



GIROUX
ENVIRONMENTAL
CONSULTING

State of Waste Management in Canada

Prepared for: Canadian Council of Ministers of Environment

Prepared by:

Laurie Giroux

Giroux Environmental Consulting

101 Chimo Drive, Kanata Ontario

K2L 2B4

In association with:

Duncan Bury Consulting

René Drolet Consulting Services

Ecoworks Consulting

PN 1528

This report contains information which has been prepared for, but not approved by, the Canadian Council of Ministers of the Environment (CCME). CCME is committed to reflect the highest standards of research and analysis in its publications, however it is not responsible for the accuracy of the data contained in this report and does not warrant the information herein. CCME or its member jurisdictions do not necessarily share or affirm, in any way, any opinions expressed herein.

Acknowledgements

This report was prepared by Giroux Environmental Consulting and associates Duncan Bury Consulting, René Drolet Consulting Services, and Ecoworks Consulting. Stakeholders who contributed to this report are listed below:

Government Representatives

Bill Westwell, Government of Nunavut
David Lawes, Government of British Columbia
Diep Duong, Government of Northwest Territories
Gordon Murphy, Government of Newfoundland and Labrador
Jacinthe Séguin, Environment Canada
Jamessee Moulton, Government of Nunavut
Jim Ferguson, Government of Manitoba
John Armiento, Government of Ontario
John Hughes, Government of Prince Edward Island
Kim Yee, Government of Saskatchewan
Mark Boldon, Government of New Brunswick
Marie Dussault, Gouvernement du Québec
Nicole Warren, Government of Nova Scotia
Patrick Kane, Government of Alberta
Shannon Jensen, Government of Yukon

Other Stakeholders

Brock McDonald, Recycling Council of British Columbia and National Zero Waste Council
Cathy Cirko, Canadian Plastics Industry Association
Christina Seidel, Recycling Council of Alberta and National Zero Waste Council
Dan Cassleman, FCM and National Zero Waste Council
Dan Lantz, Cascades Recovery
David Szeptycki, Regional Municipality of York
Joan Meyer, Recycle Saskatchewan
Joe Hall, Canadian Carpet Recovery Effort
John Foden, Canadian Energy-From-Waste Coalition
John Mullinder, Paper and Paperboard Packaging Environmental Council (PPEC)
Monica Turner, Association of Municipalities of Ontario
Patrick Emond, Fédération Québécoise des Municipalités
Peter Hargreave, Ontario Waste Management Association
Renée Gratton, Construction Resources Initiative Council

GLOSSARY

CRD	Construction, Renovation, and Demolition waste. Also sometimes referred to in literature as DLC (Demolition and Land Clearing), or C&D (Construction and Demolition). In this report we are using CRD.
Devolution	The transfer of powers from one public government to another, usually from a national level of government to a sub-national one such as a province or territory. Devolutions may transfer program responsibilities and budgets only and may include the right to create related legislation.
EFW	Energy-from-Waste facilities (including combustion, gasification, pyrolysis).
EPR	Extended Producer Responsibility: a policy approach in which a producer's responsibility (physical and/or financial) for a product is extended to the post-consumer stage of a product's life cycle. EPR shifts responsibility upstream in the product life cycle to the producer and away from municipalities. As a policy approach it intends to provide incentives to producers to incorporate environmental considerations in the design of their products. The intention of EPR is to shift the public sector tax-supported responsibility for waste to the individual brand owner, manufacturer or first importer.
E - L	Legislated EPR programs: programs in which producers (e.g. manufacturers, brand owners and/or first importers) are directly responsible for both the funding and the operation of the programs.
E - V	Voluntary EPR programs: industry-led programs where producers (e.g. manufacturers, brand owners and/or first importers) have come together to provide a province-wide or Canada-wide collection and recycling program for specific products that have reached their end-of-life. Governments have not regulated or otherwise mandated these EPR programs and are not involved with their operation.
HHSW	Household Hazardous and Special Wastes (small amounts of ICI special wastes which might be corrosive, flammable, etc. are included in this category). The term is not universally applicable across jurisdictions.
ICI	Industrial, Commercial, and Institutional
IPR	Individual Producer Responsibility: rather than a collective approach for an EPR program, an IPR approach is a better approach for some material categories that are diverse (non-homogeneous) such as CRD.
LFG	Landfill Gas (methane and other gases)
MSW	For the purposes of this report, "waste" refers to municipal solid waste which includes recyclable, organic, and residual materials from residential and industrial, commercial and institutional (ICI) sources as well as materials generated by construction, renovation and demolition (CRD) activities. Although MSW is primarily non-hazardous in nature, it also includes small quantities of residential, commercial and institutional hazardous and special waste as defined in the Canada-wide Action Plan for Extended Producer Responsibility, Appendix F Household Hazardous and Special Waste List.
Organics	Organic waste refers to biodegradable, compostable waste of plant or animal origin from domestic or industrial sources. Examples include food scraps, grass clippings and garden waste, soiled paper products (e.g. tissue, paper towels) and boxboard, and sometimes animal or human waste.
PPP	Packaging (all sources, paper, plastic, metals or glass), and Printed Paper
Product Stewardship	Programs in which manufacturers, brand owners and importers are neither directly responsible for program funding, nor for program operations. Product stewardship programs are waste diversion initiatives funded by consumers or general taxpayers and are operated by public agencies or other public authorities. These programs may be mandated through legislation and regulations. Producers may play an advisory role but have no responsibilities for the program.
Reduce	The first priority within the waste management hierarchy is to reduce by as much as possible the amount of material that enters the recycling or the solid waste stream and the associated impact on the environment.
Reuse	The second priority in the waste management hierarchy is to ensure that materials and/or products are reused as many times as possible before entering the recycling or waste stream. This element would also support repair and refurbish.
Recycle	The third priority in the waste management hierarchy is to recycle (collect, sort, render as a resource input, sell to secondary market(s)) as much material as possible.
Recovery	The fourth priority in the waste management hierarchy is to recover material that cannot be reused or recycled to produce another output, e.g., energy, through the application of technology. Some jurisdictions do not formally recognize a 4th R (i.e., energy recovery is considered on the same level as disposal).
Waste Prevention	Preventing the generation of waste in the first place at the manufacturing level.
WMTG	CCME Waste Management Task Group
Zero Waste	A policy framework that goes beyond recycling to focus first on reducing waste and reusing products and then recycling and composting/digesting the rest, with the ultimate goal of achieving zero waste.

Table of Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	Scope	1
1.3	Methodology	1
1.4	Overview of the Structure of this Report	2
2	Canada-wide Overview of Waste Management	3
2.1	Current Situation at-a-Glance.....	3
2.2	A Review of Policy Frameworks for Waste Management	11
2.3	Waste Prevention and Reduction-at-Source	13
2.4	Waste Diversion: EPR, Product Stewardship, and Other Diversion Programs	16
2.5	Waste Recovery: Energy-from-Waste	40
2.6	Waste Disposal: Landfills and Incineration.....	43
2.7	Performance Measurement and Reporting.....	52
3	Jurisdictional Profiles	56
3.1	British Columbia	56
3.2	Alberta	60
3.3	Saskatchewan	63
3.4	Manitoba	65
3.5	Ontario.....	67
3.6	Québec	70
3.7	New Brunswick	74
3.8	Nova Scotia	76
3.9	Prince Edward Island	79
3.10	Newfoundland and Labrador.....	81
3.11	Yukon	84
3.12	Northwest Territories	87
3.13	Nunavut	90
4	Canada-wide Initiatives	93
4.1	Federal Government Policies or Guidance	93
4.2	Canadian Council of Ministers of Environment (CCME)	97
4.3	Canadian Standards Association.....	99
4.4	Federation of Canadian Municipalities.....	99
5	Innovative Practices Identified.....	101
5.1	Innovative Practices: Waste Prevention or Reduction and Waste Planning	101
5.2	Innovative Practices: Waste Diversion	101
5.3	Innovative Practices: Waste Disposal	103
5.4	Innovative Practices: Performance Measurement	104
6	Observations, Challenges, and Opportunities Identified in Waste Management	105
6.1	Key Observations, Challenges, and Opportunities from Current Situation-at-a-Glance:	105
6.2	Key Observations, Challenges, and Opportunities in Waste Management Policy Frameworks.....	106
6.3	Key Observations, Challenges, and Opportunities in Waste Prevention / Reduction Upstream	107
6.4	Key Observations, Challenges, and Opportunities in Waste Diversion	110
6.5	Key Observations, Challenges, and Opportunities in Energy Recovery from Waste.....	117
6.6	Key Observations, Challenges, and Opportunities in Waste Disposal	118
6.7	Key Observations, Challenges, and Opportunities in Monitoring and Reporting.....	120
	Appendix A: Fact Sheets.....	121

List of Exhibits

Exhibit 1: Total Waste (Residential and non-Residential) Disposed in Canada 2002 to 2010	3
Exhibit 2: Total Waste (Residential and non-Residential) Disposed by Jurisdiction 2008 and 2010.....	4
Exhibit 3: Per Capita Disposal of Waste (Residential and non-Residential) by Jurisdiction 2008 and 2010	5
Exhibit 4: Residential and non-Residential Waste Generation in Canada 2010.....	6
Exhibit 5: Residential and non-Residential Waste Disposed by Jurisdiction 2008 and 2010	7
Exhibit 6: Residential and non-Residential Recycling Diversion Rates 2000 to 2010.....	8
Exhibit 7: Residential and non-Residential Recycling Diversion Rates 2000 to 2010 as a Graph.....	8
Exhibit 8: Municipal Government Expenditures on Waste Disposal and Diversion, 2010.....	9
Exhibit 9: Waste Diverted and Municipal Government Expenditures, 2010	10
Exhibit 10: Waste Management Policy Framework – Summary of Provincial, Territorial and Federal	11
Exhibit 11: Waste Management Policy Review	12
Exhibit 12: Location of Waste Prevention and Reduction in the Waste Management Hierarchy	13
Exhibit 13: Waste Reduction Initiatives Currently in Place	14
Exhibit 14: Location of Waste Diversion in the Waste Management Hierarchy	16
Exhibit 15: Quantity of MSW Diverted (Recycled and Composted)	16
Exhibit 16: MSW Waste Diversion (EPR and Stewardship Programs) CAP EPR Phase 1 Materials	18
Exhibit 17: Shared Program Funding for PPP: % of Program Operating Costs Paid by Producers.....	19
Exhibit 18: Total Beverage Container Collection Rates: Deposit and Non-Deposit Programs, 2010	20
Exhibit 19: Jurisdictional Collection Rates, All Beverage Containers, 2010	21
Exhibit 20: Jurisdictional Collection Rates, All Beverage Containers, by Material 2010	22
Exhibit 21: Jurisdictional Summaries of End-of-Life Electronics and Electronic Products Diverted from Disposal.....	24
Exhibit 22: Key Indicators: Jurisdictional Summaries of Batteries Diverted from Disposal in 2011.....	24
Exhibit 23: Reported Recovery Percentages for the Used Oil Management Associations	27
Exhibit 24: Quantity of CRD Waste Diverted from Landfill 2000-2010 Canada-wide	29
Exhibit 25: Overview of New CRD Diversion Initiatives Jurisdiction-wide	29
Exhibit 26: Overview of (Potential) Carpet Diversion Initiatives Jurisdiction-wide.....	32
Exhibit 27: Overview of (Potential) Appliance Diversion Initiatives Jurisdiction-wide	35
Exhibit 28: Quantity of Organics Diverted from Landfill in Canada 2000-2010	36
Exhibit 29: Total (MSW&ICI) Quantity of Organics Diverted from Landfill by Jurisdiction 2000-2010 (Tonnes)	36
Exhibit 30: Jurisdictional Approaches to Composting and % of Households Composting	37
Exhibit 31: Number of EFW Facilities Treating MSW in Operation and Planned for Construction.....	41
Exhibit 32: Details on Existing Large EFW Facilities Primarily Treating Mixed MSW	42
Exhibit 33: Jurisdictional Review: Regulations, Standards, Guidelines Applicable to Solid Waste Disposal.....	45
Exhibit 34: Number of Open MSW/ ICI/CRD Landfills and Number with LFG Recovery (Flaring and Utilization)	50
Exhibit 35: LFG Recovery Criteria for Venting and/or Utilization.....	51
Exhibit 36: Overview of Current Diversion Monitoring and Reporting Issues Across Jurisdictions	53
Exhibit 37: Performance Measurement Approaches for Waste Diversion and/or Disposal.....	55
Exhibit 38: BC Service Plan Solid Waste EPR Targets in Place.....	56
Exhibit 39: BC EPR Programs in Place for CCME CAP EPR Phase 1 and 2 Materials.....	57
Exhibit 40: Materials Banned from Landfill across Nova Scotia.....	78

Executive Summary

Waste Management in Canada – What is the Problem?

Canada has a poor record on waste according to a recent international ranking of OECD countries by the Conference Board of Canada (Canada is 17th out of 17)¹. Nationally, the amount of non-hazardous total waste (residential and non-residential) sent to disposal in 2010 was 25 million tonnes². This waste is expensive to manage, increases demand on natural resources and represents a missed opportunity to extract value from materials in the waste stream. In 2008 the OECD Council adopted a recommendation that encourages its members to improve resource productivity by promoting environmentally effective and economically efficient uses of natural resources and materials as well as to strengthen capacity for analysing material flows.

“Vision 2050 - The New Agenda for Business Report”³ by the *World Business Council for Sustainable Development* lays out a pathway leading to a global population of 9 billion people living within the resource limits of the planet by 2050. It spells out the things that must happen over the coming decade to make a sustainable planet possible: material demand, consumption and production are transformed to match the limits of non-renewable resources; closed-loop recycling - making the concept of waste obsolete is normal business practice, and societies have a circular approach to resources; used products and materials can be reengineered to function again for multiple and distinct purposes or reduced to raw materials for manufacturing other products; greenhouse gas emissions, energy and water use are no longer constraints on the materials industry.

Canada is a long way from achieving the 2050 Vision objectives and the OECD commitments. This report presents the results of a jurisdictional review of current waste management policies, waste reduction initiatives, waste diversion programs, energy from waste initiatives, and waste disposal practices across the country to provide a snapshot of the *State of Waste Management in Canada*. It was commissioned by CCME in August 2013. The terms of reference for the report were to collect and review data directly from submissions by each jurisdictional member on CCME’s Waste Management Task Group, conduct a literature review for publicly available information, and to conduct interviews. Once information collection was complete, the findings were assessed to identify trends, challenges to and opportunities for improved waste prevention, reduction, diversion, recovery and disposal, as well as potential opportunities for improved performance measurement and reporting of waste management.

¹ Conference Board of Canada Municipal Waste Generation 2013

<http://www.conferenceboard.ca/hcp/details/environment/municipal-waste-generation.aspx>

² Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

³ World Business Council for Sustainable Development Vision 2050: The new agenda for business, Materials, p. 30,

Following are some of the key opportunities identified from the information collected for this report. Further detail on these opportunities is presented in Section 6 of this report.

Key Opportunities Identified in Waste Policy Frameworks

- There is room for improvement in the content of the strategy, action plan, policy, or legislation in many Canadian jurisdictions by including targets for **waste disposal limits** to drive action in waste reduction and diversion. To date, most jurisdictions measure waste diversion only; while this is an important indicator it could mask increases in waste generation overall.
- Waste policy frameworks need to have more direct engagement and requirements for the **ICI sector** – possibly legislated, or through negotiated agreements.
- Waste policy frameworks should require municipal **disposal performance monitoring and ICI disposal monitoring** to be reported to jurisdictional authorities to ensure monitoring capabilities at the provincial or territorial level.

Key Opportunities Identified in Waste Prevention and Reduction Upstream

- Increased Canada-wide **collaboration** between governments and industry stakeholders is vital to achieve changes upstream. This collaboration could happen via the **National Zero Waste Council** which has members from municipalities, provincial governments, recycling councils, and large retailers. There is an opportunity for governments, individually or through CCME, to capitalize on this momentum and get more involved with the Council activities - possibilities include leading a steering group or working group on data, extending inclusions to other industry stakeholders that wish to participate, contributing additional funding, etc.
- Potential increased **roles** for provincial, territorial and/or federal governments: influencing product design through providing incentives such as tax breaks or carbon offset credits when recycled content is used; support for research and data; support for pilot projects (e.g. carpet or mattress recycling); support to secure secondary markets; and greater use of economic instruments (e.g. removal of service taxes for repairing used goods; examination and changes to low landfill tip fees); and legislative bans on disposal for easily recyclable materials (e.g. cardboard).
- The U.S. Environmental Protection Agency (EPA) has reported on studies that indicate that EPR is not as successful in driving design change upstream as are **performance-based regulations**. For example, limiting the mercury content in a product might be more effective in reducing emissions of mercury than establishing an EPR program to collect the product to recover the mercury. Provincial and territorial jurisdictions – along with the federal government, could consider if this is an opportunity to drive change upstream.

Key Opportunities Identified in Waste Diversion

- There are a few remaining gaps in coverage of the Canada-wide Action Plan for Extended Producer Responsibility **CAP EPR Phase 1 materials** which should be addressed more consistently in all jurisdictions: **electrical tools, mercury containing products** (e.g. CFLs), **and sharps**. The federal government has authority to address mercury containing products such as CFLs because they have authority for toxics in products, and they have previously engaged producers when consulting on draft regulations on this topic. They should capitalize on this and work together with producers and provinces and territories on EPR.
- Continuing **harmonization** for homogeneous material categories in the CAP EPR Phase 1 materials (e.g. beverage containers, electronics, used oil) offers opportunities particularly for smaller jurisdictions (e.g. Atlantic Canada) and northern territories to establish diversion programs with other jurisdictions to access economies of scale for program operations, shared infrastructure, and administrative functions. **CAP EPR Phase 1** materials currently managed in this model include the National Used Oil Management Association (5 out of 13 jurisdictions), Electronics Products Recycling Association, and some packaging and printed paper programs are in the early stages of harmonization (BC, Manitoba, and Ontario). All three of these programs have room to grow with additional jurisdictions. Phase 2 materials that are good candidates for harmonization across jurisdictions include materials that are mainly homogenous (carpet, appliances, mattresses).
- Since industry readiness is a key factor in establishing producer responsibility programs, the best candidates for developing EPR programs in the **CAP EPR Phase 2** category should be **1) appliances; 2) CRD; 3) carpets; and 4) mattresses**. In these three material groups industry has demonstrated they are aware of potential EPR programs in their sector, in some cases there are pilot projects under way, and in the case of appliances EPR is well-established in BC. There could be an opportunity for CCME to be involved in developing a model program so that it could be easily adapted on a Canada-wide scale - the next steps would be: gather baseline data on current disposal quantities; engage stakeholders; assess technology readiness; and develop program requirements (e.g. banning specific waste streams such as wood waste from landfill).
- In the case of **CRD**, *Individual Producer Responsibility* is preferred over collective approaches to EPR due to the diverse industry characteristics of the sector and the uniqueness of the product mix. Recycling technologies exist for many CRD materials including concrete, asphalt shingles, carpets, gypsum, and roofing materials. The application of these technologies is product-specific, very different recycling technologies are utilized for each – so the materials need to be considered separately. Next steps include reviewing baseline data, engage industry; assess technology readiness; identify priority materials and program development.

- The **CAP EPR Phase 2** materials categories that are **not ready** to progress with EPR due to lack of data, lack of engagement with industry, and lack of recycling technologies are: **textiles** (clothing, footwear, car seats, linens, etc.), and **furniture**. A first step that jurisdictions could do for these categories would be data gathering on estimates of quantities reused or disposed jurisdiction wide, and identification of stakeholders.
- CCME's CAP EPR does not target the **ICI sector** specifically, nor do most jurisdictional programs target the ICI sector. This could be considered the remaining gap in coverage and a potential opportunity for jurisdictions (e.g. requiring PPP and e-waste recycling at all ICI places of business, not just the residential sector).
- At the municipal level, the issue of PPP from **public street-scapes** (sidewalks, parks, arenas, libraries, bus stops, schools, public spaces) should be targeted. If jurisdictions required this to be done by municipalities, it is likely that some form of support would be required to help municipalities. Public street-scapes can also be part of EPR programs.
- Increasing use of **landfill bans** across an entire jurisdiction is an opportunity currently only realized for a small segment of the Canadian population. Landfill bans should target the materials where recycling technologies already exist and industry has demonstrated readiness for establishing a diversion program.
- **Composting** of food and yard waste has seen a 125% increase in diversion Canada-wide from 2000-2010 (access to curbside or backyard programs). However, curbside only access to food waste composting is approximately 40%. Investments in composting programs (either high or low tech) provide "the biggest bang for the buck" in terms of opportunities to significantly increase diversion in any community (typical residential waste composition show food and yard waste represent 40% and paper 26% of MSW). Low technology windrow composting has been demonstrated to be viable in small or remote communities where it is not cost effective to transport organic waste long distances. Paper fibres can be included in many types of composting activity. In addition, increased organics diversion in the **ICI sector** in particular represents a significant opportunity to lower disposal quantities, produce valuable compost and renewable energy in the case of anaerobic digestion. Jurisdictions could implement **landfill bans** of organics, facilitate ICI organics diversion through education and outreach, and provide infrastructure support where needed in small, remote or northern communities.
- Given the past success of CCME's achievements of 50% packaging waste reduction by the year 2000, it might be useful to explore the idea of a renewed effort to develop a new **strategy for waste reduction** in Canada. This type of a strategy would be different from the CAP EPR because it would be broader in scope. Under the CAP EPR, provinces or territories develop EPR programs which tend to target the residential sector, and overall the CAP EPR does not resonate with municipalities or the smaller players in the ICI sector. A broader strategy could: engage municipalities; implement landfill bans; implement CRD diversion programs or incentives; require organics diversion from the ICI sector; engage ICI (small business, schools, hospitals, other) to recycle designated

materials for which diversion programs exist (e.g. electronics, organics, PPP); fully engage the public through a broad-based outreach / education strategy; and investigate possibilities in northern communities via partnering with educational institutions / business sustainability programs to access new ideas to develop solutions for the unique situation in northern Canadian jurisdictions.

Key Opportunities in Energy Recovery from Waste

- **Cement manufacturing** occurs in BC, Alberta, Ontario, Québec, and Nova Scotia. The sector would like to increase use of MSW as an alternative energy source (e.g. using tires, carpets, MSW, CRD wood waste, CRD asphalt shingles, used oil, and non-recyclable plastics) which varies from 0% in Alberta to 34% in Québec (2008). In Europe this amount is much higher. Approval processes need to be updated to allow these materials to be used in cement kilns, and policies could be developed so that materials not suitable for recycling can be targeted for recovery in cement manufacturing.
- There is growing interest in the use of waste-to-energy in the form of **bioenergy** facilities, rather than large EFW incinerators. The newer anaerobic technology can be utilized on a smaller scale, and be specifically targeted for the organics waste stream, including MSW, biosolids, and/or agricultural or wood chips/saw dust waste from industry. Biofuel facilities that process organic waste streams and produce fuel (e.g. methane or other) are gaining popularity and provide an opportunity to address organics on a regional basis for smaller or remote communities.
- There is an opportunity to increase utilization of **LFG** from existing large landfills (over 40,000 tonnes/year capacity) for energy recovery (not just flaring) in jurisdictions that have large landfills (i.e. Ontario, Québec, BC).

Key Opportunities in Waste Disposal

- There is an opportunity to improve waste management in Canada's **Northern Territories** by: diverting more waste by requiring segregation (e.g. tires, white goods, vehicles, CRD), storing hazardous materials; stopping open burning; constructing waste facilities to modern standards; ensuring that all disposal sites have controlled access; and requiring disposal monitoring of quantities disposed.
- Only two jurisdictions (Nova Scotia and PEI) have utilized regulatory instruments on a broad-basis with **landfill bans** for materials with diversion infrastructure in place, including organics (these jurisdictions have the highest diversion rates for organics). Other jurisdictions (Québec) have signalled interest in implementing landfill bans for organics. This regulatory tool is an opportunity that jurisdictions could use for regulated programs.
- This report did not include research of best practices at the **municipal** level – however it is well known that many municipalities across Canada address waste disposal in a variety of innovative ways (e.g. use of bag limits, clear bags, user pay per bag, and even by-laws

that issue fines for individuals or businesses if they do not participate in recycling programs). There is an opportunity for governments, individually or through CCME, to conduct a municipal best practice review of waste diversion and reducing waste disposal approaches in Canada. Such a research exercise could review innovative practices to identify those that could be scalable province or territory-wide.

- Only two jurisdictions (Manitoba and Québec) are utilizing province-wide levies for waste disposal at landfills to fund diversion programs and infrastructure investments for organics processing. In both cases the levies go into special funds not into general revenue. Both jurisdictions report that the levies are working well in their respective provinces. The successful use of levies often requires a good enforcement strategy and monitoring program to ensure that the levy achieves the intended results⁴.
- The fact that **landfill tipping fees are low in some Canadian jurisdictions** as well as south of the border is an issue and jurisdictions could review their ability to address this. They could embark on a process to discuss tip fee structures in their province or territory with municipalities and private landfill owners with a goal to changing fee structures as a lever to increase waste diversion. With respect to treating municipal solid waste on a waste-shed basis and finding a disincentive for the practice of MSW exporting – a by-law could be established by most municipal governments that would restrict MSW from being exported to another jurisdiction.

Key Opportunities in Monitoring and Reporting

- When programs are **harmonized** among more than one jurisdiction it is much easier to compare data because they have the same monitoring metrics, etc. (for example, harmonized electronics or oil programs had comparable statistics; however, other programs that are harmonized administratively by the same producer organization did not publish comparable data (e.g. paint and HHSW programs operated by ProductCare). For virtually all CAP EPR Phase 1 materials there are opportunities to improve monitoring and reporting to be more consistent (e.g. tires – some report on volume of rubber collected, other jurisdictions report on the number of tires recycled; paint programs – some report on paint and aerosols together, others report on only paint cans).
- Current work underway by the Ontario Waste Management Association (OWMA) and the Canadian Standards Association (CSA) to develop a **recycling guideline** entitled: *Recycling Process, Audit and Verification Guideline for Ontario* to provide a more consistent framework to define, measure and interpret recycling data at the facility level. Once developed, this guideline may be a product for future consideration that could be

⁴ Kelleher, Maria. "Landfill Levies" in Solid Waste & Recycling, February 2013 edition.

used in other jurisdictions to ensure consistent recycling monitoring and reporting for a range of materials.

- A national **database of disposal information** has been gathered by Statistics Canada, however it is not complete given that it does not include data for Nunavut, Northwest Territories, Yukon, PEI, and Newfoundland and Labrador. If changes to the requirements for collecting data from these jurisdictions are not feasible, then alternatives will need to be explored by each jurisdiction. For example, this could potentially require municipal reporting and landfill reporting similar to census reporting within each jurisdiction.

Résumé

La gestion des matières résiduelles au Canada – quel est le problème?

Le Canada affiche un bilan médiocre dans le secteur des matières résiduelles selon un récent classement des pays membres de l'OCDE établi par le Conference Board du Canada (le Canada se classe 17^e sur 17 pays)⁵. À l'échelle nationale, la quantité totale de matières résiduelles non dangereuses (résidentielles et non résidentielles) envoyées à l'élimination en 2010 s'élève à 25 millions de tonnes⁶. Les matières résiduelles sont coûteuses à gérer, et leur élimination accroît les besoins en ressources naturelles et représente une occasion manquée de valoriser les matières appartenant à cette filière. En 2008, le Conseil de l'OCDE a adopté une recommandation qui encourage ses membres à renforcer leur capacité d'analyse des flux de matières et à améliorer la productivité des ressources en favorisant une utilisation efficace des ressources naturelles et des matières sur les plans environnemental et économique.

Le rapport *Vision 2050: The New Agenda for Business*⁷ du World Business Council for Sustainable Development montre la voie à suivre pour qu'une population mondiale de neuf milliards de personnes puisse vivre dans le respect des limites des ressources de la planète d'ici 2050. Il décrit ce qui doit se produire au cours des dix prochaines années pour permettre l'avènement d'une planète durable : la demande, la consommation et la production de matières se transforment pour s'adapter aux limites des ressources non renouvelables; le recyclage en boucle fermée, qui rend caduc le concept de matières résiduelles, est une pratique courante dans le milieu commercial, et les sociétés adoptent une approche circulaire vis-à-vis des ressources; les produits et les matières usagés peuvent être modifiés pour servir à différents usages ou transformés en matières premières pour la fabrication d'autres produits; les émissions de gaz à effet de serre, l'énergie et la consommation d'eau ne sont plus des obstacles pour l'industrie des matériaux.

Le Canada a beaucoup de chemin à parcourir pour atteindre les objectifs de *Vision 2050* et pour remplir les engagements de l'OCDE. Le présent rapport présente les résultats d'un examen gouvernemental des politiques de gestion des matières résiduelles, des mesures de réduction des matières résiduelles, des programmes de détournement des matières résiduelles, des mesures destinées à transformer les matières résiduelles en énergie et des pratiques d'élimination des matières résiduelles en cours au pays pour donner un aperçu de l'état de la gestion des matières résiduelles au Canada. Le présent rapport a été commandé par le CCME en août 2013. Pour le produire, les responsables ont réuni et examiné les données soumises par chacun des gouvernements membres du Groupe de travail sur la gestion des matières

⁵ Conference Board du Canada. *Municipal Waste Generation*, 2013. Internet : <http://www.conferenceboard.ca/hcp/details/environment/municipal-waste-generation.aspx>.

⁶ Statistique Canada (2013). *Enquête sur l'industrie de la gestion des déchets : secteur des entreprises et des administrations publiques*, 2010. Catalogue n° 16F0023X.

⁷ World Business Council for Sustainable Development. « Materials », dans *Vision 2050: The new agenda for business*, p. 30.

résiduelles du CCME, ont effectué une analyse de la documentation accessible au public et ont réalisé des entrevues. Une fois la collecte de données terminée, les responsables ont analysé les résultats afin de dégager des tendances, d'identifier les difficultés et les possibilités en matière d'amélioration de la prévention, de la réduction, du détournement, de la valorisation et de l'élimination des matières résiduelles et d'identifier des solutions possibles pour améliorer l'évaluation de la performance et la production de rapports en matière de gestion des matières résiduelles.

Les pages qui suivent font état des principales possibilités identifiées grâce à l'information recueillie pour ce rapport. Pour de plus amples renseignements sur ces possibilités, voir la section 6 du rapport complet (en anglais seulement).

Cadres d'action pour les matières résiduelles : principales possibilités identifiées

- De nombreux gouvernements au Canada pourraient améliorer le contenu de leur stratégie, plan d'action, politique ou réglementation en établissant des **limites cibles pour l'élimination des matières résiduelles** qui orienteraient les mesures de réduction et de détournement des matières résiduelles. Jusqu'à maintenant, la plupart des gouvernements se sont contentés de mesurer le détournement des matières résiduelles; bien qu'il s'agisse d'un important indicateur, cette mesure pourrait néanmoins masquer une augmentation de la production globale de matières résiduelles.
- Les cadres d'action pour les matières résiduelles doivent prévoir une participation plus directe du **secteur industriel, commercial et institutionnel (ICI)** ainsi que des exigences pour ce secteur, possiblement par voie législative ou encore par la négociation d'ententes.
- Pour donner une capacité de suivi aux provinces et territoires, les cadres d'action sur les matières résiduelles devraient exiger que les municipalités et le secteur ICI communiquent aux autorités gouvernementales leurs données de suivi sur leur **performance en matière d'élimination des matières résiduelles**.

Mesures de prévention et de réduction des matières résiduelles en amont : principales possibilités identifiées

- Une **collaboration** accrue entre les gouvernements et les intervenants de l'industrie à l'échelle pancanadienne est essentielle pour opérer des changements en amont. Cette collaboration pourrait se faire par le biais du **National Zero Waste Council**, composé de représentants des municipalités, des gouvernementaux provinciaux, de conseils de recyclage et de grands détaillants. Les gouvernements, individuellement ou par le biais du CCME, peuvent profiter de cette occasion pour participer davantage aux activités du conseil, notamment en assurant la direction d'un groupe directeur ou d'un groupe de travail sur les données, en intégrant d'autres intervenants de l'industrie désireux de participer à ces activités entre autres par l'apport d'une contribution financière supplémentaire.

- Voici d'autres **rôles** possibles pour les gouvernements fédéral, provinciaux et/ou territoriaux : influencer la conception des produits en offrant des mesures incitatives telles que des allègements fiscaux ou des crédits compensatoires pour le carbone lorsqu'il y a utilisation de contenu recyclé; soutenir la recherche et l'information; soutenir des projets pilotes (p. ex. recyclage de tapis ou de matelas); offrir du soutien à des marchés secondaires sans risque; faire une plus grande utilisation des instruments économiques (p. ex. exempter la réparation de biens usagés de la taxe sur les produits et services; examiner les faibles redevances imposées aux clients des lieux d'enfouissement et y apporter des changements); et interdire, par voie législative, l'élimination de matières facilement recyclables (p. ex. carton).
- L'agence de protection de l'environnement des États-Unis (Environmental Protection Agency ou EPA) a fait état d'études qui indiquent que la responsabilité élargie des producteurs (REP) ne réussit pas à instaurer des changements en amont dans la conception des produits avec autant d'efficacité qu'une **réglementation basée sur la performance**. Par exemple, limiter la teneur en mercure d'un produit peut s'avérer plus efficace pour réduire les émissions de mercure que l'établissement d'un programme de REP qui assurerait la cueillette de ce produit pour en récupérer le mercure. Les gouvernements provinciaux et territoriaux, de même que le gouvernement fédéral, pourraient se demander si le moment est venu d'opérer des changements en amont.

