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MUNICIPAL SOLID WASTE MANAGEMENT IN CANADA: AN OVERVIEW

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I. INTRODUCTION

This paper is intended to provide an overview of law and public policy related to municipal solid waste management in Canada. The role of the federal government will be reviewed, along with a more detailed discussion of the legal and policy approach taken by the province of Ontario, which is generally regarded as the most advanced province in Canada in these matters. The evolution of the law and policy framework governing waste disposal and waste diversion through waste reduction, reuse, recycling and compost is provided. A discussion of the increasing use of economic policy instruments in the solid waste field is also included.

II. AN OVERVIEW OF SOLID WASTE MANAGEMENT IN CANADA

i) Waste Generation, Disposal and Diversion

Canadians are among the world's leading generators of solid wastes, producing at least 20 million tonnes per year. That amounts to nearly a tonne per person per year. Approximately 40% of this total comes from residential sources, while the remainder is generated by Industrial, Commercial and Institutional (IC&I) sectors. A break-down of the Residential and IC&I waste streams, and of the total amounts of waste generated in the province of Ontario, is provided in **Table 1.**

The majority of these wastes are disposed of in sanitary landfills, operated either by municipal governments or private operators. Incineration is an option pursued by some municipalities, although there is growing opposition to the practice for a environmental reasons. Finally, in some remote rural areas, open dumps continue to be employed for waste disposal.

Public concerns over the environmental effects of traditional waste management practices have become increasingly acute over the past decade. Public criticism has been particularly strong in relation to leachate contamination of ground water, and noise and

other public nuisances, in the case of landfills, and in relation to the toxicity of bottom and fly ash in the case of incineration and energy-from-waste facilities. In addition, there is growing concern of the waste of resources represented by traditional waste management approaches. As a result, there has been an increasing emphasis on waste diversion through the hierarchy of waste reduction, reuse and recycling, and through composting. This has included, in varying degrees from province to province, the introduction of deposit-return requirements on beverage containers, the development of curbside recycling programs, and the establishment of home and municipal composting programs.

ii) Governmental Roles and Responsibilities

The Canadian System of Government

Canada is a federal state consisting of a federal government, ten provinces and two territories. The federal and provincial governments operate on a cabinet-parliamentary system based on the Westminster model. The provinces have primary constitutional jurisdiction over natural resources management and the environment. The federal government's role is limited to certain specific areas, such as fisheries and sea coasts, although the potential extent of federal jurisdiction over environmental matters through the its residual powers (the power to make legislation for the Peace, Order and Good Government of Canada) is evolving.[1]

The Role of the Federal Government

The role of the federal government in solid waste management is extremely limited. Federal responsibility only extends to waste management on federal lands and facilities, such as national parks, Indian reservations and Department of National Defence lands. The federal environment department, Environment Canada, does provide some background research on waste generation, disposal and diversion to support provincial and municipal solid waste management activities.

The Role of the Canadian Council of Ministers of the Environment (CCME)

The Canadian Council of Ministers of the Environment is a body consisting of the federal, ten provincial, and two territorial environment ministers. The CCME meets twice per year. In 1989 a national packaging protocol between Canadian industry and the Canadian federal and ten provincial governments was developed through the CCME. The protocol set goals of a 20% diversion of packaging from landfill by 1992, and 50% by the year 2000, based on 1988 figures.[2] The CCME has also begun work on a national waste management strategy.[3]

The Role of Provincial Governments

The provincial governments, through their jurisdiction over public health, municipal affairs, and local works and undertakings have primary jurisdiction of municipal solid waste management. In practice most of the provinces have delegated responsibility for the approval and oversight of waste disposal facilities to municipal governments. However, in recent years, in response to public concerns over the environmental effects of disposal facilities, provincial governments have begun to take a more active role in the approval of disposal sites, particularly through the application of environmental impact assessment requirements.

