary and whether the concept could be applied in a real world setting. Three of the 5 interviewees thought IPP could be applied in Canada. "We don't have an integrated product policy kind of framework in Canada at the moment, but I think we have some of the elements. We haven't officially linked them all together. But we've got things like

labelling, EPR programs, and proactive procurement at all levels of government at varying degrees of success. We've got some of the elements here, and I think increasingly we will see more and more focus on tying them together in a more integrated fashion" (GOV1, 2009).

### *4.3 Conclusion*

Interviews with key experts in the field of waste management provided further depth to the research. Interviewees (n=11) suggested that increased stakeholder communication can result in source reduction of packaging waste. Half the interviewees (n=9) felt that Ontario does not have a policy framework that supports packaging reduction, reuse and recycling. Yet, an overwhelming majority (n=15) felt a policy framework would be a useful tool to support policy implementation. There were many suggested components of an ideal framework—EPR stood out as being recommended most frequently (n=13). Few interviewees (n=14) felt comfortable answering questions about IPP, but those who did, spoke positively, and sixty percent (n=3) recommend the implementation of IPP in Ontario to support packaging reduction, reuse and recycling.

# 5.0 Chapter Five: Discussion

Many contributing factors influence the production of excess packaging waste—Policy Objectives, Policy Instruments, Actors and Product Materials. Chapter five discusses the four quadrants as they relate to bottled water packaging waste, specifically examining for successes, failures and oddities that do not seem to properly fit with the rest of the quadrangle. The quadrangle can be discussed in any order because all quadrants are equally important for the conceptual framework. In an attempt to maintain clarity, the discussion of these theories will be outlined in a different order than they appear in the literature review. The chapter will begin with a discussion and evaluation of potential principles that could be applied in Ontario as policy objectives. It is helpful to establish these objectives first, in order to lay the groundwork for the policy tools that can support the objectives. Next, the chapter will discuss policy instruments, actors and product materials. For ease of reading, the discussion will refer to other sections of the text, by stating "see page x". Recommendations will be italicized. An examination of these four areas provides some insight into what the provincial government should consider when attempting to promote source reduction and waste minimization of bottled water packaging waste.

## *5.1 Policy Objectives*

### 5.1.1 Zero Waste Goal

When the research started in June 2008, the only policy paper was the 2004 Ontario waste diversion discussion paper (see page 140). Soon after in October 2008, the Minister of the Environment announced the review of the *WDA*, and the goal towards zero waste (see page 141). Zero waste represents the end goal—for Ontario to be diverting all of its waste from landfill and incineration. Zero waste requires other parts of the waste hierarchy[41] to achieve their maximum potential for waste minimization. This will have to occur for all types of materials entering landfill.

The Ontario provincial government's rationale to implement zero waste is less clear. Since disposal costs are low (MOE, 2004) and recycling costs are high[42], it seems likely that the

[41] Reduction, reuse and recycling, see waste hierarchy on page 42.
[42] See page 99.

rationale for zero waste is not economic. Moving towards zero waste does not dramatically affect citizens, so it is likely a goal based on the environment and a lack of landfill space. The 2008 waste diversion discussion paper identified cradle to cradle as a guiding principle for zero waste— a key objective is a concern for the environment[43]. Zero waste emphasises the entire waste hierarchy, and thus encourages waste minimization of packaging. To achieve zero waste, all areas of waste must be managed effectively and all stakeholders must act together to prevent unnecessary packaging from entering landfills. As a result, the objective of zero waste recognizes the complexities of the packaging issue—and the individuals involved in improving the situation. Ontario waste management will move beyond its current focus on recycling packaging, and emphasis policy tools that promote waste reduction and reuse. Zero waste is an impressive and ambitious goal; the research finds that the goal of zero waste should be implemented in Ontario.

If the implementation of zero waste is due to environmental concerns, a number of important topics could help to support this policy objective. By encouraging sustainability[44] of bottled water packaging, one must examine the effects of bottled water packaging on the environment. As a result, the emphasis moves from an economic focus[45], to an environmental focus. This environmental focus would include an examination of the effect bottled water packaging has on the current environment and the environment of future generations (see page 22). Environmental sustainability is likely to raise issues about the amount of energy used to create a plastic water bottle (see page 35). As discussed in the section Refillable Containers section, a 500mL refillable container uses 26 times less energy and produces 53% less GHGs than a single-use 500mL water bottle (see page 35). If sustainability was the priority, refillable containers may be deemed a better system as they use less energy, and create less waste and air pollution. Single-use containers may be more convenient for consumers[46], but, do not represent sustainability. As a result, convenience for consumers may no longer be prioritized, if single use containers are environmental degrading. *Sustainability is an important goal and should be one component of the theoretical framework associated with the WDA.*

[43] See discussion section: 5.1.2 Clearly Stated Objectives on page 80 for comments about a clear objectives
[44] See page 34.
[45] See discussion on page 92.
[46] See Excessive Consumption on page 56.

*The Ontario provincial government should recognize and state in their policy paper that although zero waste is the end goal, it is not a target that is likely to be achieved in the next few years. The goal should emphasize the movement towards zero waste, and minimizing waste production so long as it maintains sustainability throughout the system.* Even the most efficient systems are likely to produce some waste. For example, it may not be environmentally beneficial to transport a water bottle for refilling from a remote location. The additional fuel maybe prohibitively environmentally degrading and thus waste is created. Zero waste may not actually always represent environmental sustainability—other factors that influence the environment should be considered. See page 84 for LCA discussion.

Environmental sustainability should not be the only consideration: economic and social factors must be considered equally. This concept is the triple bottom line[47] and it also could be considered as a concept to promote zero waste. Since, waste policy has had a focus on economics in the past (see page 89), the triple bottom line might be better able to balance all three considerations. If refillable bottled water packaging was examined while considering the triple-bottom line, the results might different than if sustainability was the only factor. Refilling bottled water containers[48] requires increase man labour to manage a local refilling centre, and transport the refillable containers to their various destinations. From a social perspective, increasing the amount of jobs in communities is considered to be a positive effect and thus refillable containers might be prioritized over other options that do not promote job creation. *The research recommends triple bottom line concept is identified as a guiding concept to support the packaging policy and the WDA. Triple bottom line should be entrenched in the new WDA and policy paper that supports the new WDA.*

The precautionary principle can be implemented to avoid environmental degradation in situations of uncertainty (see page 24). Likewise, the proximity principle might also be implemented to ensure that waste is being managed locally (see page 24). Waste should not be transported unnecessary distances producing uncalled for GHGs based on economics. Managing bottled water waste locally will ensure that it remains in the community. If citizens want to keep their community free of excess waste, they have the power to act on that wish. *The proximity principle has been identified as a principle to help minimize waste. In situation of uncertainty,*

[47] See triple bottom line on page 34.
[48] See page 43.

*the research recommends employing the precautionary principle to avoid unnecessary environmental degradation. The precautionary principle should be identified as one of the objectives to support the new WDA and packaging policy paper.*

Zero waste can be supported by cradle to cradle (see page 23). Cradle to cradle emphasises bottled water waste minimization at every stage of the waste hierarchy (see page 30). Cradle to cradle also recognizes the inherent value of waste (see page 93). This theory promotes design for the environment (see page 22), so further waste does not need to be produced. *Cradle to cradle and Design for the Environment are both concepts that can help to promote waste minimization of bottled water packaging. The MOE should consider using both of these tools to support their MOE packaging policy and the new WDA. Cradle to cradle to should be outlined in both the new WDA and the policy discussion paper.*

The principle polluter pays can also help to promote environmental packaging sustainability. As discussed on page 24, polluter pays places the responsibility on the actor that has created the pollution. This can be interpreted differently depending on which actor is considered responsible for the pollution. Responsibility could fall on: the consumer that throws away the used bottle, the producer that creates the bottled water, or the company who sells the bottled water. A tool that comes from polluter pays is Extended Producer Responsibility—suggesting that the corporation that creates the product or the first importer is responsible for the waste associated with it[49].

### 5.1.2 Clearly Stated Objectives

Often the goals of public policy are not clearly stated or shared with stakeholders and the public (Hessing *et al.*, 2005) (see page 43). This certainly seems to be the case for packaging diversion. The overall goal, as outlined in the *Waste Diversion Act* is "to promote the reduction, reuse and recycling of waste and to provide for the development, implementation and operation of waste diversion programs" (*WDA*, 2002). There is little description of how the environmental goals of the Act (reduction, reuse and recycling) are to be implemented[50]. There are a number of different objectives that the new *WDA* could attempt to achieve: further support municipalities

[49] See page 81 for further discussion on extended producer responsibility.
[50] *Section 25* is only subsection that refers specifically to the diversion program (see full citation starting on page 139). The other 24 pages of the act refer to the set up the WDO, economic responsibility and other details (see page 139 for the full description of the *WDA)*.

financially; reduce waste produced; promoting increased diversion; developing world-class innovative solutions to waste management: reducing waste entering landfills; moving towards alternative waste disposal methods like incineration; develop a 'feel good' waste solution for Ontario municipalities; increase financial revenues for the province; increase employment levels; and reduce litter. There will be other options and solutions.

Although the 60% waste diversion goal is noted in the 2004 Ontario waste diversion discussion paper, there was no final report affirming and implementing this goal (see page 140). The Blue Box program was implemented under the *WDA* and managed by Waste Diversion Ontario and Stewardship Ontario. The focus of diversion has mainly been through recycling of waste (WDO, 2009). The 2008 waste diversion discussion paper comes closer to stating objectives— the goal of zero waste. As previously noted on page 72, zero waste represents the newly stated end goal for the 2008 Ontario waste diversion discussion paper. The objectives behind these goals have not been specific enough. It is excellent to have a goal, but the reasons for the goal must be clearer because those reasons will dramatically affect what policy instruments are recommended. *It is reasonable to recommend that the Waste Policy Branch answer the following question, and entrench the answers in the new WDA. What are the current objectives regarding waste management? Is the primary objective of the WDA environmental or economic? Would the provincial government still like to be moving towards increased diversion? If so, what areas of the hierarchy does the government wish to encourage? How important is it to promote packaging reduction and reuse? Should industry be working to help the provincial government meet these goals? The research recommends that the Ontario government respond to these questions as follows.*

| ***What are the current objectives regarding waste management?*** |
|---|
| To promote zero waste through waste reduction whenever possible; next, reuse; and finally recycling. Landfill should only occur when the Rs are not implementable. |
| ***Is the primary objective of the WDA environmental or economic?*** |
| The primary objective is to promote environmental sustainability for waste management, while maintaining both economic and social standards. For example, economics, environment and social components must all be balanced when making decisions. |
| ***Would the provincial government still like to be moving towards increased diversion?*** |

| |
|---|
| The provincial government encourages increased waste minimization, so long as it is environmentally, economically and socially beneficial. |
| ***If so, what areas of the hierarchy does the government wish to encourage?*** |
| The Ontario provincial government encourages in hierarchical order—redesign, reduction, reuse, repair, recycling and finally landfill additional material. |
| ***How important is it to promote packaging reduction and reuse? Should industry be working to help the provincial government meet these goals?*** |
| Industry should play a key role in promoting waste reduction and reuse of bottled water packaging, while maintaining the integrity of the package. |

*It must be concluded that the objectives in the new WDA need to be clear and specific. In addition, a follow-up policy paper should be published by the Waste Policy Branch providing more details on the objectives and policy framework that are associated with the new WDA.*

### 5.1.3 Policy Framework

The literature review examined a wide range of sources on bottled water minimization as it relates to concepts, objectives, instruments, actors and materials. The literature review did not find a cohesive, legally binding explanation that guided stakeholders towards bottled water packaging minimization, with relevant concepts and instruments to support these actions. The *WDA*'s goal[51] and the direction Regulations 101-104[52] seems to promote increased waste reduction, reuse and recycling. Interviewees' responses of whether Ontario had a policy framework were divided (see responses on page 63). If 50% (n=9) of experts believe that there is no framework that supports reduction, reuse and recycling, then any framework that has been identified is either not adequate or not adequately communicated to Ontario experts. Stakeholders did agree on the value of a policy framework, 88 percent agreed it would help support Ontario's policy development and policy implementation (see page 65). *These results strongly suggest that Ontario should consider implementing a guiding framework with policy*

[51] See discussion of objectives on page 79 and the *WDA's* goals on page 133.
[52] See page 128 to 129.

*tools to support packaging minimization, and communicate objectives with stakeholders so they can act in their own areas to support zero waste. Many of the instruments discussed later in this chapter could help to support or be a part of such a framework.*

### 5.1.4 Extended Producer Responsibility

As noted in the results, 87 percent of interviewees (n= 13) identified producers/ industry/brand owners/first importers/manufacturers as a major stakeholder supporting source reduction of packaging waste (see page 61). In addition, 65 (n=13) percent of interviewees suggested that EPR should be a component of a framework that encourages source reduction and waste minimization of packaging (see page 68).