Détournement des matières résiduelles : principales possibilités identifiées

- Il reste quelques lacunes à combler dans la couverture des **produits et matières de l'étape 1 du Plan d'action pancanadien pour la responsabilité élargie des producteurs (PAPREP)**, lacunes auxquelles il faudrait remédier de façon plus uniforme dans l'ensemble des provinces et territoires; il s'agit des **outils électriques**, des **produits contenant du mercure** (p. ex. ampoules fluocompactes) et des **objets pointus ou tranchants**. Le gouvernement fédéral a le pouvoir d'intervenir lorsqu'il est question de produits contenant du mercure comme les ampoules fluocompactes, puisque les substances toxiques présentes dans les produits relèvent de sa compétence; il a d'ailleurs déjà engagé un dialogue avec les producteurs lors de consultations entourant un projet de règlement sur cette question. Le gouvernement fédéral devrait faire fond sur ces éléments et travailler en collaboration avec les producteurs et les provinces/territoires à des mesures de REP.
- Poursuivre l'**harmonisation** pour homogénéiser les catégories de produits et de matières de l'étape 1 du PAPREP (p. ex. contenants de boisson, matériel électronique, huiles usées) permet aux provinces et territoires, particulièrement aux petites provinces (p. ex. Canada atlantique) et aux territoires nordiques, d'établir des programmes de détournement avec d'autres gouvernements pour pouvoir profiter d'économies d'échelle sur le plan de l'exécution des programmes, des infrastructures communes et des fonctions administratives. Parmi les programmes qui visent des produits ou matières de l'**étape 1 du PAPREP** et qui fonctionnent actuellement selon ce modèle figurent le programme de la National Used Oil Management Association (cinq provinces ou territoires sur treize), le programme de l'Electronics Products Recycling Association et certains programmes pour les emballages et les imprimés, qui en sont aux premières

étapes de leur harmonisation (C.-B., Manitoba et Ontario). Ces trois programmes sont ouverts à d'autres provinces et territoires. À l'étape 2 du PAPREP, les bons candidats à l'harmonisation intergouvernementale sont les produits et matières essentiellement homogènes (tapis, appareils électroménagers, matelas).

- Comme l'état de préparation de l'industrie est un facteur déterminant dans la création de programmes de REP, les meilleurs candidats à la REP parmi les produits et matières de l'**étape 2 du PAPREP** seraient **1) les appareils ménagers; 2) les matériaux de CRD; 3) les tapis; 4) les matelas**. Pour ces trois catégories de produits, les membres de l'industrie ont montré qu'ils étaient conscients des programmes de REP possibles dans leurs secteurs respectifs. Dans certaines catégories, des projets pilotes sont en cours; dans le cas des appareils électroménagers, la REP est bien établie en Colombie-Britannique. Le CCME pourrait éventuellement participer à l'élaboration d'un programme type qui serait facilement adaptable à l'échelle pancanadienne; à cet égard, les prochaines étapes seraient les suivantes : rassembler des données de référence sur les quantités de matières résiduelles éliminées actuelles; mobiliser les intervenants; évaluer l'état de préparation sur le plan technologique; définir les exigences de programme (p. ex. interdire l'enfouissement de certains flux de matières résiduelles comme les résidus de bois).
- Dans le secteur de la **CRD**, les approches de la REP qui favorisent la *responsabilité individuelle* plutôt que la responsabilité collective des producteurs sont à privilégier en raison de la diversité des caractéristiques de ce secteur et du caractère unique de la gamme de produits ciblés. Il existe des techniques de recyclage pour bon nombre de matériaux de CRD, y compris le béton, les bardeaux d'asphalte, les tapis, le gypse et les matériaux de couverture. Non seulement l'application de ces techniques varie-t-elle d'un produit à l'autre, mais il existe aussi différentes techniques pour chaque produit; il convient donc de considérer les matériaux de CRD séparément pour le recyclage. Les prochaines étapes sont les suivantes : examiner les données de référence; mobiliser l'industrie; évaluer l'état de préparation sur le plan technologique; déterminer les matériaux prioritaires et l'avancement des programmes.
- Les catégories de produits et de matières de l'**étape 2 du PAPREP** qui ne sont **pas prêtes** à faire l'objet de programmes de REP sont les **textiles** (vêtements, chaussures, sièges d'auto, linges de maison, etc.) et les **meubles** en raison du manque de données, de dialogue avec l'industrie et des techniques de recyclage. La première mesure que pourraient prendre les gouvernements pour faire avancer les choses dans ces catégories serait de recueillir des données sur les quantités estimatives de matières réutilisées ou éliminées à l'échelle provinciale/territoriale et d'identifier les intervenants.
- À l'instar de la plupart des programmes en vigueur dans les provinces et territoires, le PAPREP du CCME ne cible pas spécifiquement le **secteur ICI**. Certains pourraient y voir la dernière lacune à combler et une occasion pour les gouvernements (p. ex. de rendre obligatoire le recyclage du papier et des imprimés dans tous les établissements ICI, pas seulement dans le secteur résidentiel).

- À l'échelle municipale, il conviendrait de s'attaquer à la question du papier et des imprimés que l'on trouve dans le **paysage urbain** (trottoirs, parcs, arénas, librairies, arrêts d'autobus, écoles, espaces publics). Si les provinces et territoires confient cette tâche aux municipalités, ces dernières auront probablement besoin d'une certaine forme de soutien pour s'en acquitter. Le paysage urbain peut également faire partie des programmes de REP.
- Accroître l'utilisation des **interdictions d'enfouissement** à l'échelle de l'ensemble d'une province ou d'un territoire est une possibilité qui est exploitée dans une petite portion du territoire canadien seulement. Les interdictions d'enfouissement devraient cibler des matières pour lesquelles il existe déjà des techniques de recyclage et pour lesquelles l'industrie s'est montrée prête à établir un programme de détournement.
- La quantité de résidus de cuisine et de jardin détournés de l'élimination grâce au **compostage** a augmenté de 125 % à l'échelle pancanadienne de 2000 à 2010 (accès à des programmes de collecte sélective et de compostage domestique). Toutefois, le pourcentage de ménages ayant accès à un service de collecte sélective des résidus de cuisine aux fins de compostage s'élève à environ 40 %. Investir dans des programmes de compostage (à haute ou faible technologie) est la solution qui offre le meilleur rendement par dollar investi parmi les solutions possibles pour accroître le détournement dans une collectivité donnée quelle qu'elle soit (en général, les résidus de cuisine et de jardin représentent 40 % des résidus solides municipaux [RSM] et le papier, 26 %). Le compostage en andain, peu exigeant sur le plan technique, s'est révélé viable dans les collectivités de petite taille ou éloignées où le transport de résidus organiques sur de longues distances n'est pas rentable. Les fibres de papier peuvent s'intégrer à de nombreux types d'activités de compostage. En outre, le détournement d'une quantité accrue de résidus organiques d'origine **ICI** est une bonne façon de réduire les quantités vouées à l'élimination et de produire, par digestion anaérobie, du compost et de l'énergie renouvelable utiles. Les gouvernements pourraient **interdire l'enfouissement** des résidus organiques, favoriser le détournement des résidus organiques d'origine ICI par des mesures d'éducation et de sensibilisation et soutenir au besoin les infrastructures des collectivités de petite taille, éloignées ou nordiques.
- Au vu du succès que le CCME a connu par le passé avec son plan de réduction des déchets d'emballage (réduction de 50 % de ces déchets avant l'année 2000), il serait peut-être bon d'envisager de renouveler l'expérience en élaborant une nouvelle **stratégie de réduction des matières résiduelles** au Canada. Cette stratégie serait différente du PAPREP, car elle aurait un champ d'application plus large. Dans le cadre du PAPREP, les provinces et territoires élaborent des programmes de REP qui tendent à cibler le secteur résidentiel, si bien que, dans l'ensemble, le PAPREP ne trouve pas d'écho auprès des municipalités ou des petits acteurs du secteur ICI. Une stratégie plus vaste pourrait permettre de mobiliser les municipalités; de mettre en place des interdictions d'enfouissement; de mettre en place des programmes ou des mesures incitatives pour favoriser le détournement des résidus de CRD; d'exiger le détournement des résidus organiques provenant du secteur ICI; de mobiliser le secteur ICI (petites entreprises, écoles, hôpitaux, etc.) pour recycler les matières qui font l'objet de programmes de détournement (p. ex. matériel électronique, résidus organiques et papier/imprimés); de

mobiliser pleinement le public par une vaste stratégie d'éducation ou de sensibilisation; et d'explorer les possibilités pour les collectivités nordiques en établissant des partenariats avec les programmes de développement durable des établissements d'enseignement ou des entreprises de manière à trouver de nouvelles pistes de solutions qui conviendraient à la situation si particulière des collectivités nordiques du Canada.

Transformation des matières résiduelles en énergie : principales possibilités

- Il existe des usines de **fabrication du ciment** en Colombie-Britannique, en Alberta, en Ontario, au Québec et en Nouvelle-Écosse. Ce secteur souhaiterait augmenter son utilisation de résidus solides municipaux (p. ex. pneus; tapis; résidus de bois et bardeaux d'asphalte du secteur de la CRD; huiles usées; plastiques non recyclables) comme source d'énergie de remplacement, utilisation qui varie de 0 % en Alberta à 34 % au Québec (2008). En Europe, ce taux est beaucoup plus élevé. Il faut moderniser les procédures d'autorisation pour permettre l'utilisation de ces matières dans les fours à ciment; de plus, les gouvernements pourraient élaborer des politiques pour que les matières impropres au recyclage puissent être valorisées via la fabrication du ciment.
- L'utilisation d'installations de production de **bioénergie** plutôt que de gros incinérateurs pour transformer les matières résiduelles en énergie suscite un intérêt croissant. La nouvelle technologie anaérobie peut être utilisée à petite échelle et cibler précisément le flux des résidus organiques, notamment les RSM, les biosolides et/ou les résidus agricoles ou les résidus de bois (copeaux, sciure) d'origine industrielle. Les usines de biocombustibles qui transforment les résidus organiques en combustibles (p. ex. méthane ou autres) gagnent en popularité et offrent, aux collectivités de petite taille ou éloignées, une solution de gestion régionale pour les résidus organiques.
- Il serait possible d'accroître l'utilisation du **gaz d'enfouissement** provenant de grands sites d'enfouissement (capacité de plus de 40 000 tonnes/année) aux fins de la valorisation énergétique (pas seulement pour le torchage) dans les provinces dotées de grands sites d'enfouissement (c.-à-d. Ontario, Québec, Colombie-Britannique).

Élimination des matières résiduelles : principales possibilités

- Il serait possible d'améliorer la gestion des matières résiduelles dans les **territoires nordiques** du Canada grâce aux mesures suivantes : détourner plus de matières résiduelles en rendant le tri obligatoire (p. ex. pneus, électroménagers, véhicules, matériaux de CRD); stocker les matières résiduelles dangereuses; mettre un frein au brûlage à ciel ouvert; construire les installations de matières résiduelles selon des normes modernes; voir à ce que l'accès à tous les centres d'élimination soit contrôlé; exiger le suivi des quantités de matières éliminées.
- Seules deux provinces (Nouvelle-Écosse et Î.-P.-É.) ont utilisé des instruments réglementaires à grande échelle, notamment des **interdictions** relatives à l'enfouissement des matières résiduelles pour lesquelles il existe des programmes de détournement (dont les résidus organiques). Ces provinces affichent d'ailleurs les meilleurs taux de détournement pour les résidus organiques. D'autres provinces (Québec) se sont dites intéressées à mettre en place des interdictions concernant

l'enfouissement des résidus organiques. Cet instrument réglementaire est une possibilité que les gouvernements pourraient exploiter dans le cadre de programmes réglementés.

- Aucune recherche n'a été faite sur les bonnes pratiques en usage à l'**échelle municipale** dans le cadre du présent rapport, mais il est bien connu que de nombreuses municipalités canadiennes s'arment à combattre l'élimination des matières résiduelles par un éventail de mesures novatrices (p. ex. imposition de limites sur le nombre de sacs à ordures permis ou d'un coût à l'utilisateur par sac à ordures, utilisation de sacs à ordures transparents voire adoption d'un règlement prévoyant l'imposition d'amendes aux particuliers ou aux entreprises qui ne participent pas aux programmes de recyclage). Les gouvernements, individuellement ou par le biais du CCME, pourraient réaliser un examen des bonnes pratiques municipales en matière de détournement et de réduction de l'élimination des matières résiduelles au Canada. Pendant ce travail de recherche, les intéressés pourraient examiner les pratiques novatrices pour identifier celles qu'il serait possible de mettre en place à l'échelle provinciale ou territoriale.
- Seules deux provinces (Manitoba et Québec) imposent des redevances provinciales sur l'enfouissement des matières résiduelles qui servent à financer les programmes de détournement et les infrastructures dédiés au traitement des résidus organiques. Dans les deux cas, les redevances perçues vont dans des fonds spéciaux et non dans les recettes générales. Les deux provinces mentionnent que ces redevances fonctionnent bien sur leur territoire respectif. Pour assurer le succès de ces redevances, il faut généralement prévoir une bonne stratégie d'application et un bon programme de suivi pour s'assurer que les redevances atteignent les résultats voulus⁸.
- Le fait que les **frais de disposition aux lieux d'enfouissement soient faibles dans certaines provinces ou certains territoires du Canada** ainsi qu'au sud de la frontière pose problème – les gouvernements pourraient s'interroger sur leur capacité à résoudre ce problème. Ils pourraient engager une discussion avec les municipalités et les propriétaires de lieux d'enfouissement privés sur les barèmes de disposition dans le but de modifier ces barèmes pour accroître le détournement de matières résiduelles. Pour ce qui est de traiter les matières résiduelles non-dangereuses par « bassins de matières résiduelles » et de trouver une mesure dissuasive pour empêcher l'exportation de matières résiduelles non-dangereuses, la plupart des municipalités pourraient adopter un règlement qui limiterait l'exportation de ces matières.

Suivi et production de rapports : principales possibilités

- Lorsque les programmes de plus d'un gouvernement sont **harmonisés**, il est beaucoup plus facile de comparer les données, notamment parce qu'elles sont recueillies selon les mêmes paramètres de mesure (p. ex. les programmes harmonisés pour le matériel électronique et les huiles usées ont produit des statistiques comparables; cependant,

⁸ Kelleher, Maria. « Landfill Levies », *Solid Waste & Recycling*, numéro de février 2013.

d'autres programmes harmonisés sur le plan administratif par la même association de producteurs n'ont pas publié de données comparables [p. ex. les programmes pour la peinture et pour les résidus domestiques dangereux et déchets spéciaux administrés par ProductCare]). Pour pratiquement tous les produits et matières de l'étape 1 du PAPREP, il est possible d'améliorer les mesures de suivi et de production de rapports pour les rendre plus cohérentes (p. ex. les pneus – certains gouvernements rendent compte du volume de caoutchouc récupéré et d'autres, du nombre de pneus recyclés; les programmes pour la peinture – certains font rapport sur la peinture et les aérosols mis ensemble et d'autres, sur les contenants de peinture seulement).

- L'Ontario Waste Management Association (OWMA) et l'Association canadienne de normalisation (ACNOR) travaillent à l'élaboration d'une **directive de recyclage** intitulée *Recycling Process, Audit and Verification Guideline for Ontario*, laquelle offrira un cadre plus cohérent pour définir, mesurer et interpréter les données sur le recyclage à l'échelle des installations. Une fois élaborée, cette directive pourrait être présentée à d'autres instances pour qu'elles envisagent de l'utiliser sur leur territoire en vue d'assurer un suivi et la production de rapports cohérents pour un éventail de matières.
- Une **base nationale de données sur l'élimination** a été créée par Statistique Canada, mais elle n'est pas complète, ne contenant pas de données pour le Nunavut, les Territoires du Nord-Ouest, le Yukon, l'Î.-P.-É. et Terre-Neuve-et-Labrador. S'il est impossible d'apporter des changements aux exigences de collecte de données de ces gouvernements, chacun de ces gouvernements devra explorer des solutions de rechange. Par exemple, la déclaration de données municipales et de données sur l'enfouissement pourrait être exigée dans chaque province/territoire au même titre que la déclaration des données de recensement.

1 Introduction

1.1 Background

The Canadian Council of Ministers of Environment (CCME) Waste Management Task Group (WMTG) commissioned this report to summarize the current state of waste management in Canada, and identify recent trends, best management practices, challenges and opportunities for waste prevention or reduction, diversion, energy recovery and disposal in Canada.

1.2 Scope

The scope of this report includes municipal solid wastes (MSW) specifically from the residential and industrial, commercial and institutional (ICI) sectors, as well as construction, renovation, and demolition (CRD) waste. The definition of MSW includes small amounts of hazardous and special wastes commonly found in the residential and ICI sectors such as batteries, cleaners, or flammable material (which may include small quantities of liquid wastes).

For this report, the following materials were excluded as per the terms of reference: wastes that are designated hazardous wastes; wastes associated with primary resource extraction or harvesting; agricultural wastes; mining wastes; conventional air pollutants; liquid effluents discharged from processing or manufacturing sites; nuclear wastes; liquid and hazardous wastes [except those defined in Appendix F of the CAP EPR]; pathological wastes; gaseous wastes; and gravel and rocks.

Aspects within the defined scope for this report included: waste generation during manufacturing, retail, or consumer use, as well as primary processing of wastes (e.g. quantities recycled or composted, or disposed). The report does not include protocols for secondary processing such as application of finished compost. Similarly, it does not include transportation regulations for waste, or information pertaining to waste transfer stations.

Data presented in this report includes quantitative information (volumes disposed, diverted, etc.), as well as qualitative information such as a review of policies, programs, regulations, standards and guidelines, as well as discussion and observations. It does not include technology reviews or waste management facility details.

1.3 Methodology

The methodology used to compile this report was as follows:

- *Data Collection from Jurisdiction Submissions:* Information was obtained from each jurisdiction directly via email submissions to the consulting group.
- *Literature Review from Internet Searches and Consultant Libraries:* The consultant team had relevant documentation in hand for this assignment, and targeted internet searches were undertaken for publicly available information on jurisdictional websites or by third

parties with a waste management role, municipal websites, or other waste management publications.

- *Interviews:* A total of 26 interviews were undertaken with jurisdictional representatives, municipal representatives, and external stakeholders to fill information gaps and obtain insight related to waste management challenges, and potential new roles or opportunities in waste management.

Once information collection was complete, the findings were assessed to identify trends, challenges of and opportunities for improved waste prevention, reduction, diversion, recovery and disposal, as well as potential opportunities for improved performance measurement and reporting of waste management aspects across Canada.

1.4 Overview of the Structure of this Report

Section 2 provides a Canada-wide overview of waste management and is presented in the following sub-sections:

- 2.1 Current Situation at a Glance
- 2.2 Policy Frameworks: Overarching Strategies and Policies for Waste
- 2.3 Waste Prevention and Reduction-at-Source
- 2.4 Waste Diversion: EPR, Product Stewardship, and Other Diversion Programs
- 2.5 Waste Recovery: Energy-from-Waste
- 2.6 Waste Disposal: Incineration and Landfills

Note that EPR as a policy tool is intended to address waste reduction and reuse, as well as diversion. It is included in the Waste Diversion section of this report since most activity under EPR programs has so far focused on recycling.

Section 3 presents jurisdictional overviews for the thirteen provinces and territories, including a discussion of the overarching policy framework for addressing waste (legislative, strategy, or policy), waste reduction initiatives, waste diversion programs, energy recovery facilities, and waste disposal approaches.

Section 4 presents key roles and responsibilities that are applicable Canada-wide: federal government departments / agencies that have a role in waste management in Canada; work undertaken by the Canadian Council of Ministers of the Environment (CCME); and key programs related to waste management undertaken by the Federation of Canadian Municipalities and the Standards Council of Canada.

Section 5 presents highlights from some innovative practices which were identified in relation to waste management in Canada through the information gathering stage of this work.

Section 6 presents key observations, challenges, and opportunities for improved waste prevention, reduction and diversion, and waste management performance monitoring in Canada.

2 Canada-wide Overview of Waste Management

2.1 Current Situation at-a-Glance

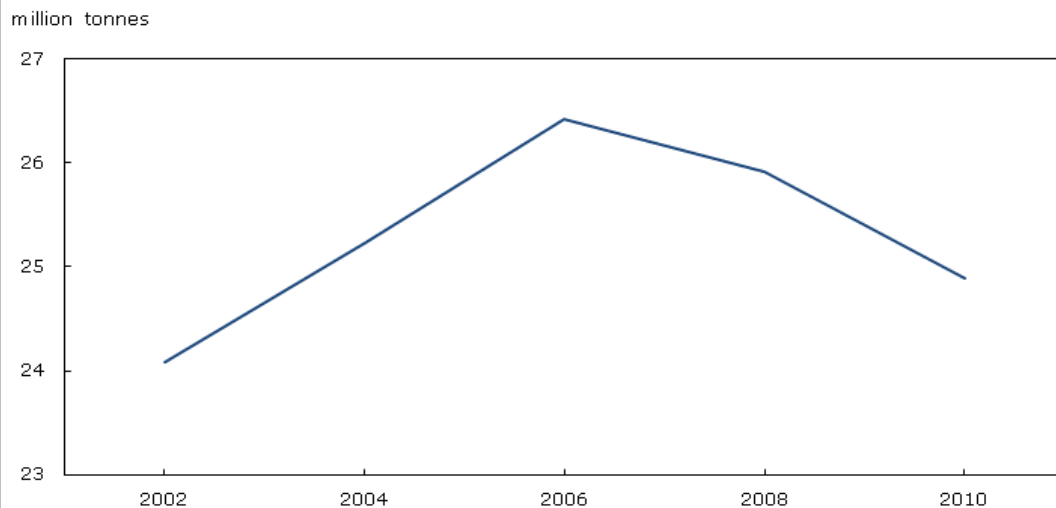
Municipal solid waste (MSW) is regulated by the provinces and territories and managed by the waste management industry under contract to municipal or regional authorities, or managed by municipal authorities directly. In addition the waste management industry provides services under contract to industrial, commercial or institutional waste generators. In some areas of Canada's territories that have not yet devolved, the federal government is responsible for regulating MSW disposal activities.

The following tables present the current situation of waste disposal and diversion in Canada using published Statistics Canada information. In most cases, Statistics Canada does not report on information from the territories or Prince Edward Island due to confidentiality requirements of the Statistics Act, so these jurisdictions are not included in the tables presented in this introductory section.

Total Waste Disposal Canada-Wide

Nationally, the amount of non-hazardous total waste (residential and non-residential) sent to private and public waste disposal facilities decreased 4% from 2008 to approximately 25 million tonnes in 2010. The quantity of waste disposed per capita is presented in Exhibit 3.

Exhibit 1: Total Waste (Residential and non-Residential) Disposed in Canada 2002 to 2010⁹



Note(s): Totals for 2002, 2004, 2006, and 2008 have been revised since their original publication.

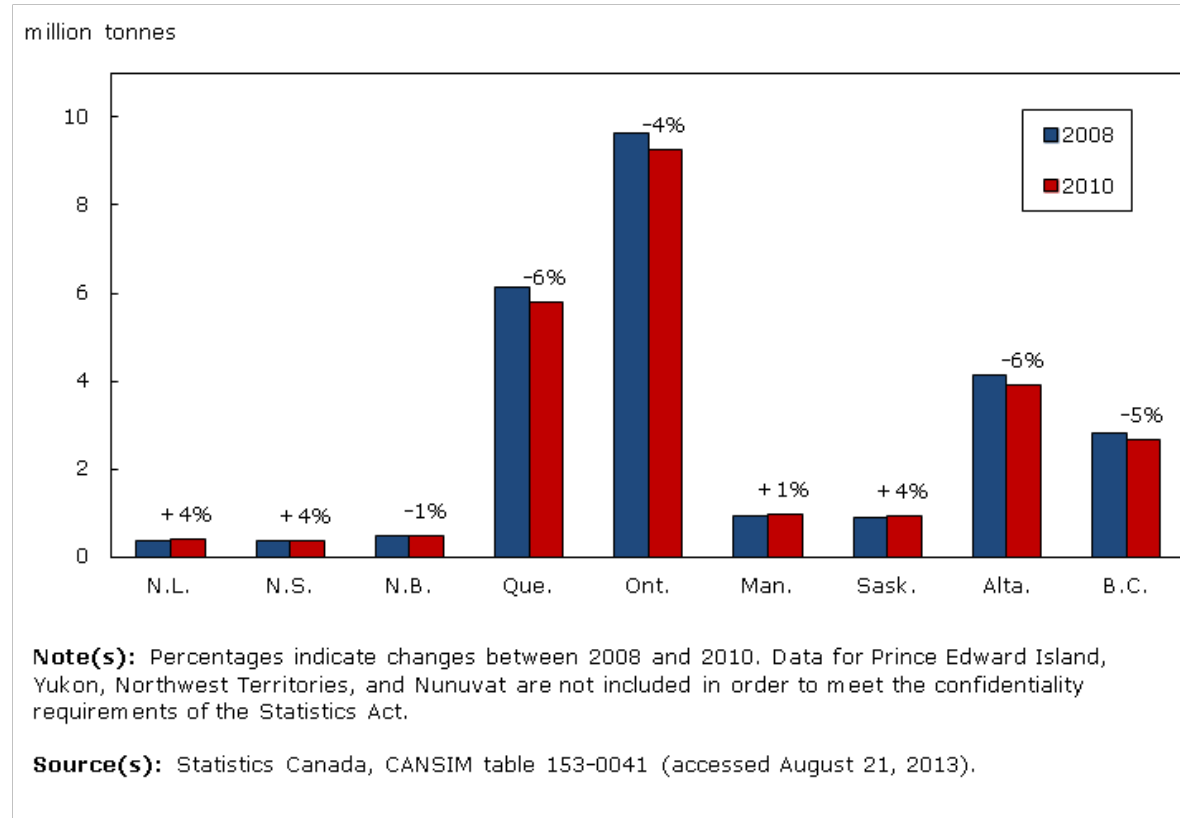
Source(s): Statistics Canada, CANSIM table 153-0041 (accessed August 21, 2013).

⁹ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

Total Waste Disposed by Jurisdiction

At the jurisdiction level, Ontario disposed the most waste at 9.2 million tonnes in 2010, followed by Québec, Alberta, and British Columbia at 5.8, 3.9, and 2.7 million tonnes, respectively. The four provinces that disposed the most waste are also the four provinces with the highest population. Québec and Alberta saw the greatest declines in waste disposal, each decreasing by 6% from 2008. Newfoundland and Labrador, Nova Scotia, and Saskatchewan had the highest increases in total waste disposed over the same period, at 4% each¹⁰.

Exhibit 2: Total Waste (Residential and non-Residential) Disposed by Jurisdiction 2008 and 2010¹¹



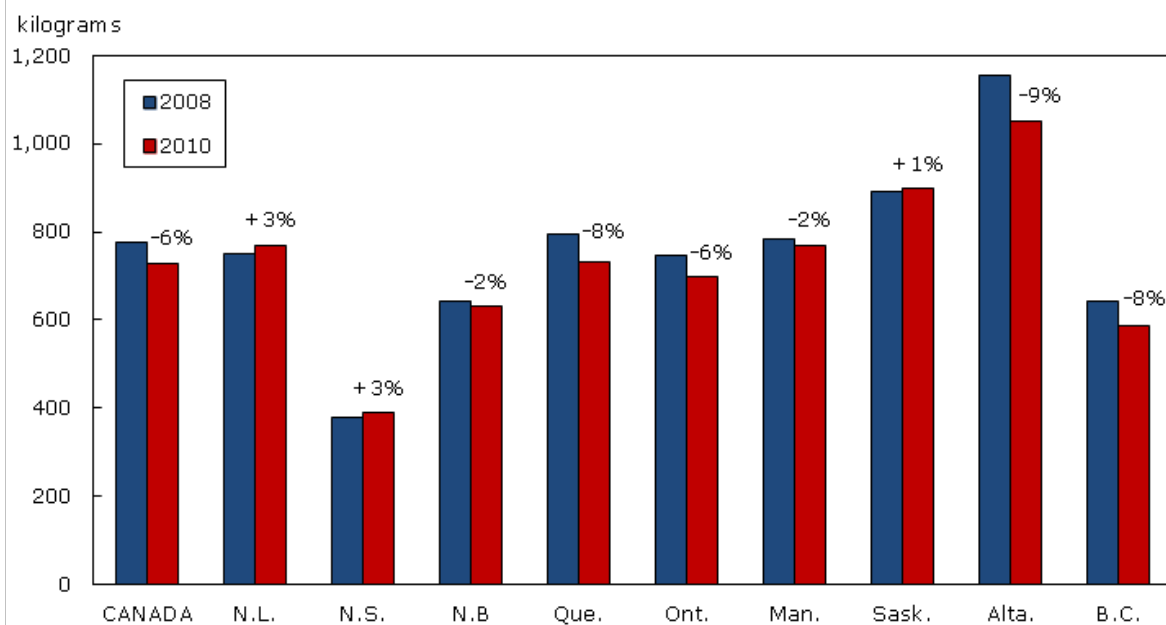
¹⁰ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

¹¹ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

Per Capita Total Waste Disposal by Jurisdiction

Per capita total waste disposal figures show that a total of 729 kg of waste was disposed per person in 2010 in Canada. This per capita quantity, which includes both residential and non-residential waste, was down 6% from 2008. The province with the lowest per capita disposal rate in 2010 was Nova Scotia at 389 kg per person. British Columbia, New Brunswick, and Ontario also disposed less waste per capita than the national average. The province with the highest per capita disposal rate was Alberta at 1,052 kg per person. Per capita waste disposal decreased between 2008 and 2010 for all provinces except Newfoundland and Labrador, Nova Scotia, and Saskatchewan¹².

Exhibit 3: Per Capita Disposal of Waste (Residential and non-Residential) by Jurisdiction 2008 and 2010¹³



Note(s): Percentages indicate changes between 2008 and 2010. Data for Prince Edward Island, Yukon, Northwest Territories, and Nunavut are not included in order to meet the confidentiality requirements of the Statistics Act.

Source(s): Statistics Canada, CANSIM tables 051-0001 and 153-0041 (accessed August 21, 2013).

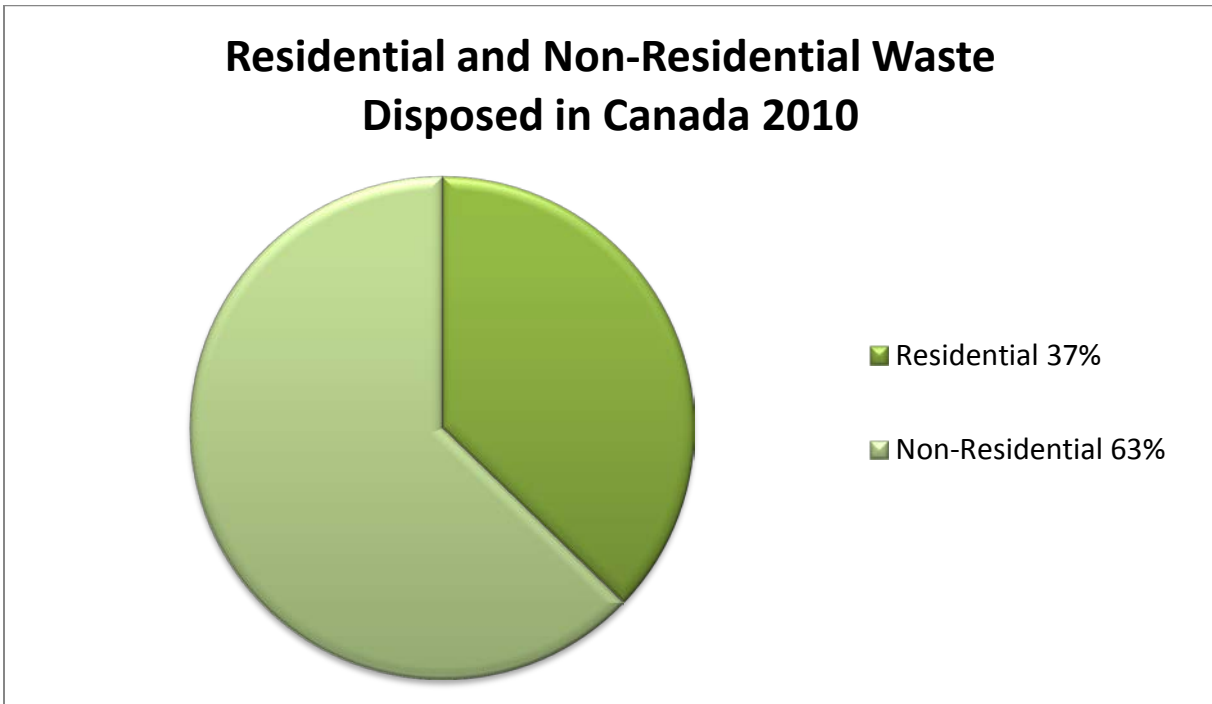
¹² Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

¹³ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

Residential and Non-Residential Waste Disposed Canada-Wide

The non-residential proportion of the waste disposed Canada-wide was 63% in 2010. The total disposal of residential waste decreased by 1% between 2008 and 2010 to 9.3 million tonnes¹⁴.

Exhibit 4: Residential and Non-Residential Waste Disposed in Canada 2010¹⁵



¹⁴ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

¹⁵ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

Residential and Non-Residential Waste Disposed by Jurisdiction

Across Canada, the total amount of non-residential waste disposed fell by 6% to 15.6 million tonnes in 2010. Québec, British Columbia, Alberta, and Ontario all contributed to the decrease. The amount of non-residential waste exceeded the amount of residential waste disposed in 2010 for all provinces examined. The difference is most notable in Alberta, where 75% of disposed waste came from non-residential sources¹⁶.

Exhibit 5: Residential and Non-Residential Waste Disposed by Jurisdiction 2008 and 2010¹⁷

	Residential sources ¹		Non-residential sources ²		All sources	
	2008	2010	2008	2010	2008	2010
Canada	9,350,354 ^r	9,256,540	16,557,113 ^r	15,627,006	25,907,467 ^r	24,883,546
Newfoundland and Labrador	200,918 ^r	x	179,257 ^r	x	380,176 ^r	394,235
Nova Scotia	148,060	145,589	206,171	221,657	354,231	367,246
New Brunswick	233,703	219,486	245,758	255,779	479,461	475,265
Québec	2,848,822 ^r	2,853,189	3,297,497 ^r	2,942,518	6,146,319 ^r	5,795,707
Ontario	3,231,399	3,204,264	6,400,160	6,043,151	9,631,559	9,247,415
Manitoba	400,297	388,683	545,144 ^r	562,929	945,441 ^r	951,612
Saskatchewan	289,760	283,726	613,182	653,541	902,943	937,268
Alberta	993,976 ^r	970,422	3,153,581 ^r	2,947,070	4,147,558 ^r	3,917,492
British Columbia	960,472	953,761	1,851,097	1,704,510	2,811,568	2,658,271

1. Residential non-hazardous waste disposal includes solid waste produced by all residences and includes waste that is picked up by the municipality (either using its own staff or through contracting firms), and waste from residential sources that is self-hauled to depots, transfer stations and disposal facilities.