Provincial governments are also becoming increasingly active in their efforts to promote waste diversion. Deposit-return requirements for beverage containers have existed in some provinces for more than twenty years.[4] A number of provinces are currently considering the introduction or expansion of deposit-return requirements.[5] In addition, in cooperation with municipal governments and some industries, curbside and depot collection programs for dry recyclables, such as metal and glass containers, and newsprint, have been established.

The Role of Municipal Governments

Municipal governments have primary responsibility for the planning and actual delivery of both waste disposal and waste diversion services. This includes waste collection, transfer, and disposal operations and the delivery of residential recycling and composting programs.

III. A CASE STUDY: THE SOLID WASTE MANAGEMENT POLICY EXPERIENCE OF THE PROVINCE OF ONTARIO

As is the case with hazardous wastes, Ontario is both the largest generator of solid wastes in Canada, and the most advanced in terms of its regulatory oversight of waste disposal and its efforts to promote waste diversion. Other provinces often follow Ontario's lead on waste management issues. Consequently, the Ontario experience provides an excellent vantage point on the past and likely future evolution of solid waste management policy in Canada.

i) Legislative Framework[6]

The fundamental legislative framework governing solid waste management in Ontario is provided through the Environmental Protection Act of 1971, the Environmental Assessment Act of 1975

and the Waste Management Act of 1992.

The Application and Requirements of the Environmental Assessment Act (EAA)

The Environmental Assessment Act (EAA) applies to most major waste management projects. The Act covers all public sector projects unless exempted. Private projects are not automatically subject to the EAA. However, a private undertaking can be "designated" as subject to the requirements of the Act. The MoEE has a stated policy of designating significant private sector waste management projects for review under the Act.

The Act provides that the proponent of a waste project must undergo an approvals process involving public consultation and the preparation of an environmental assessment document. This document must establish the purpose and rationale for the undertaking. In addition, the environmental impacts of alternatives to the undertaking must be identified and evaluated, along with alternative methods of carrying out the undertaking. The advantages and disadvantages of these alternatives must be weighed in arriving at a preferred undertaking.

A government and public review of the document is required once it is completed. In the case of waste management undertakings, this is usually followed by a public hearing before the Environmental Assessment Board (EAB). Joint Boards of the EAB and the Ontario Municipal Board (OMB), may be employed where approvals are required under other provincial statutes, particularly the Planning Act, identified in the Consolidated Hearings Act of 1981. No action can be taken on a undertaking until the environmental assessment process is completed. The time required to complete the process varies from several months for undertakings for which no hearing is required, to several years for large or controversial projects, such as landfills.

The Application and Requirements of the Environmental Protection Act (EPA)

All solid waste management facilities must be authorized under Part V of the Environmental Protection Act (EPA). Section 27 of the Act provides that Certificates of Approval or provisional Certificates of Approval are required for the use, operation, establishment, alteration, enlargement or extension of any "waste management system" or "waste disposal site".[7] Under section 20 of the Act public hearings are required for sites disposing of "the equivalent of the domestic waste of not less than 1500 persons," which by Ministry policy has been interpreted as capacity of over 40,000 cubic meters. A public hearing before the EAB may be required for other facilities at the discretion of the Director of the Approvals Branch of the Ministry of the Environment and Energy (MoEE)[8].

In practice, it is ministry policy to require a hearing if a request is made by the municipality where the proposed site is to be situated, a significant number of requests are received, or the proposed land use is inconsistent with official plans and zoning by-laws.[9] Under section 31 of the Act, the MoEE has a discretionary power to issue Certificates of Approval without a public hearing in "emergency situations."[10]

Environmental Protection Act hearings are not as broad, and are generally much shorter, than those conducted under the Environmental Assessment Act. Their primary focus is the technical acceptability of the proposal. The hearing attempts to address the question of whether a proposed site is suitable for waste disposal, and not whether it is the best possible site, or even more broadly, whether alternatives to disposal exist. The time required to obtain a Part V approval can vary from several months to several years depending upon the nature of the proposal.