This research describes true EPR as a tool where industry is required to manage waste collection, disposal and take all economic responsibility for the waste that they produce. This description of EPR connects the waste system so the producer is responsible for the design and disposal of a product. An embedded assumption of EPR is that industry is financially focused, and they will change their actions if it is in their interest.

*When implementing an EPR system, one must be careful to allow industry to develop innovative ways of managing their waste rather than just be an economic substitute that helps with waste management.* For example, Ontario has just developed a system that requires a fee on all electronic equipment (OES, 2009). This research describes this type of EPR as full financial EPR. Currently, the same fee applies for all computers, so, there is no incentive for an individual company to redesign their computers to cost less to recycle. The results of EPR (as described on page 25) are not being implemented, and the advantages to EPR (see page 25) may not come to pass. *The research suggests that full financial EPR will provide the economic bail-out, but does not encourage design changes. As a result, full financial EPR is not recommended.*

*The research recommends implementing true EPR in Ontario[53] for all Ontario water container packaging. True EPR must give industry the flexibility to manage their waste and develop the most efficient system to meet their needs. This recommendation should be entrenched in the new WDA. The WDA should specifically address quantifiable recovery targets and waste minimization quotas must also be clearly stated (see discussion about targets on page 84). This may require municipalities to change their collection systems or relinquish their*

[53] More than just a financial mechanism, and as discussed on page 37.

*responsibility to manage residential waste. Industry would develop an individual or collective system to reduce waste before it is produced, and to decide what packaging to reuse and recycle. Packaging would be designed for the environment and a cradle to cradle perspective, thus promoting zero waste.*

### 5.1.5 Integrated Product Policy

Integrated Product Policy (IPP) is a well-designed approach and encourages many of the objectives needed in Ontario. IPP encourages zero waste[54] by attempting to reduce the environmental impacts associated with the entire product and its packaging from a cradle to cradle perspective (see page 27). Its holistic approach to managing a product like bottled water considers important factors such as product materials, objective, instruments and actors. Governance is an important part of IPP[55], just as it has been important in the Ontario context for bottled water packaging minimization.[56] Ontario's waste management system was often described as a fragmented system where waste is managed differently in each municipality across the province and the legislation to support diversion targets emphasize easy to achieve targets rather than a thorough approach.[57] These barriers might be addressed by a pre-developed and organized policy framework like IPP. For example, IPP's tool box of options[58] could help to supports packaging minimization by helping to guide and organize Ontario policy. This could result in a less scattered approach to promoting bottled water minimization.

IPP is relatively unknown in Ontario. It was not mentioned in the 2004 and 2008 discussion papers, or the *WDA*. It is particularly surprising that IPP was not mentioned in the discussion papers, as they were discussing potential strategies to reduce waste in Ontario. The research finds that IPP certainly could fit into that category—it is a useful mechanism to support packaging minimization. Interviews with Ontario stakeholders revealed that only thirty percent (n=6) were familiar enough to answer questions about it. This is a clear sign that IPP is relatively unknown among Ontario waste experts. The experts who were familiar with IPP, were very positive about it (see page 70), sixty percent of interviewees recommended implementing IPP in Ontario.

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[54] See page 77 and page 140.
[55] See page 38.
[56] Various stakeholders have taken action to reduce bottled water waste entering the landfill.
[57] See Barriers to implement on page 72 and page 144.
[58] See page 40.

Although IPP was not discussed, the 2008 Ontario waste policy discussion paper did suggest that reduction and reuse should be emphasised (see page 141). IPP could also help to support this goal as IPP stresses the importance for packaging minimization on both the supply and the demand side. See supply-side tools to encourage packaging reduction and reuse on page 28. The Ontario provincial government (specifically the Waste Policy Branch) could choose appropriate tools from this toolbox and implement them to support packaging reduction.

With the suggested implementation of true EPR[59], Ontario stakeholders have been moving towards single-responsibility for dealing with produced waste. This has the potential to conflict with IPP, because IPP encourages a co-operative, shared responsibility model (see page 27). IPP may have to be modified for Ontario's EPR focus: industry is responsible for waste entering landfills and recycling facilities. To prevent excess waste from entering landfills and recycling facilities, other stakeholders should take action to promote waste minimization.

IPP can help to compliment EPR and promote waste minimization of bottled water packaging. EPR has no direct control over whether a consumer chooses to use a personal refillable container over a single-use container. IPP's education program could help to educate citizens on the advantages and disadvantages of different bottled water containers. EPR does not require any sort of eco-labelling system, effectively making it difficult for consumers to make informed purchasing decisions about bottled water packing. An IPP supporting framework might encourage an eco-labelling system that communicates the benefits of packaging to consumers. An EPR system would not encourage various levels of government to promote the use of municipal water over bottled water— the IPP tool—Public procurement would do so. EPR does not encourage co-ordinated reduction efforts across all provinces, whereas IPP is designed to help provinces implement waste reduction strategies together. EPR may fall short without the support of IPP. Rubik (ACA2), an expert in IPP, also identified that EPR and IPP could be implemented together.

*The research recommends that IPP and EPR be implemented together to support Ontario's waste policy. Further analysis should be done to determine which instruments could best be implemented in Ontario to support packaging waste reduction, reuse and recycling. This analysis should include stakeholder consultation to gain all perspectives on these issues. It might also be wise to develop a standardized evaluation for potential instruments. This may*

[59] See discussion of EPR on page 81.

*provide a quantifiable way to compare systems based on the triple bottom line principles. The research recommends using the same identified factors that are used in the packaging evaluation (see page 84).*

*Implementing IPP and EPR should be emphasised in the WDA and within a policy paper that outlines the implemented tools of IPP. This will ensure there is accountability to implement IPP and EPR. The tools discussed in the sections below should be considered in the evaluation.* The implementation of full EPR would put pressure on industry to remove inefficiencies in their system—ensure the packaging is as small as possible, and is managed efficiently from cradle to cradle. The implementation of IPP would help to encourage integrated planned policies to support and communicate with the other stakeholders. Together, EPR and IPP would effectively target all stakeholders—industry, various levels of government, consumers, and NGOs. For example, implementing EPR without IPP

## *5.2 Policy Instruments*

### 5.2.1 Enforcement

*Regulation 340* and *357* are an excellent example of Ontario waste management regulations that are no longer enforced (see page 133 and 134). It is clear that based on the declining refillable rates, these regulations are no longer enforced[60] (see Barriers to Policy Implementation starting on page 43). Without adequate enforcement by government, stakeholders will not be obligated to follow the regulations (see page 43), and waste minimization will not occur. *It is essential for the MOE and the Waste Policy Branch to continue to enforce the WDA to maintain stakeholder compliance after the implementation the new WDA.*

Within the old *WDA* there are problems associated with enforcement. The *WDA* leaves many important decisions to the Minister, and does not prescribe or require certain behaviour. For example, the legislations states that the Minister may designate provincial officers to enforce the legislation[61]. As emphasised above in Barriers to Policy Implementation, adequate enforcement is an essential component of any legislation. If legislation does not outline

[60] Only 2% of the Ontario market share in 1996.
[61] See Section 36 of the *WDA*, description of *WDA* starting on page 135.

enforcement, there is no incentive for the relevant individuals to comply with the legislation. Non compliance may lead to increased waste production as it has with the Refillable legislation discussed above. *This analysis strongly suggests that Waste Policy Branch should amend the act to include clear statutory language requiring designated enforcement officers, responsible for enforcing the Act. The language should clearly emphasize that enforcement is not optional but mandatory. Penalties associated with enforcement should remain as they have been previously designated under the current WDA (see page 136, Section 41).*

### 5.2.2 Unclear and Undefined Language associated with Diversion

The *Waste Diversion Act* stated waste objectives are to promote waste reduction, reuse and recycling (see page 136). At the beginning of the *WDA*, there is a list of relevant terms that are defined (see page 136 for examples). It is notable that this list does not include important terms such as "diversion", "reduction", "reuse" and "recycling". Consider the sub-title of the *WDA,* which states it is "an Act to promote the reduction, reuse and recycling of waste", the terms are covered in very little detail (see page 136). The terms 'reduce'/'reduction' are only mentioned a total of three times at it relates to waste[62]. 'Reuse' is mentioned 3 times and 'recycling'/''recycle' are mentioned four times. All of these are terms are mentioned in the title, the purpose (Section one) and what a diversion program may entail (Section 25)[63].

It is also interesting to observe that the language used in the current *WDA* does not clearly emphasis the hierarchical importance[64] of waste reduction, reuse and recycling in either Section 1 or Section 25 (1)[65]. Other regulations, for example *Regulation 102,* do emphasize the hierarchical importance of waste diversion (please see page 131). The difference in language between these two documents is remarkable. The lack of clarity in the *WDA* is either deliberate or the result of a very poorly written act. One result of such unclear language is that the act can be interpreted in various ways, and there is no emphasis on the beginning of the hierarchy and packaging reduction and reuse.

There are many other examples of unclear language in the *WDA*. The term "may" weakens the act. For example, Section 25 (1) of the *WDA* (see page 136) states, "a waste

[62] "Reduce" and "Reduction" are mentioned three times as it relates to waste reduction, and two additional times as it relates to fee schedules.
[63] See the Waste Diversion Act, 2002, S.O. 2002 starting on page 135.
[64] See page 42 and further discussion of hierarchies on page 99.
[65] See full citations for both these sections starting on page 135 of the Waste Diversion Act, 2002, S.O. 2002.

diversion program developed under this Act for a designated waste may include the following/ 1. Activities to reduce, reuse and recycle the designated waste..." (see page 136). The term 'may' weakens the statement and removes accountability as action may or may not need to happen. *If the objective of this subsection (as stated in Section 25) is to mandate the development of waste diversion programs, "shall" or "will" should be used.*

*The research recommends that objectives of each subsection are reviewed and re-affirmed by the Waste Policy Branch and through the stakeholder consultation. Once objectives are determined any language that removes accountability and provides options to complete or not complete the designated task should be removed from the Act to strengthen the document. All important terms should be defined—this includes "waste", "reduction", "reuse", "recycling", and any other new language added to the new WDA.*

As recommended by 30% of interviewees, clear quantifiable recycling targets can help to promote bottled water waste minimization. *The research supports a recommendation that the WDA state clear targets for the entire waste hierarchy (see page 68). The WDA should also indicate that if recycling targets are not met within a designated period of time (for example 2 years), that a program will be set up through Stewardship Ontario to help achieve these targets. Targets should be gradually increased over time*[66]*. A follow-up study by the Waste Policy Branch should determine how quickly recycling targets should be increased. The research recommends raising diversion rate targets by 5 percent every two years until the final target has been achieved.* A high recovery rate represents and contributes to the zero waste goal for bottled water (see page 141) and has previously been achieved within the Ontario context for other types of beverage container (see page 49). *For bottled water packaging, the final recovery rate goal should be diverting 90% of all single-use water containers. Specific recovery rates for each type of packaging should be stated in a regulation under the new WDA.*

This research recommends developing a number of new projects to encourage source reduction of waste packaging. The research recommends implementing polluter pays principle and industry should be responsible for paying an additional cent for each water bottle sold in Ontario. Likely, industry would funnel that cost to the consumers of the products; as a result, consumers who purchase bottled water will be responsible for funding the projects that help to promote waste minimization of bottled water packaging. Industry should pay the additional cent

[66] See Appendix : Policy Instruments: Targets starting on page 147.

per bottle to Stewardship Ontario along with regular 50% recycling fees[67]. This money should be kept in a separate fund and allocated to the various projects recommended in this research. The Waste Policy Branch should be responsible for designating funds based on need. If the projects require additional funds, the research recommends increasing the amount per-bottle to the required amount. If costs exceed 5 cents per bottle, the research recommends that additional funds are paid by the Ontario provincial government. Once projects are completed, the additional charge can be reduced accordingly.

### 5.2.3 Legislated Actors

*Regulation 340* mandates that producers of beverages must sell 40% of their products in refillable containers[68]. In application, consumers influence the bottled water sold and producers influence the amount of bottled water produced. The producers have no direct control over product sales, and so it more difficult to achieve the legislated target. Whereas if the MOE regulates that industry must produce 50 percent in refillables, producers have direct control to make that happen. *Any legislation to be implemented should ensure that the stakeholder named, is the stakeholder that has the direct power to achieve the target.*

This recommendation may be applicable to the new *WDA*. If the MOE implements full EPR and requiring industry to achieve a certain diversion rate, the results maybe similar to the ineffectiveness of *Regulation 340*[69]. Consumers influence recovery rates of recyclables, so it may be difficult for the bottled water industry to achieve the required diversion rates. Industry would not have the complete power to influence diversion rates. *Supporting a target with an economic incentive for consumers might successfully allow industry to achieve required target. For example, a 25 cent deposit on all bottled water containers will provide adequate incentives for consumers to return the used container.*

### 5.2.4 Effective Product and Packaging Analysis

In order to measure sustainable packaging, the research recommends implementing a packaging environmental assessment (see page 23). Fifteen percent of expert interviewees found

[67] One interviewee explained that if Ontario moved to 100% producer responsibility, the costs associated with disposal would be less than 1 cent per single-use water bottle.
[68] For the full citation, please see Section 7 of Regulation 340 starting on page 133.
[69] See page 133.

that inadequate assessment of bottled water packaging and product was a barrier to waste minimization. One interviewee[70] noted that the three R hierarchy was not based on science and is not always the best option for the environment[71]. Another interviewee[72] added that it is difficult to conduct an accurate product lifecycle assessment because an LCA compares two products when the societal need is to compare many options at once. Without an environmental assessment of various products, there would be no way to determine which product is most sustainable and thus best to use.