2. Non-residential non-hazardous solid waste are those wastes generated by all sources excluding the residential waste stream. These include: industrial materials, which are generated by manufacturing, and primary and secondary industries, and is managed off-site from the manufacturing operation; commercial materials, which are generated by commercial operations, such as, shopping centers, restaurants, offices, and others; and institutional materials which are generated by institutional facilities, such as, schools, hospitals, government facilities, seniors homes, universities, and others. These wastes also include construction, renovation and demolition non-hazardous waste, also referred to as DLC (demolition, land clearing and construction waste). These refer to wastes generated by construction, renovation and demolition activities. It generally includes materials, such as, wood, drywall, certain metals, cardboard, doors, windows, wiring, and others. It excludes materials from land clearing on areas not previously developed as well as materials that include asphalt, concrete, bricks and clean sand or gravel.

Note(s): "r" Figures may not add up to totals due to rounding. Total amount of non-hazardous waste disposal in public and private waste disposal facilities includes waste that is exported out of the source province or out of the country for disposal. This does not include waste disposal in hazardous waste disposal facilities or waste managed by the waste generator on site.

¹⁶ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

¹⁷ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

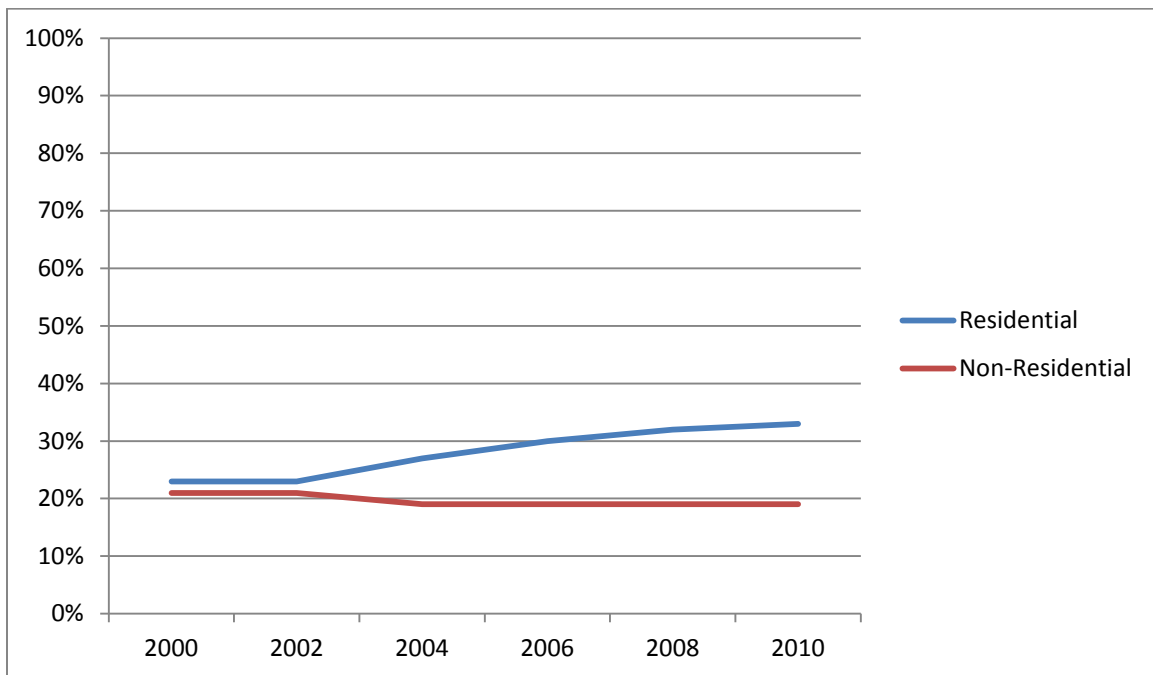
Residential and Non-Residential Diversion Rates Canada-Wide

The exhibit below shows that over the past decade the residential diversion rate has been climbing steadily across Canada while the non-residential diversion rate has remained fairly stagnant, and in fact has declined a small amount (2%) over the last ten years.

Exhibit 6: Residential and Non-Residential Diversion Rates 2000 to 2010¹⁸

	2000	2002	2004	2006	2008	2010
Non-Residential Diversion Rate	21%	21%	19%	19%	19%	19%
Residential Diversion Rate	23%	23%	27%	30%	32%	33%

Exhibit 7: Residential and Non-Residential Diversion Rates 2000 to 2010 as a Graph¹⁹



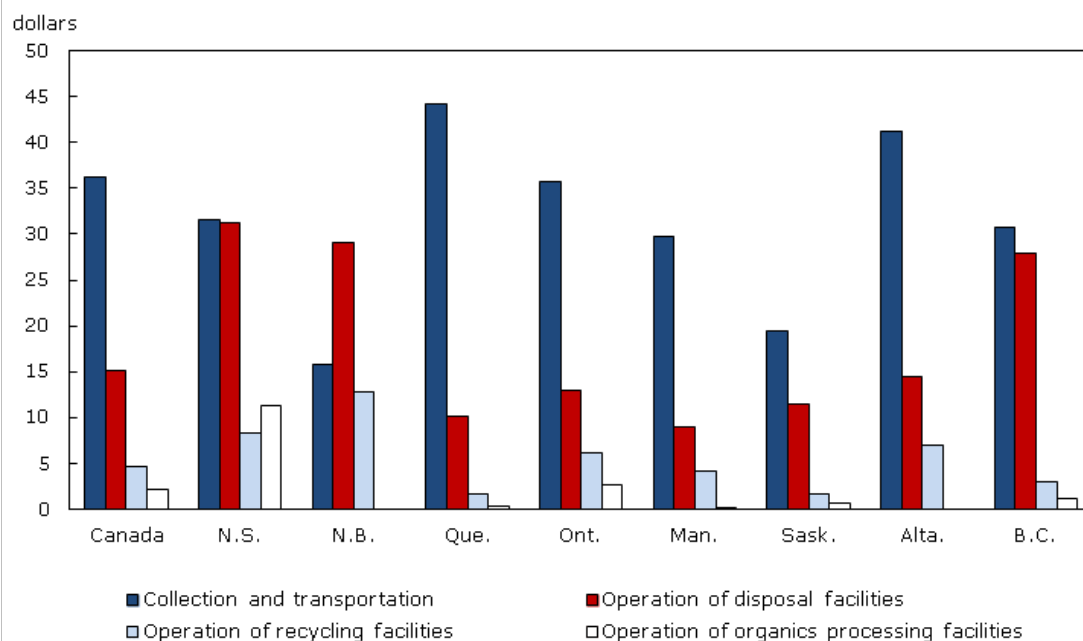
¹⁸ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

¹⁹ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

Local Government Expenditures on Waste

At \$2.9 billion, 2010 expenditures for local governments across Canada increased by 12% from 2008. Collection and transportation costs represent the largest portion of these expenditures, followed by the operation of disposal/processing facilities (\$517 million), and paying tipping fees (\$425 million). The largest increases between 2008 and 2010 were in contributions to landfill post closure and maintenance funds (\$93 million; up 60%). The only category with decreases in expenditures between 2008 and 2010 was the operation of transfer stations (\$146 million; down 13%)²⁰.

Exhibit 8: Municipal Government Per Capita Expenditures on Waste Disposal and Diversion, 2010²¹



Note(s): Data for Newfoundland and Labrador, Prince Edward Island, Yukon, Northwest Territories, and Nunavut are not included in order to meet confidentiality requirements of the Statistics Act. For the same reason, the government expenditures related to the operation of organics processing facilities for New Brunswick and Alberta are not included.

Source(s): Statistics Canada, CANSIM tables 051-0001 and 153-0045 (accessed August 21, 2013).

In 2010, local governments Canada-wide spent an average of \$15 per person on the operation of disposal facilities, \$5 per person on the operation of recycling facilities, and \$2 per person on the operation of organics processing facilities. The direction of public funds towards waste diversion varied amongst the provinces. For example, New Brunswick (\$13), Nova Scotia (\$8), Alberta (\$7), and Ontario (\$6) all spent more than the national average on the operation of recycling facilities per capita. Nova Scotia (\$11) and Ontario (\$3) spent more than the national

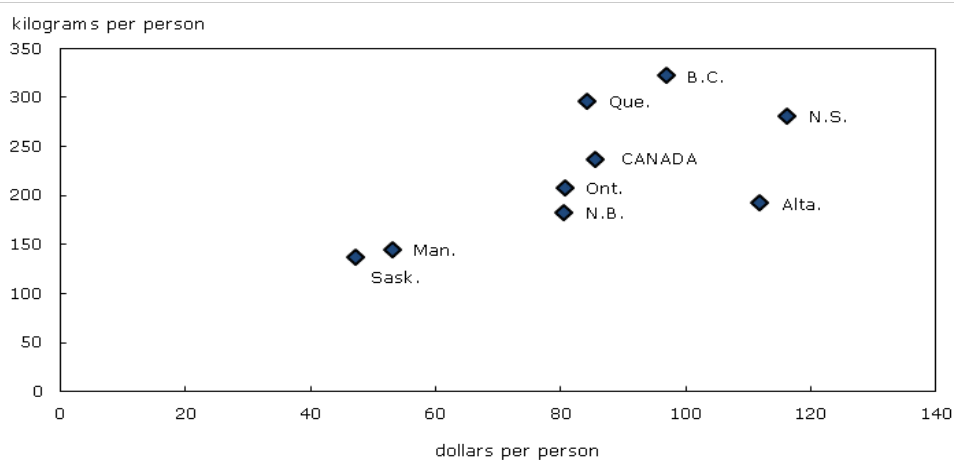
²⁰ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

²¹ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

average on the operation of organics processing facilities per capita²².

There is a relationship between money spent by governments and the proportion of waste that is ultimately diverted from disposal. Local governments in Nova Scotia, Alberta, and British Columbia had higher per capita operating expenditures for diversion than the national average of \$86 in 2010. British Columbia, Québec, and Nova Scotia all diverted more waste from disposal than the national average of 236 kilograms per person. Saskatchewan and Manitoba had the two lowest per capita current expenditures as well as the two lowest diversion rates in 2010. Total capital expenditures on the waste management industry by local governments totalled \$537 million in 2010, up by 9% from 2008. Alberta, British Columbia, Nova Scotia, and New Brunswick all surpassed the national average of \$16 per capita in capital expenditures²³.

Exhibit 9: Waste Diverted and Municipal Government Expenditures, 2010²⁴



Note(s): Data for Newfoundland and Labrador, Prince Edward Island, Yukon, Northwest Territories and Nunavut are not included in order to meet the confidentiality requirements of the Statistics Act.

Source(s): Statistics Canada, CANSIM tables 051-0001, 153-0043 and 153-0045 (accessed August 21, 2013).

²² Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

²³ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

²⁴ Statistics Canada, 2013. Waste Management Industry Survey, Business and Government Sectors 2010. Catalogue no. 16F0023X.

2.2 A Review of Policy Frameworks for Waste Management

A policy framework is the umbrella approach to waste management such as over-arching strategies, policies or legislation from which programs and initiatives are developed for waste reduction, reuse, waste diversion, energy recovery, or waste disposal.

Jurisdictional waste policy frameworks were reviewed to identify:

- If an overarching strategy or policy exists for waste;
- The extent to which the legislation/policy framework makes the connection to key upstream waste prevention objectives, such as the wider economic environment in which resources are extracted, transformed, and from which waste is generated, to the role of waste management in sustainable development;
- Whether the policy framework includes waste reduction or prevention initiatives;
- The extent to which the legislation/policy framework engages producer responsibility;
- The extent to which the legislation/policy framework includes the use of specific measurable targets for waste diversion or disposal;
- The reach of the legislation/policy with respect to the industrial-commercial-institutional (IC&I), and construction-renovation-demolition (CRD) sectors;
- If the legislation/policy framework promotes performance measurement and reporting.

The following exhibit presents a summary of the elements listed above by jurisdiction. This review reveals that there are a wide variety of policy frameworks in place across Canada for solid waste management. Some jurisdictions have a dedicated Solid Waste Management Strategy, while others have a Solid Waste Action Plan (which can mean the same thing), or a more generalized Sustainability Policy within which there is a solid waste goal or set of initiatives.

Exhibit 10: Waste Management Policy Framework – Summary of Provincial, Territorial and Federal

Policy Element	# Jurisdictions that Have the Policy Element in Place
Existence of an overarching waste management legislative framework, policy or strategy?	9 yes 3 pending
Does the policy include an upstream waste prevention or waste reduction vision?	6 yes
Does the policy include direction to follow an EPR approach?	10 yes
Is a numeric target included in the policy for waste <i>diversion</i> ?	3 yes
Is a numeric target/limit included in the policy for waste <i>disposal</i> ?	3 yes
Are specific strategies targeted at ICI wastes?	4 yes
Are specific strategies/policies targeted at CRD wastes?	5 yes 2 pending
Does the policy include indicators for monitoring and evaluation?	3 yes
Does the policy include parameters for reporting on progress?	7 yes
Does the policy include diversion or disposal targets for municipalities and if so are they monitored?	1 yes

The next exhibit presents a breakdown of this information by jurisdiction. In the first row the original date of the initiative is listed and any updates are identified with the more recent year in parentheses.

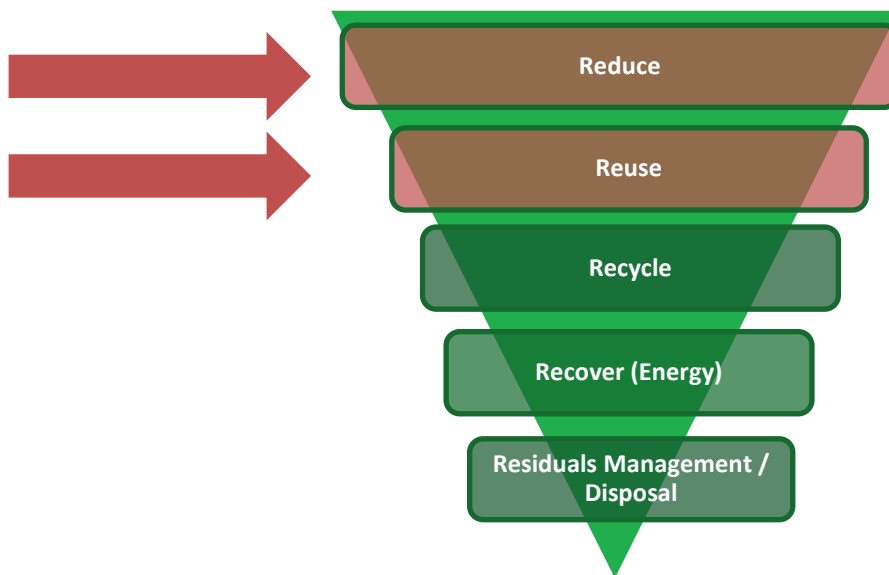
Exhibit 11: Waste Management Policy Review – Comparison Table of Provincial, Territorial and Federal Policies/Strategies

	BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	YT	NT	NU	Federal
Overarching policy /strategy for waste?	Act 2004	Strategy 2007	Strategy pending	Strategy 2012	Act (2002) Strategy 2013 pending	Policy 2011	Strategy pending	Action Plan 2001	Strategy 1995 (2011)	Strategy 2002	Action Plan 2010	Strategy pending	-	-
Does the policy include an upstream waste prevention or reduction vision?	Yes	Yes	-	Yes	Yes	Yes	-	-	Yes	-	-	-	-	-
Does the policy include direction to follow an EPR approach?	Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	-	-	-
Is a numeric target included for waste <i>diversion</i> ?	-	-	-	-	60% diversion for EPR programs	70% recycling 60% organics (2015)	-	-	50% by 2015 in 1995 Strategy	50% by 2020	-	-	-	-
Is a numeric upper limit included for waste <i>disposal</i> ?	-	648 kg/ per capita 2015-16 (target is set annually in business plan)	-	-	-	700 kg/capita (2015)	-	-	300 kg/capita (2015)	-	-	-	-	-
Are specific strategies targeted at ICI wastes?	-	-	-	-	(Yes pending)	Yes	-	-	Yes	-	-	-	-	-
Are specific strategies targeted at CRD wastes?	Planned for 2017	Yes	-	Yes	(Yes pending)	70% diversion (2015)	Pending	-	Yes	-	-	-	-	-
Does the policy include indicators for monitoring and evaluation?	-	-	-	-	Yes	Yes	-	-	Yes	-	-	-	-	-
Does the policy include parameters for reporting on progress?	Yes	Yes	-	Yes	Yes	Yes	-	-	Yes	Yes	-	-	-	-
Does the policy include diversion or disposal targets for municipalities and if so are they monitored?	-	-	-	-	-	-	-	-	Yes	-	-	-	-	-

2.3 Waste Prevention and Reduction-at-Source

Waste prevention and reduction refers to reducing the production of waste in the first place before it enters the recycling stream, energy recovery stream, or residuals disposal stream. Preventing waste means reducing the amount of waste generated, reducing the hazardous content of that waste and reducing its impact on the environment. Generating less waste means fewer natural resources are extracted and less energy is used in the production, distribution and consumption of products. It also means that less money has to be spent on recycling and disposal programs. Waste prevention and reduction involves the avoidance of waste generation, qualitative and quantitative reduction at source, and reuse of products²⁵.

Exhibit 12: Location of Waste Prevention and Reduction in the Waste Management Hierarchy



Examples include:

- *Upstream waste prevention at the manufacturing level:* Examples include: better environmental management practices during manufacturing to reduce waste during production; decreasing the need for raw materials by incorporating secondary materials; utilization of design-for-environment concepts so consumable products are produced with less packaging, or designed for durability with repairable features, not disposable.
- *Reducing or preventing waste from a consumer or commercial and institutional level (targeting the residential or ICI sectors):* Examples include: implementing bulk purchasing policies at the institutional level; implementing paper usage reduction policies at the institutional level, initiatives to limit purchases of single-stream or disposable products (e.g. plastic bags, disposable cutlery, etc.) or reuse programs.

²⁵ National Zero Waste Council Discussion Paper, February 2013
<http://www.metrovancouver.org/region/ZWCouncil/ZWCouncilDocs/ZWMCDiscussionPaper.pdf>

Note that the concept of Extended Producer Responsibility (EPR) is a policy approach in which a producer's responsibility (physical and/or financial) for a product is extended to the post-consumer stage of a product's life cycle. EPR intends to shift responsibility upstream in the product life cycle to the producer and away from municipalities. As a policy approach it intends to provide incentives to producers to incorporate environmental considerations in the design of their products. However, in practical application the concept of EPR in Canada has primarily translated into increased diversion activity since many producers pass the recycling program cost on to consumers at point of sale. For this reason, EPR programs are discussed in this report under Section 2.4 Waste Diversion initiatives instead of upstream waste reduction.

Jurisdictional Review of Waste Reduction Initiatives

A jurisdictional review of initiatives that target waste prevention and reduction at-source that are applied across Canadian jurisdictions was undertaken. These are presented below, but do not include those initiatives that are within a single municipality, or those that are implemented by a single company for example. Currently, seven out of fourteen jurisdictions have some form of waste prevention or reduction-at-source initiatives in place. These are summarized below, and presented with additional detail in the jurisdictional summaries in Section 3.

Exhibit 13: Waste Reduction Initiatives Currently in Place

British Columbia	Analysis: A report commissioned on the business case for zero waste is currently under review, and will help drive the Government's next steps and approach to waste prevention and management.
Alberta	Formal Agreement and Goal: The Government has a Memorandum of Understanding with three major retail associations to reduce the distribution of one-way plastic bags by 50% by Dec. 31, 2013. Disposal Target: the Government also sets annual per capita waste disposal targets.
Manitoba	Waste Reduction and Pollution Prevention Fund: Funding available to support waste reduction projects. Goal: Government sets goal to reduce the use of one-way plastic bags by 50% by 2015 and a beverage container recycling target of 75% by 2016.
Québec	Formal Agreement: The Government has an agreement with the ICI sector to reduce waste upstream at the manufacturing level. Disposal Upper Limit Max: The Government also sets annual disposal upper limit targets of waste disposal per capita which could help drive reduction activity.
Nova Scotia	Policy: The Government has a Sustainable Procurement Policy for government purchasing. Disposal Upper Limit Max: The Government also sets annual disposal upper limit targets of waste disposal per capita which could help drive reduction activity.
Yukon	Waste Reduction and Recycling Fund: Funding available to support waste reduction and recycling projects.
Northwest Territories	Goal: Government sets goal to reduce the use of one-way single-use bags (includes all single-use retail bags such as plastic, paper, biodegradable) by 75% (no year identified).

Remaining jurisdictions in Canada do not have jurisdiction-specific initiatives targeting waste reduction upstream.

Inter-jurisdictional Approaches in Canada

CCME worked with industry on a Canada-wide initiative to develop an industry-driven approach to reduce non-recyclable packaging, reduce greenhouse gas emissions, and increase recycled content in packaging. In order to measure success, industry commits to creating a baseline by 2014 to measure how much packaging is in the marketplace, by using best available data as well as identifying sources for new data. With this information, industry and government will

proceed with discussion of quantitative targets to reduce the environmental footprint of packaging through packaging optimization upon completion of baseline data.

The National Zero Waste Council established in 2012 by Metro Vancouver and the Federation of Canadian Municipalities (FCM) has embarked on a multi-stakeholder initiative to engage industry for waste prevention changes upstream, and to change consumer behaviour downstream to generate less waste. In their 2013 Discussion Paper they have conducted a jurisdictional policy scan of waste reduction initiatives internationally. They have observed that regulations that are overly prescriptive do not drive innovation to reduce waste upstream. Rather, Governments that establish clear public health and environmental objectives and limitations regarding the use of public funds for waste management demonstrate better results from businesses to address waste prevention upstream. This approach provides business an opportunity to drive innovation and develop feasible solutions that are not prescribed to them. They also observe that design change is *not* restricted to physical changes in a product or its packaging (e.g. using less material, making components replaceable or recyclable). Design changes can also be spurred through broader changes that create enabling conditions for preventing waste generation. Examples include changes in pricing, changes in the marketing of products including practice of bundling, and developing incentives, programs or services that enable consumers to share the use of products (e.g. tax reductions on car share programs, toy share programs, clothes or furniture reuse stores)²⁶.

Comparison with European Union Directives on Waste Prevention

Waste prevention and reduction has been given the highest priority under European waste management law. The *Thematic Strategy on the Prevention and Recycling of Waste* establishes waste prevention as a priority in the waste hierarchy. The *Thematic Strategy on the Sustainable Use of Natural Resources* makes the case for decoupling economic growth from resource use and adopting a life cycle approach to the sustainable management of resources. Policy makers in the European Union (EU) have begun to assess progress on these strategies and have found limited improvement has been made in transforming the objective of waste prevention into practical action. They conclude that prevention can only be achieved by influencing practical decisions taken at various stages of the product life cycle. A progress report establishes clear links between the performance of member states and the use of economic instruments. This finding has led to the launch of a new study to further assess how economic instruments can be more effectively used. In the EU, waste prevention and reduction is positioned as an economic imperative – necessary for a resource scarce society but one that opens up new business opportunities. The business case for both governments and the private sector in making this shift are well defined, with a focus on trying to identify the value of waste as a resource and the potential for sustainable management of materials to fuel innovation and job creation²⁷.

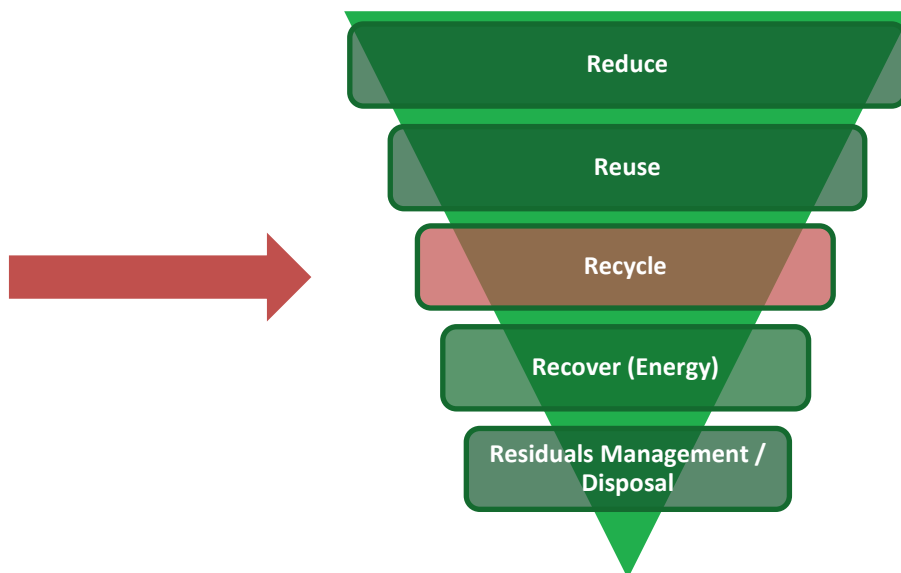
²⁶ National Zero Waste Council 2013 Discussion Paper
<http://www.metrovancouver.org/region/ZWCouncil/ZWCouncilDocs/ZWMCDiscussionPaper.pdf>

²⁷ National Zero Waste Council 2013 Discussion Paper
<http://www.metrovancouver.org/region/ZWCouncil/ZWCouncilDocs/ZWMCDiscussionPaper.pdf>

2.4 Waste Diversion: EPR, Product Stewardship, and Other Diversion Programs

For this report, the term “diversion” refers to the “recycle” aspect of the Waste Management Hierarchy, as noted with the arrow in the exhibit below. In this report, “composting” is also included in diversion as one way of recycling food waste without energy recovery (composting with energy recovery is presented in Section 2.5).

Exhibit 14: Location of Waste Diversion in the Waste Management Hierarchy



This section presents a summary of total diversion activity Canada-wide, information pertaining to the CCME Canada-wide Action Plan for Extended Producer Responsibility (CAP EPR) Phase 1 and 2 materials, as well as other diversion programs including voluntary industry programs and a summary of the status of composting Canada-wide.

Overview of Total Diversion

Diversion highlights from Statistics Canada²⁸ show that from 2000-2010 the total amount of waste diverted to recycling or organic processing facilities *increased* by 33%.

Exhibit 15: Quantity of MSW Diverted (Recycled and Composted)²⁹

	2000	2002	2004	2006	2008	2010	Long Term Change (2000 to 2010)
Tonnes (million)	6.1	6.6	7.1	7.5	8.3	8.1	+33%
Kg per capita	199	212	223	237	249	236	+19%
% diversion	21%	22%	22%	22%	24.3%	24.5%	+3.5%

²⁸ Statistics Canada, 2013. Waste Management Industry Survey: Business and Government Sectors, 2010. Catalogue no. 16F0023X.

²⁹ Statistics Canada Waste Management Industry Surveys 2000-2010.

Overview of CCME CAP EPR Phase 1 Materials for each Jurisdiction

The following table (overleaf) presents a Canada-wide overview of current and planned diversion programs to address the Phase 1 materials listed in CCME's CAP EPR.

Terminology Used:

- **Legislated EPR (E-L):** are programs in which manufacturers, brand owners and first importers are directly responsible for both the funding and the operation of the programs via legislation or regulations. This includes both operational programs and those to be implemented at a future date (i.e. regulations and/or legislation have been adopted).
- **Voluntary EPR (E-V):** are industry-led programs where manufacturers, brand owners and/or first importers have come together to provide a provincial or territorial or Canada-wide collection and recycling program for specific products that have reached their end-of-life. Governments have not regulated or otherwise mandated these EPR programs and are not involved with their operation. Such programs may report publicly, and in some cases are required to achieve performance targets and report publically via commitments made in memorandums of understanding. *(Please note that this inventory does not take into account initiatives led by individual manufacturers or retailers to collect end-of-life products.)*
- **Shared responsibility (S)** programs operated by governments (e.g. municipalities or other public agencies) but with varying degrees of producer responsibility and/or funding. They are commonly found in the areas of packaging and printed papers where municipalities provide collection and recycling services with substantial funding provided by producers, notably through a producer responsibility organization or an industry funding organization.
- **Product stewardship (P)** are programs in which manufacturers, brand owners and importers are neither directly responsible for program funding, nor for program operations. These are waste diversion initiatives funded by consumers or general taxpayers and are operated by public agencies or delegated administrative organizations. These programs may be mandated through legislation and regulations or may be voluntary. Producers may play an advisory role.
- **Pending:** programs or requirements for which regulations or legislation are being developed. The colour of the cell refers to the type of program or requirement. These are shaded in lighter colors.
- **Consider:** programs which are being considered by governments, subject to consultation. The designated colour of the cell refers to the type of program.
- Note that the term **Household Hazardous AND Special Wastes (HHSW)** is used in the table to facilitate presentation and denote a category where all these substances fit, but we recognize that the "special wastes" in some cases are from the ICI sector not residential, and that not all jurisdictions utilize this terminology. One term had to be selected for use in an aggregate table such as this to enable program presentation.
- If an entry is in parenthesis () then the program is only operated in part of the jurisdiction (but not yet jurisdiction-wide) and there is involvement by a jurisdictional authority.
- Initiatives that are indicated with a descriptor may not cover all of the materials listed in that material/ product category (e.g., includes oil filters and oil containers, but not used oil).

All EPR programs are shaded in blue cells.

Legislated EPR Program:

E-L

Voluntary EPR Program:

E-V

All shared responsibility programs are shaded in green cells with an S:

S

All Product Stewardship programs are shaded in orange cells with a P:

P

Exhibit 16: MSW Waste Diversion (EPR and Stewardship Programs) CAP EPR Phase 1 Materials

Material	BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	YT	NT	NU
Packaging - Milk Containers	E – V	P	E – V	S	S	S	P	E – V	S	(E – V)	consider	P	
Packaging - Beverage Containers	E – L	P	P	E – L	P liquor/wine	P beer & soft drinks	P	P	P	P	P	P	(P) liquor/beer
Multi-packaging and printed materials	E-L	consider	S	S	S	S	consider	consider	consider	consider			
Electronics - Audio-visual and Telecom	E – L	consider	E – L	E – L	E – L	E – L	E – L	pending	E – L	E – L	consider	consider	
Electronics - cell phones	E – L	E – V	E – V	E – L	E – L	E – L	E – L	E – V*	E – L	E – L	E – V consider P	E – V	
Electronics- computers, accessories and IT equipment	E – L	P	E – L	E – L	E – L	E – L	E – L	pending	E – L	E – L	consider	consider	
Electronics - tools	E – L	consider				consider	consider						
Electronics - TVs	E – L	P	E – L	E – L	E – L	E – L	E – L	pending	E – L	E – L	consider	consider	
HHSW- batteries	E – L	S*	E – V	E – L	E – L single use	E – L	E – V	E – V	E – V	E – V*			
HHSW- corrosives & irritants	E – L	S*	consider	E – L corrosives	E – L	consider	P		consider	consider			
HHSW- aerosols, solvents & flammables	E – L	S*	consider	E – L solvents & flammables	E – L	consider	P		consider	consider			
HHSW- mercury lamps, other mercury products	E – L	consider	consider	E – L	P	E – L	pending		consider	consider			
HHSW - paint	E – L	P	E – L	E – L	E – L	E – L	E – L	E – L	E – L	E – L			
HHSW -pesticides/ fertilizers & containers	E – L pesticides	E – V	E – V*	E – L	E – L	E – V	E – V	E – V	E – V	E – V			
HHSW-pharmaceuticals	E – L	E – V	E – V	E – L	E – L	E – V	pending	E – V	E – V*	E – V	E – V		E – V
HHSW- sharps/syringes			consider	E-L	E – L	consider	pending		E – V*	consider	E – V		
Automotive -batteries	E – L			E – L		consider	pending	E – V		E – V*			
Automotive -tires	E – L	P	P	E – L	E – L	P*	P	P*	P	P	P		
Automotive -used oil, oil containers and/or filters	E – L	P	E – L	E – L	E – L (containers and filters)	E – L	pending	E – L	P* (used oil)	P*			
Automotive -other (e.g. glycol)	E – L	consider	E-L	E – L	E – L	E – L	pending	E – L	consider	pending			

Notes: * = legislated EPR being considered; (P) = Deposit is charged territory-wide, collection depot only in Iqaluit. This inventory does not take into account initiatives led by individual manufacturers or retailers to collect end-of-life products. There is a national stewardship program for mercury switches (end-of-life vehicles, ELVs) as part of the federal notice to prepare and implement pollution prevention plans for mercury releases from ELVs processed by steel mills. Currently, there are no legislated EPR requirements at the federal level.

Packaging and Printed Paper (PPP)

Total PPP: Residential PPP recycling programs are widely established in urban areas across the country and in many jurisdictions almost all single family households are provided with either a curbside or depot recycling program (multi-unit buildings typically have recycling services within the building or access to a depot system in many jurisdictions). Most jurisdictions have depot service for rural and remote communities in northern regions of some provinces and also in the Territories (with the exception of Nunavut). PPP programs are usually operated and financed by governments (municipal, provincial, or territorial) but in two provinces a portion of the net program costs are paid by producers under a shared responsibility EPR program, and all of the costs paid by producers in one program. There are also two planned shared responsibility EPR programs underway, as noted below.

Exhibit 17: Shared Program Funding for PPP: % of Program Operating Costs Paid by Producers

	Current Programs			Planned Programs	
	Manitoba	Ontario	Québec	BC	Saskatchewan
% Net Costs by Industry	80%	50%	100%	100%	75%
Model	Municipality-Operated	Municipality-Operated	Municipality-Operated	Industry or Municipality-Operated (2014)	Municipality-Operated (2014)

The four Atlantic Provinces are actively engaged in reviewing the current operation and funding of PPP programs and are collaborating on the development of a common framework for the implementation of a packaging and printed material stewardship program across the region. BC is the only jurisdiction which has recently mandated a full EPR PPP producer-operated program where municipalities have the option of providing recycling services as a contracted service provider to an industry stewardship association. The transition is currently in the planning stages. The BC PPP model includes a wider array of packaging than conventional PPP programs have to date, including “streetscape” sources (sidewalks, parks etc.).

There are no comprehensive sources of data available for PPP diversion across jurisdictions. The most comprehensive PPP data that exists was from a 1996 10-year survey by CCME and Statistics Canada which targeted both the residential and ICI sectors. Final survey results, while now dated, covered 31 separate industry sectors of the economy and 32 different packaging material types. Two significant findings of the study were that over 70% of all packaging consumed in Canada was re-used or recycled; and that industrial recycling of packaging accounted for almost 75% of all packaging recycling³⁰.