Once a Certificate of Approval is granted, the MoEE may vary its terms and conditions or even rescind it if the Ministry believes it to be in the public interest to do so. In addition, Environmental Protection Act provides the Director with a wide range of administrative orders which can be imposed on the operators of waste management sites or systems which cause environmental problems. In 1986 the maximum fines for violations of the Environmental Protection Act were raised to a maximum of $25,000 or a first offense, and up to $50,000 for each subsequent offense. The Courts are also empowered to require the clean-up of pollution, set our measures to prevent future occurrences, as to impose additional penalties to strip "ill-gotten" profits.

The Waste Management Act

The Waste Management Act was enacted in April 1992. The first three parts of the Acts addressed the provision of solid waste disposal facilities in the area of the provincial capital, Toronto. The forth section of the Waste Management Act made extensive amendments to the Environmental Protection Act, giving the provincial government wide-ranging powers to promote waste reduction, reuse and recycling. These include the capacity to require municipalities to provide for the collection of dry recyclables, either through the provision of Blue Box services or, in rural areas, the establishment of recycling depots. The Act also permits the province to require that municipalities provide leaf and yard waste composting services and facilities.

In addition, the Act provides for an accelerated approval process for recycling and leaf and yard waste composting facilities operated by municipalities or private operators. The Waste Management Act also gives the provincial government wide powers in relation to products or packaging which are determined to pose "waste management problems," including the imposition of deposit-

return requirements and even bans. Finally, the Act provides for the establishment of regulations requiring Industrial, Institutional and Commercial (IC&I) waste generators to conduct waste audits, source separate their wastes, and develop waste reduction plans. Regulations implementing the requirements for municipalities to provide recycling and composting services, the accelerated approval process for diversion facilities, and requiring IC&I sector waste audits, source separation and waste reduction plans, are to come into force in August 1993.[11]

ii) The Evolution of the Provincial Policy Framework Governing Solid Waste Management

The Government of Ontario first formally entered the municipal solid waste management field through the Waste Management Act of 1970. This statute became Part V of the Environmental Protection Act in July 1971. In 1976 the Ontario government introduced regulations under the Environmental Protection Act requiring that 75% of all soft-drink containers be refillable. However, this requirement was not met, as it was never strenuously enforced.[12]

In June 1980 the exemption granted in 1976 to municipal undertakings, including municipal solid waste management projects, from the requirements of the 1975 Environmental Assessment Act, was removed. As a result, municipalities found themselves required to demonstrate that they had considered alternative waste management options, instead of simply applying for permission to open another landfill under the Environmental Protection Act. In the following year (1981), the first experimental curbside recycling program, using the now familiar Blue Box, was started in Kitchener.

On June 13, 1983, the Minister of the Environment, Keith Norton, released a Blueprint for Waste Management in Ontario. The Blueprint addressed both hazardous and municipal solid wastes. There were a wide range of proposals for regulatory reform regarding hazardous waste management. The aspects of the Blueprint related to municipal solid waste management were less clear. Municipalities were told that they must undertake long-term and comprehensive solid waste management planning. In addition, the Minister stated that the "four Rs (reduce, reuse, recycle, and recover)... must and will be a major part of waste management in our province... (representing) the greatest challenges we face in bringing new life to waste management in this province."[13] However, the Blueprint provided no indications of how municipal solid waste reduction, reuse, recycling and recovery was to be achieved.

The arrival of a Liberal minority government in May, 1985 marked an important watershed in the evolution of waste management policy in Ontario. A Recycling Advisory Committee was appointed shortly after the new government's arrival. In December 1985 the 1976 soft drink container regulations were relaxed, permitting the

use of aluminum cans and reducing the requirements to provide refillable containers, provided that recycling requirements were met.

The following spring Ontario Multi-Material Recycling Incorporated (OMMRI) was established by the soft-drink industry as a vehicle to provide funding ($20 million) for the curbside collection and recycling of soft-drink containers. Capital costs for new Blue Box programs were to be split evenly between OMMRI, the Ministry of the Environment and the participating municipality. Between 1986 and 1992 Blue Box programs would be established in hundreds of Ontario Communities, involving more than three million households.