Waste entering the landfill is not the only consideration for sustainability— LCAs consider a number of factors (see page 23). The research recommends implementing an LCA that uses cradle to cradle to examine all aspects of a product's impact (see Cradle to cradle on page 23).

*The effects of a product and its packaging on the environment must be assessed. This research suggests that a follow up study must be conducted by the Ontario provincial government (specifically the Waste Policy Branch) to develop a product assessment before the new Waste Diversion Act is implemented. As the product assessment would be likely controversial[73] for stakeholders[74], the research recommends that the Waste Policy Branch set up a committee to develop the assessment. This committee should be run by the Waste Policy Branch, with committee members from industry, municipalities, NGO groups, Waste Diversion Ontario, consumers and citizens. Before implementation, the developed assessment should be reviewed during a stakeholder consultation and by the CCME so other provinces can make recommendations. Ideally, an assessment system implemented across Canada would be the most effective and most convenient for Industry that develops products for national markets. Once the assessment program has been fully designed, Waste Diversion Ontario would be the best stakeholder to implement and monitor the program to ensure compliance. The Ontario provincial government would need to transfer the necessary funds to develop this program. The actual assessments of each product should be covered by the industry developing the product*

[70] Not identified to maintain Anonymity.
[71] See deposit return on page 91 and economic incentives for deposit return on page 61.
[72] Not identified to maintain Anonymity.
[73] Politics was identified by 20 percent of interviewees as being a barrier to implement a policy framework (see page 73).
[74] Each stakeholder will be pushing their own agenda, as was the experience with the development of the new *WDA*. This was observed through participant observation at Wealth without Waste and in some of the interviews (see page 68).

*(EPR). This evaluation system should be applicable to all packaging, and thus include bottled water packaging.*

*The assessment should include economic, environmental and social factors. As best as possible, the assessment should factor in all impacts from cradle to cradle. The new assessment should be able to factor various products at one time. The research recommends developing a rating system— 0 being no impact, 100 being a very high impact. There should be an overall number associated with the product—as well as a breakdown of the various subsections. The assessment should be inexpensive and easy to conduct. It must be easy to understand so that is accessible to all stakeholders. Figure 6 provides examples of potential subcategories:*

*Figure 6: Product Assessment*

**Total Impact: 0-100**

**Environment Total – 0-100**

Air Pollution – 0-100

Water Pollution – 0-100

Waste Production – 0-100

Energy Used – 0-100

Packaging – 0-100

**Economic Total– 0-100**

Profitability of Product – 0-100

Impact of Product on Community – 0-100

**Social Total– 0-100**

How business gives back to community – 0-100

Jobs created by product – 0-100

The results of true product and packaging assessment would allow for better decision-making for industry, government and consumers. The research recommends implementing this assessment with eco-labelling to communicate advantages and disadvantages of a product to

consumers[75]. It would be implemented simultaneously with EPR. Since it is a tool that helps support packaging decisions and consumer behaviour, it does not conflict with EPR's main focus— economic responsibility.

When bottled water is compared to municipal water, the evaluation must remember that bottled water is designed to complement a municipal water system, and not designed to replace it. A consumer that primarily purchases bottled water will still need municipal water to cook, clean, for washing, and for outside activities. Current bottled water industry is aimed at water directly related to consumption[76]. The assessment must consider the dynamic that bottled water is not a standalone product. As a result, an assessment must compare all effects associated with municipal water[77] (effect of A) with all effects associated with municipal water (effects of A) and bottled water[78] (effects of B). Logic would suggest that any comparison that evaluates effects of A and the effect of A and B, would find that the effect of just one would be less than the effects of two. The total effects of A and B combined would only result in a smaller environmental impact than the effects of just A, when the effects of B are to the benefit of the environment. Since, the research has found that there are negative impacts associated with bottled water,[79] it is unlikely that bottled water provides a positive impact on the environment. Logically, one can conclude that the effects of A and B will be greater than just the effects of A, and thus A (municipal water) is better on the environment. This type of assessment cannot determine the difference between A and A+B. See Figure 7 for a visual representation of this comparison.

*Figure 7: Logical Comparison of Municipal Water vs. Municipal Water and Bottled Water*

| | | | | |
|---|---|---|---|---|
| Municipal Water | VS. | Municipal Water | + | Bottled Water |
| A | VS | A | + | B |

[75] Much like the current "Nutrition Facts" found on food packaging.
[76] Large bottle water containers are 18.5L, which would be prohibitively small for many activities including watering a lawn (see page 46).
[77] This includes the water infrastructure development, running of the municipal water facility and any effluent or adverse effects caused by the service to provide municipal water.
[78] All environmental effects associated with bottled water and its packaging from cradle to cradle.
[79] For example, energy use and packaging entering landfills— see page 47.

### 5.2.5 Eco-labelling

Seventy-three percent of Ontario experts interviewed for this study suggested that increased stakeholder interaction and communication could lead to source reduction of bottled water packaging (see page 64). This impressive consensus suggests that policy instruments that promote communication between stakeholders should be considered. Eco-labelling was identified in the literature review as an innovative tool to empower and communicate with consumers (see page 47). It was also identified as a tool to support IPP (see page 27). However, it was not identified by experts as a tool that can promote source reduction and waste minimization of bottled water packaging. It is unclear whether interviewees did not mention it because it was not the first tool that came to mind, or because they believe it is not a helpful tool for Ontario. Considering the interviewees focus on industry as the major stakeholder, it is likely the former rather than the latter. Since 87 percent of interviewees (n=13) identified industry as the one stakeholder who should play a major role in reduction of waste, it is likely that tools that promote consumer awareness may not be the current focus (see page 61).

The research strongly recommends that eco-labelling only be implemented after an extensive packaging evaluation system has been developed (see page 84). The development of a packaging evaluation system (see page 84) must be fully developed or an eco-labelling system will not be able to communicate all of the necessary information to consumers. The eco-labelling should go beyond our current Environmental Choice program[80] and should be required on all products. The information should be provided in a way similar to the health information "Nutrition Facts" that already appear on package, see example on page 86 (Figure 6: Product Assessment). *The research recommends that the WDO be responsible for the set-up and implementation of an eco-labelling program alongside the product assessment program (see page 84 for set-up details). The research also recommends creating an online calculator for the WDO website. The website would have a more detailed analysis of each product. This website could also allow for a more detailed description and allow for local considerations to be factored into the analysis.*[81]

[80] See page 59 for more information about Environmental Choice.

[81] For example, the calculator could include an analysis of the distance the bottled water travelled between the consumer's residence and the bottling plan t. Depending on location of the bottling plant, a consumer might chose to purchase water that is bottled closer to their house to reduce transportation effects.

### 5.2.6 Focus on Financial Obligations

Unlike the poor wording found in the *WDA*'s environmental diversion program set-up[82], the financial component requiring a 50/50 fee split between industry and municipal governments is clearly stated. See Section 25 (5) of the *WDA*[83] for the citation specifying the 50/50 split. The notable difference in clarity between these two sections seems to indicate a focus on economics.

The detail used to describe financial mechanisms is thorough. The minute details for developing Waste Diversion Ontario were prescribed in the *Act*[84], but there is no explanation for waste reduction, reuse and recycling[85]. The financial focus of the *WDA* has been confirmed by Ontario expert interviewee Clarissa Morawski (CON 4), who describes the current *WDA* as "a financing mechanism whereby municipalities receive some money to offset their system costs, paid for directly by brand owners of first importers." *The research finds that the current WDA is financially motivated. If the current WDA is purely a financial mechanism, it makes sense that the 60% diversion goal has not been achieved, because the motivations behind the act are not emphasising waste diversion. Waste minimization (reduction, reuse and recycling) should all be emphasised and implemented in the new WDA*[86].

### 5.2.7 Alternative Collection Systems: Deposit Return

Deposit-return systems have been successfully implemented in many Canadian provinces including Alberta, British Columbia, Prince Edward Island, among others (CERB, 2005). The deposit-return section of this report describes the success of deposit-return in comparison to Ontario's Blue Box system (see page 49). In addition, deposit-return systems have been effectively implemented in Ontario. Ontario's own recently implemented deposit-return system for wine and spirit containers has been more successful at achieving higher diversion rates in the first year of implementation (achieving 70% diversion) than Ontario's blue box system has ever been (achieving 39% in 2007)[87]. Thirty percent of interviewees identified deposit-return as a system that could prevent unnecessary bottled water plastic from entering the landfill, thus

[82] See discussion 5.2.2 Unclear and Undefined Language associated with Diversion on page 84
[83] Starting on page 133.
[84] See page 133.
[85] See discussion 5.2.2 Unclear and Undefined Language associated with Diversion on page 84.
[86] See discussion: 5.2.2 Unclear and Undefined Language associated with Diversion starting on page 84 for a full list of recommendations that encouraging packaging minimization.
[87] See Deposit-Return on page 61 and see page 26 for Ontario's diversion rate.

reducing waste (see page 148). Deposit-return systems seem like a worthy option to explore in more depth.

Deposit-return systems are noted in both the 2004 and 2008 Ontario waste diversion discussion papers as potential tools to minimize packaging waste. While the 2004 Ontario waste diversion discussion paper went into detail recommending deposit return as an option, the 2008 Ontario waste diversion discussion paper only notes it twice without providing further details. The 2008 Ontario waste diversion discussion paper seems to stress other areas such as EPR (see page 141). Given the current zero waste goal (see page 141), and the historical success of deposit-return systems in Ontario and other Canadian provinces, this research finds it peculiar that deposit-return systems are not a central focus of the 2008 Ontario waste diversion discussion paper. IND1 suggests that given Ontario's significant financial investment in the Blue-Box system, there may be a strong incentive to preserve it.

*The best stakeholder to conduct an investigation on alternative recycling systems for container waste is the provincial government (specifically the Waste Policy Branch) because they have the jurisdictional authority to make changes to the system. Since the WDA is currently under review, this research recommends that the investigation take place before the implementation of the new WDA.*

If it is found that a deposit return system would be beneficial from an environmental, economic and social perspective[88] -- there are a number of potential methods to implement this type of system. CON 1 noted that implementing EPR and requiring industry to achieve a higher waste diversion rate[89] may push industry to implement a deposit-return system. Alternatively, the provincial government could legislate a deposit return system for all containers. This system might be similar to the recently implemented LCBO deposit return system, in which consumers bring back their containers for cash deposits (see page 49). Since the current focus seems to be on EPR, this research recommends that the Waste Policy Branch set targets requiring industry to meet recovery rates for bottled water containers[90].

[88] See page 34.
[89] A target between 80 and 90%.
[90] See recommendations associated with targets under 5.2.2 Unclear and Undefined Language associated with Diversion, starting on page 84.

### 5.2.8 Bottle Standardization

Standardized containers for water could be useful if implementing a refillable system, as discussed on page 47. *If refillables are introduced to minimize bottled water waste, the research recommends that standardized bottles also be introduce to compliment the system. The research recommends providing an opt-out option so water companies that wish to have a unique refillable container have that option. This opt-out option should include the additional price of managing other non-standardized refillable containers. Since the bottled water industry is currently responsible for developing their own packaging, the research recommends that the bottled water industry develop a standard refillable container that they would deem suitable to use across Ontario.*

## *5.3 Actors*

### 5.3.1 Stakeholder Theory

The literature review examined both stakeholder theory and the theories of stakeholder interactions (see page 14). A governance system that includes all stakeholders in the decision-making process is complicated and difficult to achieve. Interviews with Ontario waste experts revealed that 73% (n=15) believe that increased stakeholder interaction and communication could result in source reduction and waste minimization of bottled water packaging (see page 64). *Policy instruments that help to promote stakeholder interaction and communication should be considered in the new system. Eco-labelling promotes stakeholder communication and interaction, and was discussed on page 88*

### 5.3.2 Public Procurement

One stakeholder identified public procurement as a tool that governments can implement within their own bureaucratic system to support a reduction of bottled water packaging[91]. The single-use water bottle bans implemented in municipal buildings[92] are a type of public procurement. An alternative to a bottled water ban, governments could implement a rule that refillable water glasses and pitchers of municipal water are always available in municipal facilities so individual have the choice. This will not be as effective as a ban on bottled water.

[91] See page 74.
[92] See page Current Situation with Bottled Water: The Rise of the Bottled Water Industry starting on page 23.

Procurement was only identified by one stakeholder. It is unclear whether public procurement was not mentioned by more stakeholders because it was not considered to be effective, or because it was not in the minds of the interviewees. Public procurement can be implemented with EPR. EPR ensures that industry is responsible for the full environmental costs associated with their products (see page 78). With an EPR system, consumers still have the choice to consume or not consume bottled water. Public procurement is a policy tool affecting government's consumer behaviour (Commission, 2001). The implementation of public procurement can help to target waste minimization areas that EPR cannot.