A 2013 study by CM Consulting that investigated recycling access for PPP in the residential sector shows that there is very high access (either curbside or depot recycling) for glass bottles and jars (90%), Polyethylene terephthalate (PET) plastic bottles (95%), boxboard, newsprint and paper (90%), and cartons (78%). However, access to programs that recycle expanded

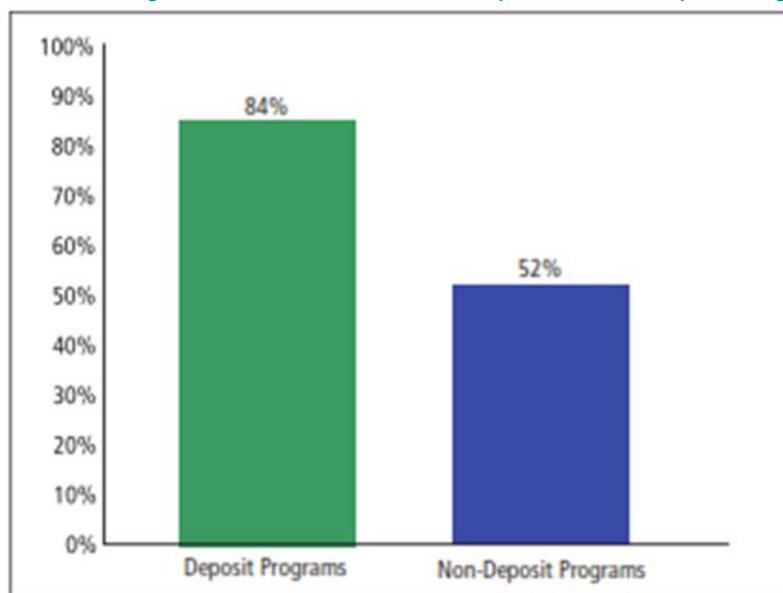
³⁰ CCME National Packaging Protocol 1996 Milestone Report, 1998.

polystyrene (EPS) is limited (30%)³¹.

Beverage Containers: With respect to beverage containers in particular as a sub-set of PPP, diversion programs operate in all provinces and in Yukon and Northwest Territories (Nunavut has a program for beer and liquor containers with one collection site in Iqaluit and a voluntary program for cans). In Ontario, only wine and liquor bottles are on deposit and as in other provinces the beer industry operates a deposit return system. Other beverage containers are managed through the municipal Blue Box recycling programs in Ontario. Only BC and Manitoba operate EPR programs for beverages. All other beverage programs operate on a product stewardship model.

In terms of deposit vs non-deposit beverage programs, the provinces of Manitoba and Québec have hybrid programs through which deposits cover some of the beverage containers and a parallel multi-material system collects the rest. Other jurisdictions operate a deposit program for all beverage containers. The following exhibit demonstrates higher collection rates for deposit programs.

Exhibit 18: Total Beverage Container Collection Rates: Deposit and Non-Deposit Programs, 2010³²



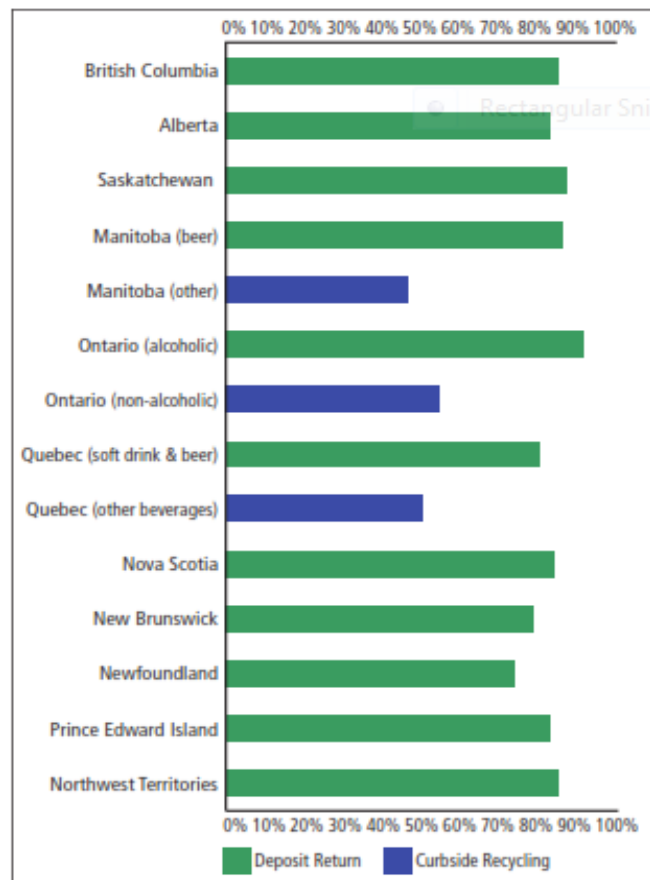
In the residential sector, Canadian provinces combined (territories not included) collect approximately 73%–75% of aluminum cans, 80%–83% of non-refillable glass, and 58%–62% of PET plastic beverage bottles for recycling. In total, including all the other container types, such as other plastic bottles, juice boxes, gable top containers, pouches, and bi-metal cans, Canadian provinces collected approximately 67% of all the non-refillable beverage containers sold in 2010. Refillable beer bottles continue to be collected at a rate of 98%, which brings the total

³¹ CM Consulting 2013. Recycling Access in Canada, published in Solid Waste Magazine Dec 2013/Jan 2014 issue.
³² CM Consulting, 2012. Who Pays What Report: An Analysis of Beverage Container Recycling in Canada.

collection rate for all beverage containers up to 72%. This rate is double that of the United States³³.

The following two exhibits present the jurisdictional collection rates of beverage containers for jurisdictions that have data for 2010. Deposit-return container programs consistently boast higher return rates than non-deposit container programs. In addition, depots provide an opportunity for economic benefit in remote and northern locations. For example, in Northwest Territories the beverage container program provided 12 full time jobs and 35 part-time jobs at depots and processing centres in 2011-2012³⁴.

Exhibit 19: Jurisdictional Collection Rates, All Beverage Containers, 2010³⁵



³³ CM Consulting, 2012. Who Pays What Report: An Analysis of Beverage Container Recycling in Canada.

³⁴ Government of Northwest Territories, Waste Reduction And Recovery Program 2011-2012 Annual Report.

³⁵ CM Consulting, 2012. Who Pays What Report: An Analysis of Beverage Container Recycling in Canada.

Exhibit 20: Jurisdictional Collection Rates, All Beverage Containers, by Material 2010³⁶

	BC	AB	SK	MB (beer)	MB (other)	ON (alcoholic)	ON (non-alcoholic)	QC (soft drinks & beer)	QC (other beverages)	NS	NB	NL	PE	NT
Aluminum Cans	89%	89%	92%	81%	48%	80%	57%	66%	-	86%	78%	67%	86%	88%
Non-Refillable Glass	93%	90%	87%	-	45%	88%	69%	77%	73%	82%	78%	64%	71%	82%
PET Bottles	78%	79%	83%	-	53%	48%	51%	70%	47%	82%	79%	74%	89%	85%
Other Plastics	78%	71%	83%	-	N/A	-	N/A	-	-	27%	79%	24%	12%	85%
Bi-Metal	66%	84%	N/A	-	N/A	-	62%	-	N/A	112%	-	55%	52%	37%
Gable / Tetra Pak	60%	65%	55%	-	20%	32%	N/A	-	43%	72%	79%	61%	48%	63%
Other	45%	-	-	-	0%	-	-	-	-	-	41%	-	-	-
TOTAL Non-Refillables	84%	82%	86%	81%	54%	82%	54%	68%	50%	79%	73%	65%	80%	84%
Refillable Beer	92%	97%	94%	99%	-	100%	-	98%	-	105%	102%	95%	95%	91%
TOTAL CONTAINERS	85%	83%	87%	87%	46%	91%	54%	80%	50%	84%	79%	74%	83%	85%

¹ Operating years vary: e.g., January 1 – December 31, 2010; April 1, 2010 – March 31, 2011; and May 1, 2010 – April 30, 2011.

Paper: The Paper and Paperboard Environmental Council (PPEC) of Canada estimated that the residential recycling rate for main paper packaging grades (corrugated and boxboard) in 2009 was 65% for the residential sector. Ontario had the highest residential paper packaging recycling rate (at 77%)³⁷. For the ICI sector, the PPEC has data that indicates that this sector is also recycling a high amount of paper products that are not accounted for – for example, just one large Ontario supermarket chain sends over half a million tonnes of corrugated boxboard direct to a recycling mill every year, but this tonnage is not counted in the Statistics Canada Waste Management surveys³⁸. It is also important to note that while most paper products are recyclable, sometimes they are just too far away from a recycling mill for recycling to be economically worthwhile. This is the case in the Territories and some northern or remote areas of provinces. Paper is readily compostable and is accepted in many composting programs (e.g. Nova Scotia, and PEI) as an alternative diversion option than recycling. Paper (cellulose) materials provide a good carbon source.

Plastic Bags: Often not included in the definitions for PPP, plastic bags are still another plastic-based waste stream that can be problematic, especially in coastal jurisdictions. In 2012, conclusions of a survey-based study³⁹ found that 61% of the residential sector in provinces (territories were not included in the study) had access to plastic bag (and in some cases, plastic film wrap) recycling through either curbside municipal recycling or depot based programs. In 2013, an update to the 2012 study found that when return to retail is considered, 93% of the residential sector in provinces (territories were not included in the study) had access to either the municipal or return to retail recycling channel (return to retail was defined as access if a resident was within 16 kilometers of a retail store that accepted plastic bags for recycling)⁴⁰.

³⁶ CM Consulting, 2012. Who Pays What Report: An Analysis of Beverage Container Recycling in Canada.

³⁷ Paper and Paperboard Environmental Council Factsheet 21-2011

³⁸ Paper and Paperboard Environmental Council, 2010. Special Report: The inconvenient truth about packaging waste in Canada.

³⁹ CM Consulting 2013. Canadian Population Access to Recycling of Plastic Shopping Bags and Other Polyethylene Plastic Film in Canada. Prepared for Canadian Plastics Industry Association.

⁴⁰ CM Consulting 2013. Canadian Population Access to Recycling of Plastic Shopping Bags and Other Polyethylene Plastic Film in Canada. Prepared for Canadian Plastics Industry Association.

Streetscape PPP: There are no provincial or territorial jurisdictions in Canada that currently require diversion of recyclables from public spaces such as parks, arenas, transit stops, bars and restaurants, elementary and secondary schools, convenience stores and gas stations, etc., Many regulations require municipalities to provide services to the residential sector only. This will be changing with the introduction of BC's new PPP program which will be the first program to require collection from public spaces. There are a variety of pilot projects that have taken place in municipalities in Canada, many of which have demonstrated positive results. For example, the city of Calgary had such a pilot project launched by the Alberta Beverage Container Recycling Corporation (ABCRC), Canadian Beverage Association (CBA) and Nestlé Waters Canada. The pilot project ran at Crossroads Market, Inglewood Business Revitalization Zone and Spruce Meadows. This project experienced an 89 % increase for the diversion of recyclables, including beverage containers. The pilot program targeted beverage containers typically constructed from two of the most valuable materials found in the waste stream – aluminum and PET plastic⁴¹. In Manitoba the Canadian Beverage Container Recycling Association has established a comprehensive program for beverage container recovery from public spaces to compliment the PPP program recovery.

Electronics and Electronic Products

All provinces, but not the territories, have programs to manage end-of-life electronics and electrical equipment (New Brunswick has released draft regulations and is expected to have an operational program in 2014). Alberta is the only jurisdiction using a product stewardship model; all others have legislated EPR programs. Cell phones are addressed either as part of the larger electronics program or as a separate voluntary program managed by industry (for more information see Voluntary Industry Programs in this section). BC and Québec have the most comprehensive list of designated electronics products in their programs. Northwest Territories is reviewing options for the management of electronic and electrical equipment while Yukon is considering amendments to its regulation that would create a stewardship program for these materials.

A provincial breakdown of the performance of end-of-life electronics products is presented in the following table using the Electronic Products Recycling Association (EPRA) suite of core performance indicators to measure the performance of each program that is a member of EPRA⁴². The table only includes data for the six most mature programs with data publicly available for 2012. The remaining programs are not included either because their collection programs have yet to launch, launched in 2013, or they do not have data readily available on a public website. There are not any Territorial programs that are members in EPRA at this time.

⁴¹ Solid Waste Magazine, Daily News Nov 19, 2013, Calgary pilot project boosts 'last mile' recycling.

⁴² <http://www.solidwastemag.com/news/calgary-pilot-project-spikes-last-mile-recycling-rate/1002736411/>
CM Consulting 2013. "The Canadian WEEE Report: Waste Electrical and Electronic Equipment Reuse and Recycling in Canada 2013".

Exhibit 21: Jurisdictional Summaries of End-of-Life Electronics and Electronic Products Diverted in 2012 ⁴³

Indicator	BC	AB	SK	ON	NS	PEI	TOTAL
Tonnes collected	21,963	15,768	3,425	75,702	4,719	605	122,182
Kilograms per capita	4.8	4.4	3.24	5.61	4.97	4.14	N/A
Collection sites	142	325	72	444	37	6	N/A
Collection events		94	24	228	2	1	N/A
Population awareness	75%	81%	87.5%	67%	79%	69%	N/A
Total Program Cost per Tonne	\$1,208	\$1,117	\$1,760	\$1,105	\$1,269	\$1,393	N/A

Household Hazardous and Special Wastes

Corrosives, irritants, aerosols, flammables and solvents

These are handled with little consistency between jurisdictions, although most provinces (but not the territories) have some form of diversion activity for these categories. In the case of solvents for example, BC, Manitoba, and Ontario have legislated EPR programs, Newfoundland and Labrador is planning an EPR program, and Saskatchewan, Québec, and Nova Scotia are considering an EPR approach. Alberta operates a shared program; PEI uses a product stewardship approach. There are no sources of comparable data to demonstrate performance of this category.

Consumer Batteries

Call2Recycle is a North American organization used for mandatory battery recycling programs in BC, Manitoba (and as of 2012, Québec). Information available for 2011 is presented below, comparing existing legislated programs (BC and Manitoba use Call2Recycle, Ontario operates an independent program). There is no publicly available information readily available for the other jurisdictional programs which include voluntary, shared, and product stewardship programs.

Exhibit 22: Key Indicators: Jurisdictional Summaries of Batteries Diverted from Disposal in 2011 ⁴⁴

Indicator	BC Call2Recycle (Rechargeable & Single Use)	MB Call2Recycle (Rechargeable & Single Use)	ON Orange Drop (Single Use only)
Tonnes collected	285	1	1,012
Kilograms per capita	0.065	0.011	0.079
Collection Points	1,569	338	1,351

For 2012, Québec's new program generated a 351% increase in collections in its first year of operation⁴⁵. In 2013, BC, Manitoba and Québec together collected 625 tonnes of alkaline and rechargeable batteries via Call2Recycle, an increase of more than 328%⁴⁶.

⁴³ CM Consulting 2013. "The Canadian WEEE Report: Waste Electrical and Electronic Equipment Reuse and Recycling in Canada 2013".

⁴⁴ CM Consulting 2012. *Managing Canada's Waste Batteries*.

⁴⁵ Call2Recycle 2012, Annual Report.

⁴⁶ Call2Recycle Press Releases, Unprecedented Success: British Columbia, Manitoba and Québec Municipalities Lead Canada's Battery Recycling Surge: Call2Recycle Canada Reports More than 328% Collection Increase in

For Ontario's 2012 data, tonnes of single-use batteries collected dropped to 845, representing a collection rate of 12% of single use batteries available for collection⁴⁷. Call2Recycle also operates voluntary programs across other jurisdictions in partnerships with retailers, see Voluntary Industry Programs page 33 of this report.

Mercury Containing Lamps and other Mercury Containing Products

BC, Manitoba, and Québec have legislated EPR programs for mercury-containing lamps; Ontario uses a product stewardship approach. Environment Canada is evaluating options for the end-of-life management of mercury-containing products. Other mercury-containing products such as thermostats are included in some HHSW programs and in many parts of the country are managed through the voluntary "Switch the Stat" program coordinated by the Heating Refrigeration and Air Conditioning Institute (HRAI). There is no performance data available for this category across jurisdictions.

Paint

The majority of jurisdictions have legislated EPR programs in place for paint or are planning to put such programs in place, while Alberta has a regulated product stewardship program. Paint programs can sometimes operate as part of a larger HHSW program and often collect a wide array of products such as varnishes, concrete paints and other specialty products from both the residential and commercial sectors.

There is no comparable performance data publicly available for this category across jurisdictions, although the same stewardship agency (ProductCare) is responsible for operating the paint recycling programs in BC, Saskatchewan, Manitoba, New Brunswick, and Newfoundland and Labrador. Annual performance reports on the ProductCare website⁴⁸ are jurisdiction-specific, there are no aggregate performance data available. Of these five jurisdictions, only three reported on the paint recovery rate (amount recovered for processing based on paint volume sold). For 2012, BC reported a 10.2% recovery rate of non-aerosol paint, Saskatchewan reported a 5.3% recovery rate, and Manitoba 3.4%. Québec's program reports total liters collected, while Ontario reports 73% of paint available for collection was diverted for recycling (NOTE: Ontario includes aerosols in this figure while other provinces separate it out, and other provinces report on the % of sales, while Ontario reports on the % "available for collection")⁴⁹.

Mandated Provinces. Toronto, November 14, 2013. www.call2recycle.ca/unprecedented-success-british-columbia-manitoba-and-Québec-municipalities-lead-canadas-battery-recycling-surge/#sthash.IMssZkyt.dpuf

⁴⁷ Stewardship Ontario website, accessed December 2013 <http://www.stewardshipontario.ca/about-us/performance-accountability/stewardship-ontario-by-the-numbers/>

⁴⁸ ProductCare website <http://www.productcare.org/>

⁴⁹ Stewardship Ontario 2012, Annual Report. http://www.stewardshipontario.ca/wp-content/uploads/2013/06/SO_2012AR_WEB.pdf

Pharmaceuticals and sharps

Almost all jurisdictions manage waste pharmaceuticals through either mandated EPR programs or rely on the voluntary take back program managed by Canadian Health Stewardship Association. Sharps are included in programs in Ontario (legislated EPR), voluntary EPR programs operate in Nova Scotia and Yukon. Manitoba is planning a legislated EPR program for sharps. In remaining jurisdictions, there may be some municipal or pharmacy take-back programs operating, but nothing formally operating jurisdiction-wide. There is no comparable performance data available for this category across jurisdictions.

Automotive Products

Used oil/containers/filters

All provinces and territories classify used oil as hazardous waste under their respective legislation, which prohibits their disposal to land. Used oil is not allowed as a dust suppressant on roadways in nine provinces (Alberta is the exception – as long as the Guidelines for the Application of Used Oil to Road Surfaces is adhered to) and all territories. All provinces and territories prohibit open burning of used oil and regulate its use as a fuel⁵⁰.

Programs to collect manage used oil, containers and filters are well established in most provinces but not in the territories. A legislated EPR approach is used in BC, Saskatchewan, Manitoba, Ontario (containers and filters only), Québec, and New Brunswick. With respect to the used oil collection gap for Ontario, the province encourages used oil collection and prohibits used oil disposal in landfill, open burning, or other non-authorized uses via legislation⁵¹. Alberta, Nova Scotia, and Newfoundland and Labrador use a product stewardship model to require used oil collection (Nova Scotia's approach only includes oil, they are considering expansion). PEI does have used oil regulations in place to require collection and proper disposal as hazardous waste – this approach targets the commercial retail sector, rather than residential and do not involve stewards since the province does not have a significant steward base located in PEI.

In Yukon, under the Special Waste Regulations, a permit is required for: generating or handling over 20 L of used oil; burning used oil; disposing of or storing used oil; mixing used oil with other substances; or collecting used oil from other waste generators. Used oil recovery in the Northwest Territories and Nunavut is encouraged but not mandated. Some Nunavut communities have programs for collection and storage⁵².

⁵⁰ Environment Canada, 2011. Follow Up on the Final Decision on the Assessment of Releases of Used Crankcase Oils to the Environment.

⁵¹ Environment Canada, 2011. Follow Up on the Final Decision on the Assessment of Releases of Used Crankcase Oils to the Environment.

⁵² Government of Yukon, Special Waste Regulations, website accessed December 2013
http://www.env.gov.yk.ca/air-water-waste/documents/sw5_oil_2011.pdf

In 2004, the companies (wholesalers and first sellers of lubricating oil products) that were members in the first five provincial used oil materials recycling associations (British Columbia, Alberta, Saskatchewan, Manitoba, and Québec) formed one Used Oil Management Association which allows for consistent data reporting across these five programs (note: both product stewardship and EPR approaches are used in this harmonized association). These associations are responsible for facilitating and increasing the collection, management and recycling of used oil material which includes used oil, used filters, and used oil containers. Of these five jurisdictions, Québec is the only province or territory with recovery and reclamation targets set out in their regulations. In Alberta some plastic containers are being collected that are not officially part of the program (i.e. windshield washer containers). Performance information available for these five programs and Ontario's containers and filters collection is presented below in Exhibit 23. Similar information is not available for the other programs at this time.

Exhibit 23: Reported Recovery Percentages for the Used Oil Management Associations from BC, Alberta, Saskatchewan, Manitoba, Québec, and Ontario⁵³

Association	Used Oil	Used Oil Filters	Used Oil Containers
British Columbia Used Oil Management Association (2012)	73%	87%	87%
Alberta Used Oil Management Association (2012)	82%	94%	92%
Saskatchewan Association for Resource Recovery Corporation (2012)	78%	85%	76%
Manitoba Association for Resource Recover Corporation (2012)	77%	79%	53%
Société de gestion des huiles usagées (2012)	94%	83%	95%
Ontario (Stewardship Ontario's MHSW Program - 2012)	-	98%	87%

Glycol

Glycol is increasingly managed in the same way as used oil, as part of the used oil, container and filter programs with the same responsible producers. Alberta, PEI, Nova Scotia, Yukon, Northwest Territories, and Nunavut currently have no explicit diversion program for glycol. There is no consolidated information source that collects and presents comparable performance data for this category across jurisdictions.

Tires

BC, Manitoba, and Ontario have mandated EPR for the end-of-life management of tires. The rest of the provinces use a product stewardship approach with Québec and Nova Scotia considering an EPR approach for this material. There is a territory-wide program operating in

⁵³ Ontario data not reported from a used oil association in Ontario. Ontario data is from Stewardship Ontario's 2012 Annual Report for the MHSW program. All other data presented in this table from the Used Oil Management Association website, accessed December 2013 <http://usedoilrecycling.com/en>

Yukon, but not the other territories. There is a Canada-wide association for the various tire recycling agencies and companies located across the country, called the Canadian Association of Tire Recycling Agencies (CATRA). CATRA's goal is to continually enhance the effectiveness of scrap tire diversion and recycling across Canada. There is no consolidated information source that collects and presents comparable performance data for this category across jurisdictions. Some jurisdictions have performance data on their websites in annual reports for diversion programs but reporting metrics used vary between reporting in tonnages of rubber collected or in absolute terms, i.e. number of tires collected. Some did not have this information publicly available at all.

Lead Acid Batteries

These are commonly regulated through environmental protection legislation and end of life management is usually driven by the value of lead as a secondary material. The average vehicle lead acid battery had a commodity value of between \$5 and \$15 depending on the proximity to a smelter in 2011⁵⁴. BC and Manitoba have regulated lead-acid batteries under EPR, and in New Brunswick the Canadian Battery Association (CBA) and the New Brunswick Government signed a Memorandum of Understanding (MoU) to start a Stewardship Program for lead-acid batteries in 2014. PEI is considering an EPR approach. In all other provinces lead acid batteries are managed through the secondary materials market without government or producer involvement, and some provinces (e.g. Nova Scotia) have banned automotive batteries from disposal.

The CBA's goal is a Canada-wide Stewardship Program from coast-to-coast-to-coast. The CBA 2011 Annual Report on its Stewardship Activities indicates that recovery rates for lead-acid batteries in Manitoba and BC exceeded expectations⁵⁵. In Manitoba, 2011 data revealed 7,479,000kg collected, which is a collection rate of 143%. In BC, 2011 data revealed 12,575,000kg collected, which is a collection rate of 80%⁵⁶. There is no data on performance of recycling initiatives in other jurisdictions. End-of-life lead-acid batteries are considered Dangerous Goods under the Federal *Transportation of Dangerous Goods Act* and designated as hazardous wastes under some provincial regulations. The CBA ensures that recycling programs are developed to meet both federal and provincial (or Territorial) requirements. In 2012 the CBA was developing: better estimates of sales and collection data on a Province-by-Province basis, and, an awareness program for the ICI sector.

A 2009 Environment Canada study⁵⁷ estimated that in 2007, 10.3 million lead acid batteries were sold in Canada representing 209,000 tonnes of material. Of these, 5 million units were estimated as going into passenger vehicles, 4.9 million into commercial vehicles and 349,000 into motorcycles. The study projected that by 2015 an estimated 11.5 million lead acid batteries would be sold in Canada representing 231,000 tonnes.

⁵⁴ Canadian Battery Association 2011. Annual Report.

⁵⁵ Canadian Battery Association website, accessed December 2013 <http://canadianbatteryassociation.ca/>

⁵⁶ Canadian Battery Association 2011. Annual Report.

⁵⁷ Environment Canada, Battery Recycling in Canada 2009: Update <http://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=52DF915F-1&offset=7&toc=show>

CCME CAP EPR Phase 2 Materials

The following series of tables present an overview of the status of Phase 2 Materials: Construction, Renovation, and Demolition (CRD) waste, carpets and textiles, mattresses, and appliances. If a jurisdiction has had some diversion activity in this material stream there is a “check mark” indicated (if the checkmark is in parenthesis, activity is only being considered in a preliminary way and is not a jurisdiction-wide program). A discussion of each material follows.

Construction Renovation and Demolition (CRD)

Looking at this sector as a whole, some progress has been made across Canada: the sector has increased the volume of CRD diverted from disposal by over 30% in a 10 year period, largely due to a variety of municipal outreach initiatives to the private sector.

Exhibit 24: Quantity of CRD Waste Diverted from Landfill 2000-2010 Canada-wide ⁵⁸

	2000	2002	2004	2006	2008	2010	Long Term Change (2000 to 2010)	% Change
Tonnes	494,683	645,931	848,197	715,364	720,076	653,255	+158,572	+32.06

In 2007, the Recycling Council of Ontario published a Canada-wide study which found that limited provincial guidelines exist to target this sector and that most CRD diversion effort occurs at the municipal level⁵⁹. As of 2013, there are still no mandatory provincial or territorial diversion programs for CRD wastes. However, the following exhibit indicates which jurisdictions are starting to implement new CRD waste initiatives – either voluntary industry initiatives, or in some cases a jurisdiction-wide strategy is being implemented. Descriptions of initiatives follow the table.

Exhibit 25: Overview of New CRD Diversion Initiatives Jurisdiction-wide

Canada-wide	BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	NU	NT	YT
✓ Industry outreach Guidance	✓ 2017 EPR	-	-	✓ Strategy	-	✓ 2015 Targets	-	-	✓ Diversion credits	-	-	-	-

Canada-wide voluntary industry initiative (1): Construction Resources Initiative (CRI) Council is a non-profit industry group with a vision to eliminate CRD wastes sent to landfill across Canada by 2030. The initiative aims to motivate all decision makers on the building and product design, construction practices, purchasing, policy, operations and maintenance, to base their decisions on resource efficiency and reduce CRD waste to landfill with the following targets: 35%

⁵⁸ Statistics Canada Waste Management Industry Surveys 2000-2010.

⁵⁹ Recycling Council of Ontario, 2007. Let's Climb Another Molehill: An Examination of Construction, Demolition and Renovation Waste Diversion in Canada and Associated Greenhouse Gas Emission Impacts.

diversion by 2015; 50% by 2020; 75% by 2025, and 100% by 2030. CRI advocates that, although government policies can target the end of the lifecycle and restrict access to landfills, a more effective approach is to complement these regulations or policies with strong industry actions that provide a cost-effective means to easily source-separate and reuse or recycle on-site. Mission 2030 is an Official Partner of the United Nations Environment Programme's Global Partnership on Waste Management & Architecture, and is now listed in the United Nations Environment Programme's Sustainable Consumption and Production Branch Initiative as part of the 10 Year Forward Program resulting from Rio+20⁶⁰.

Canada-wide voluntary industry initiative (2): The Canadian Standards Association has developed a "Deconstruction" standard for existing buildings (CSA Z783). This Standard specifies minimum requirements for procedures connected with the deconstruction of buildings at the end of life - the standard applies to existing buildings. This Standard does not address procedures for assessing the suitability of deconstruction components or materials for reuse.

Federal Government: Canada Mortgage and Housing Corporation (CMHC) has published guidance on CRD diversion best practices. Public Works and Government Services Canada together with Environment Canada produced a guidance document for environmentally-responsible CRD practices⁶¹. Environment Canada is undertaking a comprehensive study of CRD waste across Canada; this work will quantify CRD waste that is currently generated, recovered, and disposed and identify recycling and disposal methods and facilities by province/territory. Results are anticipated in 2015.

BC: Some municipalities have CRD landfill bans, tipping fee incentives, facility licensing or other diversion measures. The Ministry of Environment's Service Plan targets comprehensive coverage of the products in all subcategories of the CAP EPR, which includes CRD by 2017/18. An example of a municipal initiative in this jurisdiction is Metro Vancouver, a municipality that has a current ban in effect for gypsum drywall from landfill, and plans to ban wood waste by 2015 once a series of wood waste drop off depots are established throughout the region. The regional municipality developed a CRD toolkit for businesses, and a sample municipal bylaw for members to use to encourage CRD recycling - the bylaw could be customized as needed.

Alberta and Saskatchewan: Some municipalities have differential tipping fees to divert CRD waste and some have CRD recycling or reuse facilities (e.g., Saskatoon). An example of a municipal initiative in Alberta is the City of Edmonton which opened a voluntary CRD recycling facility in 2012 that accepts and segregates wood, drywall, asphalt shingles, flooring material, asphalt and concrete below 80 cm for \$60/tonne. Pre-sorted loads of wood, asphalt and drywall are charged \$40/tonne, while there is no charge for segregated concrete. The City of Calgary charges \$70/tonne for regular CRD waste disposal at municipal landfills but the rate jumps to \$145/tonne for concrete, wood or other easy-to-recycle materials.

⁶⁰ CRI Council 2013. Mission 2030 – Creating Sustainable Building Industry Change

⁶¹ PWGSC 1999. *The Environmentally Responsible Construction and Renovation Handbook*. Website accessed Oct 2013 <http://www.tpsgc-pwgsc.gc.ca/biens-property/gd-env-cnstrctn/page-1-eng.html>.

Manitoba: Funding for CRD diversion projects is available from the provincial Waste Reduction and Pollution Prevention (WRAPP) Fund. The TomorrowNow plan identifies CRD as a priority waste stream for action.

Québec: The 2011-2015 Action Plan of the Residual Material Management Policy has two targets for CRD waste: to recycle or otherwise reclaim 80% of concrete, brick and asphalt waste (from infrastructure projects such as bridges, sidewalks, etc.) and source separation of 70% for CRD materials from the building sector by 2015 (including residential, ICI buildings). Quebec has indicated its intention to review a possible EPR model for waste asphalt shingles and gypsum wall board.

Nova Scotia: The Resource Recovery Fund Board (RRFB) has sponsored R&D studies related to CRD: 1) drywall scrap from new construction to centralized composting, 2) processing drywall waste with biosolids, 3) asphalt shingles as an additive to hiking trails, 4) mixing wood waste with wallboard to produce animal bedding, 5) developing efficiencies by introducing asphalt shingle flake into cement, and 6) cost analysis of dismantling versus demolition. The government has a goal of working with the building and renovating community to develop best practice guidance on CRD. In addition, the province identified CRD as a priority for diversion and they have demonstrated this priority through the provision of diversion credits (funding) to municipalities based upon their diversion performance for a list of materials including CRD. An example of a municipal initiative in this jurisdiction is the 2001 Halifax Regional Municipality (HRM) by-law “Respecting Licensing of Construction and Demolition Materials Recycling and Disposal Operations” which requires all CRD materials to be transported from the place of generation to either a transfer station or a CRD processing facility. The by-law has recycling targets and prohibits CRD materials from remaining onsite at a CRD Processing Facility longer than one year. HRM has a by-law requiring that 75% of the CRD debris received at registered sites must be diverted. They also have a flow control by-law to control the export of CRD debris to other municipalities.

Ontario: Ontario’s 3Rs regulations (1994) require the completion of a waste audit and source separation for large construction projects over 2,000 m², but there are no specific diversion requirements. There are some voluntary private sector initiatives underway in Ontario, however. The Aggregate Recycling Council of Ontario has brought forward a private members’ bill, the proposed *Aggregate Recycling Promotion Act*, through which would encourage contractors to use recycled aggregate that can be sourced from old concrete recovered from the demolition activities when bidding on public construction projects.

Carpet

An estimated 230 to 270 million kilograms of waste carpet is generated in Canada annually⁶². Carpets can be reused, recycled, and recovered for energy (carpet has value in cement kilns in that it has calcium carbonate, an ingredient in cement). In terms of recycling, nylon and polypropylene fibres have value for recycling, while polyethylene fibres are currently a challenge for the sector to find a secondary market. The Canadian Carpet Recovery Effort (CCRE) has identified key market solutions to facilitate greater diversion of carpets: 1) a corporate commitment to green procurement and waste diversion; and 2) municipal policy support by not allowing residential disposal of carpet at curbside. CCRE is watching the California carpet stewardship plan evolve to identify any future trends with design for recyclability in mind as the program matures.

Exhibit 26: Overview of (Potential) Carpet Diversion Initiatives Jurisdiction-wide

Canada-wide	BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	NU	NT	YT
√	-	-	-	-	(√)	(√)	-	-	-	-	-	-	-

Canada-wide voluntary industry initiative: CCRE launched in 2010 as an industry-led voluntary initiative. They have submitted an expression of interest to the Ontario Minister of Environment and have been actively engaged in promotion and education for carpet diversion in various provinces. CCRE has identified the ICI sector as the most potential for carpet diversion since the carpet fibres used in ICI buildings are often nylon-based so the technology exists to recycle this type of carpet, and because the ICI sector generates large homogenous volumes at one time when replacements are done on entire floors of buildings. This provides a cost-efficient opportunity to consolidate and ship material for recycling. CCRE has been working with the Region of Peel as well as Home Depot to establish programs for carpet collection and they have one recycling facility in Ontario. Since 2012, the Region of Peel has been sending 35 tonnes of carpet for recycling each week. The municipalities of Toronto and Vancouver are also looking to establish carpet recycling programs.

Ontario: carpets have been identified for potential future EPR programs as part of the *draft* Waste Reduction Strategy. Some municipalities are pilot testing carpet recycling with CCRE.

Québec: Carpets are being evaluated as a potential EPR candidate.