In March, 1987 the Minister of the Environment, Mr. Bradley announced the application of the Environmental Assessment Act to all public and private sector incineration and energy-from-waste undertakings. Three months later, the Comprehensive Funding Program for Waste Management was introduced.[14] The program included financial assistance to municipalities for waste management master plan development, and for landfill operations, improvement and closure. In addition, capital grants were provided for the establishment of facilities to recover or process materials from municipal waste. Funding was also made available to support public education programs on the 4Rs and to assist in the development of markets for recycled materials.[15]

On March 10, 1989, Mr. Bradley announced an Ontario policy objective of a 25% diversion of municipal solid waste from landfill or incineration by 1992 and a 50% diversion by the year 2000. The announcement was accompanied by a suggestion that municipalities charge "true cost tipping fees" and a promise of legislation to clarify the province's powers to make 3Rs activities mandatory should efforts to promote voluntary action prove unsuccessful.

The Liberal government was defeated and replaced by a New Democratic Party government in September 1990. The previous government's commitments to the 1992 25% and 2000 50% goals for waste diversion were reaffirmed, although greater emphasis was to be placed on waste reduction over waste recycling.

In February 1991 a Waste Reduction Office was created within the Ministry of the Environment to oversee municipal solid waste 3Rs efforts. A Waste Reduction Action Plan also was introduced. In April of that year the Minister of the Environment announced a ban on the establishment of new municipal solid waste incineration or energy-from-waste projects in Ontario.[16]

On October, 24, 1991, the Minister of the Environment introduced Bill 143, the Waste Management Act. As noted earlier, the first three parts of the bill addressed waste management issues in the Greater Toronto Area. The fourth part amended the

Environmental Protection Act to provide the province with a wide range of regulatory powers to promote waste reduction, reuse and recycling. The bill waste enacted in April 1992. The regulations to be made under the statute are expected to be promulgated in the fall of 1993.

Notwithstanding these developments, there is growing concern among municipalities regarding the costs of continuing to participate in recycling programs. Some have even indicated a willingness to curtail their 3Rs activities if financing issues are not addressed adequately. Claims that Blue Box recycling costs up to $190 per tonne, while disposal costs are said to be typically in the range of $90-$115 per tonne, have been at the centre of the debate. A discussion paper on the subject of "who pays" for waste management and 3Rs activities has been expected from the Waste Reduction Office for some time.

In the meantime, the Waste Reduction Advisory Committee (WRAC - formerly the Recycling Advisory Committee) has proposed a "shared model" which would spread the responsibility for the 3Rs from the generators of waste back to the producers of products and users of packaging.[17] The government appears to favour this approach, although final decisions on the matter have yet to be taken. The Grocery Products Manufacturers of Canada have also proposed a stewardship model through which they would assume some responsibility for the costs of recycling their packaging.[18] Finally, the province has recently introduced amendments to the Municipal Act which will strengthen the capacity of municipalities to operated recycling programs.[19]

IV. POLICY TRENDS: THE PROBLEM OF FINANCING AND THE USE OF ECONOMIC INSTRUMENTS TO PROMOTE WASTE REDUCTION, REUSE AND RECYCLING

In 1991, Ontario municipalities spent a total of $858 million on solid waste management.[20] This represents a major proportion of municipal expenditures in the province. However, it is critical to keep in mind that the issue of financing goes far beyond the question of how to raise sufficient revenue to operate waste management programs. Appropriate choices regarding the assignment of financial responsibilities can provide enormously powerful incentives to critical sectors to reduce, reuse and recycle.

i) The Inadequacy of the Present Funding Mechanisms

The present funding structure for waste management in Ontario appears to be on the verge of collapse. Provincial funding for Blue Box operating costs is running out for many municipalities, as it was only provided for the first five years of each program. At the same time, revenues expected from the sale of recovered materials goods have been slow to materialize. Recycling programs at the household level are therefore being hampered by costs which are

much higher than disposal.