*The research finds that public procurement can certainly promote waste reduction of bottled water packaging. Municipal governments, the Ontario provincial government and the federal government should implement procurement policies encouraging the consumption of municipal water over bottled water.*

### 5.3.3 Industry as Environmental Leaders

The literature review identified a lack of corporate environmental leadership as a barrier to environmental packaging reform (see page 38). Industry only seemed to act as an environmental leader when it benefited their economic bottom line. This barrier was partially observed within the context of Ontario packaging policy.

As identified in the literature review, Wal-Mart is strongly promoting source reduction of packaging waste (see page 38). Grocery stores like Loblaws are promoting re-useable cloth bags and discouraging the use of plastic bags (see page 48). This packaging waste will no longer enter MURFs and landfills—reducing the stress on municipal waste facilities. These initiatives have occurred significantly after the implementation of the *WDA*, and this suggests that the changes have not occurred because of the implementation of legislation. As a result, these initiatives are all evidence of corporate environmental leadership resulting in a reduction of packaging waste.

The motivations behind these initiatives are less clear. A reduction in packaging requires industry to pay for a smaller package to be produced, transported and disposed of. Packaging reduction initiatives are all environmentally positive actions, but they are profitable to industry and do not appear to hinder the economic bottom line. Two Ontario interviewees identified

economic bottom line as a potential barrier for implementing a policy framework (see page 145). Economic profitability drives packaging changes.

*Whatever the motivation behind the packaging change, it is important to support and encourage industry to take a leadership role on packaging reduction. It seems unreasonable and unproductive to fault industry for developing green initiatives that also happen to be economically savvy. Industry should not be blamed for inaction that could lead to economic instability.*[93]

### 5.3.4 Stakeholder Involvement: Community vs. consumers

Stakeholder theory[94] suggests the need for stakeholder involvement. Stakeholders often include various levels of government, various industry sectors, NGOs and other interest groups, and finally the public. There is a relevant distinction between consumers and citizens. Citizens are the individuals living in the community (see page 18) and consumer are the individuals who purchase a product (see page 17). Consumers are also citizens, but the opposite is not necessarily true. It is important to consider both parties when developing a policy framework. A framework that only included consumers in stakeholder participation would be considerably less inclusive and could dramatically impact program development in unintended ways. *This paper recommends that any stakeholder consultation on Ontario packaging or bottled water include both citizens and consumers.*

## *5.4 Product Groups*

### 5.4.1 Definition of Waste

As found in the *WDA*, waste is perceived as a material that must be managed and diverted through some part of the hierarchy (see page 136). This definition is similar to the Oxford English Dictionary's definition of waste found on page 1. Waste should not have an embedded negative connotation (see page 1), when there are so many positive solutions—waste reduction, reuse and repair. If a used single-use water bottle is perceived as damaged, useless, unsaleable, it is not surprising that the focus is to either recycle the bottle or put it in a landfill. If it is valued

[93] See page 102 for Industry reward systems.
[94] As outlined on page 26.

as a resource full of potential, then maybe this positive connotation will result in different minimization techniques (such as reuse or repair). *The new WDA should recognize the embedded value associated with waste, or it should develop a new neutral or positive term that recognizes the value of waste. This new term could be "resources" "materials", "goods", or "substances". This change should be implemented by the Waste Policy Branch of the MOE before the implementation of the new WDA.*

### 5.4.2 Waste Minimization

The term waste minimization[95] more accurately represents the entire waste hierarchy (see page 30). Diversion represents the materials that have already been created and need to be diverted away from landfill (see page 30). Bottled water packaging redesign and reusable bottled water containers prevent additional waste from being created, thus it will never need to be diverted. As the 2008 Ontario waste diversion discussion paper has noted, waste reduction and reuse should be stressed in the new *WDA* (see page 141). It might be appropriate to rename the *WDA* something that represents the entire waste hierarchy and the goal of zero waste— waste minimization. *The Waste Diversion Act should be renamed the Waste Minimization Act and changed accordingly after the completion of the five year WDA review.*

### 5.4.3 Waste Measurement

There are two significant methods to measure and determine how much waste is being produced: by weight and by volume (Maclaren, 2004). Measuring by weight is typically preferred because it is easier to calculate (Maclaren, 2004). Measuring by volume is more complicated and consequently more expensive. Measuring by volume is more difficult because volume can differ greatly depending on how much the waste has been compressed. As a result, measuring by volume is not easily comparable if the methods used to compress the material are even slightly different. There are also a number of advantages to measuring by volume. Since landfill capacity and garbage and recycling truck capacity are measured in volume, it makes sense to monitor waste in that same unit. If waste is measured by weight then municipalities will have a reduced ability to accurately predict the number of years left in their landfill, as this is a measurement taken in volume. Using weight to measure waste production has some negative

[95] Defined on page 10 in the section 1.4 Research Questions.

implications. For example, if municipalities are attempting to achieve certain diversion targets measured by weight, they are likely to target heavier items that will increase their diversion rates most dramatically. Alternatively, if diversion rates were measured in volume as landfill capacity is measured, then municipalities might target problematic bulky lighter objects that take up space but not much weight. Depending on what measurement is used, different consequences are emphasised. Currently, there is a problematic disincentive to achieve diversion targets measured by weight that do not necessarily target the most practical materials to divert.

There many examples of how this current bias has influenced recycling habits in Ontario. If one looks at recycling rates, newsprint has an extremely high recovery rate and is also a heavier item in the blue bin. In the WDO's 2008 Annual Report, 90% of newsprint was recovered and only 44.9% of aluminum and 22.1% of plastic (WDO, 2008). It is interesting that aluminum's recovery rates are not at the levels of newsprint, as aluminum has a very high resale value. It costs municipalities $22.23 per ton to recycle newspaper, whereas municipalities profit $622.39 per ton from aluminum (Morawski, 2005). Plastics water bottles made of PET are very expensive to process and cost municipalities $810.55 per ton (Morawski, 2005). Under the current measuring system of waste, plastic water bottles have a high volume and a low weight, so there is less incentive to promote diversion. The decoupling of waste facilities' primary objectives (waste minimization, economic stability, etc) and faulty methods used to quantify their achievements in weight rather than volume have contributed to results that do not support these primary objectives. *Diversion rates should be calculated as they impact our landfills—by volume. This change should be entrenched in the new Waste Diversion Act and should be implemented by the provincial government, WDO, Stewardship Ontario, all Ontario municipalities, and all industry sectors.*

### 5.4.4 Evaluation of Waste Hierarchy

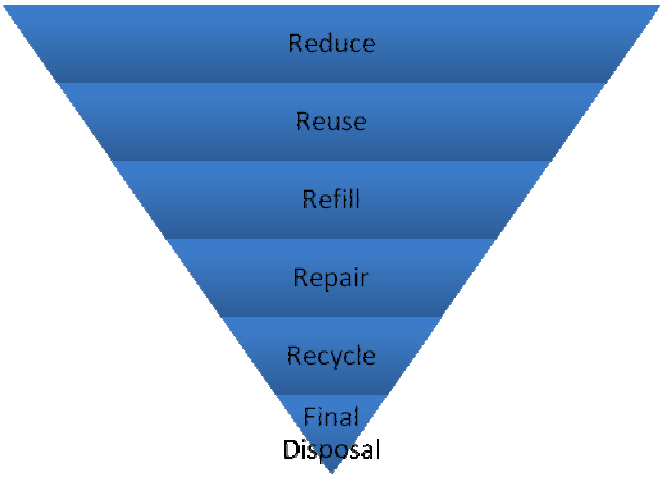
The final page of the 2008 Ontario waste diversion discussion paper outlines A Waste Value Chain[96]. Overall, this seems to be a good waste hierarchy for the province of Ontario—waste reduction is found at the top of the hierarchy (see page 30). The waste value chain is missing the category of "Repair". From the perspective of bottled water packaging, repair should be emphasised to Ontario stakeholder as one method of promoting zero waste. If a

[96] See Figure 2: The Waste Value Chain on page 42.

consumer's refillable bottle has a strap that breaks, one reaction may be to throw away the old and buy a new container. But, this strap might be repairable, thus reducing waste entering the landfill. *The category of "Repair" should be added to the waste value chain.*

The visual representation of the diagram does not communicate how prevention should be emphasised in relation to the other categories of the waste value chain. Purely from a visual examination, it is unclear whether the Waste Value Chain should be considered as a hierarchy[97] or a list of important diversion techniques. Also, the name "waste value chain" could be interpreted as a system that stresses equal importance among all categories like a chain. The diagram does not provide a visual explanation how much of a priority should be given to waste reduction over waste disposal. Showing the attempted percentage of waste being diverted versus disposed could be easily demonstrated in a triangle. See example in Figure 8 below.

*Figure 8: Example of Hierarchy with an emphasis on Waste Reduction*




After having carefully examined the document, it is apparent that the only place the waste value chain is noted is at the ended of the 2008 Ontario waste diversion discussion paper. It is not referred to on page 16 where the there is a discussion about the need for an Ontario waste hierarchy (MOE, 2008). It is unclear why the waste value chain is not further clarified and emphasised.

*Ontario's final waste policy framework should clearly stress the hierarchical importance of the waste value chain with an emphasis on waste reduction and reuse. The diagram used to*

[97] Where the top of the hierarchy is prioritized over the bottom for diversion.

*depict the hierarchy should clearly demonstrate the hierarchical importance of the various waste minimization options. The priority of one minimization option over another should be quantifiable and demonstrated visually using a triangle. This final version of the hierarchy should be developed by the Waste Policy Branch in the MOE and should be confirmed in a final policy document used to support the new Waste Diversion Act and be in the new Waste Diversion Act.*

### 5.4.5 Refillables Water Bottles

Refillable water containers have been identified as producing less waste, less GHGs and use less energy[98]. Ten percent of Ontario experts also suggested that refillable bottled water can help to promote source reduction and waste minimization of bottled water packaging waste (see page 148). *When bottled water is deemed necessary, the research recommends the use of refillable containers whenever possible. Since, larger refillable containers create less waste[99], the research recommends that consumers purchase the largest refillable container available (usually 18L). The research strongly encourages consumers to fill their own refillable container with municipal water to avoid extra transportation emissions associated with commercial refillable containers.*

### 5.4.6 Reporting Waste Reduction and Reuse

Some elements of waste reduction and reuse do not fit into an easily quantifiable equation to report diversion rates. This is evident in the 2004 Ontario waste diversion discussion paper. The equation for diversion can be seen in Figure 9: MOE's 2004 Waste Diversion Equation on page 140. The equation suggests that Ontario's waste diversion rate can be calculated by comparing the amount of waste diverted to the amount of waste being produced. This equation can only work if the amount of waste diverted is calculated properly. There is no system for measuring the total waste reduction and reuse among stakeholders. For example, every time a citizen uses a refillable bottle of water instead of a single-use bottle of water it is not recorded and calculated for Ontario's diversion rate. From the perspective of a bottled water company, if it reduces the amount of plastic in their bottle, that waste will never enter the recycling stream.

[98] See Refillable Containers on page 47 for specific percentages.
[99] See Refillable Containers on page 47 for specific percentages.

With the current system, reduction and reuse of materials will never be reported properly. As a result, there may be an unintentional bias towards diversion techniques that can be accurately reported (like recycling), and a de-emphasis on methods that are difficult to report (some forms of reduction and reuse). *This paper recommends that the Waste Policy Branch conduct a study to examine how reduction and reuse can be quantifiably reported by individuals, municipalities and industries before the implementation of the WDA.*

### 5.4.7 Learning from History

Examining historical methods of managing waste provides interesting and creative insight to alternative waste reduction techniques. Previous generations had access to fewer natural resources; as a result, less waste was generated because everything could be used again. There were a number of ways that packaging was designed with systems that prevented packaging waste— reuse, refillables, dual-use (see page 36). For example, dual-use beer bottles were designed to also function as a building material (see page 36). The 2008 Ontario waste diversion discussion paper targeted reduction and reuse as areas of the waste value chain that require further attention (see page 141) and an examination of historically successful packaging alternatives might help to achieve the zero waste target. The corporations responsible for developing a product are the best suited for developing packaging innovations to suit their specific needs. The literature review[100] and 87 percent of Ontario stakeholder interviews (see page 61) identified industry as a major actor in promoting packaging design changes. *An award program that recognizes innovative packaging designs can provide an incentive to develop packaging that reduces waste or reuses materials*[101]*. This might promote waste reduction through options like dual-use, reusable or refillable packaging. A previously established waste recognition program may be the easiest and most effective place to put a new award. This research recommends two potential stakeholders that have such awards competitions are the RCO's Ontario Waste Minimization Awards and PACKEX Toronto.*

[100] See page 37.
[101] See page 145, subsection Policy Instruments: Incentives.