Nova Scotia: The province has been active in supporting graduate student research in these areas. In 2010, the RRFB sponsored an R&D study on recycling of waste carpet. Nova Scotia hosted a carpet symposium in 2012. No indication of next steps as of yet.

⁶² Canadian Carpet Recovery Effort, presentation to the Recycling Council of British Columbia, http://rcbc.bc.ca/files/u7/con2012_JosephHall.pdf

Textiles

No Canadian jurisdictions were identified as having province or territory-wide diversion programs for textiles at this time. There is an informal recycling system for textiles in many municipalities in Canada through charitable organizations, although there is no Canada-wide data available on how many participate or what volumes are collected for recycling. The informal recycling system utilizes clothing drop bins either through charitable organizations or through textile recyclers directly. Approximately 10-20% of donated textiles are sold at storefront locations, and then the charity generates additional revenue by selling the remaining materials to rag brokers, or foreign or domestic rag graders. Textile recyclers grade and sort mixed post-consumer textiles to recycle into wiping materials and used clothing markets – both in North America and abroad, where nearly 100% of donated textiles are recycled.

Informal textiles recycling organizations exist in many jurisdictions across Canada. A waste audit conducted by RRFB in Nova Scotia indicates there is over 25,000 tonnes of textiles and footwear in the MSW stream (11% to 16% of materials in Nova Scotia landfills are textiles)⁶³. RRFB has conducted waste characterization studies that examined volumes of textiles also, and a textiles recycling symposium was held in 2013. No indication of next steps as of yet.

The Secondary Materials and Recycled Textiles Association (SMART) of the United States estimates that only 15% of used and unwanted textiles are being diverted from the waste stream for recycling purposes in North America. They also cite a new trend: more than a dozen local governments, including in the states of Arizona, Massachusetts, New Jersey, Pennsylvania and Washington have begun curbside pickup of textiles, often in special bags next to bins containing paper and cans. New York City has put clothing collection bins in nearly 250 apartment buildings in the last two years. SMART says there is a strong international market for used clothing⁶⁴. However, concern has occasionally been raised about the end markets for such textiles in developing countries and specifically by developing countries concerned about the possible negative impacts of textile imports on their domestic markets.

There is no data available on footwear disposed or recycled for any jurisdiction in Canada. This material would be problematic for EPR programming because of the thousands of brands and manufacturers selling into the Canadian marketplace.

Another item with textiles, plastics, and metal components combined are children's car seats which must be disposed upon reaching their expiry date. There are no recycling programs for these products in Canada; however there are only ten manufacturers so this product might be a candidate for EPR programming as a sub-set within the textiles category.

⁶³ RRFB website, news <http://www.rffb.com/news.asp?id=52>

⁶⁴ Secondary Materials and Recycled Textiles Association website
<http://www.smartasn.org/consumers/lifecycleofrags.pdf>

Furniture

No Canadian jurisdictions were identified as having province or territory-wide diversion programs for furniture at this time. Reusable furniture is commonly collected by charitable organizations from residential donors for no charge and resold in used furniture stores. However, there is no data available on discarded furniture disposed in landfills in any jurisdiction.

Mattresses

Generally, most provinces and territories deal with end-of-life mattresses in a similar way. If the materials are not diverted through the existing informal reuse infrastructure then the materials are disposed of at MSW disposal facilities (typically landfills). Some large mattress retailers voluntarily collect and recycle end-of-life mattresses when a new mattress is delivered. Mattress recyclers exist in BC, Alberta, Ontario, and Québec. Industry mattress recyclers estimate that only 7% of used mattresses are being recycled in Canada⁶⁵. Some municipalities have started to ban from landfills large bulky items like mattresses. Once local recycling infrastructure was established in 2008, Metro Vancouver implemented a mattress landfill ban in 2012⁶⁶. Québec has included mattresses in its evaluation of potential EPR candidate products.

In 2009, the RRFB of Nova Scotia sponsored an R&D study on recycling used mattresses. There is no indication of next steps as of yet. Bulky items, including mattresses, have been identified for potential future EPR programs as part of Ontario's *draft* Waste Reduction Strategy. No indication of next steps as of yet.

Although there is no legislated EPR yet in place in Canada for mattresses, an initiative in California will be worth watching to determine its applicability in the Canadian context. In 2013 the State of California became the first state in the United States to announce the implementation of an EPR program for mattresses. The EPR program will be operated by an industry group, and will be financed by a still-to-be-determined fee paid by consumers. The concept is similar to existing programs for paint, tires and electronic waste⁶⁷.

⁶⁵ Solid Waste Recycling Magazine, Oct/Nov 2013 Edition "Soft and Firm Markets – the Slow Road to Recycling Best and Carpets in Canada". Article by David Neseth. <http://www.solidwastemag.com/issues/de.aspx>

⁶⁶ Metro Vancouver website, <http://www.metrovancouver.org/region/dialogues/Reports%20and%20Issue%20Summary%20Notes/Construction-Demolition-Waste-WSK-Summary20110428.pdf>

⁶⁷ Saskatchewan Waste Reduction Council, <http://www.saskwastereduction.ca/blog/in-the-news/2013/10/14/california-first-state-to-have-mattress-recycling-law/>

Appliances

Exhibit 27: Overview of (Potential) Appliance Diversion Initiatives Jurisdiction-wide

Canada-wide	BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	NU	NT	YT
√	√	(√)	-	√ Micro waves only	(√)	(√)	-	-	-	-	-	-	-

Canada-wide voluntary industry initiative: The Canadian Appliance Manufacturers Association (CAMA) established a national stewardship agency (Canadian Electrical Stewardship Agency).

Federal: Environment Canada is developing a P2 Pollution Prevention Planning Notice under CEPA 1999 to have industry manage recovered halocarbon refrigerants. The P2 Notice will not include halocarbon refrigerants recovered in the mobile sector and in domestic appliance hulks. The federal government controls production, import and export of bulk ODS, while the provincial/territorial governments are responsible for control of use, emissions, recovery and recycling as well as disposal/destruction of ODS⁶⁸.

BC: EPR program for small appliances was implemented in 2011. EPR program for large appliances was implemented in 2012.

Alberta: Small household appliances are included under the *proposed* expansion of the electronics program.

Manitoba: Microwaves are currently captured under the electronics EPR program. There are no plans identified for EPR for other appliances at this time.

Ontario: Bulky items, including appliances, have been identified for potential future EPR programs as part of the *draft* Waste Reduction Strategy.

Québec: The 2013-2020 Climate Change Action Plan calls for the application of EPR to refrigeration, freezer and air conditioning equipment by 2014.

Other than noted above, in all other jurisdictions appliances are commonly set aside at landfills for ultimate scrap metal recovery. A well-established informal recycling industry exists in most parts of Canada to manage the hulks of large appliances at end-of-life for the scrap metal value. The territories and some remote locations are distant from this informal sector and generally store large appliances at their end-of-life at disposal facilities.

⁶⁸ Kelleher Environmental and Marbek. Feasibility Assessment: Application of EPR to Phase 2 Materials. 2010.

Other Diversion Programs - Composting

Composting in this section of the report refers to the recycling of organic matter by degrading materials to generate compost – a nutrient rich soil amendment⁶⁹. Canada-wide, organics composting (of food and leaf/yard waste) has seen a 125% increase in diversion over the last decade. In most jurisdictions this is a result of significant efforts by municipalities, who are at the front lines of diversion issues due to decreasing landfill space.

Exhibit 28: Quantity of Organics Diverted from Landfill in Canada 2000-2010 ⁷⁰

	2000	2002	2004	2006	2008	2010	Change (2000 to 2010)	% Change
Tonnes (million)	0.98	1.3	1.5	2.0	2.4	2.2	+1.2	+125%

The following exhibit presents a jurisdictional breakdown of organics (food and yard waste) diversion; no data were available for Newfoundland and Labrador or the three territories.

Exhibit 29: Total (MSW&ICI) Quantity of Organics Diverted from Landfill by Jurisdiction 2000-2010 (Tonnes) ⁷¹

Jurisdiction	2002	2004	2006	2008	2010	Change (2002 to 2010)
BC	198,996	254,878	292,031	343,586	378,139	+179,143
AB	261,069	234,970	231,459	231,544	210,657	- 50,412
SK	-	-	3,627	12,190	-	-
MB	16,261	15,636	12,490	-	19,672	+3,411
ON	393,328	573,098	732,200	1,029,510	1,058,272	+664,944
QC	246,000	225,000	360,000	384,000	253,000	+7,000
NS	82,341	93,458	133,934	158,419	148,750	+66,409
NB	82,725	90,585	-	122,863	94,716	+11,991
PE ⁷²	20,664	26,671	-	23,233	21,886	+1,222

Two provinces (Nova Scotia and PEI) have legislated organics diversion programs for both residential and ICI sectors across the entire province and have banned organics from landfill. Québec plans to ban organics from landfill by 2020. The following exhibit (overleaf) presents a jurisdictional overview of approaches to composting. Jurisdictions with legislation are shaded light blue, jurisdictions with a policy that supports municipalities (e.g. guidance) to operate organics diversion programs are shaded in light pink. The numerical value presented in the last row depicts the % of households that compost either kitchen and/or yard waste. When only access to food composting programs are examined, the rate falls to only 40% nationally⁷³.

⁶⁹ Organic ingredients intended for composting can alternatively be used to generate biogas through anaerobic digestion. See Section 2.5 Waste Recovery – Energy from Waste for more information on anaerobic digestion.

⁷⁰ Statistics Canada Waste Management Industry Surveys 2000-2010.

⁷¹ Statistics Canada Waste Management Industry Surveys 2000-2010.

⁷² PEI data for 2002 and 2004 is from Statistics Canada EnviroStats Spring 2008 edition, Catalogue no. 16-002-X. Data for 2008 and 2010 is from Island Waste Management Corporation Annual Report citing incoming tonnages of organics to the centralized composting facility.

⁷³ CM Consulting, 2013. Recycling Access in Canada, published in Solid Waste Magazine, Dec 2013/Jan 2014 issue.

Exhibit 30: Jurisdictional Approaches to Composting and % of Households Composting Kitchen and/or Yard Organics via Curbside or Backyard⁷⁴

BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	Territories	Federal
Provincial Policy Driver (Voluntary)	No Provincial Policy	No Provincial Policy	Policy (2012) commitment to provide support for organics diversion. Landfill Levy revenue to be directed to organics diversion (Forthcoming 2014)	No Provincial Policy currently in effect (proposed Strategic Plan for Organics if new WDA passes)	Action Plan includes 60% organics diversion by 2015. Organics banned from landfill by 2020	Legislated at provincial level (MSW and ICI organics)	Provincial Policy Driver (Voluntary)	Legislated at provincial level (MSW and ICI organics)	No Provincial Policy	No policy in any of the three Territories.	No federal policy
Many municipal organics diversion programs	Many municipal organics diversion programs	Many municipal organics diversion programs	Many municipal organics diversion programs	Many municipal organics diversion programs	Many municipal organics diversion programs	All municipal and ICI organics diverted	Many municipal organics diversion programs	All municipal and ICI organics diverted	Some municipal organics diversion programs	Yukon: organics separation at some waste facilities. Whitehorse: curbside program; multi-res pilot; Dawson City pilot. NT: composting at 1 waste facility; Yellowknife pilot project ongoing. NU: no current composting activities.	Guidance
64%	56%	47%	56%	75%	42%	96%	58%	94%	43%	-	-

⁷⁴ Statistics Canada, 2013. Composting by Households in Canada. EnviroStats. Catalogue no: 16-002-X

Other Existing Diversion Programs – Voluntary EPR

Clean Farms: CleanFarms represents the manufacturers and brand owners of agricultural chemicals. The organization has operated a take back program for used pesticide containers for over 20 years on a voluntary basis with generally good recovery rates. Although primarily targeting the agricultural sector, this program can also include used products from the residential homes on agricultural farm land. The program operates in most provinces through a system of depots usually sited at farm supply dealers. CleanFarms also operates special collections for used pesticides and is exploring through pilot programs and other initiatives the take-back of other farm packaging wastes including fertilizer bags and plastics such as grain bags and bale wrap. In Manitoba the operating program has recently been included under Manitoba EPR legislation. In response Clean Farms presented a stewardship plan and program largely based on their existing operations which the province approved. The program continues under the new regulatory regime largely unchanged from its former status as a voluntary program.

Canadian Wireless Telecommunications Association CWTA – “Recycle My Cell”: The Canadian Wireless Telecommunications Association (CWTA) operates a voluntary take-back program (Recycle My Cell) for cell phones in Alberta, Saskatchewan, New Brunswick, Yukon and Northwest Territories. In all other provinces, cell phones are regulated and captured as part of, or ancillary to, the legislated EPR programs for electronics and electrical equipment. In Alberta, the government has an MOU with CWTA – this is the only jurisdiction identified with a formal MOU for this material. The MOU outlines certain performance measures that the industry must meet. All of the recyclers involved with the Recycle My Cell program are ISO 14001:2004 certified *or* certified under Electronic Product Stewardship Canada’s Recycling Vendor Qualification Program – therefore the standards for performance measurement criteria for environmentally sound management for recycling cell phones are fairly consistent across the country⁷⁵.

CWTA operates the program in conjunction with cell phone carriers, handset manufacturers and certified processors, including Bell, Blackberry, Eastlink, GEEP Inc., GREENTEC, LG Electronics Canada, Inc., Lynx Mobility, Motorola Mobility, MTS, Nokia, Rogers Communications, Samsung Electronics Canada Inc., SaskTel, Sims Recycling Solutions, Sony Mobile Communications, TBayTel, TELUS, Videotron, and Virgin Mobile Canada. The program includes numerous producer take-back programs operated by manufacturers and retailers⁷⁶.

Call2Recycle: The Call2Recycle program (formerly called the Rechargeable Battery Recycling Corporation [RBRC] - as of January 2013 their name was legally changed), recycles both single-use and rechargeable consumer batteries on a Canada-wide basis (through regulated programs in BC, Manitoba, and Québec, and voluntary programs in many other jurisdictions with retailer or municipal partnerships). The organization also operates in the United States. They have battery recycling drop off bins at over 2000 Home Depot locations in North America. Collections

⁷⁵ Recycle My Cell website, accessed December 2013 <http://www.recyclemycell.ca/faqs/>

⁷⁶ Recycle My Cell website, accessed December 2013 <http://www.recyclemycell.ca/participating-programs/>

in jurisdictions that operated voluntary take-back initiatives across Canadian municipalities increased by more than 273% from January to October 2013. Total Canadian battery collections for 2012 were 1,348,677kg from both voluntary and mandatory programs⁷⁷.

The Call2Recycle program has been in place for over 20 years. The organization used to advocate for voluntary regulation of rechargeable battery recycling, however, a recent audit showed that as much as 40% of the Call2Recycle battery waste stream comes from companies not participating in the Call2Recycle program in North America, but rather from companies located overseas. The organization now supports regulatory approaches to battery recycling to advocate for a level playing field among producers so that first importers are required to contribute funding to the program⁷⁸.

Health Products Stewardship Association: The Health Products Stewardship Association, representing pharmaceutical manufacturers and importers, provides collection services for expired prescription medications across the country in ten provinces, Yukon, and Nunavut on a voluntary basis with a return-to-pharmacy program. Producers are regulated to provide collection services, usually through retailer partnerships at pharmacies, in British Columbia, Manitoba and Ontario.

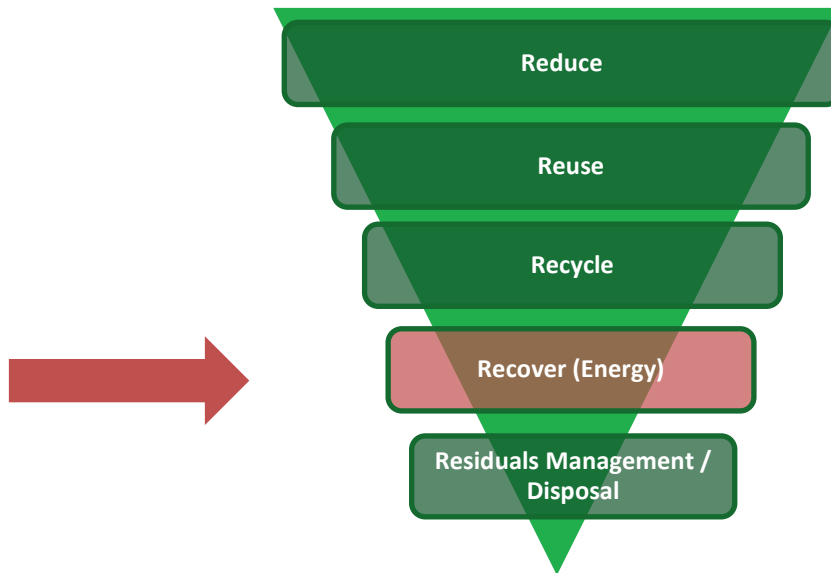
Ozone Depleting Substances: Refrigerant Management Canada operates a voluntary industry program to manage the end-of-life disposal of CFC and HCFC refrigerants collected by certified technicians in commercial stationary refrigeration equipment. Environment Canada is proposing to support the life cycle management of ODSs and their halocarbon alternatives with the P2 Planning Notice to manage end-of-life refrigerants used in the stationary refrigeration and air-conditioning sector.

⁷⁷ Call2Recycle Press Release: Unprecedented Success: British Columbia, Manitoba and Québec Municipalities Lead Canada's Battery Recycling Surge. November 14, 2013. www.call2recycle.ca/unprecedented-success-british-columbia-manitoba-and-Québec-municipalities-lead-canadas-battery-recycling-surge/#sthash.XmTsurpO.dpuf

⁷⁸ Call2Recycle 2012. Annual Report.

2.5 Waste Recovery: Energy-from-Waste

Energy-from-Waste (EFW) facilities are considered the 4th “R” in the waste management hierarchy of “reduce”, “reuse”, “recycle”, and “**recover**”⁷⁹. EFW is a waste treatment that recovers energy in the form of electricity, heat, or steam from a waste source after recycling and diversion, except for anaerobic digestion which typically processes source separated organics.



Technology options for EFW include thermal treatment (incineration with energy recovery), gasification⁸⁰, pyrolysis⁸¹ and can be considered to include anaerobic digesters for organic waste streams (also called “biofuel facilities”) which are capable of converting organic waste to energy (e.g. electricity, compressed natural gas, ethanol). Anaerobic digestion involves fermenting organic materials such as food waste, manure, sewage sludge, industrial effluent, forest and agricultural waste in an oxygen-deprived environment to produce biogas, compost and heat^{82,83}.

Some jurisdictions do not consider anaerobic digestion as an energy recovery technology; rather they consider it in the diversion category – while others do consider it as energy recovery. It can

⁷⁹ Some jurisdictions do not formally recognize a 4th R (i.e., energy recovery is considered on the same hierarchy level as disposal).

⁸⁰ Gasification breaks down organic material using a combination of high heat and combustion. Canadian EFW coalition website, <http://www.energyfromwaste.ca/resources/FAQs> accessed August 2013.

⁸¹ Pyrolysis thermally decomposes organic material either in the complete absence of air or with a very small amount of it. Canadian EFW coalition website, <http://www.energyfromwaste.ca/resources/FAQs> accessed August 2013.

⁸² Natural Resources Canada website “Producing Renewable Energy from Urban Waste”, 2011. See <http://www.nrcan.gc.ca/science/story/3604>

⁸³ Composting of organic waste without heat or gas recovery is addressed in the previous section, 2.4 Organics Diversion.

be considered as both and for the purposes of this report has been included in this section at the consultant's discretion.

There are approximately 800 conventional EFW facilities worldwide (thermal treatment with energy recovery for treating MSW), mainly in Europe and the United States⁸⁴. Anaerobic digestion with energy recovery for biofuel is becoming very popular worldwide: Europe now has over 10,000 operating digesters with some communities essentially fossil-fuel-free because of them⁸⁵. There are over 200 smaller facilities operating in Europe and producing both compost and heat and power⁸⁶.

In Canada there are five large EFW facilities operating that treat mixed MSW and recover heat or steam. There are an additional four large mixed MSW EFW facilities approved for construction in Ontario.

There are two large anaerobic digestion facilities in BC and Ontario, with other large biofuel facilities planned in BC, Alberta, Ontario and Québec. These facilities process different combinations of food waste, wood waste, sewage sludge, or yard waste, and produce biofuel as a usable product. Only those that include processing waste from the MSW waste stream (i.e. residential and ICI) sectors together have been identified in the following exhibit, however some jurisdictions also have industrial facilities such as paper mills or cement kilns that process MSW waste (e.g. tires) that have not been included in the following exhibit (an inventory of these facilities was not provided by jurisdictions for inclusion in this report). Similarly, facilities that primarily process sewage sludge and manure have not been inventoried.

Exhibit 31: Number of EFW Facilities Treating MSW in Operation and Planned for Construction

Details	BC	AB	SK	MB	ON	QC	NB	NS	NL	PE	NU	NT	YT
# Large EFW Facilities treating MSW or Organics (>25t/day)	1 MSW 1 organics	1 MSW	-	-	1 MSW 1 organics	1	-	-	-	1 MSW	-	-	-
# Small EFW Facilities treating MSW / Organics (<10t/mo)	-	420 ⁸⁷	-	-	-	2	-	-	-	-	-	-	-
NEW Mixed MSW EFW Facilities Planned (Large or Small)	-	1	-	-	4	2+	-	-	-	-	-	-	-
NEW Biofuel EFW Facilities Planned (Organics) <i>Large or Small</i>	1	1	-	-	1	7+	-	-	-	-	-	-	-

⁸⁴ EFW from non-MSW sources such as industrial facilities were not included in this report.

⁸⁵ American Recycler.com December 2013 issue <http://www.americanrecycler.com/1213/2391anaerobic.shtml>

⁸⁶ Harvest, 2012. Benefits of Anaerobic Digestion.

⁸⁷ There are 420 small EFW facilities registered in Alberta to treat organics (e.g. food, yard, or manure), MSW and small quantities of hazardous waste. The registrations never expire: these facilities may be operational or may not be operational. The Government does not track operational facilities versus non-operational facilities.

KEY: - = 0 facilities

All existing large mixed EFW facilities (BC, Alberta, Ontario, Québec, and PEI) treat mixed non-hazardous MSW and generate electricity or steam. The two currently operational large MSW organics anaerobic treatment facilities are located in Richmond, BC (first commercial-scale high solids anaerobic digester facility in Canada funded in part by Natural Resources Canada's Clean Energy Fund⁸⁸) and in Toronto (Dufferin facility). A large EFW facility is under construction in Ontario for Durham and York Regions. The City of Edmonton also has a large bio-fuels facility currently under construction for MSW (non-recyclable residuals). The city of Surrey, BC is planning a large biofuel facility utilizing the organics waste, and the Metro Vancouver plans to expand its EFW capacity with an additional EFW facility (but no facility currently planned). Typically construction and operation of all EFW facilities in Canada would need a provincial or territorial approval to build, and operate.

The following exhibit presents additional detail on the five large mixed EFW facilities in Canada.

Exhibit 32: Details on Existing Large EFW Facilities Primarily Treating Mixed MSW⁸⁹

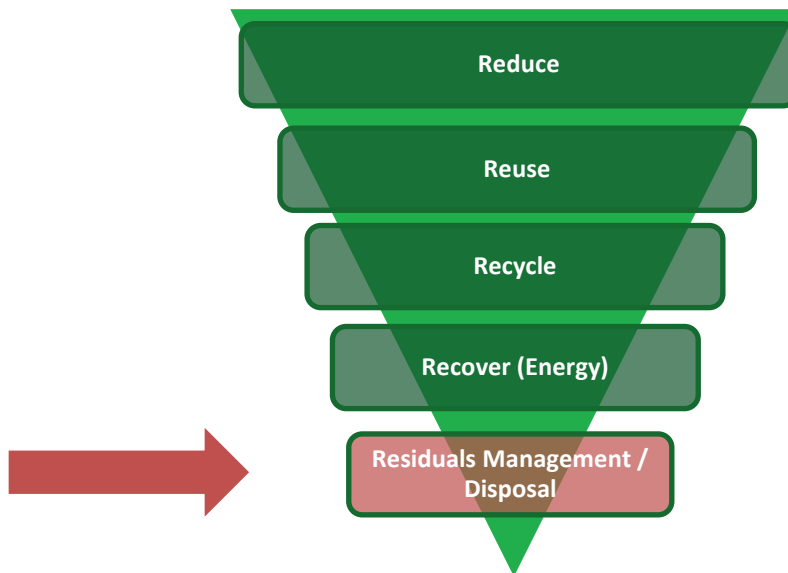
Facility	Population Served	Waste Input	Annual Volume of Waste Processed	Type of Energy Generated	End-Use
BC (Burnaby) EFW Facility	450,000	MSW / ICI non-hazardous, non-recyclable residual waste	285,000 t/yr	Electricity	BC Power Grid
AB (Wainwright) EFW Facility	10,000	MSW / ICI / biomedical non-recyclable residual waste	11,000 t/yr	Steam	Industrial Use
ON (Peel Region) EFW Facility	1,160,000	MSW non-hazardous, non-recyclable residual waste	180,000 t/yr	Electricity	Ontario Power Grid
QC (Ville de Québec) EFW Facility	500,000	MSW / ICI / Sludge non-hazardous, non-recyclable residual waste	300,000 t/yr	Steam	Industrial Use
PEI EFW Facility	65,000	MSW non-hazardous, non-recyclable, and sawmill residue	33,000 t/yr	Steam	District Heating, Charlottetown Government Buildings

⁸⁸ Natural Resources Canada, Energy Sector, Science programs website
<http://www.nrcan.gc.ca/energy/science/programs-funding/2064>

⁸⁹ Environment Canada 2007. MSW Thermal Treatment in Canada 2006. Prepared by Genivar.

2.6 Waste Disposal: Landfills and Incineration

The most common final disposal option utilized in Canada is **landfill**, where waste is buried in the ground (or sometimes above ground, especially in areas with bedrock). Approximately 97% of the residual MSW waste after diversion (recycling and composting), and recovery (energy-from waste) is landfilled (or about 24,111,546 tonnes)⁹⁰. There are currently almost 2000 operating landfills across Canada that accept MSW⁹¹. Most provinces have been moving towards regionalization of landfill facilities over the past 10-20 years – closing smaller, older, unlined facilities and using fewer, larger, lined facilities constructed to meet improved environmental standards. Conventional **incineration**, or thermal treatment, is a less-popular alternative to landfill which reduces the overall volume of waste with no energy recovery from the combustion process.



There is only one large (>25 tonnes/day) MSW incinerator remaining in Canada (located in Lévis, Québec)⁹². Alberta has 66 small/mobile incinerators registered to treat both MSW and small quantities of hazardous waste, and Newfoundland and Labrador has 6 small mobile wood residue burners in operation in remote areas. BC and Newfoundland and Labrador are phasing out wood residue burners (including beehive burners) by 2016. Yukon has one small incinerator for MSW. There were no other MSW incinerators operated by communities that target the residential sector identified in other Canadian jurisdictions. However, an unknown number of small-scale incinerators are operated by the private sector at remote resource development

⁹⁰ Statistics Canada, 2013. Waste Management Industry Survey: Business and Government Sectors, 2010. Catalogue no. 16F0023X. (Total MSW disposal: 24,883,546 tonnes). Environment Canada 2007. MSW Thermal Treatment in Canada 2006. Prepared by Genivar. (Quantities sent for incineration: 773,000 tonnes).

⁹¹ This number has decreased from a much higher unknown number where every single community used to have its own landfill / dump site – Ontario alone has over 1500 smaller sites that are now closed.

⁹² Québec has recently closed its other large MSW incinerator which was located at Isles-de-Madeleine. Other facilities that only treat biomedical waste, hazardous waste or federal facilities (i.e. DND, CFIA) were not included.

sites (e.g., mines) and exploration camps to manage food waste, packaging, and other waste generated by the workers.

Standards and Guidelines

In most provincial and territorial jurisdictions, the regulatory profile for waste disposal includes guidelines and standards on landfill design and operation, as well as incineration design and operation. Permits are required to design and operate in all cases. Some jurisdictions also include landfill bans on designated materials for which recycling programs exist (at either the local by-law or provincial level). Most commonly, hazardous material is usually banned from landfill disposal at the provincial or territorial level, while some jurisdictions have other product-specific bans; these are described in the jurisdictional review (Section 3).

Exhibit 33 (overleaf) presents a jurisdictional review of regulations, standards, and guidelines applicable to solid waste disposal across Canada.

Note this table is solely focussed on final *disposal* regulations (does not include liquid waste, agricultural waste, or hazardous waste disposal regulations), nor does the table include diversion, recycling, or composting regulations.

Exhibit 33: Jurisdictional Review: Regulations, Standards, Guidelines Applicable to Solid Waste Disposal

Title & Description of Regulations, Standards, or Guidelines for Disposal	Category	Sector	Voluntary or Mandatory
British Columbia			
Environmental Management Act (EMA) and the Waste Discharge Regulation require site specific authorization for waste disposal, in a municipal landfill or incinerator	Landfills and Incineration	All Sectors	M
Wood Residue Burner and Incinerator Regulation under the EMA established the phase-out dates (Dec 2016) and operating conditions for all types of specified burners used in BC and sets emission limits and fees for the discharge of associated particulate matter for all burner facilities in the province. There is a supporting Code of Practice for this Regulation targeting ICI sector.	Incineration	ICI wood	M
Open Burning Smoke Control Regulation restrict open burning of: tires, treated lumber, plastics, drywall, demolition waste, rubber, domestic waste, paint, asphalt products, hazardous waste, fuel, and debris burning from land clearing and harvesting.	Open Burning	All Sectors	M
The Landfill Criteria for Municipal Solid Waste document addresses the siting, design, operation and performance requirements for three classifications of landfills: sanitary landfills; modified sanitary landfills; and selected waste landfills. Mandatory if included in a site-specific landfill authorization.	Landfills	MSW	V/M
Landfill Gas Management Regulation: province-wide criteria for LFG capture from municipal solid waste landfills, and identification of opportunities to increase LFG recovery. The regulation phases in new requirements for LFG capture that take into account economic and technical feasibility requirements and associated implications for landfill owners.	Landfill gas	MSW	M
Code of Practice for Industrial Non-Hazardous Waste Landfills Incidental to the Wood Processing Industry (including logging operations, manufacturing lumber, wood or millwork products). The code of practice is a results-based regulation requiring all landfills to register their facility, provide financial security and prepare a conceptual closure plan, an annual report and a final closure plan, while large wood waste landfills are also required to prepare a waste characterization report, a design plan and an operation plan.	Landfills	ICI wood	M
Concrete and Concrete Products Industry Code of Practice - establishes province-wide standards for waste discharge from this industry. It includes the management of waste solids — as well as registration, monitoring, record keeping and enforcement.	Landfills	ICI concrete	M
The Combustion of Municipal Solid Waste FactSheet provides guidance on emission limits and other operating parameters.	Incineration	All Sectors	V
Considerations for the Inclusion of Waste-to-Energy Facilities (WTE) in Solid Waste Management Plans information sheet provides guidance regarding an efficiency threshold that distinguishes between disposal and energy recovery.	Incineration	All Sectors	V
Alberta			
Alberta's Waste Control Regulation under the Environmental Protection and Enhancement Act outlines the requirements for waste management including: certification of operators; burning, disposing and transporting hazardous waste and hazardous recyclables. The Waste Control Regulation is supported by standards and codes of practice for both composting and landfills.	Landfills	All Sectors	M
Standards for Landfills in Alberta, 2010 – detailed siting, design, operation, monitoring and reporting, post closure requirements for large landfills. Developed with a multi-stakeholder steering committee.	Landfills	All Sectors	M
Code of Practice for Landfills – includes siting and design requirements for landfills accepting less than 10,000 tonnes/yr of non-hazardous waste, as well as monitoring and reporting requirements. Landfills of this size do not need a provincial approval to operate, but they must register with the province before beginning construction.	Landfills	All Sectors	M
Code of Practice for Energy Recovery, 2005 includes design, operation, and emission requirements to be met as well as all outlines monitoring and reporting obligations. Required information on fuel produced by the facility is also included in the Code.	EFW	All Sectors	M
Code of Practice for Small Incinerators, 2005 includes design, operation, and emission requirements to be met as well as outlines sampling methods to fulfill monitoring and reporting obligations.	Incinerators	All Sectors	M
Provincial Energy Strategy - Bioenergy Producer Credit Program - the program provides incentives to develop a wide variety of bioenergy products including fuels, power and heat, in support of the Renewable Fuels Standard. The program includes the production of biogas, which uses feedstocks like agricultural animal waste (manure), food waste from the ICI sector, and municipal organic waste.	EFW	All Sectors	V

Title & Description of Regulations, Standards, or Guidelines for Disposal	Category	Sector	Voluntary or Mandatory
Saskatchewan			
The Municipal Refuse Management Regulation (MRMR), 1986 outlines the requirements for landfills to design, build, and operate a landfill. There are no monitoring or reporting requirements outlined, however the ministry has the authority to conduct inspections, request routine environmental monitoring programs, submit reports and impose other operational conditions.	Landfills	All Sectors	M
The Waste Oil Burning Equipment Guideline, 2008 requires a permit for waste oil burning equipment –for Northern communities the province recommends (but does not require) that they follow this guideline but they are allowed to operate without a permit because of their lack of access to recycling services. The guideline meets Canadian Standards Association standards.	Used Oil Recycling	Waste oil	V
Manitoba			
Waste Disposal Grounds Regulation, 1991 outlines the need for a permit or license for landfill construction or operation, and specifies some operating conditions for landfill facilities.	Landfills	All Sectors	M
Special Waste (Shredder Residue) 2003, under the Dangerous Goods Handling and Transportation Act. Allows a facility that generates shredder residue to dispose of the residue by using it as intermediate cover in a Class 1 waste disposal ground. The facility must have a protocol to minimize the presence of contaminants including hazardous waste in materials received at the facility.	Landfills	Used Tire Recycling	M
Prescribed Landfills Regulation under the Climate Change and Emissions Reduction Act outlines that all operating landfills with 750,000t or more of waste in place must submit to the minister an assessment of the potential for mitigating emissions generated at the landfill and a proposed plan for monitoring those emissions and for controlling, collecting or using them before they are released into the atmosphere, both during operation of the landfill and after it is closed.	Landfills	All Sectors	M
Incinerators Regulation, 1998 requires a permit to operate an incinerator. There are no MSW incinerators in the province but there are biomedical type incinerators operating to address medical waste or agricultural carcasses.	Incineration	All Sectors	M
Ontario			
General – Waste Management Reg. (347) under the Environmental Protection Act (EPA) requires, among other things, an environmental compliance approval to: operate a waste disposal site or an industrial waste disposal site, including treatment or disposal. LFG must be collected and managed if a landfill has a total waste disposal volume of more than 1.5 million metres ³ .	Landfills / EFW	All Sectors	M
Landfill Standards Regulation 232/98 under the EPA include requirements for design, operation, closure, post-closure care and financial assurance. The standards apply to all new or expanding municipal (i.e. non-hazardous) waste landfilling sites larger than 40,000m ³ . The standards cover design specifications as well as operational requirements that address: groundwater protection, air emissions, surface water conditions, buffer areas, final cover, landfill gas control, monitoring requirements, record keeping and reporting, leachate contingency plans, site closure and post-closure care provisions; and financial assurance requirements. LFG must be collected and managed if a landfill has a total waste disposal volume of more than 1.5 million metres ³ .	Landfills	All Sectors	M
Landfill Standards – A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites is a companion document that provides additional information in support of the requirements set out in Landfill Standards Regulation 232/98.	Landfills	All Sectors	M
Landfill Gas Capture - A Guideline on the Regulatory and Approval Requirements for Landfill Gas Capture Facilities - regulatory and approval requirements for the capture of LFG, and the information needed to obtain approval for LFG facilities under Part V (waste management) and Section 9 (air and noise) of the EPA.	Landfills	MSW	M
Air Pollution — Local Air Quality Reg 419/05 under the EPA outlines the point of impingement air emission requirements to be met, including for waste thermal treatment (incinerators/EFW), as well as industrial facilities. The requirement for an air approval is specified in section 9 of the Environmental Protection Act. Specific conditions and record keeping for individual facilities specified on each Environmental Compliance Approval.	Incineration/ EFW	MSW and ICI	M