At the same time, OMMRI has failed to provide promised financial support to municipalities participating in the Blue Box program. Current members pay according to the amount of business they do, and the recession has cut their contributions. In addition, OMMRI has not attracted as many new members as was expected. In the result, by April 1992 OMMRI was $3 million in arrears in its contributions to the start-up costs of municipal Blue Box programs. These problems have been compounded by the sudden collapse of tipping fee revenues which many municipalities have suffered as a result of the growing practice of private waste haulers exporting IC&I waste to cheaper landfill facilities in the United States.

In addition to these fiscal problems, the existing system suffers from a number of other serious weaknesses. It is argued that the present arrangements are inequitable, in the sense that household and small retail pick-up is being subsidized by the tipping fees charged at municipally operated landfills from large IC&I sector waste generators. At the same time, the producers of products, who have the most control over product design and utility, pay almost nothing at all.

Consequently, the existing system provides limited incentives to engage in waste reduction, reuse and recycling. This is especially true in the case of households and small businesses, who pay for waste management through property tax assessments. As these assessments do not vary with the amount of waste generated there is little economic reason to engage in 3Rs activities.

In the case of both residential and IC&I wastes, prices of goods and products fail to reflect their waste management costs. Rather these are externalized by the manufacturer and passed on to the final user in the case of IC&I waste, and to the provincial and municipal taxpayer in other situations. If product manufacturers were required in some way to internalize the waste management costs associated with their products, then they might be provided with very strong incentives to reduce these costs through product redesign. This principle is sometimes referred to as "product stewardship," and is based on the widely accepted principle of "polluter pays."

In sum what is required is a financing system which:

1) allocates financial responsibilities for all sectors and all waste streams which are consistent with the goal of polluter pays and cost internalization; and

2) ensures that these responsibilities are structured to make disposal the most expensive option and to reinforce movement up the 3R`s hierarchy.

It is apparent that a system which achieves these goals will have three principle components:

i) Full-Cost Disposal Pricing;

ii) User-Pay Requirements for Residential Waste Collection; and

iii) a Product Stewardship system which causes the producers of goods and users of packaging to internalize the post-consumer management costs of their products and packaging.

ii) Full Cost Pricing of Waste Disposal

High tipping fees at landfills have been widely demonstrated to be a very effective means of providing incentives to Industrial-Commercial and Institutional (IC&I) sector waste generators to reduce, reuse or recycle their wastes by making the 3Rs a less expensive option than disposal. High tipping fees can also result in substantial revenues to municipalities to finance the development of waste diversion infrastructure. Many Ontario municipalities have raised tipping fees at their landfills over the past few years to encourage waste diversion from IC&I sector generators. Metro Toronto, for example, at one point raised its fee to $152/tonne, although this has been subsequently reduced.

At a minimum tipping fees should include capital, operational, planning and post-closure care costs for disposal facilities. In addition, there should be allowances for the creation of contingency funds against unanticipated environmental damage, and to provide for the capital costs of 3Rs infrastructure. It should also be noted that without controls on pricing at privately operated landfills, and on the interjurisdictional movement of wastes, high tip fees can result in the widespread transportation, and even export, of wastes. This has been the case in Ontario over the past few years.

iii) User-Pay Systems for Residential Waste Collection

Collection charges for household waste disposal are now widely employed in Europe and the United States,[21] and the approach has been adopted by a small number of municipalities in Ontario. The experiences of these jurisdictions indicates that user-pay systems produce cost savings, reduce garbage generation rates and increase participation in recycling programs. They also appear to have a significant influence on citizen buying decisions and behaviour.

Three methods of household collection charges are available: a flat fee per bag: a variable rate per container; and charges by weight. The first is easier to administer and less costly, relying on the purchase of stickers or bags from the municipality or local

stores. The second requires more administration as it involves billing households for a standard container each year. This method also does not reward reduction to the same extent as the other two. The third is more complicated and expensive, requiring the use of weighing equipment on each pick up truck. However, it encourages weight reductions to a greater degree, by rewarding lower generation with lower charges.[22]

iv) Product Stewardship Systems

The concept of product stewardship is based on the principle that if producers can be compelled in some way to internalize the costs of the post consumer processing of their products they will be provided with very strong incentives to reduce waste. Indeed, under such systems the waste management costs of a given good or product would be reflected in its price. With such an arrangement goods with low waste management costs would enjoy a price advantage over those whose ultimate disposal involves higher costs.