### 5.4.8 Alternative methods to encourage the consumption of municipal water

Twenty percent of interviewees identified banning the sale of bottled water in municipal facilities as an approach they would not recommend implementing. It is a reactionary and controversial action. A ban is implemented to prevent the sale and consumption of bottled water. There are various reasons for enacting the ban—unnecessary production of waste, health concerns and to remove any competition with municipal water (see page 45). CON2 identified that a ban on bottled water might have the unintended result of citizens consuming other single-use beverages that contain higher amounts of sugar. *All public facilities and certainly all facilities that ban the sale of bottled water must re-evaluate the public water infrastructure to ensure it is maintained properly. The owners of these buildings should keep water fountains in good working order and a sanitary state. The research also recommends that municipalities develop educational programs (see page 64) to help their citizens to regain confidence in the public water infrastructure (see page 11).*

Vending machines that sell refillable containers might be an alternative to selling bottled water. If a consumer forgets their bottle, they could purchase a new bottle and then fill it with municipal water. Similarly, a reverse vending machine could be available in public buildings. These reverse vending machines would sell a multi-use water container and require an additional deposit. A consumer could then fill this water container with municipal water. It they could use it for the day, and then placed back in the reverse vending machine (after which their deposit would be returned). The reverse vending machine would require a service to wash these containers. These are potential alternative systems that remain convenient for consumers[102], use municipal water and do not create waste. *The research recommends that municipalities that enact bans on bottled water consider what alternative options are available to support their ban. These types of systems should be implemented before or concurrently with the ban on bottled water. If the ban has already been enacted, the research recommends that action is taken within three months to implement a system to allow for accessible water.*

[102] See excessive consumption on page 56 for more information about products designed for consumer convenience.

## 6.0 Chapter Six: Conclusion

The research examined what options were available to the Ontario provincial government to help support bottled water packaging reduction and minimization. A great variety of options have been indentified from policy objectives, product materials, actors, and policy instruments. The research has found that although the policy discussion papers and *WDA* tend to stress waste minimization, the primary function of the current *WDA* is economics. One contributing factor is that there is no system to evaluate product and packaging from an environmental, social and economic perspective. This is a significant barrier; the research recommends that the Waste Policy Branch receive funding from the Ontario provincial government to develop a product and packaging evaluation system. Once an evaluation system has been developed, the research recommends that this be implemented in the new *WDA*, and a short version of it be communicated to consumers through the tool of eco-labelling. A full triple bottom line evaluation of a product and its packaging will allow for better decision-making and waste minimization. An eco-labelling program will communicate these findings with citizens, and allow them to make informed decisions that will also support waste minimization.

The current system for managing waste has been scattered and unorganized. The research recommends the implementation of a policy framework to support packaging minimization. The policy framework will also support communication with all stakeholders the true direction of packaging policy. This information will allow industry to make informed changes in their system. For example, the development an eco-labelling system will communicate environmental impacts of products to consumers. If industry is aware of this implementation, they may start to re-evaluate their products and packaging to ensure the product receives the best evaluation possible.

The current movement seems to be towards EPR. This seems like a reasonable movement which will help to provide the economic support needed for waste management. EPR would be complimented by an IPP system to support packaging minimization initiatives that EPR cannot address. For example, the implementation of IPP would encourage public education. Education would help to support consumer awareness and help to encourage consumers to take the relevant actions to support waste minimization. Similarly, the recommendation of bottled water public procurement could help to minimize bottled water waste

entering the landfill. Many concepts can support bottled water minimization, a short list includes: governance, triple bottom line, cradle to cradle, sustainability, the waste hierarchy and stakeholder theory.

Associated with EPR, the Waste Policy Branch should set quantifiable diversion targets. This will ensure that recycling rates do not drop significantly. Targets for bottled water should be 80 to 90% to ensure full waste minimization of bottled water packaging. The research recommends that industry consider a deposit-return system with a refillable bottle component and a standardized bottle. This system has proven effective in Ontario and would promote bottled water minimization. Deposit-refund ensures a high return of empty beverage containers so they do not enter the landfill. Refillable containers prevent the product of extra waste and saves energy.

The research finds that the current *WDA* does not provide enough focus on waste reduction and reuse. The wording of the *WDA* should be changed to stress the importance of these two areas. Other areas to support bottled water packaging minimization include: environmental award programs, a better system for evaluating amounts of waste, a re-evaluation of what historical packaging techniques could be useful for modern life, and a re-evaluation the term waste and diversion. The research finds that all stakeholders that own buildings with public access should maintain adequate drinking water infrastructure. Better drinking water infrastructure and educational program to communicate that municipal water is safe, will help to encourage citizens to consume municipal water. This will prevent the unnecessary consumption of bottled water and consequently prevent the production of excess bottled water packaging waste.

The findings of the research focus on bottled water packaging minimization, but are not exclusively applicable to this product. The results may support packaging minimization of other containers. PET plastic is common for many types of container packaging including soft-drinks, fruit juice, ketchup, mayonnaise, among others. Interviewees confirmed that the findings associated with the project are likely applicable to most PET packaging for beverages. Recommendations associated with improving the municipal water system, and encouraging personal water containers are only applicable to bottled water. Recommendations about deposit-return systems are applicable to any type of container. Other recommendations that examine policy frameworks and packaging analysis are more broadly applicable to all packaging. An

EPR/IPP system that provides policy direction can help to support bottled water minimization just as it can help to support ice-cream containers. In both cases, EPR/IPP system will ensure producer responsibility of waste, which will help to do such things as redesign packaging—it does not matter if this is packaging of a water bottle, for ice cream, or any other type of food packaging. IPP component will help to provide eco-labelling, and educational programs to inform consumers about their choices.

### *6.1 Contributions to the Literature*

There is a great deal of information about packaging waste, bottled water and various environmental concepts. This paper attempts to bring these concepts together in one cohesive document. It also brings together literature that may not have all been linked in the past, as it relates to the context of Ontario.

Second, the research introduces the concept of Integrated Product Policy, and relates it to the Canadian context. IPP is not a frequently discussed topic in Canada. This paper will attempt to provide some insights into how IPP could be implemented with EPR.

The research examines packaging through the case study of bottled water. Often, bottled water has been examined because of its "water issues". This research will provide more detail about a less discussed issue relating to bottled water—waste management.

Since this study has been conducted during the review of the *Waste Diversion Act*, the information collected during the interview process may be a valuable resource for further historical analysis. This information may allow for an in-depth understanding of what many key stakeholders felt during the review of the *WDA*.

Industrial ecology examines how to remove inefficiencies throughout the entire cycle of a human created system. The research has examined one particular component of industrial ecology—waste minimization of bottled water packaging. The research findings affirm the possibility of improvements in a human created waste management system by examining stakeholder participation, improved policy organization and efficiencies. The findings of the research contribute to a better understanding of the relationship between Ontario packaging policy and Industrial Ecology.

### *6.2 Policy Contributions*

The following short-list of recommendations provides a brief summary of the policy contributions to Ontario waste management packaging policy. For more information on each topic, the reader should refer to the subsection as referenced by number.

*Table 6: Shortlist of Recommendations*

| **Policy Objectives** | **Policy Instruments** |
|---|---|
| • Zero waste (5.1.1)<br>• Clearly stated objectives (5.1.2)<br>• Develop and implement a policy framework (5.1.3)<br>• Focus on environment not economics (5.2.6) | • IPP/EPR strategy (5.1.4 and 5.1.5)<br>• Enforce legislation (5.2.1)<br>• Clear language in Division Act (5.2.2)<br>• Set diversion targets (5.2.2)<br>• Eco-labelling (5.2.5)<br>• Deposit-return system (5.2.7)<br>• Bottle standardization (5.2.8) |
| **Product Groups** | **Actors** |
| • Waste minimization not diversion (5.4.2)<br>• Effective product and packaging analysis (5.2.4)<br>• Redefine waste (5.4.1)<br>• Reconsider waste measurement system (5.4.3)<br>• Encourage refillable containers (5.4.5)<br>• Alternative methods to encourage consumption of municipal water (5.4.8) | • Legislated actors have power to make changes (5.2.3)<br>• Increased stakeholder communication (5.3.1)<br>• Public procurement (5.3.2)<br>• Industry as a leader (5.3.3)<br>• Consider citizens and consumers (5.3.4) |

Given the broad scope of Ontario packaging policy examined in this research, there are a number of recommendations that could potentially lead to source reduction and waste

minimization of bottled water packaging. All of the noted recommendations have advantages and disadvantages.

The most important recommendation to support waste minimization of bottled water packaging is to develop a system to evaluate the environmental implications associated with bottled water packaging. Without a quick and cost-effective system to evaluate the environmental implications of packaging, the *WDA* will never be able to focus on the environmental implications. Without an evaluation system, there is significantly less reason to implement the other tools to support minimization because it is unknown whether these actions are counter-productive.

The recommendation that should be implemented first is to develop and apply clearly stated policy objectives for Ontario. As noted by Oosternhuis *et al.* (1996), developing policy objectives are essential to guide the policy and achieve adequate results. The clear discrepancy between the *WDA*'s objectives and what is required in the act, results in a confusing mixed message. Stakeholders are much less likely to support policy and legislation that is difficult to understand, and thus they will be less likely to participate in the process of promoting waste minimization. Clear policy objectives are recommended as first to be implemented because without organized objectives, it will be difficult to proceed with policy development.

The recommendation most supported by stakeholders is to ensure that industry is responsible for promoting source reduction and waste minimization of bottled water packaging. Expert interviewees agree that industry should take a leadership role to promote source reduction of packaging waste. Industry has the power to control packaging re-design that promotes design for the environment. Industry should be encouraged and recognized for their innovation and commitment to waste minimization. The most realistic recommendation is to promote packaging minimization through stakeholder interaction and communication. There are a number of tools that could support this objective. Public education is one of the policy tools most likely to be accepted by all stakeholders.

The recommendation that will most immediately result in waste minimization is the implementation of a deposit-return system for bottled water packaging. As discussed, deposit return systems have been effective in various provinces and in Ontario (for beer, liquor and wine) (Morawski, 2006). British Columbia's container deposit-return system collects wine,

spirits, imported and domestic beer through a depot and retail system. Consumers bring these types of containers back to the depot or retailer, and are given back their deposit. Curb-side collection covers milk containers and other recyclables (Morawski, 2006). This joint depot collection and curb-side system allows for maximum flexibility and waste minimization. British Columbia's waste diversion for deposit-return container recycling was 81 percent diversion in 2004 (Morawski, 2006). British Columbia's deposit-return for plastics container recycling was 72 percent diversion in 2004 (Morawski, 2006). Ontario's diversion rate in 2008 was 39 percent (Stewardship Ontario, 2009). Clearly, British Columbia's system is diverting recyclable containers more effectively than Ontario's blue box system, thus promoting packaging minimization. The implementation of a deposit-return system is an effective tool to encourage diversion rates for single-use water bottle packaging.

### *6.3 Further Research*

The research recommends that a further study be conducted to evaluate how IPP and EPR could be integrated effectively in Ontario. This research has made recommendation for how it could potentially be integrated, but a more detailed follow up study would be useful to examine how a combined EPR/IPP strategy could reduce packaging waste. The study would do the following: evaluate what policy tools would be most useful within the Ontario context (eco-labelling, procurement, environmental design awards, etc); examine which tools might conflict with Ontario's current system; evaluate what adverse effects might result from the implementation of IPP/EPR system; conduct stakeholder consultations to gain their insight into the proposed system; and evaluate the effectiveness of the designed system.

The movement to a full EPR system, where Industry is responsible for full management of waste: collection, recycling, final disposal and 100 percent of economic costs— raises concerns about the privatization of public services. The privatization of public services has resulted in considerable debate in other fields such as municipal water management (Grosskurth, 2003). Although the introduction of full EPR might improve waste packaging efficiency, Ontario experts must evaluate whether it is worth implementing at expense of a public service. All Ontario citizens must have the right to equal and efficient waste removal care.

The research recommends that further studies be conducted on product and packaging evaluation that consider social, environmental and economic factors. Further research should move beyond the existing approach which has no system for evaluating the environment impacts associated with the product. . The evaluation should consider all impacts from cradle to cradle. The assessment should be inexpensive to conduct and should be able to compare multiple products at one time.

Since waste reduction and reuse are difficult to quantifiably measure (see page 97), the research recommends further research in this area. This will allow municipalities and industry to report and receive recognition for reduction and reuse initiatives. The research recommends that a new method of evaluating waste entering the landfill should be developed using volume rather than mass. This evaluation would need to be inexpensive enough for municipalities to be able to measure the volume. It would also need to be standardized across the province so that the same technique could be used everywhere.

The above studies could be conducted by a number of stakeholders including: an academic institute, Waste Diversion Ontario, the MOE or various NGOs. Consultation with stakeholders would be essential to the process. The research recommends that whoever is designated to conduct the study receive provincial funding to conduct these research projects.

Finally, the research recommends an evaluation of the true objectives of the *WDA*. This evaluation should be conducted by the MOE's Waste Policy Branch. The findings should be entrenched and clearly stated in the new *WDA*. All terminology should be clearly defined. The research strongly recommends that the triple bottom line principle be consider as part of the objectives.