Title & Description of Regulations, Standards, or Guidelines for Disposal	Category	Sector	Voluntary or Mandatory
Guideline A-7 Air Pollution Control, Design and Operation Guidelines for Municipal Waste Thermal Treatment Facilities provides guidance on minimum expected requirements for air emissions from municipal waste thermal treatment (incinerators/EFW). The standards are incorporated in the Environmental Compliance Approval for each site.	Incineration/EFW	MSW and ICI	M
Québec			
Environment Quality Act determines abilities and provides framework for waste management covering disposal, as well as national policy, 4R hierarchy, regional planning, waste reduction and reclamation. More specifically, the EQA requires regional municipalities to develop Regional Waste Management Plans, including where they intend to dispose of waste generated on their territory, including ICI and CRD. The provincial government has developed Guidelines for regional municipalities on how to develop their plans in order to be compliant with the Act and receive Minister approval.	Reduction, reclamation, disposal	MSW, CRD and ICI	M
Regulation respecting the charges payable for the disposal of residual material (disposal levies): specifies the levy each landfill or incinerator must charge, how the funds are remitted, and reporting to the Minister.	Landfills Incineration	MSW, CRD and ICI	M
Regulation respecting the Landfilling and Incineration of Residual Materials: defines landfill types including for northern and remote regions, and wastes acceptable for landfills and incineration, and outlines requirements for design, operation, LFG capture and destruction, environmental monitoring, closure, post-closure and financial guarantees (operation stage).	Landfills Incineration	MSW, CRD and ICI	M
Guide d'application du Règlement sur l'enfouissement et l'incinération des matières résiduelles (c. Q-2, r.19)	Landfills Incineration	MSW, CRD and ICI	M
Regulation respecting environmental impact assessment and review. This regulation provides for all new landfills and incinerators receiving MSW or such existing installations requiring an increase in capacity to be submitted to the impact assessment procedure, which includes a public hearing process and authorization by the Council of Ministers.	Landfills Incineration EFW	MSW	M
Directive pour la réalisation d'une étude d'impact sur l'environnement d'un projet d'incinération de déchets ou de gestion de matières dangereuses	Incineration	MSW	M
Directive pour la réalisation d'une étude d'impact sur l'environnement d'un projet de lieu d'enfouissement technique	Landfills	MSW	M
Act Respecting Northern Villages and the Kativik Regional Government delegates authority for managing residual materials and landfills.	Landfills	MSW	M
New Brunswick			
Construction And Demolition Debris Disposal Site Siting Standard and Application Requirements specifies siting requirements to minimize the environmental impacts from the operation of a CRD debris disposal site and the information required for approvals.	Landfills	CRD	M
Policy for Limiting the Number of CRD Disposal Sites – the department of Environment has a policy to restrict the number of approvals for CRD disposal sites based on population levels to streamline regionalized facilities.	Landfills	CRD	M
Guidelines For the Siting, Design and Operation of a Municipal Solid Waste Transfer Station – reviews requirements for an interim storage facility used for the discharge, temporary storage and/or reloading of municipal solid waste from collection vehicles to larger vehicles for transport over an extended distance to a processing centre or a permanent waste disposal facility.	MRF	MSW	M
Design Guidelines for Sanitary and Industrial Landfill Sites outline requirements for design, water management, leachate control, LFG venting, and monitoring.	Landfills	MSW	M
Garbage Collection Regulation under the Municipalities Act requires municipalities to provide a garbage collection services to all residential and farm properties. It also outlines how people should prepare their garbage for disposal.	Landfills	MSW	M

Title & Description of Regulations, Standards, or Guidelines for Disposal	Category	Sector	Voluntary or Mandatory
Nova Scotia			
Solid Waste-Resource Management Regulations of the Environment Act: Outlines role of RRFB in stewardship plans and annual reporting requirements of RRFB to the Minister; permit requirements for landfill operators and compost facilities including reporting requirements; designated materials for which product stewardship programs must exist; and disposal bans from landfill.	Landfills	MSW	M
Nova Scotia Environmental Goals and Sustainable Prosperity Act contains waste management goals: having a solid-waste disposal rate <300kg/pp per year by 2015; and a sustainable procurement policy for the Province including by integrating sustainable procurement criteria into Provincial government purchasing and promoting adoption of this approach to the greater public sector in the Province.	Landfills	MSW	M
Activities Designation Regulations of the Environment Act list which materials and packaging the Minister requires to be banned, reduced, composted or recycled. It regulates landfills, transfer stations, and compost facilities, and outline how a product stewardship program operator must collect deposit fees for designated materials. These regulations also grant the Minister the authority to impose requirements or standards with respect to the type, size, labelling, composition, and disposal of packaging, including standards for material degradability, compostability and recyclability. Activities Designation Regulations designate the construction, operation and reclamation of a municipal solid waste management facility as an activity that requires and approval from the department.	Landfills	MSW	M
Municipal Solid Waste Landfill Guidelines, 2004 (1997) outline the requirements to obtain an approval to construct and operate a MSW landfill, including siting and design, and construction. The guidelines require LFG to be collected and vented for safety reasons from existing landfills, but not for energy recovery. All new landfills will be assessed for the viability of LFG energy recovery and utilization.	Landfills	MSW	M
Prince Edward Island			
Waste Resource Management Regulations under the Environment Act outline all standards and requirements for design, building, and operation of landfills, recycling centres, CRD Disposal sites, and transfer facilities, as well as requirements for LFG venting. Annual reports from all disposal and recycling facilities must be submitted to the Minister of Environment.	Landfills / Compost Facilities	MSW / ICI / CRD	M
Newfoundland and Labrador			
Waste Material Disposal Areas under the Waste Material Disposal Act – establishes the specific boundaries for the solid waste management administrative regions.	Landfills	MSW / ICI	M
Environmental Standards for Municipal Solid Waste Landfill Sites, 2010 covers the legislation and approvals process, site selection, facility design and construction requirements, operational standards, monitoring and reporting requirements.	Landfills	MSW	M
Used Oil Control Regulations under the Environmental Protection Act bans used oil from all landfills in the province.	Landfills	Used Oil	M
Northwest Territories			
Used Oil and Waste Fuel Management Regulations under the EPA. Regulates used oil and waste fuel from registered oil burners.	Landfills	Used Oil	M
Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites, 2003. The Guidelines include waste characteristics, site selection, design and construction, waste collection procedures, operations and performance monitoring, recycling, decommissioning and post-commissioning, contingency and mitigation planning, and record keeping and reporting.	Landfills	MSW	V
Drum Disposal Protocol For Municipal Landfill provides the requirements for acceptance of drums and tanks at municipal landfill.	Landfills	MSW/ICI	V
Municipal Solid Wastes Suitable for Open Burning - paper products, paperboard packaging and untreated wood wastes.	Landfills	MSW	V
Guideline for Industrial Waste Discharges in the NWT including a decision flow chart for managing industrial solid wastes.	Landfills	ICI	V
Guidelines for Developing a Waste Management Plan by the Makenzie Valley Land and Water Board. It includes guidance on overall waste management planning for the industrial sector, as well as waste storage or disposal on land, waste combustion.	Landfills / Incineration	ICI	V

Title & Description of Regulations, Standards, or Guidelines for Disposal	Category	Sector	Voluntary or Mandatory
Nunavut			
The Nunavut Public Health Act outlines air emission requirements for solid waste incinerators and waste oil burners.	Incineration	MSW / ICI	M
Environmental Guideline for the Burning and Incineration of Solid Waste (2012) is a resource for traditional, field and commercial camp operators, communities and others considering burning and incineration as an element of their solid waste management program.	Incineration	MSW / ICI	V
Environmental Guideline for Industrial Waste Discharges into Municipal Solid waste and Sewage Treatment Facilities, 2011 includes a process-flow chart to assist industrial generators on proper disposal destinations (i.e. determining if their waste is hazardous or not).	Landfills	ICI	V
Environmental Guideline for Used Oil and Waste Fuel 2012 outlines options for used oil and waste fuel management, including recycling and reuse for heat recovery as a final disposal option.	Incineration	Used Oil	V
Yukon			
Solid Waste Regulations under the Environment Act set standards for building and operating dumps and waste disposal sites for operators to follow across the territory. Solid waste permits issued by the Department of Environment are required to operate and each public facility is subject to review under the Yukon Environmental and Socio-economic Assessment Act.	Landfills	All sectors	M
Siting Requirements for Public Waste Disposal Facilities 2010, a fact sheet interpreting the Solid Waste Regulations.	Landfills	MSW	M
Construction Requirements for New Public Waste Disposal Facilities 2010, a fact sheet interpreting the Solid Waste Regulations.	Landfills	MSW	M
Environmental Monitoring at Public Waste Disposal Facilities 2010, a fact sheet interpreting the Solid Waste Regulations. Yukon has established monitoring criteria for all solid waste disposal facilities that are contained in the operating permits issued for each site. Annual site monitoring reports are to be submitted to the Environmental Programs Branch.	Landfills	MSW	M
Guidelines for Preparing Solid Waste Management Plans 2011, a fact sheet interpreting the Solid Waste Regulations.	Landfills	MSW	M
Closure Requirements for Solid Waste Disposal Facilities 2011, a fact sheet interpreting the Solid Waste Regulations.	Landfills	MSW	M
CCME			
Operating and Emission Guidelines for Municipal Solid Waste Incinerators, 1989.	Incineration	MSW	V
Provisional Code of Practice for the Management of Post Use Treated Wood, 1996.	Incineration	MSW / ICI	V
Canada-wide Standards for Mercury Emissions from Base-Metal Smelters and Waste Incinerators, 2000.	Incineration	MSW / ICI	V
Canada-wide Standards for Dioxins and Furans Emissions from Waste Incinerators, Coastal Pulp and Paper Boilers, 2001	Incineration	MSW / ICI	V
Code of Practice for Used Oil Management in Canada. CCME-TS/WM-TRE006E 1989.	Incineration	Used Oil	V
Environment Canada			
Environment Canada (EC). 2010. Technical Document for Batch Waste Incineration	Incineration	MSW / ICI	M
Aboriginal Affairs and Northern Development Canada			
Indian Reserve Waste Disposal Regulations under the Indian Act sets the rules for planning and developing and permitting waste disposal on reserves across Canada. Permits are required for operating a garbage dump, storing waste, or burning waste on a reserve. There is a supporting document, <i>INAC National Guidelines for Administering the Indian Reserve Waste Disposal Regulations</i> , effective September 1, 2001 for permitting of solid waste facilities.	Landfills	MSW	M
Standards Council of Canada			
CAN/CGA-B105-M93 (B149.6) Code for Digester Gas and Landfill Gas Installations: This Code applies to the installation of systems for the production, handling, and utilization of landfill gas in newly-constructed landfill gas systems, as well as additions to, and the upgrading of, existing systems. This Code applies to the safety aspects of the operation and maintenance for handling, storage, and utilization of digester gas in landfill gas at landfill sites.	Landfills	MSW / ICI	V

Landfill Gas Recovery

Provinces typically develop guidelines and criteria for landfill gas recovery practices. Nunavut and Northwest Territories typically have above ground disposal due to bedrock underground, but don't have guidelines for landfill gas recovery. Methane produced in landfills is a potent greenhouse gas and its capture and utilization is gaining importance as a way to reduce emissions. Utilization typically consists of five possible approaches to recovering energy: direct heating, electricity generation, chemical feedstock, purification to pipeline-quality gas, and heat recovery⁹³.

The following exhibit presents the total number of MSW landfills (accepting residential, ICI, or CRD wastes) operating in each jurisdiction – both private and publicly owned, along with the number with LFG recovery systems identified (total of both flaring and utilization).

Exhibit 34: Number of Open MSW/ ICI/CRD Landfills⁹⁴ and Number with LFG Recovery (Flaring and Utilization)

Details	Canada-wide	BC ⁹⁵	AB ⁹⁶	SK	MB	ON ⁹⁷	QC	NB	NS	NL	PE	NU	NT	YT
# of Operating Landfills	1973	92	136	338	195	880	104	22	26	88	5	25	33	29
# Landfills with LFG Recovery ⁹⁸	70	8	4	2	3	28	16	6	2	1	0	0	0	0

Based on the information collected in the exhibit above, the rate of LFG recovery Canada-wide is about 3.5%⁹⁹. LFG recovery includes flaring as well as utilization for energy. The process of flaring converts methane to carbon dioxide which is a less potent greenhouse gas for release to the atmosphere. A 2011 Environment Canada report using 2009 data indicated that 14 of the 68 large sites (active sites of more than 40,000 tonnes per year capacity) surveyed used recovered methane for energy purposes, 36 sites flared it, while 18 both flared and utilized LFG

⁹³ Environment Canada, An Inventory of Landfill Gas Recovery and Utilization in Canada 2008 and 2009.

⁹⁴ Some provinces had separate numbers for each type of landfill (i.e. MSW, ICI, CRD), while others provided total licenced landfills without segregating by type so total aggregate number has been included in this table.

⁹⁵ The B.C. Ministry of Environment does not have current data on the total number of landfills, however this number came from a 2006 study completed by Golder Associates entitled *Inventory of Greenhouse Gas Generation from Landfills in British Columbia*.

⁹⁶ http://www.env.gov.bc.ca/epd/codes/landfill_gas/pdf/inventory_ggg_landfills.pdf

⁹⁷ Of the 136, some landfills may be closed or close to closure and may or may not be taking waste.

⁹⁸ Approximately 84% of Alberta's population is served by only 31 of these 136 landfills.

⁹⁹ Landfill Inventory Management Ontario website

www.ene.gov.on.ca/environment/en/monitoring_and_reporting/limo/index.htm. Note that for the 880 landfills currently operating, only 30 of these are large landfills, the rest are small (<40,000m³).

⁹⁸ Environment Canada, GHG Division. *An Inventory of Landfill Gas Recovery and Utilization in Canada 2008 and 2009*. Data presented in Table 5 is from 2009 and updated with 2013 responses from provincial and territorial representatives via email for this CCME project. Data for Canada's territories is from the 2012 Artkis Report: *Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation*. Prepared for Environment Canada.

⁹⁹ This value was changed from 35% to the correct value of 3.5% on April 10, 2015.

for energy purposes¹⁰⁰. For the current report, provincial/territorial breakdowns of the number of landfills collecting LFG for energy versus flaring were not available for all jurisdictions.

The following exhibit presents LFG recovery criteria (if applicable) for LFG venting and/or utilization across Canada. BC, Manitoba, Ontario, Québec, New Brunswick, Nova Scotia, and PEI all require collection of LFG and venting at a minimum as a safety precaution.

Alberta requires subsurface landfill gas migration monitoring and subsequent venting if required; landfill gas can be combusted or used for heat/electricity. Manitoba requires collection of LFG above a threshold of disposal volume but does not dictate end use. Saskatchewan does not have criteria to require LFG recovery, although they do have two LFG recovery facilities operated by municipal authorities. New Brunswick, Nova Scotia, and PEI do not have criteria to require LFG recovery for utilization but they do require LFG venting on existing landfills with a requirement for utilization of LFG potential to be assessed on a case-by-case basis for any new landfills.

Exhibit 35: LFG Recovery Criteria for Venting and/or Utilization

BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	NU	NT	YT
All landfills require venting for safety	All landfills require subsurface LFG monitoring and venting if required	No Criteria for venting	All landfills require venting for safety	All landfills require venting for safety	All landfills require venting for safety	All landfills require venting for safety	All landfills require venting for safety	All landfills require venting for safety	No Criteria for venting	No Criteria for venting	No Criteria for venting	No Criteria for venting
Waste disposal weight of >100,000t in place OR Waste disposal weight of >10,000t /annually AND Generation of 1000t /yr CO ₂ ^e	Emissions ¹⁰¹ of 100,000t /yr CO ₂ ^e	No Criteria	Waste disposal volume of >750,000t /annually	Waste disposal volume of > 1.5 million m ³ /annually	No Criteria: assessed on a case by case basis	No Criteria: assessed on a case by case basis	No Criteria: assessed on a case by case basis	No Criteria: assessed on a case by case basis	No Criteria	No Criteria	No Criteria	No Criteria

¹⁰⁰ Environment Canada, GHG Division. An Inventory of Landfill Gas Recovery and Utilization in Canada 2008 and 2009.

¹⁰¹ This doesn't only apply to landfill gas capture; the Specified Gas Emitters Regulation requires large emitters to reduce emissions by 12% from baseline emissions.

2.7 Performance Measurement and Reporting

The previous sections of this report noted variances in reporting on performance among material groups, especially with respect to the different diversion programs. The following information provides an indication at a *very* high level – the jurisdictional approaches to waste management performance measurement that were identified for: waste prevention or reduction; diversion programs; energy recovery; and disposal.

Waste Prevention or Waste Reduction-at-Source

As noted previously, most jurisdictions did not have waste prevention or waste reduction-at-sources policies that targeted the ICI or residential sectors as a whole. There were three jurisdictions that had policies for a reduction in one-way plastic bag usage (Alberta, Manitoba, and Northwest Territories) which does involve both the ICI and residential/consumer sectors. All three of these jurisdictions included a goal or target (% reduction) and a timeline for measurement. Programs use a baseline measurement of number of plastic bags used for the population, along with information provided by retailers and distributors to monitor performance (e.g. Northwest Territories used estimates based on a Manitoba study).

Two jurisdictions have formal Memoranda of Understanding in place with industry to address waste reduction upstream such as to address packaging or plastic bags (Alberta, Québec). Details of these agreements with respect to specific objectives, and performance monitoring were not publicly available; industry will prepare a final progress report following completion of the MOU with Alberta on December 31, 2013.

Three jurisdictions have a per capita disposal upper limit maximum (Quebec, Nova Scotia) or target (Alberta) to drive waste reduction activity. This disposal quantity is monitored by surveys and reporting of MSW disposal tonnages from landfills or regional waste authorities to provincial governments.

Diversion

Three jurisdictions (BC, Québec, Nova Scotia) have legislated waste diversion performance targets for the majority of their EPR diversion programs; however different targets may be set through stewardship programs plans if approved by the government. Others (Ontario, Alberta) do not legislate diversion targets for existing stewardship programs. In Alberta, the delegated administrative organizations (DAOs) set the performance measures in their business plans and report on them in their annual reports, both of which are approved by the minister.

Prince Edward Island does not legislate diversion targets, but states that they anticipate 100% collection based on the small geographic size and full access to the waste management system by all sectors. Newfoundland and Labrador and New Brunswick have some legislated diversion targets for one or two EPR programs, but not for the rest.

Remaining jurisdictions do not have any diversion targets, although Manitoba has a new performance monitoring system under development. A review of monitoring and reporting of current diversion programs demonstrates that there are inconsistencies with metrics used to monitor and report on progress in individual programs.

Exhibit 36: Overview of Current Diversion Monitoring and Reporting Issues Across Jurisdictions

Material	Monitoring/Reporting Metrics Consistent?	Comment
Packaging - Beverage Containers (including milk)	Yes	No government or national organization has consolidated this data, however CM Consulting produces a biannual report by contacting jurisdictional programs directly in each province and using information from each recycling authorities.
Multi-packaging and printed materials	No	Fragmented program reporting: some report on % total diversion goal reached, others report on material-specific tonnages, some include beverage containers, all packaging, and printed paper. Some report on packaging only – beverage containers are on deposit separately. Some do not include printed paper.
Electronics - all	Yes	For EPRA harmonized programs metrics are consistent.
Electronics - cell phones	No	Alberta requires annual reporting as part of its voluntary MOU with the Canadian Wireless Telecommunications Association. Most are voluntary industry programs that do not report publicly by jurisdiction.
HHSW- batteries	No	Some report both rechargeable and non-rechargeable. Some report on only non-rechargeable. Some programs are legislated, some are voluntary industry programs.
HHSW- corrosives, irritants, aerosols, solvents & flammables	No	Some have provincial programs and report on total tonnage of all HHSW. Some provincial programs report total tonnage and break out by material. Some operate municipal programs voluntarily, no aggregate data available for province/territory.
HHSW-Mercury lamps, other mercury products	No	Some have provincial programs and report on total mercury products. Some operate municipal programs voluntarily; some operate voluntary EPR programs only - no aggregate data available for province/territory.
HHSW - paint	No	Many have province-wide programs, but some report on tonnage of paint collected including paint only, some report on total tonnage of paint and aerosol cans collected, some operate municipal programs voluntarily – no aggregate data available for province/territory.
HHSW -pesticides/ fertilizers & containers	No	Only 3 provinces have legislated programs and data available on tonnages collected. Others, no data available.
HHSW-pharmaceuticals	No	Voluntary industry program, no data available by each jurisdiction.
HHSW- sharps/syringes	No	Only 1 jurisdiction has a legislated program with data available.
Automotive -batteries	No	No data identified.
Automotive -tires	No	Some report on tonnage of rubber collected for recycling, others report on number of tires collected for recycling. Others report on performance to date (from program initiation) not annually.
Automotive -used oil, oil containers and/or filters	Yes – for UOMA members	UOMA members have consistent monitoring for recovery rate of used oil, filters, containers. Only 5 of 13 jurisdictions are members.
Automotive -other (e.g. glycol)	No	No data identified.
Composting	No	Statistics Canada does a periodic survey of composting in Canada by Census Metropolitan Area. It is voluntary.

Disposal

Five jurisdictions regularly monitor volumes entering landfills and track this information to assist in monitoring disposal rates, and remaining capacity (Alberta, Ontario, Nova Scotia, PEI, and Québec). Of these five, two jurisdictions monitor only large landfills (Alberta, Ontario) – with different definitions on what constitutes “large”—so smaller landfills are not monitored in those jurisdictions. Nova Scotia and PEI track all waste volumes from each landfill. In Nova Scotia waste disposal volumes are tracked for each municipality, and these numbers are rolled up provincially for all waste entering each landfill. Québec monitors disposal volumes at all of its

landfills and incinerators, and tonnages reported are audited by third parties. This is the only province to utilize a third party verification system, it is a regulated requirement. Remaining jurisdictions do not have a system in place to accurately monitor waste disposal.

Exhibit 37: Performance Measurement Approaches for Waste Diversion and/or Disposal

Details	BC	AB	SK	MB	ON	QC	NB	NS	NL	PE	NU	NT	YT
Does the jurisdiction implement performance measurement to monitor waste diversion?	Yes - legislated for EPR programs	Yes - not legislated	No	No (new system under development)	Yes - not legislated	Yes – legislated for EPR programs and blue box PPP	Yes - legislated for EPR programs	Yes - legislated for all materials	Yes - legislated for EPR programs	Yes - not legislated	No	Yes, legislated for existing programs	No
What performance monitoring approach is used to monitor diversion?	Legislated diversion recovery targets (%) for EPR programs	Non-legislated diversion targets set in DAO business plans	Stewardship program authorities voluntary monitor and report on diversion	Stewardship program authorities mandated by regulation to monitor and report on diversion	Targets set by stewardship program organizations in their business plans. There is no overall aggregate target.	Diversion targets %	Legislated diversion targets %	Legislated for stewardship programs, and legislated disposable max. for the entire province.	Legislated diversion target % for overall diversion, and for EPR programs	Diversion amount collected is tracked	-	Annual reports are tabled by our Minister in the Legislative Assembly	-
Does the jurisdiction implement performance measurement to monitor waste disposal?	Case-by-case for regional district (voluntary per capita disposal reporting)	Yes – selection of landfills accepting MSW only	No	No (new system under development)	Yes – large landfills only	Yes	No	Yes	Yes	Yes	No	No	No
What performance monitoring approach is used to monitor disposal?	-	Voluntary survey of disposal tonnages of large landfills accepting MSW	-	-	Tonnages are monitored at each landfill and reported to Ministry of the Environment Inventory	Third-party verified waste tonnages and the total amount of levy payments collected	-	Disposal tonnages monitored for each municipality	Disposal tonnages monitored at over 80% of disposal facilities	Disposal tonnages monitored at each disposal facility	-	-	-

3 Jurisdictional Profiles

The following sub-sections profile the approaches utilized by each jurisdiction with respect to:

- Policy Frameworks – overarching legislation, strategies or policies for waste
- Waste Prevention and Reduction-at-Source - upstream
- Waste Diversion Programs – EPR, Product Stewardship, Other Diversion
- Energy Recovery from Waste – policy approach and facilities
- Waste Disposal – regulatory and management approaches, landfill gas collection
- Performance Measurement – approaches used.

3.1 British Columbia

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Legislative - Environmental Management Act (EMA) (2003), including the Recycling Regulation (2004, 2012); the Organic Matter Recycling Regulation (OMRR) (2002); and, the Waste Discharge Regulation (2004). The Recycling Regulation provides a single results-based framework for EPR in BC with an emphasis on environmental outcomes and program performance. Product categories included in the Regulation must be full EPR programs. BC selects product categories to be managed under EPR by aligning with CCME's CAP EPR. The Recycling Regulation and Solid Waste Management Planning guide articulate the principle of the pollution prevention hierarchy.

Strategy: The EMA requires that all Regional Districts (municipal) prepare and submit a solid waste management plan. These plans include management of recyclable material and MSW¹⁰². In addition, BC's Ministry of Environment produces a Service Plan in which it describes its overall environmental goals, objectives, strategies, and performance measures for three years. Solid waste is covered under the current Plan's fourth goal of sharing responsibility for the environment, which has an objective that industry and client groups implement best environmental management practices. This objective contains specific overall EPR targets linked to CCME's CAP EPR:¹⁰³

Exhibit 38: BC Service Plan Solid Waste EPR Targets in Place

Performance Measure	2011/12 Baseline	2012/13	2013/14	2015/16
<i>Target:</i> Percentage of product sub-categories in the Canada-wide Action Plan for Extended Producer Responsibility covered by EPR	53%	68%	68%	79%

¹⁰² Government of British Columbia website <http://www.env.gov.bc.ca/epd/mun-waste/waste-solid/sw-mgmt-plan/guideplan/part-1.htm#s3>, accessed September 7, 2013

¹⁰³ Page 26, BC Ministry of Environment Service Plan 2012/13 – 2014/15, <http://www.bcbudget.gov.bc.ca/2012/sp/pdf/ministry/env.pdf> <http://www.bcbudget.gov.bc.ca/2012/sp/pdf/ministry/env.pdf>, accessed September 7, 2013

Waste Prevention and Reduction-at-Source

The Ministry of Environment recently commissioned a report on the business case for Zero Waste in BC. The report makes a comparative evaluation of three MSW diversion scenarios (43%, 62%, and 81%) for waste generated, projecting economic costs and benefits and employment impacts by 2025. The residential, ICI and CRD sectors are the basis for the analysis. The report is currently undergoing expert review. Preliminary results indicate a positive business case for moving waste up the pollution prevention hierarchy.

Waste Diversion

EPR: EPR programs are operated by producer organizations and report directly to the BC Government through the Ministry of Environment. BC does not have any kind of agency or delegated authority in place to manage and oversee programs as is the case in many other jurisdictions. The Recycling Regulation designates products and materials for EPR without individual product or material regulations. BC has EPR programs for 68% of the product categories in CCME's CAP EPR, including all of the Phase 1 materials. Table 20 outlines the products covered in existing and planned programs¹⁰⁴.

Exhibit 39: BC EPR Programs in Place for CCME CAP EPR Phase 1 and 2 Materials

Phase 1		Phase 2
1994-2010 Paint (1994) Pesticides, gasoline, solvents, flammable liquids (1996) Pharmaceuticals (1996) Beverage Containers (1997) Lubricating Oil (2003) Tires (2007) TV's, Computers (2007) Batteries, cell phones (2009) Audio Visual (2010) Thermostats, Fluorescent lamps (2010)	2011-2012 Car batteries, antifreeze (2011) Smoke Detectors (2011) Small Appliances (2011) Automatic dispensers (2012) E-Toys, electric/electronic tools (2012) Monitoring equipment, lighting equipment, IT telecom. equipment (2012) Planned 2014: Packaging and printed paper (2014)	2012 Large Appliances (2012) Planned 2017: CRD materials Furniture, textiles and carpet

Current EPR efforts are focused on residentially generated PPP which has been designated for EPR for May 2014. ICI sources of PPP are not covered and the existing beverage container program will continue to operate independently. This PPP initiative is unique in mandating producer operational responsibilities. Under the proposed program, municipalities have the option of acting as service providers under contract to Multi-Material BC (MMBC) or vacating the operation of collecting PPP. Preliminary indications are that 90% of municipalities have agreed to the MMBC incentive for collection and will operate the curbside programs as service providers. The MMBC program also has responsibilities to collect PPP generated from what is

¹⁰⁴ For example the final expansion of the Electronics Stewardship Association of BC (ESABC) program (2012) includes large appliances with ozone-depleting substances; electrical and electronic tools; medical devices; automatic dispensers; lighting equipment; toys; leisure and sports equipment; monitoring instruments; and IT and telecommunications equipment.

called the “streetscape” which includes municipal parks, sidewalks, public squares and plazas. A 2012 study¹⁰⁵ on PPP in BC provides data on the amount of PPP supplied into the BC market, the collection and processing infrastructure and the amount collected and recycled. The report estimates that 79% of both single family and multi-family households received collection services. An estimated 350,000 tonnes to 400,000 tonnes of PPP is supplied into the province annually and in 2011 a combined total of 213,992 tonnes of PPP was collected from single and multi-family dwellings and from depots by municipal programs. It should be noted that in BC beverage containers are on deposit and are not included in these amounts.

Product Stewardship: There are no provincially operated product stewardship programs.

Other Diversion: Many local governments have developed MSW management strategies and set targets as a result of the Solid Waste Management Plans. As an example, Metro Vancouver’s (53% of the provincial population¹⁰⁶) plan includes priorities: to reduce the per capita waste generated by 10% of 2010 volumes by 2020; to recycle up to 80% by 2020. To reach these goals, three priority areas were identified: recycling of wood waste, food waste and multi-family residences (40% of the housing in the region is multi-family).¹⁰⁷ BC does not have province-wide requirements for the diversion of organic waste. The percentage of households composting kitchen and/or yard waste in the province was 64% in 2011¹⁰⁸. Metro Vancouver will be banning organic materials disposal by 2015. The ban will apply to all sectors, including ICI buildings and single family and multi-family residential buildings and mixed-use buildings. Similarly, Capital Regional District will be implementing a similar ban by 2015. The Regional District of Nanaimo already banned organics from landfill in 2007¹⁰⁹.

DIVERSION for BC: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)	
Total materials diverted	1,457,062 tonnes (676,102 tonnes residential/ 780,960 tonnes non-residential)
Total Kg/capita diverted	322 kg/capita
Diversion rate	35.4%

Recovery: EFW

BC does not have a regulated EFW requirement, but guidance to regional districts articulates the expectation that districts achieve a diversion rate of 70% prior to considering EFW¹¹⁰. BC has one large incinerator in Metro Vancouver which is an EFW facility. The City of Richmond has a large commercial-scale high solids anaerobic digester producing renewable heat and electricity

¹⁰⁵ Glenda Gies and Associates 2012. Current System for Managing Residential Packaging and Printed Paper in British Columbia. Prepared for Multi-Material B.C.

¹⁰⁶ Government of B.C. website, accessed August 27, 2013. <http://www.env.gov.bc.ca/epd/mun-waste/waste-solid/organics/http://www.env.gov.bc.ca/epd/mun-waste/waste-solid/organics/>

¹⁰⁷ Metro Vancouver’s website,

¹⁰⁸ Statistics Canada Composting by Households in Canada, 2013.

¹⁰⁹ Government of B.C. website, accessed August 27, 2013. <http://www.env.gov.bc.ca/epd/mun-waste/waste-solid/organics/http://www.env.gov.bc.ca/epd/mun-waste/waste-solid/organics/>

¹¹⁰ B.C. Ministry of the Environment, Considerations for the Inclusion of Waste-to-Energy Facilities (WTE) in Solid Waste Management Plans, <http://www.env.gov.bc.ca/epd/mun-waste/waste-solid/sw-mgmt-plan/pdf/wte-factsheet-nov25.pdf>

from food and yard waste which is sold back to the electricity grid¹¹¹. The City of Surrey is proceeding with a biofuels facility for the residential and ICI sectors to convert organics into compressed natural gas¹¹².

Disposal Approaches

Landfills are authorized with a provincial permit and operated by municipal authorities or privately. All landfills require engineered designs regarding construction and operation of the facility and closure plan. All landfills undergo environmental assessment prior to construction. There are no province-wide material bans in BC however regional districts are authorized to implement bans. For example, Metro Vancouver has banned: corrugated cardboard; newsprint; paper; glass, metal and plastic containers; yard trimmings; gypsum drywall; electronic waste; refundable beverage containers; paint, solvents, flammable liquids, gasoline and pesticides; oil, oil filters and empty oil containers; lead-acid batteries; pharmaceuticals; and tires.

Policies regarding landfill fees are set by regional districts, municipal or private authorities as applicable, not the province. Metro Vancouver's landfill uses a variable fee as an incentive to source-separate recyclables. A surcharge of 50% is applied to the tipping fee for waste loads found to contain 5% or more by volume of banned materials.