There are a number of ways in which a product stewardship system might operate. In some cases, manufacturers or distributors might be required to accept the return of their products once they have reached the end of their useful life. This approach has been applied in the Federal German Republic through a "return to sender" policy for packaging, implemented through its Waste Management Act of 1990. The system is expected to be extended to include automobiles, batteries and electronics in the near future.[23] The costs of collecting the used goods and their recycling is entirely the responsibility of the manufacturer.

An alternative approach would be to apply a variable unit charge on each item sold by a given manufacturer. This charge would cover the costs of collection and/or processing of used products, including secondary material revenues. If a municipality ran the facilities and collected the materials through the Blue Box system the charges would be returned to the municipality to cover these costs.

There are a number of proposals for product stewardship systems under consideration in Canada. Ontario's OMMRI-supported Blue Box system provided an early example of a stewardship system. More recently there have been proposals from the Ontario Waste Reduction Advisory Committee,[24] and the Grocery Products Manufacturers of Canada.[25] The industry model (GPMC) appears to have been motivated by concerns over the consequences of different stewardship requirements emerging in different provinces for firms selling into the national market.

For its part, CIELAP, and its partner organization, the Canadian Environmental Law Association, (CELA) released a proposal for a stewardship system in Ontario in September 1993. In essence

what CIELAP and CELA have proposed is a "packaging" or "waste management" levy on consumer packaging and certain products (principally newspapers). Exemptions would be granted from the levy for items subject to deposit-return requirements, or for which the producer (brand owner or distributor) presents a waste reduction, reuse or recycling plan which is acceptable to the province. Such plans could include the elimination of the subject packaging, the establishment of a deposit-return system, or participation in an industry-supported recycling system which would both finance curbside blue box collection and sorting and provide commitments regarding market development and material use.

V. CONCLUSIONS

The focus of solid waste management policy in Canada has undergone a remarkable evolution over the past decade. Until recently, solid waste management policy was concerned simply with the public health aspects of waste disposal. This is no longer the case. Solid waste management has been fundamentally linked to the wider issues of patterns of resource use and consumption, particularly in consumption-oriented societies, such as Canada's. Waste reduction, reuse and recycling are being recognized not merely as means of minimizing waste disposal, but, more importantly, as essential components of environmentally and economically sustainable patterns of global resource use.

ENDNOTES

1.On constitutional jurisdiction and the environment see generally D. Vanderzwaag and L. Duncan, "Canada and Environmental Protection: Confident Political Faces, Uncertain Legal Hands, " in R. Boardman, ed., Canadian Environmental Policy: Ecosystems, Politics and Process (Toronto: Oxford University Press, 19912), pp. 3- 23.

2.See Canadian Council of Ministers of the Environment, The National Packaging Protocol, (Toronto: Canadian Council of Ministers of the Environment, 1989).

3.The Waste Management Task Group, A Discussion Paper on Waste Management Issues in Canada, (Winnipeg: Canadian Council of Ministers of the Environment, 1992).

4.Deposits are currently required in British Columbia, Alberta, Saskatchewan and, in a limited fashion, Ontario.

5.These include Nova Scotia, New Brunswick, Manitoba and Ontario.

6.See generally J. Tidball, "Waste Management," in J. Swaigen, ed., Environment On Trial: A Handbook of Ontario Environmental Law and Policy (Toronto: Emond-Montgomery Publishers and the Canadian Institute for Environmental Law and Policy, 1993).

7.These are defined in section 25 as "any facilities or equipment used in, and any operations carried out for, the management of waste including the collection, handling, transportation, storage, processing or disposal of waste, and may include one or more waste disposal sites" and "(a) any land upon, into, in or through which, or building or structure in which, waste is deposited, disposed of, handled, stored, transferred, treated or processed, and (b) any operation carried out or machinery or equipment used in connection with the depositing, disposal, handling, storage, transfer, treatment or processing referred to in clause (a)" respectively.