The product policy quadrangle has been a useful way of examining these issues as it has provided structure and organization. Using the quadrangle has ensured that areas like historical management are considered. One challenge associated with the quadrangle is that many of the issues discussed in the research are complicated and could fit into more than one quadrant. It is often difficult to evaluate which quadrant a given topic fits in best, and how best to show these connections. For example, when examining and classifying an issue like refillables could be classified as a material or as a policy instrument. This classification relationship both provides a double check to ensure that all relevant topics are covered. It also may allow topics to be accidently left out entirely if their classification is unclear. This can be prevented by careful

examination of the issues, and a system to double check. Overall, the product policy quadrangle seems like an excellent framework to examine packaging minimization.

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# Appendices

## *Appendix One: Names of Interviewees, Positions and Dates Interviewed*

| Name | Job Title | Affiliation | Coding | Date Interviewed |
|---|---|---|---|---|
| Milena Avramovic | Senior Policy Advisor | Association of Municipalities of Ontario | ASSOC 1 | March 25, 2009. |
| Duncan Bury | Head of Product Policy | Product Policy Environment Canada Regulatory Innovation and Management Systems | GOV 1 | March 19, 2009. |
| John Challinor | Director of Corporate Affairs | Nestlé Waters Canada | IND 1 | May 11, 2009. |
| Joe Cressy | Campaign Co-ordinator | Polaris Institute | NGO 1 | April 20, 2009. |
| Guy Crittenden | Editor-in Chief | Solid Waste & Recycling Magazine | CON 1 | March 3, 2009. |
| Vivian De Giovanni | Executive Director | Municipal Waste Association | ASSOC 2 | March 31, 2009. |
| Glenda Gies | Executive Director | Waste Diversion Ontario | NGO 2 | March 19, 2009. |
| Joe Hruska | Principal | Hruska & Associates, Environment & Management Strategies Group | CON 2 | May 11, 2009. |
| Maria Kelleher | Principal | Kelleher Environmental | CON 3 | April 2, 2009. |
| Mengo McCall | Director of Business Development | Canadian Springs Water Co., Labrador Laurentienne Inc. Aquaterra Corporation | IND 2 | May 11, 2009. |
| Art Mercer | Supervisor of Waste Processing and Environmental Compliance | The Regional Municipality of Halton | GOV 2 | April 1, 2009. |
| Clarissa Morawski | Principal | CM Consulting | CON 4 | March 2, 2009. |
| Geoff Rathbone | General Manager | Solid Waste | GOV 3 | March 20, 2009. |

| | | | | |
|---|---|---|---|---|
| | | Management Services Division, City of Toronto | | |
| Jim Robinson | Associate Professor | Department of Environment and Resource Studies, University of Waterloo | ACA 1 | April 8, 2009. |
| Frieder Rubik | Senior Researcher and Head of the Department of Ecological Product Policy for the IOW in Heidelberg, Germany | Institute for Ecological Economic Research (IOW) | ACA 2 | March 26, 2009. |
| Justin Sherwood | President | Refreshments Canada | IND 3 | April 24, 2009. |
| Helen Spiegelman | President | Product Policy Institute | NGO 3 | March 24, 2009. |
| Jo-Anne St. Godard | Executive Director | Recycling Council of Ontario | NGO 4 | April 24, 2009. |
| Usman Valiante | Senior Policy Analyst | Corporate Policy Group LLP | CON 5 | March 16, 2009. |
| John Vidan | Director | Waste Policy Branch, Ministry of the Environment | GOV 4 | May 19, 2009. |

## *Appendix Two: Interview Questions*

INTERVIEW

Legislation Questions: Asked to the first three interviewees only.

Are you aware whether Ontario has laws or regulations that relate to waste management packaging? Would you tell me about them?

Are you aware whether Ontario has laws or regulations that relate specifically to bottled water waste management packaging? Would you tell me about them?

Current Situation

Would you briefly describe what the _____'s role is in source reduction of packaging waste?

In your opinion, who should be responsible for ensure source reduction of packaging waste?

(Policy Framework— Policy Mandate or Approach with a developed theoretical bases. These theories are linked together to provide direction, and provide potential implementation strategies.)

Based on your knowledge, does Ontario have a policy framework that supports bottled water waste packaging reduction, reuse and recycling?

Yes…

Would you please describe the framework?

What are the strengths of the current framework?

What are the weaknesses of the framework?

Would you recommend keeping the current framework?

Yes/No…
Opinion on Frameworks:

In your opinion, could increased stakeholder interaction and communication lead to source reduction of bottled water waste?

In your opinion, would a policy framework be a useful tool for policy development and implementation?

What results might follow, if a jurisdiction does not have a policy framework to support their policy on bottle water packaging waste management? (<u>if **no** framework</u>—What has happened in Ontario?)

What are the potential barriers to implementing a policy framework?

In your opinion, what would be the components of an ideal waste framework that promotes source reduction and waste minimization of bottled water packaging?

<u>Integrated Product Policy:</u>

Are you familiar with the waste framework Integrated Product Policy? (Used in Germany and other parts of Europe. It uses an integrated approach , emphasizes co-operation between stakeholders and promotes "shared Responsibility" of waste, system perspective, Tool box of options – Supply and Demand)

**YES…**

Has the framework been used for bottled water waste/packaging?

What are the strengths of the IPP framework?

What are the weaknesses of the IPP framework?

Would you recommend implementing an IPP framework to support Ontario's waste management policy? (or Canada wide?)

How could an IPP framework be applied to bottled water packaging waste?

<u>Product Stewardship</u>

Are you familiar with the waste framework Product Stewardship?

**YES…**

Has the framework been used for bottled water waste/packaging?

What are the strengths of a product stewardship framework?

What are the weaknesses of a product stewardship framework?

Would you recommend implementing a product stewardship framework to support Ontario's waste management policy? (or Canada wide?)

How could a product stewardship framework be applied to bottled water packaging waste?
**Is there anyone else you might recommend I talk to?**

## *Appendix Three: Water Legislation*

### *Legislation relating to water management*

The federal government has jurisdiction over navigation and shipping (*Constitution Act,* Section 91 (10), 1867), and sea coast and inland fisheries (*Constitution Act,* Section 91 (12), 1867), as well as power "less obviously implicated through federal authority over agriculture (shared with provinces), trade and commerce, taxation, and criminal law (Saunders and Wenig, pp 122, 2007).

The provincial government has most of the jurisdictional authority over water management. Bottling companies must follow strict procedures outlined in *Ontario Water Resources Act: Ontario Regulation* 387/04*: Water Taking* to ensure that no environmental harm occurs (Reg. 387/04, 2007). In addition, Regulation 450/07 mandates that "facilities that manufacture or produce bottled water or water in other containers, whether or not for use as a beverage" (section 3.1.1) must report and begin to pay for their water use. Section 7(1) of states:

> "As of January 1, 2009, the owner of a facility that is phase one industrial or commercial water use shall be charged $3.71 per million litres of water used for the total amount of water the facility uses annually or in any other 12-month period as specified by the Director" (Reg. 450/07, Section 7(1) .

A fee will not be charged if the facility uses less than 50,000 litres on any single day in the specified 12 month period (Reg. 450/07, Section 7 (5), 2007).

There are also strict regulations regarding drinking water quality, reporting and monitoring of municipal drinking water. The Annual Report 2007-2008 found that "99.85 per cent of drinking water tests reported by municipal residential drinking water systems met the province's rigorous, health-based drinking water quality standards during the year. These systems serve more than 80 per cent of Ontario's population" (MOE, pp 8, 2009). There are 56 laboratories licensed to test Ontario drinking water. Each one received at least two inspections during 2007-2008. A total of 114 inspections were conducted, with 53 of these inspections being unannounced.

From a water management perspective, there are a number of key issues pertaining to the production of bottled water: removal of water from its natural water basin, the reasonable

distribution of water, and the commodification of water. The environmental consequence of diverting water in the long term is unclear (Lasserre, 2007). Canadians are concerned about water transfer proposals that remove water from Canada (Lasserre, 2007). Action has been taken to prevent bulk removal of water from a water basin through the implementation of C-6 Bill, which prevents inter-basin transfer of more than 50,000 litres per day (Lasserre, 2007). Bulk water transfer has been regulated, but the removal of multiple smaller amounts of water could cumulatively result in significant amounts of water being diverted from the Great Lakes and potentially causing environmental problems (Lasserre, 2007).

## *Appendix Four: Waste Legislation*

### *Current Legislation*

The following is a description of Ontario's current regulatory framework as it relates to bottled water packaging. Relevant federal and provincial legislation is outlined.

### *Federal Legislation*

A number of important statutes govern waste management. The *Constitution Act* (Bill c3: 1867) divides jurisdiction between federal and provincial governments. Other important federal legislation includes the *Canadian Environmental Protection Act (c.33: 1999), Canadian Environmental Assessment Act (c.37: 1992), Transportation of Dangerous Goods Act (c. 34, 1992), and Federal Sustainability Development Act (c.33: 2008)3.*

### *Provincial Legislation*

### *Environmental Protection Act, 1994*

The Ontario regulatory framework has a number of important regulations under the Ontario *Environmental Protection Act.*

### *Environmental Protection Act, Regulation 101/94*

*Regulation 101/94* requires that municipalities with a population over 5,000 must develop and implement a recycling program for their citizens. Municipal are required to recycle the follow material if they are food or beverage containers: Aluminum, Glass, PET and Steel. In addition, they are required to divert newsprint. Following these five required materials, municipalities are required to recycle at least two more materials on this list: aluminum foil items, cardboard, boxboard, expanded polystyrene food and beverage containers and packaging, fine paper, magazines, paper cups and plates, phone books, plastic film, polycot food and beverage containers, rigid plastic containers, textiles (MOE, 2004).

***Environmental Protection Act, Regulation 102/94***

*Regulation 102*, titled Waste Audits and Waste Reduction Work Plans, and requires industry (as identified under the act) to conduct waste audits and develop waste reduction work plans. Regulation 102 clearly states that waste reduction should be emphasised over reuse and recycling. Section 3 of Regulation 102 states:

> 3. (1) A waste reduction work plan required under this Regulation shall include, to the extent that is reasonable, plans to reduce, reuse and recycle waste and shall set out who will implement each part of the plan, when each part will be implemented and what the expected results are.
> (2) In developing the work plan, regard shall be had to the following principles:
> 1. Reduction is the first objective.
> 2. If reduction is not possible, then reuse is the next objective.
> 3. If reduction and reuse are not possible, then recycling is the final objective. O. Reg. 102/94, s. 3.

***Environmental Protection Act, Regulation 103/94***

*Regulation 103/94* requires multi-residential apartment buildings of six or more residential units to have a recycling program and ensure that these materials are being properly recycled.

***Environmental Protection Act, Regulation 104/94***

Regulation 104, packaging audits and packaging reduction work plans, requires packaging to be audited as described in section 2:

> "2. A packaging audit required under this Regulation shall include examinations of,
> (a) the type and amount of the packaging;
> (b) the extent to which the packaging consists of reused or recycled materials;
> (c) the management decisions and policies that relate to packaging, including decisions and policies that relate to product design that affect packaging;
> (d) the reusability and recyclability of the packaging after use; and

(e) the impacts of packaging that becomes waste, including the final destination of the packaging after use. O. Reg. 104/94, s. 2."

Again, it is interesting to see the level of focus on waste packaging reduction. Section 3 outlines what is required in the packaging reduction work plan:

"3. (1) A packaging reduction work plan required under this Regulation shall include, to the extent that is reasonable, plans,
(a) to reduce the amount of packaging used;
(b) to increase the extent to which packaging consists of reused or recycled materials;
(c) to increase the reusability and recyclability of the packaging after use; and
(d) to reduce the impacts of packaging that becomes waste.
(2) A packaging reduction work plan required under this Regulation shall also set out who will implement each part of the plan, when each part will be implemented and what the expected results are.
(3) In developing the work plan, regard shall be had to the following principles:
1. Reduction is the first objective.
2. If reduction is not possible, then reuse is the next objective.
3. If reduction and reuse are not possible, then recycling is the final objective. O. Reg. 104/94, s. 3."

Large food or beverage manufacturers, as outlined in section 7, are required to create a packaging audit and update it every year. Manufacturers must audit all packaging products they manufacture (section 8).

***Environmental Protection Act, Regulation 273/02***

*Regulation 273*, titled Blue Box Waste, outlines the responsibilities of Stewardship Ontario, the corporation designed to be act as the industry funding organization. Under the regulation, glass, metal, paper, plastic and textiles are defined as blue box waste. The regulation outlines the required procedures for organizing and running Stewardship Ontario (Reg. 273, 2006).