The Landfill Gas Management Regulation establishes province-wide criteria for LFG capture: existing landfills with >100,000 tonnes of waste in place or with an annual waste acceptance rate > 10,000 tonnes must undertake an assessment of LFG generation. If the site is estimated to generate >1000 tonnes of methane annually, a LFG management system is required.

DISPOSAL SUMMARY for BC: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)
Total materials disposed: 2,658,271 tonnes (953,761 tonnes residential/ 1,704,510 tonnes non-residential)
Approximate Number of Operating Landfills: 92 (2008 data)¹¹³
Number of Landfills with LFG Collection for Flaring or Utilization: 8 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: BC's requirements for monitoring and reporting on the performance of EPR programs are set out in the Recycling Regulation. The regulation sets out a minimum 75% recovery rate (amount of material recovered as a percentage of generation). There is an expectation of continuous improvement from this base target. Recovery can also be expressed as amount recovered as a percentage of that available for recovery or can be expressed as a kg/capita number. The Recycling Regulation also requires annual reporting by producers on consumer

¹¹¹ Solid Waste Mag News, Sept 20, 2013. "BC's massive new AD facility feeds electricity grid" <http://www.solidwastemag.com/news/bcs-massive-new-ad-facility-feeds-natural-gas-system/1002598742/?btac=ta&eid=1477b925-d3fc-4a0d-841d-a188856563c7&stpc=SW&e=y0ps84M68svpmWsv64srM2vx>

¹¹² The Now newswire, September 20, 2012 <http://www.thenownewspaper.com/news/surrey-will-house-canada-s-largest-organic-biofuel-facility-1.508322> and City of Surrey website, "Surrey Moves Forward on Organics Biofuel Facility" <http://www.surrey.ca/city-government/13424.aspx>

¹¹³ Golder Associates, 2008. Inventory of Greenhouse Gas Generation from Landfills in British Columbia.

awareness. A third party assurance auditing protocol for certain non-financial information is also now in place for all programs. The protocol applies to performance reporting on recovery rates, collection facilities and end-of-life management with regard to the pollution prevention hierarchy. Each regulated program publishes an annual report.

Disposal: An annual Operations and Monitoring Report is to be submitted to the Ministry of Environment by each landfill operator. These reports are to contain total volume accepted into the landfill, remaining site capacity, operational plans, operation and maintenance expenditures, monitoring data, amount of leachate collected and treated, contingency plans, landfill gas collection volumes, and closure plan updates.

A method of measuring per capita disposal rates at the regional district level is under development.

Environmental Reporting BC provides access to scientific data about BC's environment. Its most recent publication on waste (Municipal Solid Waste Disposal in BC 1990-2010, *September 2013*) reports that approximately 2.9 million tonnes of MSW were disposed of in 2010, and that the provincial per capita disposal rate in 2010 was 587 kg per person. The publication also presents a ranking of regional district performance on solid waste disposal rates.^{114,115}

3.2 Alberta

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Legislated through the *Alberta Environmental Protection and Enhancement Act*. Regulations under this Act include end of life management programs for beverage containers, paint, tires, lubricating oil materials, and electronics.

Strategy: In 2007, a provincial strategy was approved: *Too Good to Waste*, a roadmap for waste reduction and management in the province.¹¹⁶ The strategy notes a goal of reducing landfill waste to 500kg per capita by 2010 including residential, ICI and CRD sectors. In 2008, Alberta Environment & Sustainable Resource Development's Business Plan targets were adjusted as the 500 kg per capita target was not considered attainable; the targets are now set annually in the business plan. The strategy identifies the desired outcomes as developing innovative approaches to waste management, recycling and resource recovery and to reduce overall waste disposal in landfills. These outcomes are supported by a number of strategies and actions, including: development of economic instruments to discourage waste generation and disposal; development of disposal bans where necessary to facilitate waste reduction initiatives;

¹¹⁴ Solid Waste Generation in British Columbia 2010-2025 Forecast, (www.bcstats.gov.bc.ca), accessed 28 September 2013.

¹¹⁵ BC Ministry of Environment State of the Environment
http://www.env.gov.bc.ca/soe/indicators/waste/municipal_solid_waste.html

¹¹⁶ Government of Alberta website, <http://environment.gov.ab.ca/info/library/7822.pdf>, accessed September 21, 2013.

incorporate reporting, information collection and evaluation as an integral part of resource recovery; and set recovery targets for specific materials.

Waste Prevention and Reduction-at-Source

Alberta has signed an MOU with three of Canada's major retail associations (the Retail Council of Canada, Canadian Federation of Independent Grocers and the Canadian Association of Chain Drug Stores) on an industry-operated strategy to reduce the distribution of plastic bags by 50% by December 31, 2013. The MOU is complete and industry is working to report on its final achievements.

Waste Diversion

Diversion programs in Alberta are managed by three Delegated Administrative Organizations (DAOs) that are not-for-profit agencies reporting to the Minister of Environment and Sustainable Resource Development.

EPR: As of the fall of 2013, Alberta is consulting on several proposed changes to its existing regulatory framework for designated materials recycling. These proposed changes include enabling EPR and designating PPP and HHSW to be managed under EPR programs (currently HHSW materials are managed under a voluntary program funded by the provincial government and municipalities. PPP is currently a municipal responsibility). There are voluntary EPR programs operating in Alberta for pesticide containers, medications, rechargeable batteries, and cell phones. The cell phone recycling program operates under a Memorandum of Understanding (MOU) between the Canadian Wireless Telecommunications Association and the Government of Alberta (2011). In this MOU, industry committed to increasing the collection rate from 19% in 2011 to 37% by 2015.

Product Stewardship: Alberta has five provincially-regulated stewardship programs operated by DAOs. The Alberta Recycling Management Authority (ARMA) manages programs for electronics, paint, and tires. The Alberta Used Oil Management Association manages the program for used oil, containers and filters and the Beverage Container Management Board manages the deposit return program for beverage containers.

Other Diversion: Some municipalities also develop local solid waste management plans and some developed sustainability goals voluntarily. For example, the Edmonton Waste Management Centre of Excellence has a closed loop recycling partnership to build paper production and recycled glass/aggregate brick manufacturing, CRD waste recycling; and a new biofuels facility¹¹⁷.

There is no provincial organics diversion strategy, however many municipalities have leaf and yard waste collection programs and some have food waste composting. The percentage of

¹¹⁷ Edmonton Sustainability Papers – May 2010: Discussion Paper 10 – Sustainable Waste Management.

households composting kitchen and/or yard waste in the province was 56% in 2011¹¹⁸.

DIVERSION for AB: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)	
Total materials diverted	713,153 tonnes (332,431 tonnes residential / 713,153 tonnes non-residential)
Total Kg/capita diverted	192 kg/capita
Diversion rate	15.4%

Recovery: EFW

Alberta is the only jurisdiction in Canada that has a province-wide Code of Practice for Energy Recovery Facilities. In addition, EFW is part of their provincial Energy Strategy.

There is one large EFW facility in Wainwright which treats MSW, biomedical, and some non-hazardous industrial wastes to generate heat for use at an adjacent processing plant. In addition, Alberta has 420 small EFW facilities which include anaerobic digestion facilities and waste-to-alternative fuels; all are registered facilities (which may or may not be operating; the Government does not track operational facilities versus non-operational facilities) and are limited to waste volumes less than 10 tonnes per month. Larger facilities are being planned by some municipalities. The City of Edmonton has begun construction on the world's first industrial scale MSW mixed waste-to-biofuels facility. This facility will have the capacity to convert 100,000 tonnes per year of MSW into 38 million litres of biofuels (methanol and ethanol) annually¹¹⁹. Other municipalities are also exploring the potential of EFW. For example, the Southern Alberta Energy from Waste Association (SAEWA) is a coalition of municipal jurisdictions committed to researching technological applications for recovering energy from non-recyclable waste materials. In 2013, SAEWA completed a feasibility study and is moving forward with planning a large scale EFW facility to treat MSW in southern AB, expected to be commissioned by 2018¹²⁰.

Waste Disposal Approaches

All landfills require authorization and engineered designs for construction and operation, and undergo environmental assessment. Alberta began regionalizing its municipal landfill system in the 1970's and utilizes fewer, larger regional landfills with a network of transfer stations. Landfills are classified by the waste streams (hazardous, non-hazardous, and inert). The Waste Control Regulation outlines waste classification while the Activities Designation Regulation outlines operating requirements. The only materials currently banned from landfills are biomedical waste and bulk liquids. The province has authority to prescribe tipping fees; however it does not exercise this authority. Alberta regulates LFG capture based on the quantity of greenhouse gases emitted. There are two LFG projects that generate offset credits in accordance with the provincial protocol for LFG capture, and four projects that collect LFG in

¹¹⁸ Statistics Canada Composting by Households in Canada, 2013.

¹¹⁹ City of Edmonton website http://www.edmonton.ca/for_residents/garbage_recycling/biofuels-facility.aspx

¹²⁰ Southern Alberta Energy from Waste Association, Feb 13, 2013 media release http://www.saewa.ca/pdf/saewa_media_release_02-13-13.pdf
http://www.saewa.ca/pdf/saewa_media_release_02-13-13.pdf

total. Alberta has 66 small incinerators that treat both MSW and non-MSW. There is an industrial Code of Practice for Small Incinerators in place.

DISPOSAL SUMMARY for AB: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)
Total materials disposed: 3,917,492 tonnes (970,422 tonnes residential/ 2,947,070 tonnes non-residential)
Approximate Number of Operating Landfills: 136 (2013 data from WMTG)
Number of Landfills with LFG Collection for Flaring or Utilization: 4 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: Targets exist for all regulated product stewardship programs. Each DAO submits a business plan and annual report to government each year with metrics for all regulated programs. In 2007 a special report was completed on design for environment opportunities within Alberta's stewardship programs¹²¹. Targets also exist for voluntary EPR programs and can be found in the corresponding MOUs.

Disposal: The province conducts State of the Environment reporting, and one of the indicators reported on is per capita municipal solid waste disposal (including residential, CRD, and ICI waste disposed in 29 municipal and two private landfills that voluntarily reported data; approximately 84% of Alberta's population is served by these landfills)¹²².

3.3 Saskatchewan

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Legislative, through the Environmental Management and Protection Act (EMPA) (2002) which includes regulations related to beverage containers (regulations related to beverage containers are included in the Litter Control Act and not in EMPA), PPP, tires, used oil, waste electronics, and paint, and the Litter Control Act.

Strategy: Saskatchewan initiated its consultation on the development of a Solid Waste Management Strategy for the province in 2005, the new strategy is pending release soon.

Waste Prevention and Reduction-at-Source

There are no waste prevention or waste reduction initiatives in this jurisdiction.

Waste Diversion

EPR: The province has adopted EPR regulations for electronics, used oil, containers and filters,

¹²¹ See <http://environment.gov.ab.ca/info/library/7634.pdf>.

¹²² There are a number of private landfills that accept only commercial and industrial waste, which are not included in the survey.

paint, and glycol and glycol containers. The Household Packaging and Paper Stewardship Regulation has been adopted as a shared responsibility program where producers will fund up to 75% of the net program costs with municipalities maintaining responsibility for collection and recycling. In 2014 the program will include printed paper, newsprint, cardboard, plastic, metal and glass packaging. Voluntary EPR programs exist for dairy beverage containers, rechargeable batteries, and pesticide containers. The province is also participating in pilot testing of a voluntary industry-led EPR program to recycle agricultural plastics as a potential Canada-wide program model with Clean Farms.

Product Stewardship: The province runs a beverage container program through SARCAN (the recycling division of the Saskatchewan Association of Rehabilitation Centres) and a used tire program through the Saskatchewan Scrap Tire Recycling Corporation.

Other Diversion: Municipalities and private operators run a variety of recycling programs in some cases on a fee for service basis and commonly through depots. In 2013, 31% of households had access to a curbside municipal recycling program. There is no provincial organics diversion strategy, but some municipalities have leaf and yard waste collection. The percentage of households composting kitchen and/or yard waste was 47% in 2011¹²³.

DIVERSION for SK: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)

Total materials diverted	142,659 tonnes (55,625 tonnes residential / 142,659 non-residential)
Total Kg/capita diverted	137 kg/capita
Diversion rate	13.2%

Recovery: EFW

There were no EFW facilities identified in this jurisdiction, and no EFW policy.

Waste Disposal Approaches

All landfills require approval and engineered designs for construction and operation and all landfills undergo environmental assessment. Disposal requirements for municipal landfills are identified in the provincial Municipal Refuse Management Regulations, which also require all municipalities to have a disposal program for MSW. There are no provincial policies or protocols regarding LFG capture and utilization. The province has regionalized waste management services, as of 2012 there were 17 Regional Waste Management Authorities (RWMA), which have the authority to implement material bans for landfills, as well as set tipping fees and other levies. Some do not charge any tipping fees while others have tipping fees that range from \$20/tonne to \$44/tonne. A 2012 study found regionalizing waste services through RWMA's increase economies of scale; RWMA's have a higher recovery rate of recyclables at a lower net cost per tonne compared to individual municipal programs¹²⁴.

¹²³ Statistics Canada Composting by Households in Canada, 2013.

¹²⁴ StewardEdge, 2012. Saskatchewan Datacall Analysis Report 2012. Prepared For Multi-Material Stewardship Western (MMSW).

The province conducted a detailed waste stream analysis to quantify flows of MSW, CRD and ICI in 2009. The findings show that retail trade represented the greatest proportion of this sector, and that ICI waste had a significant opportunity for reducing overall waste disposed. CRD waste was also identified as a substantial and growing component of the overall waste stream¹²⁵.

There were no MSW incinerator facilities identified in this jurisdiction.

DISPOSAL SUMMARY for SK: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)
Total materials disposed: 937,267 tonnes (283,726 tonnes residential/ 653, 541 tonnes non-residential)
Approximate Number of Operating Landfills: 338 (2013 data from WMTG)
Number of Landfills with LFG Collection for Flaring or Utilization: 2 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: The government produces a State of the Environment Report every two years. The report presents information on indicators, including total amount recycled for each regulated product; however the report does not include waste tonnages generated. The province does not set recovery rate targets for regulated programs, however all EPR programs track and report on recovered quantities in their annual reports.

Disposal: The majority of municipal landfills do not have weigh scales.

3.4 Manitoba

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Legislative via the Sustainable Development Act, including guidelines for the efficient use of resources, and waste minimization and substitution. Landfill operations are regulated under The Environment Act and the Waste Disposal Ground Regulation. Waste diversion activities and product stewardship programs are regulated under the Waste Reduction and Prevention (WRAP) Act (1990). Manitoba utilizes a landfill levy.

Strategy: Manitoba's 2012 strategy, *Tomorrow Now – Manitoba's Green Plan*, is an eight-year strategic plan including priorities for waste reduction. As recycling programs mature, landfill bans will be utilized with targets and reporting requirements. The strategy specifies that the government will work with municipalities and industry to expand recycling options for CRD and organic waste and will support the recovery and recycling of agricultural plastic products. The strategy also initiated a process to develop a new Green Prosperity Act to link sustainability activities.

¹²⁵ Earthbound environmental Inc., StewardEdge Inc., MGM Management. 2009. System Analysis of Saskatchewan Waste Management Practices and Costs & Development and Assessment of Selected Scenarios for a Province-wide Multi-Material Recycling Program in Saskatchewan. Prepared for Saskatchewan Ministry of Environment.

Waste Prevention and Reduction-at-Source

The Waste Reduction and Pollution Prevention (WRAPP) Fund supports projects that focus on reducing and diverting waste, including CRD, organics and composting; and implementing better waste management practices. Manitoba has a goal of 50% reduction in plastic bag use by 2015 and a 75% recovery target for beverage containers by 2016.

Waste Diversion

Green Manitoba is the delegated provincial agency with a mandate to facilitate the development of stewardship/EPR programs/plans, organic waste and CRD waste diversion programs, infrastructure, northern/remote community recycling, and communications. It also develops and manages waste reduction initiatives and the landfill levy under the Waste Reduction and Prevention (WRAP) Act.

EPR: Manitoba has 13 EPR programs including electronics, cell phones, paint, used oil, containers and filters, anti-freeze, tires, mercury thermostats and fluorescent lamps, HHSW (including gasoline, solvents, toxics, and corrosives) and batteries (lead acid, primary and rechargeable). PPP is managed through a shared responsibility program with producers using Multi-Material Stewardship Manitoba (MMSM), a producer responsibility agency, and municipal operations. The Clean Farms pesticide and fertilizer container program which operated as a voluntary program is now regulated as an EPR program and in rural areas accepts residential pesticide containers.

Other Diversion: There is no provincial organics diversion strategy. The percentage of households composting kitchen and/or yard waste was 56% in 2011¹²⁶. MMSM reports that 92.5% of households have access to curbside or depot recycling.

DIVERSION for MB: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)	
Total materials diverted	178,481 tonnes (85,460 tonnes residential / 93,021 tonnes non-residential)
Total Kg/capita diverted	144 kg/capita
Diversion rate	15.8%

Recovery: EFW

There were no EFW facilities identified in this jurisdiction, and no EFW policy.

Waste Disposal Approaches

All landfills require approval and engineered designs regarding construction and operation, and all landfills undergo environmental assessment. Since 2009, Manitoba has had a Waste

¹²⁶ Statistics Canada Composting by Households in Canada, 2013.

Reduction and Recycling Support (WRARS) levy of \$10/tonne on MSW disposed in all public landfills (private industrial landfills and First Nations landfills are exempt). Twenty percent of this fund is allocated to support priority provincial waste programs and 80% is allocated to municipalities based on recycling levels achieved. From 2009 - 2012 \$32 million was allocated to municipalities¹²⁷.

There is a legislated requirement for LFG collection and management for all landfills over a certain size (there are three LFG collection projects), the gas is not utilized for energy purposes.

There were no MSW incinerator facilities identified in this jurisdiction.

DISPOSAL SUMMARY for MB: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data) Total materials disposed: 951,612 tonnes (388,683 tonnes residential/ 562,929 tonnes non-residential) Approximate Number of Operating Landfills: 195 (2013 data from WMTG) Number of Landfills with LFG Collection for Flaring or Utilization: 3 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: MMSM reports annually to the province, as do other stewardship organizations. Targets for all regulated programs are set out in the individual stewardship plans approved by the province. Reporting protocols are currently established for each individual program, but the province is developing a standardized reporting protocol for all programs.

Disposal: In 2011 the government began to increase the level of effort dedicated to monitoring and reporting on waste management with its first Annual Waste and Recycling Summary Report. Performance measurement will be improved as they progress with this initiative.

3.5 Ontario

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Legislative - there are currently four key pieces of legislation in Ontario that drive the waste management framework. The Environmental Protection Act (EPA) (1990) regulates: 1) residential waste management and recycling services –which are mandated under the Recycling and Composting of Municipal Waste regulation, 2) the safe disposal of pharmaceuticals and sharps; and 3) the EPA regulates waste audits and waste reduction work plans from the ICI sector and ICI source separation program requirements. The recycling services provided by municipalities are mandated by the fourth key piece of legislation: the Waste Diversion Act (WDA) 2002. The WDA designates specific wastes for inclusion in diversion programs.

The province is currently planning to overhaul the WDA, and in the summer of 2013 proposed a

¹²⁷ Municipal Leader, the Magazine of the Association of Manitoba Municipalities. Summer 2013 Issue. Special Report – Greening of Municipalities, p31.

new Waste Reduction Act (WRA). The new WRA was at a second reading at the provincial legislature at the time of writing.

Strategy: Currently there is no strategy; however the proposed WRA has a supporting draft Waste Reduction Strategy. The Strategy identifies ICI PPP as the first material to be designated, proposes the development of an organics strategy, the use of disposal bans, end-of-life vehicle standards, and proposes to consider designating additional materials over time (i.e. carpets, bulky items and non-food organics)¹²⁸. The draft Strategy aims to increase waste diversion in the ICI sector. It would also allow for greater producer funding of the Blue Box program beyond 50% of net costs¹²⁹.

Waste Prevention and Reduction-at-Source

There are currently no waste prevention or waste reduction initiatives in this jurisdiction, however the proposed WRA has a supporting Waste Reduction Strategy which calls for moving to zero waste.

Waste Diversion

The WDA created Waste Diversion Ontario (WDO), a non-profit organization funded by industry to oversee the province's diversion programs for designated materials. WDO oversees four programs: Blue Box, Used Tires, Municipal Hazardous or Special Waste, and Waste Electrical and Electronic Equipment. The Minister identifies materials to be diverted from landfill then WDO oversees the development of a diversion program by stewardship agencies, called Industry Funding Organizations (IFOs), rather than Producer Responsibility Organizations (PROs): Ontario Tire Stewardship, Ontario Electronic Stewardship, and Stewardship Ontario (Blue Box Program and Orange Drop Program for household hazardous or special wastes). WDO monitors performance of these programs.

Residential waste management and recycling services are mandated under the Recycling and Composting of Municipal Waste regulation of the EPA, and are carried out by local municipalities. Each municipality develops its own waste management program which could include: curbside collection, depot drop-off, pay-as-you-throw or any combination of these elements¹³⁰. Members of the ICI sector are individually responsible for complying with waste related regulations and their compliance is determined by their size.

EPR: Ontario has EPR programs operated through IFOs for: waste electrical and electronics equipment (including cell phones); tires; and some household hazardous or special wastes including paint. Ontario's municipal Blue Box recycling program is a shared responsibility program with producers funding 50% of the net costs of the program.

¹²⁸ Ontario Waste Reduction Strategy June 2013, Page 18

¹²⁹ Ontario Waste Reduction Strategy June 2013, Page 5

¹³⁰ Recycling Council of Ontario website accessed October 2013 https://www.rco.on.ca/how_waste_is_regulated

Product Stewardship: Ontario operates a deposit return system for beverage alcohol containers sold through the Liquor Control Board of Ontario (LCBO) with handling (collection) responsibilities contracted to The Beer Store. The Beer Store also manages a voluntary deposit return system for all the beer packaging (including a refilling system for the brown 'Industry Standard Bottle'). Refundable deposits are used. There is no deposit return program for other beverage containers. Beverage containers including milk cartons are collected through the municipal Blue Box program. Some other household hazardous or special wastes, not included in the Municipal Hazardous or Special Waste (MHSW) program, are managed via a product stewardship approach, which includes rechargeable batteries, portable fire extinguishers, fluorescent bulbs and tubes, and mercury containing devices.

Other Diversion: Since 1994 municipalities greater than 5000 people are required to collect leaf and yard waste. Between 2004-2007 overall composting rates doubled and the number of households with access to curbside collection and/or depot collection for organics tripled¹³¹. The percentage of households composting kitchen and/or yard waste was 75% in 2011¹³².

DIVERSION ON: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)	
Total materials diverted	2,749,047 tonnes (1,996,047 tonnes residential / 752,990 non-residential)
Total Kg/capita diverted	208 kg/capita
Diversion rate	22.9%

Recovery: EFW

Ontario has three approved EFW facilities. Of the three approved facilities, Algonquin Power in Peel Region is a full-sized operating EFW facility and can process up to approximately 180,000 tonnes of MSW and ICI waste annually.

The second one is under construction to serve Durham and York Regions - expected to be operational in 2014. A third one is a demonstration facility in Ottawa (Plasco) utilizing new gasification technology – approved to process up to 85 tonnes MSW per day. Another facility (Entech-REM), to be located near Port Hope, is undergoing the environmental screening approval process and utilizes a new gasification technology.

Waste Disposal Approaches

All landfills require approval; engineered designs regarding construction and operation of the facility are required as part of the approval process. All landfills undergo environmental assessment prior to construction.

The Landfill Inventory Management Ontario (LIMO) (within the Ontario Ministry of the

¹³¹ Profile of Waste and Recyclable Materials Processing Facilities in Canada. Prepared by Cheminfo Services Inc. March 2010. Prepared for Environment Canada.

¹³² Statistics Canada Composting by Households in Canada, 2013.

Environment) updates an online database of all landfills every year. The online database includes the following publicly accessible information for all large landfills: capacity; fill rates; estimated remaining capacity; engineering designs; monitoring / reporting details use; and LFG collection methods. LFG must be collected and managed if there is a waste disposal volume of greater to 1.5 million m³.

Landfill tipping fees are set by the landfill owners, which could be municipal authorities or the private sector. A 2007 study showed landfill tipping fees in Ontario ranged from \$45-\$70¹³³.

There were no MSW incinerator facilities identified other than the EFW facilities noted. Biogas, biomass, and landfill gas are included in the scope of the Ontario Green Energy Act.

DISPOSAL SUMMARY for ON: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)
Total materials disposed: 9,247,415 tonnes (3,204,264 tonnes residential/ 6,043,151 tonnes non-residential)
Approximate Number of Operating Landfills: 880 (# from LIMO)
Number of Landfills with LFG Collection for Flaring or Utilization: 28 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: The Blue Box program uses overall diversion goals. There are no percentage diversion targets set for the MHSW or electronics programs, but year over year tonnage goals are set. The tire stewardship program has a target recovery rate of 91% of the available automobile/passenger car tires and 30% for all off-road tires. Diversion targets are set by the industry funding organizations through their stewardship plans. Program results are audited independently.

Disposal: Each year the Ministry requests operators of large landfills to complete a landfill data collection form to update LIMO and includes: amount of total waste received; estimated total remaining landfill capacity; and methodology used to determine the remaining capacity¹³⁴.

3.6 Québec

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Québec's Environment Quality Act provides abilities and framework related to waste management including policy development, 4Rs hierarchy, regional planning, reduction, diversion and reclamation, and disposal. It obligates government to adopt a national residual material management policy, which outlines principles for waste management and defines objectives for reduction, diversion and reclamation. This Act is supplemented by: An Act

¹³³ Saotome Tomo, 2007. Development of Construction and Demolition Waste Recycling in Ontario. School of Engineering Practice SEP 704, McMaster University.

¹³⁴ Ontario Ministry of Environment – Landfill Inventory Management Ontario website accessed September 2013 http://www.ene.gov.on.ca/environment/en/monitoring_and_reporting/limo/STDPROD_077976.html

Respecting the Société Québécoise de Récupération et de Recyclage (the est. of Recyc-Québec); an Act Respecting the Sale and Distribution of Beer and Soft Drinks in Non-Returnable Containers and the Beer and Soft Drinks Distributors' Permits Regulation (1984) and its corresponding regulation, the Act for Sustainable Development (2006) which defines 16 principles including responsible production and consumption, polluter pays and cost internalization, the Regulation Respecting the Recovery and Reclamation of Products by Enterprises (2011) [EPR reg], the Regulation Respecting Compensation for Municipal Services Provided to Recover and Reclaim Residual Materials (2004, 2010), and the Regulation Respecting the Reuse of Water Containers with a capacity exceeding 8 litres.

Strategy: The province's overall waste management strategy is articulated in the Québec Residual Materials Management Policy (adopted by government in June 2011) and its 2011-2015 Action Plan. The over-arching goal of the strategy is "to create a zero-waste society that maximizes added value through sound residual materials management. The Action Plan outlines \$650 million for organics diversion, planned disposal bans province-wide, studies on recovery systems and agreements with businesses regarding reduction in packaging and improvements to product/packaging design, as well as \$1M for projects to help develop an understanding of northern waste issues.

Waste Prevention and Reduction-at-Source

The over-arching goal of the Solid Waste Management Policy Action Plan is "to create a zero-waste society. The Action Plan has clear targets for organic wastes from the residential and ICI sectors. The Action Plan includes voluntary agreements with businesses regarding reduction in packaging and improvements to product/packaging design to facilitate recycling.

Waste Diversion

Québec has authorized Recyc-Québec, a Crown Corporation, to promote, develop and foster the reduction, re-use, recovery and recycling of containers, packaging, materials or products.

EPR: Québec has designated EPR for electronics, HHSW (i.e. batteries, mercury lamps), paint, oil and glycol. Other HHW such as solvents, irritants, corrosives and aerosols are being considered. Agreements for existing EPR programs for used oil, containers and filters and glycol and the paint program were renewed in 2012. Recyc-Québec is responsible to implement and follow those agreements. PPP is collected through curbside and depot recycling by municipalities with 100% producer funding. Québec is reviewing the possibility of transferring operational responsibilities for PPP to producers.

Product Stewardship: The tire stewardship program is run by RecycQuébec and is planned for transition to full EPR. Regulations have not yet been adopted yet.

Other Diversion: Organic waste represents 25% of MSW in Québec. Approximately 80% of this is sent to landfill. Recyc-Québec estimates that about 10% of all households in Québec have access to organics curbside recycling; and about 70% have access to yard waste recycling. To begin reaching its 60% goal organics diversion by 2015 Québec will ban paper and cardboard from landfill in 2013, wood in 2014, and food waste in 2015. The province plans to have a

complete ban of organics from landfill by 2020. Recyc-Québec has been authorized to take the lead on organics in the province, with provincial funding available (\$4 million in 2012, and \$4 million for each year until 2016 to support the implementation of an action plan for organics). Recyc-Québec will support: municipalities and the ICI sector in their establishment of effective organics collection and treatment systems; the development of secondary markets for composted materials; and, support public education and outreach.

The Government of Canada is also supporting the organics diversion initiative in Québec by contributing a total of up to \$150M. The Québec contribution is in the order of \$165M, in addition to the contributions from the target municipalities. The projects involve the construction of: two systems to treat organic waste through anaerobic digestion, two composting centres and a pilot centre for the pre-treatment of organic waste in the Montréal Region. In addition, three other projects for the construction of organic waste treatment systems in Laval, Longueuil and the southern rim of Montréal, will receive federal funding.

DIVERSION QC: RecycQuébec (2010), reported in Statistics Canada's 2013 Waste Management Industry Survey	
Total materials diverted	2,336,400 tonnes (1,112,694 tonnes residential / 1,223,706 tonnes non-residential)
Total Kg/capita diverted	296 kg/capita
Diversion rate	22.9%

Recovery: EFW

There is one large EFW facility in Québec. In addition, the province has a strategy to develop organics biogas EFW projects. Québec's landfill and incineration regulation specifically includes technology designed for smaller EFW facilities (i.e. facilities that process less than two tonnes/hr). Criteria are under development for EFW incinerators, pyrolysis chambers, gasifiers, plasma ovens, industrial ovens, and boilers based on principles that require sorting of the waste prior to combustion, a positive energy balance overall for technology rationale.

Waste Disposal Approaches

All MSW landfills require approval and engineered designs regarding construction and operation of the facility – and environmental assessment prior to construction. Québec's Regulation on disposal facilities defines landfill facility types (e.g., technical, trench, CRD, Northern, etc.) and what kind of waste each type of facility can accept. The regulation gives specific direction about design, operation, maintenance, environmental monitoring and the end-of-life responsibilities. All landfills must capture LFG and either flare or utilize it. In particular, landfills that are 1,500,000 m³ or more in size or that dispose of more than 50,000 tonnes of waste a year or more must use a vacuum mechanism to capture LFG and flare or utilize it. If LFG is not utilized it must be thermally destroyed. The regulation describes how transfer stations should be operated, what fines can be applied, and how facilities need to report.

Landfills in the northern area need a specific authorization under the EQA, equivalent to

environmental assessment. Québec's northern Territory - Nunavik¹³⁵ – is comprised of fourteen unconnected northern villages with a total population of 11,500 that generate approximately 12,000 tonnes of waste annually, which is deposited in northern landfills and either burned, buried, or stored¹³⁶. A 2013 Residuals Management Plan for Nunavik focusses on goals to improve the management of northern landfills in Nunavik, in recognition of its unique circumstances – no road network, permafrost, and a large vast region to cover. For this reason the region is not included in most of Québec's regulatory requirements regarding residuals management.

The EQA requires regional municipalities to develop Regional Waste Management Plans. Regional municipalities required to manage all MSW and ICI waste.

Québec's Regulation on landfill levies outlines that the levy will be indexed and published on January 1st of each year. In 2013 a permanent levy of \$11.41 a metric tonne to divert material from landfill; an additional \$9.69 will be charged (for a total of \$21.10 a metric tonne) to develop organics processing infrastructure.

There is one conventional MSW incinerator in Québec. The Kativik Regional Government is planning on conducting a feasibility study for a small scale incinerator for the north.

DISPOSAL SUMMARY for QC: RecycQuébec (2010), reported in Statistics Canada's 2013 Waste Management Industry Survey
Total materials disposed: 5,795,707 tonnes (2,853,189 tonnes residential/ 2,942,518 tonnes non-residential)
Approximate Number of Operating Landfills: 104 (2013 data from WMTG)
Number of Landfills with LFG Collection for Flaring or Utilization: 16 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: Québec outlines a province-wide waste management objective and a province-wide legislated indicator to measure progress: ratio of residual materials eliminated on the GDP and per capita; and residual materials recovery and reclamation rate.

Québec has established year over year, recovery targets in the regulations governing all EPR programs. Under the Residual Materials Management policy Québec has established a recovery rate for PPP. There are specific and detailed requirements for different product sub-categories with stepped recovery escalation provisions over set years established in each specific program regulation. Programs are required to report annually on the established recovery rates established for the program using independent third party auditing protocols and following certain reporting requirements set by the province. A new environmental auditing protocol has recently been adopted. Québec has also established a mechanism of fines for producer organizations that do not meet regulated targets.

¹³⁵ Comprises the northern third of the province, covering a land area of 443,684.71 km² north of the 55th parallel, it is the homeland of the Inuit of Québec and utilizes a self-governing system called the Kativik Regional Government.

¹³⁶ Kativik Regional Government. Nunavik Residual Materials Management Plan (draft) April 2013.

Québec's Solid Waste Management Policy Action Plan also sets targets for organics diversion.

Disposal: The province collects detailed disposal data. Each landfill site must report third-party verified waste quantities, and the total amount of levy payments it has received every 90 days. Environmental monitoring (leachate treatment discharge, surface and groundwater, methane migration, biogas collection system) is required for all landfills.

The province also monitors the relationship between disposal data and Gross Domestic Product (GDP). Between 2008 and 2011, the ratio of solid waste to GNP fell to 16.2%, from 21.8 tons to 18.3 tons of waste for each million dollars of production. In the same time period, solid waste generated per capita fell to 746 kg, from 877 kg per capita in 2008 (a reduction of 14.9%).

3.7 New Brunswick

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: New Brunswick's Clean Environment Act (1996), includes regulations for diversion of designated materials. New Brunswick had a voluntary five year Waste Reduction and Diversion Action Plan which included a 10 point plan that set goals for the Regional Service Commissions to develop waste diversion programs for certain waste streams. While not setting targets, the government called for regular reporting.