8.The Environmental Protection Act, s. 32.

9.Metro Toronto Waste Reduction Task Force, It Can Be Done: 50% Diversion Achieved by 1993, A Report to the Council of The Municipality of Metropolitan Toronto, (Toronto: 1991) p. 99

10.Ibid., p. V-27

11.3Rs Regulations (Unoffical Copy), Ontario Ministry of Energy and the Environment, June 1993.

12.See D. Macdonald, The Politics of Pollution: Why Canadians are Failing Their Environment, (Toronto: McClelland & Stewart Inc, 1991), p. 208.

13.The Hon. K. Norton, Minister of the Environment, "A Blueprint for Waste Management, the Challenge for Ontario in the 1980's," Remarks to the 30th. Ontario Industrial Waste Conference, June 13, 1983.

14.The Hon. J. Bradley, Minister of the Environment, comments to the 34th. Ontario Industrial Waste Conference, June, 1987.

15.W. Glenn, Waste Management Initiatives in Ontario (Toronto: Corpus Information Systems, 1987).

16.See Ontario Ministry of the Environment, Backgrounder: Amendment to Regulation 309 - Municipal Waste Incineration in Ontario, (September, 1992).

17.Waste Reduction Advisory Committee, Resources Stewardship in Ontario: A Shared Responsibility, (Toronto: Ontario Ministry of the Environment, 1992).

18.GPMC Packaging Stewardship Model Discussion Document, (Toronto: Grocery Products Manufacturers of Canada, 1992).

19.Bill 7 - An Act to Amend Certain Acts Regarding Municipal Powers Affecting Waste Management, 1993.

20.Personal communication, Evelyn Rupport, Senior Policy Analyst, Association of Municipalities of Ontario, November 1992.

21.See, for example, G. Harder and Linda Knox, " Implementing Variable Trash Collection Rates," BioCycle, April 1992, pp. 66-69.

22.For detailed discussions of these possibilities see Resource Integration Systems, Generator Pay Systems for Households: A Discussion Paper, (Toronto, Recycling Advisory Committee, Ontario Ministry of the Environment, 1990).

23.For a general discussion of the program see F. Cairncross, "How Europe's Companies Reposition to Recycle," Harvard Business Review, March-April 1992, pp. 34-45.

24.WRAC, Resource Stewardship in Ontario: A Shared Approach.

25.GPMC, Packaging Stewardship Model Discussion Document.

ADDITIONAL REFERENCES

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THE COMPOSITION OF ONTARIO'S WASTE

Residential Sector

Percentage by weight (1987)	Category	Examples
31.6	Organics	Kitchen and yard wastes
29.2	Paper	Newspapers, fine paper, magazines telephone books, tissue, etc.
19.5	Packaging	Boxboard, corrugated cardboard, glass, steel, aluminum and plastic containers
11.6	Other	Textiles, leather, rubber, pet litter, ceramics, etc.
2.8	Diapers	
2.5	White goods	Stoves, refrigerators
1.6	Demolition and construction materials	
1.2	Wood	

Industrial, Commerical and Institutional (ICI) Sector

Percentage by weight (1987)	Category	Examples
23.0	Cardboard	
22.0	Other	Textiles, leather, ceramics, rubber, misc. ferrous and plastic products
19.0	Wood	Pallets, misc. wood material
13.0	Paper	Newsprint, fine paper, magazines, telephone books, etc.
10.0	Metal	Steel, aluminum, iron, etc.
5.0	Organics	Food and yard wastes
5.0	Glass	
3.0	Plastic	

Total Municipal Solid Waste

Combined waste streams from the residential and ICI sectors.

Percentage by weight (1987)	Category	Examples
43.0	Other	Textiles, leather, rubber, white goods, misc. ferrous and plastic products
21.0	Packaging	Boxboard, corrugated cardboard, glass, metal, plastic, and aluminum containers
20.0	Paper	Newsprint, fine paper, telephone books, tissue, etc.
16.0	Organics	Food and yard wastes