***Environmental Protection Act, Regulation 357/90: Refillable Containers for Carbonated Soft Drink***

Regulation 357 pertains to refillable soft-drink containers. Section 3 of the regulation states that all soft drinks must be sold in refillable containers. Section 5(1) of sets out the required deposit placed on a refillable container depending on its size. Vendors that sell refillable containers are required to take them back. Section 5(2) gives soft drink vendors the right to refuse taking refillable bottles if they meet certain criteria. Regulation 357, sections 3- 5 state:

> "3. No person shall stock, display, offer for sale or sell a carbonated soft drink in a container other than a refillable container.
>
> 4. No person shall sell or offer for sale a carbonated soft drink in a refillable container unless the container has clearly marked thereon 'MONEY-BACK BOTTLE – BOUTEILLE CONSIGNEE' OR "MONEY-BACK CONTAINER – CONTENANT CONSIGNE".
>
> 5. (1) Subject to subsection (2), every retail vendor presented with an empty refillable container shall accept the container and shall pay to the person presenting the container, in cash,
>
> (a) 15 cents for each refillable container that, when sold at retail, has a capacity of no more than 350 millilitres;
>
> (b) 30 cents for each refillable container that, when sold at retail, has a capacity of more than 350 millilitres and less than one litre; and
>
> (c) 40 cents per litre of capacity for each refillable container having a capacity of one litre or more,
> or, where a deposit of a greater amount is being charged for a similar container, such greater amount.
>
> (2) No retail vendor is required to accept,
>
> (a) a refillable container that is not intact or is not in a reasonably clean condition;
>
> (b) more than forty-eight refillable containers from one person in a twenty-four hour period; or
>
> (c) a refillable container that, when sold at retail, contained a flavour or brand of a carbonated soft drink not sold by that retailer in a refillable container having that same capacity for consumption of the retailer's premises during the six months immediately preceding the presentation of the container.

> (3) No person shall advertise or display the price of a carbonated soft drink that is offered for sale unless the price for the drink is shown clearly distinct from the amount of any deposit for the container thereof. ”

***Environmental Protection Act, Regulation 340/90: Containers***

*Regulation 340* pertains to containers. Section 2(2) describes them as follows: “containers for carbonated soft drink that are not refillable containers are classified as non-refillable containers”. *Section 2(3)* describes recyclable containers as “non-refillable containers that as a type of container are recycled and that as used containers are collected in widespread multi-material recycling projects and for which there is a market in Ontario are classified as recyclable containers”. The regulation legislates that soft drinks must be sold in certain types of containers.

> “7(1) Every brand owner and every brand user filing a notice under section 3 shall file with the auditor monthly returns indicating all carbonated soft drinks for each brand that the owner or user is the brand owner or brand user of and in what types and sizes of containers they are sold and indicating the per cent, on an annual basis, by volume, of each brand of the carbonated soft drinks of which the owner or user is the brand owner or brand user that is sold in each sales area that he, she or it has in refillable containers.
>
> (2) The per cent referred to in subsection (1) shall be at least forty.
>
> (3) The per cent is calculated on the basis of the twelve months immediately preceding the return.
>
> (4) No monthly return shall show a monthly sales volume in refillable containers that is less than 30 per cent of the volume sold.”

Section Eight of Regulation 340 is also important. It prescribes that soft drink industries can decrease the percentage of refillable containers sold, if they meet recycling targets.

> “8(1) The requirement in section 7 that 40 per cent of the volume of carbonated soft drinks be sold in refillable containers shall vary in accordance with the Table so that when the recycling rate, as determined by the recycling advisory committee, is at a recycling target set out in Column 1 of the Table for each administrative

region, the percentage of the carbonated soft drinks required to be sold in refillable containers shall be that set out in Column 2 of the Table opposite the determined recycling target and the 30 per cent requirement in section 7 shall be adjusted proportionately.

TABLE

| Column 1<br>Recycling Target | Column 2<br>Minimum Refillable Sales |
|---|---|
| Less than 50 per cent, 9 out of the previous 12 months | 40 per cent |
| 50 per cent, 9 out of the previous 12 months | 35 per cent |
| 60 per cent, 9 out of the previous 12 months | 30 per cent |

(2) No person shall sell carbonated soft drinks in a non-refillable container that contains a material that is recycled at a recycling rate that is less than 50 per cent for each administrative region after, where the material is first used for a non-refillable container under this Regulation, the day falling eighteen months after the container is first used.

(3) Despite subsection (2), carbonated soft drinks in recyclable containers may be sold if the containers are subject to a deposit charge."

The bottled water industry was very small when Regulation 340 and 357 were promulgated and soft-drink consumption was high across North America (Clarke, 2005). The regulation was later amended to allow decreased percentages of refillables if recycling rates were achieved.

This change occurred when the blue box system was being implemented in Ontario. Currently, these two regulations are no longer enforced (Zylstra, 2001). Regulations 340 and 357 are interesting to highlight because these regulations demonstrate that Ontario has historically been willing to regulate a beverage industry and control what types of containers are deemed acceptable. Section 8(3) provides that if recycling rates drop below 50 percent for 18 months, then soft drink industries can only sell in refillable containers. If enforced, this would be a strong incentive for industry to maintain recycling rates above 50 percent.

***Waste Diversion Act, 2002, S.O. 2002***

The *Waste Diversion Act* (*WDA*) passed on 2002 is a cornerstone of law on waste management. Section 1 of the *WDA* outlines, "the purpose of this Act is to promote the reduction, reuse and recycling of waste and to provide for the development, implementation and operation of waste diversion programs". Section 2 outlines various terms such as: "blue box waste", "designated waste", "industry funding organization", "Minister", "Ministry", "regulations" and "rules". Section 3 to 22 of the *WDA* establishes Waste Diversion Ontario (now to be referred to as the WDO. Section 17 emphasis that the WDO is not an agent of the crown, the *WDA* does give the Minister permission in section 23 (1) to "require Waste Diversion Ontario to develop a waste diversion program for a designated waste". Section 23 to 35 sets out the WDO programs and funding. Section 25 of the *WDA* is a key provision which outlines, amongst other things, what programs should be developed, the elements of a waste hierarchy, required recycling rates:

> "Contents of waste diversion program
> 25. (1) A waste diversion program developed under this Act for a designated waste may include the following:
>
> 1. Activities to reduce, reuse and recycling the designated waste.
> 2. Research and development activities relating to the management of the designated waste.
> 3. Activities to develop and promote products that result from the waste diversion program.
> 4. Educational and public awareness activities to support the waste diversion program.
>
> Same
> (2) A waste diversion program developed under this Act for designated waste shall not promote any of the following:
>
> 1. The burning of designated waste.
> 2. The landfilling of the designated waste.
> 3. The application of the designated waste to land.
> 4. Any activity prescribed by the regulations.
>
> Program agreements
> (3) A waste diversion program developed under this Act must include an agreement between Waste Diversion Ontario and the industry funding organization that the program is developed in co-operation with, governing the role of the industry funding

> organization in the implementation and operation of the program and governing the exercise of the industry funding organization's power under this Act.
>
> Same
> (4) The agreement referred to in subsection (3) must set out the wording of the rules that the industry funding organization proposes to make under section 30 and must include the agreement of Waste Diversion Ontario to make those rules.
>
> Blue box program payment to municipalities
> (5) A waste diversion program developed under this Act for blue box waste must provide for payments to municipalities to be determined in a manner that results in the total amount paid to all municipalities under the program being equal to 50 per cent of the total net costs incurred by those municipalities as a result of the program."

Section 25 of the *WDA* outlines some important elements of waste treatment. Section 31 outlines the payment requirements for stewardship fees. Section 31 (2) suggests that industry may apply to have their fees reduce or eliminated "if the person has made voluntary contributions of money, goods or services to the organization". It is interesting to note that Brewers Retail is exempt from section 23, so are not required to pay for costs associated with recycling because they manage their waste separately

Section 36 to 41 of the *WDA* outlines the enforcement provisions of the act. Section 36 gives the Minister of the Environment the ability to appoint provincial officers "for the purpose of enforcing this Act, the regulations and the rules", if the Minister wishes to (*WDA*, Section 36(3), 2002). Section 37(1) provides the responsibilities of a provincial officer:

> "37(1) If a provincial officer has reasonable grounds for believing that it is necessary, for the purpose of the administration of this Act, the regulations or the rules, he or she may enter at any reasonable time any place, including any building other than a dwelling, and make or require to be made such surveys, examinations, investigations, tests and inquiries, as he or she considers necessary for the purpose, including examination of records and other documents, and may make, take and remove or may require to be made, take or remove samples, copies or extracts" (*WDA*, Section 37(1), 2002)."

If a person or corporation is found guilty of an offence, there are strict penalties for non-compliance:

41(1) A person who contravenes this Act, the regulations or the rules is guilty of an offence
(2) If a corporation contravenes this Act, the regulations or rules, every director, officer, employee or agent of the corporation who directed, authorized, participated in, assented to or acquiesced in the contravention is guilty of an offence.
(3) On conviction, a person who is guilty of an offence under this Act is liable,
(a) if the person is an individual, to a fine of not more than $20, 000 for each day or part of a day on which the offence occurs or continues; or
(b) if the person is a corporation, to a fine of not more than 100,000 for each day or part of a day on which the offence occurs or continues" (*WDA*, Section 41, 2002).

The Minister is given a great deal of power in this act. Section 42(1) permits the Minister to:

"42 (1) The Minister may make regulations,
(a) prescribing materials as blue box waste for the purposes of this Act;
(b) prescribing materials as designated wastes for the purposes of this Act;
(c) prescribing the number of members of the board of directors of Waste Diversion Ontario to be appointed under paragraph 8 of subsection 4(2) by an industry funding organization in respect of a designated waste;
(d) prescribing activities for the purpose of paragraph 4 of subsection 25(2);
(e) continuing an industry funding organization named under paragraph 1 of subsection 26(2) and designating the organization as the industry funding organization for a waste diversion program that has been approved by the Minister under section 26;
(f) governing the composition and appointment of the board of directors of an industry funding organization that is continued and designated as the industry funding organization for a waste diversion program under clause (e);
(g) prescribing provisions of the *Corporations Act* or the *Corporations Information Act* that apply to Waste Diversion Ontario or an industry funding organization;
(h) exempting any person or class of persons from any provision of this Act, the regulations or the rules, subject to such conditions or restrictions as may be prescribed by the regulations;
(i) providing that section 35 does not apply if criteria specified by the regulations are satisfied;
(j) defining any word or expression used in this Act that is not already defined;

(k) respecting any matter that the Minister considers advisable to carry out the purpose of this Act" (*WDA*, Section 41(1), 2002).

Finally, section 44(1) mandates that the *WDA* shall be reviewed within five years from when it becomes legislation. There is no further revision required after the five-year review.

## *Appendix Five: Policy Discussion Papers*

### *Ontario's 60% Waste Diversion Goal – A Discussion Paper*

A policy discussion paper was released two years after the *Waste Diversion Act* on June 10 2004 called "Ontario's 60% Waste Diversion Goal—A Discussion Paper"[103] (MOE, 2004). The comment period for the 2004 Ontario waste diversion discussion paper ended August 9, 2004; in addition, the MOE held public consultations in Kingston, London, Thunder Bay, Sudbury, and Toronto during June and July 2004 (MOE, 2004). The *WDA* was next amended in 2006, but changes did not address the 60% diversion target that was examined in the paper and consultation process (*WDA*, 2002).

The 2004 Ontario waste diversion discussion paper is a progressive document that examines how Ontario can achieve 60% waste diversion by the end of 2008. The paper recognizes that in order to meet this goal, all stakeholders must work together: "achieving 60% diversion rate by 2008 is an ambitious goal, but it can be achieved if *everyone*— Ontario residents, businesses, industry, manufacturers and packagers, waste management experts, and environmental experts, as well as municipalities and the provincial government – commits to finding better waste management solutions" (MOE, pp 1, 2004). The paper emphasizes that we must enhance the use of the three R program in a preferential, hierarchy to first reduce waste, then reuse and finally recycle waste. It suggests that diversion rates can be calculated by dividing the 'waste diverted' by the 'waste diverted and disposed'. See figure 9 below.

*Figure 9: MOE's 2004 Waste Diversion Equation*

$$\text{Waste Diversion Rate [\%]} = \frac{\text{Waste Diverted}}{\text{Waste Diverted and Disposed}} \times 100\%$$

The 2004 Ontario waste diversion discussion paper the composition of waste materials produced in the province. The paper noted that at that time, Ontario was producing over 9.4 million tonnes of solid waste annually. Construction and Demolition waste threw out 2.2 million tonnes, and 7.2 million tonnes was a combination of Industrial, Commercial and Institutional

[103] This is referred to as the "2004 Ontario waste diversion discussion paper".

(IC&I) and residential. The diversion target explicitly stated a goal of a 60% diversion rate in Ontario, this would include IC&I, C&D and residential waste. The paper then outlines how each type of waste is currently being managed. Diversion rates were low; IC&I and residential diversion rates were 28% in 2002. After outlining the current regulatory framework, the 2004 Ontario waste diversion discussion paper outlines some initiatives that could help to reach the 60% diversion goal. These included setting provincial targets, developing centralized composting, increasing the amount of recycled content in packaging, province-wide waste monitoring system, further public education about waste diversion, and developing innovative new technology. The *Ontario 60% Waste Diversion Goal—A discussion paper* is a impressive document that if applied could have been extremely helpful to achieve the set diversion rate. Many of the identified initiatives should be reconsidered.

### *Towards a Zero waste Future: Review of Ontario's Waste Diversion Act, 2002: Discussion Paper for Public Consultation*

In 2008, the *Waste Diversion Act* began its five-year review. John Gerretsen released a discussion paper called "Toward a Zero waste Future: Review of Ontario's *Waste Diversion Act*, 2002"[104] proposing changes and requesting the input of the public and stakeholders (2008). A number of consultation meetings were held in different locations around the province, to gain further perspective. The 2008 Ontario waste diversion discussion paper embraces a cradle to cradle or zero waste approach, suggesting that Ontario must work toward producing little to no waste. It also suggests that EPR may be the best method to achieve the zero waste goal. The paper identifies a number of areas as first steps to achieving zero waste:

> "1. A clear framework built upon the foundations of Extended Producer Responsibility
> 2. A greater focus on the first and the second of the 3Rs – waste reduction, and reuse.
> 3. Increasing reduction and diversion of waste from the industrial, commercial & institutional sectors.
> 4. Greater clarity around roles, responsibilities, and accountabilities, to ensure that all players are contributing to a common goal." (MOE, pp 4, 2008)

The paper then expands and discusses these steps in detail. They are excellent steps. Increasing diversion towards zero waste will depend on the successful implementation of these steps. The paper outlines the current regulatory and legal framework (these are the regulations noted

[104] This is referred to as the 2008 Ontario waste diversion discussion paper.

above), the stakeholders and a waste hierarchy. Interestingly, the federal government is not noted as a stakeholder. Finally, the paper outlines a waste value chain (see page 31). This chain includes waste reduction, reuse, recycling, composting, thermal treatment and landfilling (MOE, 2008). A discussion of the waste value chain can be found on page 95.

### *Appendix Six: Results of No Framework*

*Table 7: All Interviewees identified results for a jurisdiction that does not have a policy framework to support their packaging waste management*

| | Identified Consequences |
|---|---|
| Policy Objectives | -Blue box not achieving diversion rates (Blue Program Stalled)<br>-Chaotic system for promoting diversion<br>-Waste policies are disorganized and incoherent that potential do not work in unison<br>-High amount of material put in wrong recycling bin, creating high contamination of recycling and lower quality of product<br>-Lack of Market development for waste products<br>-Increased litter present in community<br>-No long term waste management vision/plan/strategy<br>-Not as much care managing packaging<br>-Not targeting issues that are causing the most problems for excessive waste generation (Instead tackling "low-hanging fruit")<br>-Policy unintentionally promoting energy intensive products<br>-Natural resource used ineffectively<br>-No framework may result in increased decreased diversion and increased waste Creation<br>-Potential issues with water taking, concerns regarding water aquifers<br>-Ineffective waste management system |
| Policy Instruments | -Consumer may not accept the current waste system<br>-Difficult for stakeholders to interpreting *Act*<br>-Economic focus/system based on market profitability<br>-Movement towards EPR where a framework is less necessary<br>-No education programs to help explain the waste management system<br>-Non-prescriptive policy<br>-Stakeholders are require to reactively management any problems that arise because there no system for proactively dealing with issues |
| Actors | -Stakeholders will have differing political will<br>-Municipalities across the province will manage their waste differently<br>-Municipalities are do not have the power to make changes to |

| | |
|---|---|
| | help themselves.<br>-Increased public confusion associated with management and disposal of waste |
| Product Groups | -Differing diversion rates for areas and types of materials.<br>-Decrease diversion of waste (shift to plastics and away from glass)<br>-Increased use of plastic<br>-Reduction in packaging is lead by industry<br>-Resources landfilled not diverted |

### *Appendix Seven: Potential Barriers to Implement*

*Table 8: Potential Barriers to Implementation*

| | Barriers |
|---|---|
| Whole System | -Recession/Economically difficult times<br>-Failure of public water infrastructure and the allowance of distrust in public water, thus encourage bottled water<br>-Convenient removal of waste makes excessive packaging a non-issue<br>-Subsidized transportation system- Spending tax dollars on highways allows industry to transport their goods further without prohibitive costs<br>-Existing contracts and waste management system make dramatic change slow |
| Policy Objectives | -Prevailing attitude is not correct: What is good for GM is good for America—Ie what is good for industry is good for all Canadians and their environment<br>-Conflict between Industry managing for international markets, and waste managed at local levels<br>-Packaging needs to be designed for international markets<br>-Canadian population small, 1 percent of international economy, thus does not have as much power to way production of goods in an international market<br>-A new waste management program has the potential to negatively influence business, and as a result, is a concern<br>-A new waste management program may require increase human labour (could be positive from a job creation perspective)<br>- A new waste management program has the potential to create other Unintended Results<br>-Policy not static, always changing, as a result, this is more difficult to manage for<br>-A lack of Vision<br>-A lack of Commitment |
| Policy Instruments | -CCME discussion paper was designed to help with a co-ordinated waste packaging imitative, but what has been developed is very basic<br>-Lack of science or analysis to support decision-making on packaging |

| | |
|---|---|
| | -Empirical data required to support those decisions<br>-Environmental assessments of various packaging are difficult<br>-Requires verifiable accurate information to make decisions on<br>-Non harmonizing legislation is difficult on manufacturers<br>-Difficult but necessary to keep projects moving<br>-Require resources to support long project<br>-Need more research<br>-Economic barriers (bottom line drivers)<br>-If no industry is doing it, then there will be no competitive advantage and no motivation to innovate<br>-Solution has to be developed<br>-Difficult to quantifiably assess source reduction<br>-Difficult to develop a system with a good enforcement capability (otherwise no one will follow the system)<br>-NAFTA maybe could cause problems<br>-Difficult to Engage Public<br>-Lack of acceptance of tap water |
| Stakeholders | <u>Overall Stakeholder Barriers:</u><br>-Attitudes and behaviours effecting implementation<br>-Diverse Stakeholder interests<br>-Different stakeholders lobby for a system that will benefit them, but they do not all have the same interests<br>-Laziness among stakeholders<br>-Lobbying that slows down implementation<br>-Most stakeholders are not familiar with IPP, making it a difficult framework to implement<br>-People's inability to change<br>-Political Clarity (Politicians need to know what they want to do)<br>-Political Will to implement a framework<br>-Politics during implementation create barriers<br>-Which stakeholders presents best advocacy to influences implementation<br><br><u>Industry:</u><br>-Additional costs to industry if implemented<br>-Getting Industry on board can be difficult<br>-Creates an additional inconvenience to industry<br>-Industry Backlash |

| | |
|---|---|
| | -Industry lobbying for some other system<br>-Rapid changing Industry<br>-Grocer may also not want it<br><br><u>Government:</u><br>-Ad-hoc system much more comfortable for governments<br>-Difficult to get the municipalities to support the proposed system<br>-Government may unsure whether they want to implement the framework<br>-Government may just be looking for a quick win<br>-Government not wanting to reveal political approach<br>-Government's perception of public's perception<br><br><u>Citizens:</u><br>-Confused Citizens with the changes<br>-Depends whether Ontario is actually looking to change<br>-Public agreement is beneficial and difficult to attain<br>-Public support<br><br><u>Consumers:</u><br>-Additional costs to consumers<br>-Consumer Acceptance<br>-Inconvenience to consumers<br>-Not much consumer choice |
| Product Groups | -How does source reduction effect recycling industry<br>-Not enough support to go after packaging in an aggressive way<br>-Technological changes in packaging |

### *Appendix Eight: Ideal Framework*

*Table 9: Components of an Ideal Waste Framework*

| | Components of an ideal waste framework |
|---|---|
| Policy Objectives | -Reduce, reuse and recycle all post-consumer goods<br>-Consumer choice is considered<br>-Define ultimate objectives<br>-Flexibility in policy<br>-Focus on minimizing waste<br>-The ease of implementation should be considered<br>-Incentive model that encourages companies that aren't take action to do so<br>-Movement towards good consumption<br>-Framework needs to be narrow in scope<br>- Should be flexible in its approach<br>-Framework focused on packaging of entire product<br>-Assess societal need for bottled water<br>-Develop core principles and theories to influence them<br>-Zero waste Philosophy<br>-Producer develops mechanism to get product back<br>-Careful not to disadvantage companies<br>- Better assessment of diversion<br>- Careful to think out unintended impacts<br>- To decrease the sale of bottled water<br>-Public space recycling<br>-Set clear rules<br>- Decide and communicate what is acceptable—is it okay to ship to Michigan if industry wants to |
| Policy Instruments | <u>Education</u><br>-Public education<br><br><u>Deposit Return</u><br>-Deposit Return system will result in high recovery rates<br><br><u>Ban</u><br>- Ban not sensible<br>- Bans are knee jerk reactions |

| | |
|---|---|
| | Regulations<br>-Create Legislation<br>-Develop Mix regulations<br>-Implement standardized reporting and measurement protocol and processes<br>-Policy should be flexible<br>-Expansion of infrastructure to collect PET in workplace<br>-Stated Minimum End of life uses/requirements (Morawski, 2009)<br><br>Incentives<br>- Create incentives for compliance<br>- Create incentives for industry to like it<br>- Develop awards or recognition programs, (national tasks force had one)<br>-Implement Rewarding mechanism<br>-Currently no incentive to reduce from government (they have their incentives)<br>-Develop mechanism to make consumers make the right choices<br><br>Targets for Recycling<br>-Set targets<br>-Set targets for producers<br>-System that says if you don't meet Target A , the government will set up a system to ensure that you meet A<br>-Target- 80 to 90 % recovery rate<br>-Targets based on recyclability<br>-Quantifiable Targets (Morawski, 2009)<br>-Set recovery rates<br>-Recovery Objectives<br>-Recycling Objectives<br><br>Economic Tools:<br>-Price differential has to be imposed based on environmental factors, then allow business to make their own decisions<br>-Internalize costs associated with bottled water<br>-Implement upstream carbon tax<br>-Examine costs associated with natural resources, specifically fossil fuels as they are highly undervalued<br>-Framework should ensure full cost accounting (Morawski, 2009) |

| | |
|---|---|
| | -Fully price all materials entering the system (production, etc) and all material existing the system (waste) (Also known as inputs or and outputs)<br>-Introduce Disposal Tax<br>-Higher deposit to get bottles back<br>-Look at true environmental implications of policy<br><br><u>EPR</u><br>-Implement EPR<br>-Industry in best position to reduce the amount of packaging used<br>-Producers Pays (although, it will always be the consumers that in fact pay)<br>-Provides industry with ability to influence design changes<br>-Extending property rights maybe the best way to do this- industry is held accountable, make industry start thinking about available markets, etc<br>-Producer responsibility with Penalties<br>-Identify Sole responsibility (Morawski, 2009)<br>-Industry should pay for economic costs of waste and all associated environmental costs<br><br><u>Enforce</u><br>- Enforce<br>-Enforce compliance to avoid freeloaders<br>- Penalty for throwing away waste (generators)<br><br><u>Other</u><br>- Encourage bottle light weighting<br>- Environmental assessment/value should be determined quantifiably in advance<br>-Not purchasing bottled water<br>-Re-invest in public infrastructure<br>-Rigorous accounting system<br>-Should consider green procurement (policy you are developing, should also be internalized)<br>-True evaluation<br>-Unwritten principles laid out<br>-Minimum Service Convenience (Morawski, 2009)<br>-Ensure there is a level playing-field among industry players |

| | |
|---|---|
| | -Packaging Design to protect<br>- Develop a Vision, Define the framework and areas you are going to look at, Consultation and discussion on those ideas, and explanation of why this is a good idea<br>- Lifecycle<br>-Make sure it is scientifically backed |
| Actors | - All Stakeholders have a role<br>- Involvement of consumers<br>- Provincial co-operation maybe best<br>-Look at how to encourage consumers<br>-Provincial Government take lead, feds have no jurisdiction, not practical to change jurisdictional power for something like packaging<br>-Suggest a co-ordinated provincial effort<br>-Government can set a level playing field<br>-Provincial government should take action<br>-Make sure you get the stakeholders agree to strategy |
| Product Groups | - Source reduction should be first<br>-Materials should be recyclable<br>-Mandate that bottled water must be not virgin<br>-Must be reusable, container deposit at Provincial level (LCBO)<br>- Refillables<br>-Consider using reverse vending machines to increase diversion<br>-Source reduction- only can go so far without damaging integrity of product<br>-Supportive of standardized bottle as long as there is an opt out<br>-Use Ontario's Waste Value chain as a guide for a waste hierarchy<br>- Current recycling rates need to be improved<br>- Prevention, strong incentives for reuse, recovery, recycling, ultimate disposal, needs to be flexible, link it to a particular area and packaging |
| Water | -Consider impact on ecosystem<br>-Consider water scarcity<br>- Water Leg- water taking leg (1cent per 3,000 litres they take) problematic<br>- Old houses with bad infrastructure-fix<br>- Promoting public water |