Waste Prevention and Reduction-at-Source

There are no waste prevention or waste reduction initiatives in this jurisdiction that target upstream waste prevention issues.

Waste Diversion

Recycle NB, a crown agency, establishes, administers, and in some cases (e.g., tires) operates stewardship programs for products/materials identified in the Designated Materials Regulations. Each of New Brunswick's 12 Regional Service Commissions has additional voluntary waste diversion programs in place such as recycling/diversion programs.

EPR: There are two regulated EPR programs, one for paint and the second for used oil, containers and filters and glycol. Recycle NB oversees the paint, used oil and glycol programs. Draft EPR regulations for electronics have been released and the province is also in the process of transitioning the existing tire program into a regulated EPR program under the legislation. The province has also recently signed a Memorandum of Understanding with the Canadian Battery Association to support an existing voluntary program for end of life lead acid batteries.

In partnership with the other Atlantic region jurisdictions New Brunswick is in the early stages of considering producer responsibility model for PPP.

Product Stewardship: New Brunswick operates a beverage container program using a product

stewardship model through the Beverage Containers Act. The un-refunded portion of each deposit is used to recover the costs of administering the program. A portion is also deposited into New Brunswick's Environmental Trust Fund, used to promote recycling activities. Beverage container handling fees are paid by beverage distributors to New Brunswick's privately-run beverage container redemption centres as compensation for receiving, paying out refunds for, and sorting beverage containers.

The tire program is currently managed by Recycle NB on behalf of the province.

Other Diversion: NB is divided into 12 Regional Service Commissions that operate recycling programs including PPP and organics. The previous Action Plan required every region to implement organics diversion, but did not specify targets. Each of the solid waste commissions are at various stages of implementing this strategy, some via backyard composting, others with curbside. The percentage of households composting was 58% in 2011¹³⁷.

DIVERSION NB: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)

Total materials diverted	137,515 tonnes (no residential / non-residential break out)
Total Kg/capita diverted	183 kg/capita
Diversion rate	22.4%

Recovery: EFW

There were no MSW EFW facilities identified for this jurisdiction, and no EFW policy.

Waste Disposal Approaches

All landfills require approval and engineered designs regarding construction and operation of the facility. All MSW landfills must undergo an Environmental Impact Assessment (EIA). The regional service commissions (representing municipalities, rural communities and unincorporated areas) are responsible for solid waste management and other waste diversion programs (PPP or metals). All MSW is disposed of in one of the six landfills. Three of the landfills operate LFG collection and electric generation systems, the other three operate a LFG flaring system. There were no MSW incinerators identified in this jurisdiction.

DISPOSAL SUMMARY for NB Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)

Total materials disposed:	475,265 tonnes (219,486 tonnes residential/ 255,779 tonnes non-residential)
Approximate Number of Operating Landfills:	6 (2013 data from WMTG)
Number of Landfills with LFG Collection for Flaring or Utilization:	6 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: New Brunswick has regulated targets for the recovery of used oil, containers, filters and glycol, and recovery rates increase each year. There are no established recovery rates for

¹³⁷ Statistics Canada Composting by Households in Canada, 2013.

paint, but all EPR programs are required to report annually on performance. There were no targets identified for the beverage container program.

Disposal: There are monitoring requirements for landfills outlined in the design standards, but no information identified to indicate there are reporting requirements to the government.

3.8 Nova Scotia

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: legislative framework via the Environment Act (1994-95), which legalized the first Solid Waste Management Strategy (1995). Nova Scotia was the first jurisdiction in Canada to implement a dedicated solid waste management strategy, and it was also the only jurisdiction to achieve a 50% diversion goal by 2000. A new solid waste resource strategy was released in 2011, *Our Path Forward*. It includes the development of an EPR Action Plan.

Strategy: Nova Scotia's overarching strategy includes an upstream waste prevention or reduction vision, an EPR approach, and numeric targets limiting the volume disposed (past versions of the strategy had a diversion target to achieve). The strategy includes measures for ICI and CRD wastes. The strategy includes monitoring, evaluation and reporting on progress including diversion targets for all municipalities which are publicly reported on. Each municipality in each region was required to prepare and submit to the Solid Waste Management Authority a Solid Waste-Resource Management Plan in 1997.

Waste Prevention and Reduction-at-Source

The Environmental Goals and Sustainable Prosperity Act (EGSPA) 2007, amended 2012, includes waste reduction targets: a solid-waste disposal rate that is no greater than 300 kg per person per year by 2015; and a sustainable procurement policy that integrates sustainable procurement criteria into Provincial government purchasing.

Waste Diversion

Nova Scotia mandates the Resource Recovery Fund Board Inc. (RRFB) as a not-for-profit corporation to develop and implement industry stewardship programs. The RRFB runs beverage container and tire programs with industry, and provides assistance to municipalities through funding to run organic waste, recyclables, and CRD waste programs.

EPR: Nova Scotia has legislated EPR programs in place for electronics, waste paint and an agreement with milk producers to provide funding to offset the costs for municipalities to recycle milk containers (milk containers are not part of the deposit program for beverage containers). Cell phones are covered under the EPR program for electronics operated by Canadian Wireless Telecommunications Association. Under the terms of Newspaper Stewardship Agreement newspaper companies agreed to an advertising credit for recycling programs of \$10 per tonne of newsprint consumed. Nova Scotia also has an in-kind advertising voluntary stewardship agreement with Yellow Pages Group. These in-kind funds are used by

RRFB to advertise province-wide waste reduction and diversion.

Product Stewardship: The province has product stewardship programs for beverage containers, used oil, and used tires which are managed through the province's Resource Recovery Fund Board. Beverage container and used tire product stewardship programs are overseen and/or managed by the RRFB. The used oil program is managed through retailers.

Other Diversion: The province is organized into 7 waste management regions and municipal recycling services are widely available. Since 1995, the Solid Waste Resource Management Strategy mandated source separation of recyclables including organics which are banned from landfill. This allowed the province to take an early lead on organics diversion in Canada, having the highest rates by 2006. The organics requirements also apply to the ICI sector. The percentage of households composting kitchen and yard waste was 94% in 2011¹³⁸.

The province has included CRD debris as a priority in its diversion efforts and includes CRD in its funding model to municipalities (see Performance Monitoring below for more information), and this has resulted in municipalities voluntarily initiating programs to divert CRD debris from disposal. As early as 2001 HRM established a By-law "Respecting Licensing of Construction and Demolition Materials Recycling and Disposal Operations" which requires all CRD materials to be transported from the place of generation to either a transfer station or a CRD processing facility. The By-law has recycling targets and prohibits CRD materials from remaining onsite at a CRD Processing Facility longer than one year, and in addition, 75% of the CRD debris received at registered sites must be diverted from landfill. They also have a flow control by-law to control the export of CRD debris to neighbouring municipalities. Many rural municipalities in Nova Scotia also divert CRD wood debris from disposal. Some divert asphalt shingles and drywall for various purposes.

The RRFB is also exploring opportunities to divert more textiles from landfill in the province. In spring of 2013 they hosted a Textiles Recycling Summit with textile recyclers, municipalities, and government representatives. An RRFB waste audit indicates that approximately 30,000 tonnes of textiles are sent to disposal each year in Nova Scotia¹³⁹.

DIVERSION NS: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)	
Total materials diverted	265,467 tonnes (136,967 tonnes residential / 128,500 tonnes non-residential)
Total Kg/capita diverted	281 kg/capita
Diversion rate	42%

Recovery: EFW

There were no MSW EFW facilities identified for this jurisdiction, and there is no EFW policy.

¹³⁸ Statistics Canada Composting by Households in Canada, 2013.

¹³⁹ Resource Recovery Fund Board website, News <http://www.rrfb.com/news.asp?id=52>

Waste Disposal Approaches

All landfills require approval and engineered designs, and undergo environmental assessment. Waste management is regionalized through seven regions. The regional waste management authorities are responsible for waste management coordination with municipalities. Nova Scotia is the only jurisdiction in Canada that has province-wide bans from landfill on such a comprehensive list of designated list of materials.

Exhibit 40: Materials Banned from Landfill across Nova Scotia

Materials banned between 1996-98	Materials banned between 2008-09:
Beverage containers Corrugated cardboard, Newsprint Used tires Lead-acid (automotive) batteries Leaf and yard waste, organics (food waste) Post-consumer paint products Ethylene glycol (automotive antifreeze) Steel/tin and glass food containers Low-and high-density polyethylene bags and packaging	Televisions Desktop, laptop / notebook computers, CPU's, keyboards, mice, cables; monitors; printers incl. with scan/fax Computer scanners Audio and video playback and recording systems Telephones and fax machines Cell phones and other wireless devices

There are 19 designated CRD disposal facilities which must meet recycling targets of 75% CRD diversion from disposal¹⁴⁰.

There were no MSW incinerators identified in this jurisdiction.

DISPOSAL SUMMARY for NS: Statistics Canada's 2013 Waste Management Industry Survey (2010 Data)
 Total materials disposed: 367,246 tonnes (145,589 tonnes residential/ 221,657 tonnes non-residential)
 Approximate Number of Operating Landfills: 26 (2013 data from WMTG)
 Number of Landfills with LFG Collection for Flaring or Utilization: 2 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: The RRFB, and all municipalities in the province, are required to report annually on all diversion. The RRFB reports on aggregate tonnes of recyclable materials that were recycled across the province via municipalities, along with tonnes of organics and tonnes CRD waste.

The EPR programs (electronics and the paint) are required to report on quantities recovered and reused, location and number of collection facilities and public education programs.

Disposal: There are annual reporting requirements for RRFB to the Minister where they report on each stewardship program as well as public education and outreach activities. Each municipality submits reports on progress towards achieving waste reduction goals to the

¹⁴⁰ Halifax Regional Municipality Construction, Demolition & Renovation Material brochure
http://www.halifax.ca/wrms/documents/C_DBrochure.pdf
http://www.halifax.ca/wrms/documents/C_DBrochure.pdf
http://www.halifax.ca/wrms/documents/C_DBrochure.pdf
http://www.halifax.ca/wrms/documents/C_DBrochure.pdf

regional authority, which reports to the government.

The province supports municipal recycling programs by funding waste diversion credits based upon the volume of material diverted from municipal disposal annually; the funds are distributed through the RRFB. The less volume a municipality sends to disposal (including ICI and CRD) the more funding they receive from RRFB. The province uses an innovative funding formula for this initiative which directly links performance monitoring of municipalities to actual waste reduction (rather than diversion): they multiply the 1989 MSW/CRD/ICI municipal disposal rate by the current population of a municipality to determine what a municipality “would have been” disposing if nothing had changed since 1989. Then they subtract the current municipal disposal tonnage from the ‘theoretical tonnage’ to determine the real tonnage diverted by each municipality.

Each landfill operator / owner must keep records and accounts of the operations including, but not limited to, daily quantities of all waste received, disposed, stored and diverted, daily tipping fees, types of materials received, material storage and transfer facilities used, and other data as may be required by each site-specific permit.

The Minister of the Environment must report annually on progress towards EGSPA’s goals.

3.9 Prince Edward Island

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: PEI’s authorizing legislation for waste management is the Environmental Protection Act (1988), the Beverage Container Act (1988) and its regulations, the Materials Recycling Regulations (2009) for paint, used electronics, used oil, and lead acid batteries, and the Environment Tax Act (1982), which imposes a levy on tires (1991).

Strategy: The government is working on a new Sustainable Development Strategy and waste management will be an element of this Strategy.

Waste Prevention and Reduction-at-Source

There are no waste prevention or waste reduction initiatives in this jurisdiction.

Waste Diversion

The government has endorsed EPR and works with various industries in support of regulated and voluntary stewardship programs. All designated materials are banned from the solid waste landfill. Programs are run by either the Island Waste Management Corporation (IWMC) and/or industry stewardship organisations.

EPR: PEI has EPR programs in place for paint, electronics and cell phones and is considering EPR as an approach to manage lead acid batteries, dry cell batteries, used oil, containers and filters, pharmaceuticals, PPP, and mercury containing lamps. The electronics program is operated by

Atlantic Canada Electronics Stewardship (ACES)/Electronic Product Recycling Association (ACES/EPRA) in conjunction with the program in Nova Scotia and in Newfoundland and Labrador. The province is reviewing the potential for EPR for CRD, textiles, carpet, appliances, and furniture. The ICI sector is included in PEI's regulated EPR programs.

Product Stewardship: The province operates the beverage container program and also the used oil program (under consideration for EPR). IWMC also provides services for household hazardous wastes, white goods, used tires, fluorescent tubes, pharmaceuticals and batteries.

Other Diversion: PEI has a comprehensive waste diversion program managed through IWMC. As part of its services IWMC operates a blue bag recycling program (municipalities are not involved in collection). Since 1999 PEI has had a province-wide mandatory composting program for all residents and the ICI sector. The percentage of households composting kitchen and/or yard waste was 96% in 2011¹⁴¹. In 2012, a total of 19,352 tonnes of organic waste from the residential and ICI sectors was processed in the Centralized Compost Facility¹⁴². Large businesses arrange for a private waste contractor to transport to IWMC.

DIVERSION PEI: IWMC 2012 data (2012 Annual Report, pg 10)

Total tonnage diverted (IWMC): 54,875 tonnes (residential and ICI, does not include ICI businesses that contract private haulers directly)

Waste Recovery: EFW

PEI has one EFW facility which provides steam and/or hot water heat to a 15-km heat distribution system to the City of Charlottetown, serving over 60 customers and heats 84 ICI buildings. Energy for cooling is also provided to the hospital and the university in summer.

Waste Disposal Approaches

All landfills require approval and specific engineered designs regarding construction and operation of the facility are required. All landfills undergo environmental assessment prior to construction. IWMC provides solid waste management services throughout the jurisdiction. All sectors (residential, ICI and CRD) must source-separate their wastes into recyclables, compostables, and waste. Because participation is mandatory, businesses must provide sorting receptacles onsite. Residents have curbside pick-up service for all streams, while businesses must arrange for a waste contractor to collect their sorted material or they may opt to self-haul their material to a Waste Watch Drop-off Center. Fees, based on weight, are charged for the disposal of commercial wastes at IWMC facilities. The commercial tipping fee for this fiscal period was \$100/tonne at IWMC's disposal facilities.

Venting or gas collection systems are required to be installed to monitor the LFG production,

¹⁴¹ Statistics Canada Composting by Households in Canada, 2013.

¹⁴² Island Waste Management Corporation 2012 Annual Report, page 10
<http://www.iwmc.pe.ca/pdfs/2012AnnualReport.pdf>

however PEI landfills are not large enough to justify energy utilization from LFG.

Other than the EFW facility identified above, there are no other incinerators in PEI.

DISPOSAL SUMMARY for PEI: IWMC 2012 Data
Total materials disposed: 26,215 tonnes EFW and 49,730 tonnes to landfill
Approximate Number of Operating Landfills: 5 (1 MSW, 4 CRD) (2013 data from WMTG)
Number of Landfills with LFG Collection for Flaring or Utilization: 0

Performance Measurement Approaches

Diversion: PEI does not set recovery targets for designated programs. All materials covered under the regulations are banned from disposal and the province expects that responsible producer organizations will collect and divert 100% of the materials. Producer organizations are obligated to report annually on program performance using 3rd party auditing protocols.

PEI last published a State of the Environment report in 2010. The report includes a solid waste indicator – diversion from landfill/incineration. PEI achieved a 60% diversion rate in 2003, and by 2009 the diversion rate was reported as 61%.

Disposal: Annual reports from all disposal and recycling facilities are submitted to the Minister of Environment.

3.10 Newfoundland and Labrador

Policy Framework: Overarching Strategies / Policies for Waste Management

Framework: The 2002 Environmental Protection Act outlines the goals of environmental protection and sustainable development. The Act contains the following principles: product stewardship; pollution prevention for the elimination or minimization of waste; and, polluter pays principle. The Act includes the *Waste Management Regulations* that outline requirements governing the implementation and operation of waste diversion programs (beverage containers, used paint, used tires, electronic waste), as well as disposal. It also contains the *Waste Diversion Regulations*, which give the Minister of the Environment authority to ban a designated material from disposal.

Strategy: In 2002 the province released a *Provincial Solid Waste Management Strategy* which outlines specific goals which were revised in 2007 with a provincial government commitment of \$200 million and a specific implementation plan to modernize waste management across the province. The 2007 implementation plan goals are: divert 50% of the materials going to disposal by 2015; reduce the number of waste disposal sites by 80% by 2020; eliminate open burning at disposal sites by 2012; phase out use of unlined landfill sites by 2020; and have province-wide modern waste management by 2020. The implementation plan also includes the establishment of designated CRD waste disposal sites, organics composting facilities, material recovery facilities, and transfer stations for remote communities. Financing of the infrastructure required for implementation is provided by the provincial government of Newfoundland and Labrador. In addition, part of the implementation plan included the establishment of new environmental

standards that apply to waste management systems¹⁴³.

Waste Prevention and Reduction-at-Source

There are no specific waste prevention or waste reduction initiatives identified.

Waste Diversion

The Multi-Materials Stewardship Board (MMSB) is a crown agency of the government and is authorized to develop, implement, and manage waste diversion and recycling programs on a province-wide basis. It administers the Waste Management Trust Fund (revenues from which pay for the part of the implementation of the Provincial Waste Management Strategy), and implements province-wide public awareness and education initiatives. The MMSB works with various government departments, agencies and key stakeholders such as regional waste management authorities, and individual municipalities, to fulfill its mandate.

EPR: there are five legislated EPR programs - one for waste paint operated by Product Care and four for electronics. One electronics program is operated by Electronic Products Recycling Association (EPRA) effective 2013; another, for cell phones is operated by the Canadian Wireless Telecommunications Association (CWTA). The remaining two programs are for set-top-boxes and personal video recorders and are operated by Bell Aliant and EastLink.

Milk containers are also diverted in the Eastern region of Newfoundland and Labrador - MMSB has brokered an agreement with milk producers so that operators of these recycling facilities are compensated for the management of milk containers where they are recycled.

Product Stewardship: Beverage containers are managed through a product stewardship program operated by MMSB, as is a program for used tires. The province is in the early stages of reviewing potential producer responsibility models for PPP through a joint study with other Atlantic provinces. A used oil program is operated by the province but it (along with oil containers, filters and glycol), is being considered for transition to EPR. HHSW, managed by regional waste authorities, is being considered for management through an EPR approach.

Other Diversion: The MMSB has a voluntary residential backyard composting program although there are some centralized organic waste processing facilities. The percentage of households composting kitchen and/or yard waste was 43% in 2011¹⁴⁴. A 2012-13 year long pilot project in Burin Peninsula demonstrated that windrow composting of organics, yard waste, and local paper fibres can be successful in remote areas. This project was undertaken at existing landfill facilities and required minimal infrastructure¹⁴⁵.

¹⁴³ Government of Newfoundland and Labrador, News Releases May 8, 2007.
<http://www.releases.gov.nl.ca/releases/2007/mpa/0508n01.htm>

¹⁴⁴ Statistics Canada Composting by Households in Canada, 2013.

¹⁴⁵ Paul van der Werf, 2013. Simple is Sometimes Better, in Solid Waste Magazine Dec 2013/ Jan 2014 issue.

DIVERSION NL: MMSB 2011 survey data

Total tonnage diverted: 130,246 (10,385 tonnes residential / 20,950 provincial diversion programs - Beverage Containers, Used Tire Program, HHSW Program and the Used Oil Program / 98,911 ICI sector via commercial waste haulers and operators.

Recovery: EFW

There were no MSW EFW facilities identified in this jurisdiction. Provincial policy does not favour incorporation of an EFW approach.

Waste Disposal Approaches

All new landfills require approval and engineered designs regarding construction and operation of the facility. All new landfills undergo environmental assessment prior to construction. The province utilizes eight solid waste management regions to administer disposal, recycling, and composting programs. There are two newer landfills in the province which are modern and lined; however there are still over eighty (80) older unlined landfills or above ground dumps which are being phased out by region over time. The province has made great strides in modernizing its disposal approach: in 2002 there were over 240 unlined landfills, this number has been significantly reduced.

Estimated capacity for the regional lined sites is 50 years based on current volume received. Jurisdiction-wide landfill bans are in place for tires and used lubricating oil. Any other site-specific landfill bans could be set by each waste region. One of the regions has an organics ban in place. There are no jurisdictional policies on tipping fees; each region sets its own.

In addition to financing provided by the provincial government, Newfoundland and Labrador utilizes a Waste Management Trust Fund to support waste management projects that guide the jurisdiction toward modern waste management, and support the overall implementation of the Waste Management Strategy. Projects funded include dump site closures, waste management studies, school recycling initiatives, and environmental education on recycling. Funding for the Trust Fund is made available as a result of surplus revenue generated by the Beverage Container Recycling Program. Newfoundland and Labrador also has a Solid Waste Management Innovation Fund which includes grants for research and development of new or improved technologies, products, services, or processes that support the management of solid waste at any stage of the waste management hierarchy (reduce, reuse, recycle, or recover).

Newfoundland and Labrador has 6 small incinerators. A limited number of the disposal sites open burn or use conical waste incinerators due to their remote location. These are being phased out over time.

DISPOSAL SUMMARY for NL: 2011 MMSB Survey Data

Total materials disposed: 323,991 tonnes (137,710 tonnes residential / 186,282 non-residential)

Approximate Number of Operating Landfills: 88 (2013 data from WMTG)

Number of Landfills with LFG Collection for Flaring or Utilization: 1 (2013 data from WMTG)

Performance Measurement Approaches

Diversion: Regulated EPR programs have established targets and are monitored. There were no targets identified for the product stewardship programs.

Disposal: The regional waste management sites have annual reporting requirements that should summarize annual landfill activity including waste streams and quantities, as well as monitoring data. The province is in the process of establishing reporting requirements for waste management haulers. Currently, disposal overall is monitored since 2011 with the introduction of a data call specific to landfills with scale specific information by MMSB involving communities in the Eastern, Central, and Western regions of the province. This information also led to the production of a Waste Report Card. The production of the Waste Report Card included development of an approach taken to define and segregate waste; qualify what waste was being landfilled; qualify what waste was being diverted; combine the two data sets; compare and evaluate the provincial waste profile against a creditable baseline.

Results of the 2011 Report Card show that Newfoundland and Labrador produces only 2.42 kg of waste per-person/day and diverts almost 30% of that waste from landfill. The provincial waste disposal rate seems to have only slightly increased 2.41 kg/person/day from 1992 to 2.42 in 2012 while diversion has increased from 7% to 29% over the same period. Conclusions of the Waste Report Card note that non-domestic waste generators such as the ICI sector must increase their waste diversion activities to achieve the provincial goals.

3.11 Yukon

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Yukon's Environment Act (2002) provides overarching direction and authority for environmental and human health protection in the territory. The Environment Act's *Solid Waste Regulations* and permits issued under the regulations set standards for constructing and operating dumps and landfills in the territory. The Act also enables the *Beverage Container Regulation*, the *Designated Materials Regulation* (currently covering only passenger-light truck tires) and the *Recycling Fund Regulation*.

Strategy: In 2010, the Yukon government released the *Yukon Solid Waste Action Plan* which called for a number of activities to improve waste disposal facilities and integrate waste disposal, recycling and waste reduction. In 2012 a major milestone was achieved when open burning at most public landfills ceased. In 2013 the Department of Community Services established a Solid Waste Working Group which has the objective of providing a venue for the Yukon government and municipal governments to work together to improve solid waste management in Yukon communities. They have undertaken research, analysis and discussions with communities, and they are a central point to distribute information to municipal governments.

Solid Waste Management Plans are required for all public solid waste management facilities (as of 2002) and they must plan for 10 years. Updated plans are to be submitted at least one year before current plans expire; however due to the significant changes being undertaken at Yukon facilities over the past several years, an extension to the due date was granted by Environment Yukon. The next Solid Waste Management Plans are due in June 2014. Solid Waste Management Plans are not specifically "monitoring and reporting" documents so much as

planning documents.

Waste Prevention and Reduction-at-Source

There is a Waste Reduction and Recycling Initiative (WRRI) from the Department of Community Services that has funding available for small-scale projects that reduce the generation of waste.

Waste Diversion

EPR: There are currently no legislated EPR programs operating in Yukon. Yukon has proposed updates to specific sections of the *Environment Act*, including the provisions that address the deposit of surcharges collected on designated materials into the territorial Recycling Fund. If approved, the effect of the proposed changes would be to streamline the implementation of EPR programs by industry should EPR regulations eventually be developed. The voluntary EPR program Call2Recycle operates in this jurisdiction.

Product Stewardship: The Beverage Container and Designated Materials Regulations set up product stewardship programs that operate across the territory. Beverage container recycling facilities are available in most (if not all) communities, although this is dependent on finding staff in the communities to operate facilities. Yukon utilizes depots operated by businesses, community governments, and schools for these programs; some remote communities don't have depots but material is source-separated at the landfill and transported once quantities are large enough. There are consumer surcharges for beverage containers and tires which provide most of the funding for these programs. The territorial government also subsidizes the recycling of non-designated materials (e.g. other packaging found in blue box). Recycling of non-designated "blue-box"-type materials is not regulated but is often undertaken by community depots. All recovered materials are back-hauled or otherwise shipped out of the territory for recycling. The Yukon government is considering amendments to the regulations which would expand its used tire and beverage container stewardship programs, and create a stewardship program for used electronics and electrical products.

Other Diversion: The Yukon government, with other partners, has begun a territory-wide education campaign about recycling and composting, and part of its plan is to ensure that solid waste disposal facilities offer sorting stations and proper containers for storing hazardous waste.

In Yukon there is no territorial organics diversion strategy, although one community has established a curbside compost collection program, and others encourage backyard composting¹⁴⁶. A Solid Waste Working Group Findings Report from 2013 stated that the Yukon government needs to look at options for managing organic waste suitable for northern facilities

¹⁴⁶ Profile of Waste and Recyclable Materials Processing Facilities in Canada. Prepared by Cheminfo Services Inc. March 2010. Prepared for Environment Canada.

such as composting, digesting, regional or Yukon-wide collection or backyard programs¹⁴⁷.

Recovery: EFW

There were no EFW facilities identified for this jurisdiction, and no policy approach for EFW was identified.

Waste Disposal Approaches

In Yukon most communities have a disposal facility, and there are regional transfer facilities in certain areas. Compared to other territories, there are more communities in closer geographic proximity or connected by road transportation, and for this reason Yukon utilizes a more regionalized approach to waste management¹⁴⁸. The territorial government remains the owner and operator of the majority of community solid waste facilities¹⁴⁹, but eight municipalities operate their own disposal sites. In Yukon mainly in-ground cells are used for landfill with a few facilities (e.g. Whitehorse) with above-ground facilities. Transfer stations use containers above-ground. Few facilities have solid waste facility engineering designs¹⁵⁰. There are no solid waste management facilities in Yukon that monitor or collect LFG and there is no leachate collection as there are no lined cells.

There is a new small incinerator (gasifier) located in Old Crow, installed in 2012. It is a “Mobile Batch Oxidation System” designed specifically for remote locations and intermittent use. The community decided this new technology was a good fit since their existing landfill had less than 10 years capacity remaining, and with the implementation of this unit the existing landfill is now estimated to be 100 years. Plans to acquire the unit were made with the Yukon government as well as the local First Nation to ensure stakeholders were in agreement that this technology would be utilized to supplement waste diversion programs¹⁵¹. The emissions from the gasifier are regulated under the Environment Act permit issued for the facility.

There is an open burning ban effective 2012 that prohibits the open burning of MSW at public solid waste disposal facilities (wood waste and brush are not considered to be MSW and therefore not included in the ban). Only one remote public solid waste facility now practices open burning, and all open burning at public sites is expected to cease in 2014.

¹⁴⁷ Yukon Territory, Department of Community Services website, accessed August 28, 2013
http://www.community.gov.yk.ca/pdf/solid_waste_report.pdf

¹⁴⁸ Artkis 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation. Prepared for Environment Canada.

¹⁴⁹ Artkis 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation. Prepared for Environment Canada.

¹⁵⁰ Artkis 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation. Prepared for Environment Canada.

¹⁵¹ Northern Territories Water and Waste Association. 2012. “Old Crow’s Waste Management Systems gets Upgraded” by Wilbert Yang, in The Journal of the Northern Territories Water & Waste Association – Solid Waste Management in the North.

DISPOSAL SUMMARY for YT: (Artkis Report 2012, Table 3, estimated), and (2013 data from WMTG)
 Total materials disposed: 25,245 tonnes (no information on quantity diverted)
 Approximate Number of Operating Public Waste Disposal Sites: 29
 Number of Landfills with LFG Collection for Flaring or Utilization: 0

Performance Measurement Approaches

Diversion: The Minister of the Environment publishes full or interim State of the Environment reports on an annual basis, using select indicators. For solid waste management, the indicator is the rate of waste diversion in the capital, Whitehorse. However, there are no specific targets for the diversion programs for beverage containers and tires. The *Yukon Solid Waste Action Plan* has prioritized the need for the collection of baseline solid waste information, including waste types and quantities.

Specific waste reduction targets are not set for the territory, but some municipalities do have them. For example, the City of Whitehorse has a Solid Waste Management Plan that targets 50% waste reduction for the municipal landfill by 2015. In 2012, overall the City of Whitehorse diverted 22% of its solid waste from landfills by recycling and composting. Households with curbside compost collection diverted 44% of garbage from the City's landfill.

Disposal: There are few monitoring or reporting requirements other than a requirement to monitor groundwater twice annually and report the results annually.

3.12 Northwest Territories

Policy Frameworks: Overarching Strategies/Policies for Waste Management or Reduction

Framework: In the Inuvialuit Settlement Region, AANDC has overall responsibility for regulating land and water management and issues. For land use permits on crown land the NWT Water Board is responsible for issuance of Water Licences. AANDC is responsible for enforcement and compliance of all licences and authorizations in the Northwest Territories.

The *Waste Reduction and Recovery Act* (WRRRA) provide the overall legislative framework for waste reduction, reuse, and recycling in the NWT. However, regulating waste recovery and disposal (e.g. waste to energy, incineration, and landfill facilities) currently rest with the federal department of Aboriginal Affairs and Northern Development Canada (AANDC) through the *NWT Waters Act* and the *Mackenzie Valley Resources Management Act* (MVRMA). On April 1, 2014, through devolution, it is expected that these responsibilities will come to the Government of the Northwest Territories (GNWT) for most of the land in the NWT.

Strategy: The GNWT is currently developing a Waste Management Resource Strategy. In addition to establishing policies for solid waste management, it will address the use of EPR regulations and the prioritization of CCME CAP EPR Phase I and 2 materials, as well as establish a framework for addressing product categories for future waste diversion programs.

Waste Prevention and Reduction-at-Source

The GNWT operates a legislated waste reduction program, the Single-use Retail Bag Program under which distributors of such bags are required to charge retailers \$0.25 for each bag above the wholesale cost and retailers in turn are required to pass the charge on to consumers.

Waste Diversion

EPR: The GNWT does not have any formal EPR programs. However, CCME's CAP EPR recognizes the unique circumstances of the north with respect to vast distances between small remote communities and long product-supply lines, and states that EPR instruments would need to address these circumstances with innovation among producers and regulatory authorities. Future product designations for stewardship or EPR are being considered including electronic waste for implementation in 2015. As part of this consideration, the government commissioned an Inventory and Feasibility Assessment of E-waste Recovery in the NWT to determine the best way to address e-waste in the NWT. To complement this study and to gain additional information regarding electronic products use and purchasing habits in the NWT, the government also conducted an informal survey of NWT residents in the spring of 2012.

The Rechargeable Battery Recycling Corporation (RBRC) operates a voluntary cellular phone, rechargeable battery and charger recycling program (Call2Recycle) to residents in communities served by Purolator Courier Services. ENR will pay the shipping costs for participating groups or communities in areas not serviced by Purolator to make this service available across the NWT.

Product Stewardship: The GNWT operates a product stewardship program for beverage containers. The program provides service to all territorial communities through depots operated by businesses, community governments, and schools. All program costs are covered through the environmental handling fees placed on each beverage container that is distributed or sold in the NWT, with all recovered materials back-hauled or otherwise shipped out of the territory for reuse or recycling.

Other Diversion: There is no organics collection strategy across the NWT; however the City of Yellowknife is the only municipality with organics collection activity. Smaller communities such as Hay River are exploring the feasibility of centralized composting.

Depot recycling programs operate in the major territorial centres of Yellowknife for multi-material packaging such as paper, glass, tin cans and some plastic containers. Some source separation is conducted at landfills in other communities or community depots in smaller more remote communities but there are no territory-wide common recycling programs for multi-material packaging or printed paper.

The NWT has a series of guidelines on diverting special wastes from landfills. For all of these guidelines the recommended practice is to store it safely until authorized transfer to a hazardous waste facility. There are guidelines on: waste solvents; waste asbestos; waste antifreeze; waste batteries; waste lead and lead paint; and waste paint.

Recovery: EFW

There were no MSW EFW facilities identified for this jurisdiction.

Waste Disposal Approaches

Each community in the NWT has their own solid waste disposal facility – likely due to the geographic distances between communities, and lack of road infrastructure. The NWT has a mix of communities that are accessible by road (all weather or winter), barge, or airplane. Most often, disposal facilities in each community tend to be used for residential, ICI and CRD, although CRD wastes are sometimes segregated. Many communities are operating historical dump facilities that were not initially designed by an engineer, and there are no supporting engineering designs or operation and maintenance plans¹⁵². Most solid waste facilities have source-separation on site and storage for recyclables, but facilities are not staffed. In the NWT, there are waste management facilities that are situated on Commissioner's Land but still regulated by the federal government because they are all federally licensed. There were no solid waste management facilities identified in NWT that monitor or collect LFG.

There are no large MSW incinerators in the NWT. Small private sector incinerators that process onsite MSW may exist in mining camps. Territorial regulations that pertain to emissions from incinerators do not exist, but the air emissions standards endorsed by CCME¹⁵³ do apply, as does Environment Canada's Technical Guidance Document on Batch Waste Incineration.

<p>DISPOSAL SUMMARY for NT: (Artkis Report 2012, Table 3, estimated) Total materials disposed: 42,884 tonnes (no information on quantity diverted) Approximate Number of Operating Landfills: 33 (2013 data from WMTG) Number of Landfills with LFG Collection for Flaring or Utilization: 0 (2013 data from WMTG)</p>
--

Performance Measurement Approaches

Diversion: Diversion statistics are published for the beverage deposit programs. The beverage deposit program began with a 75% recovery target but is now achieving a rate of 88% (2011/2012) recovery. Targets are now based on the average performance of the program and on the performance of other provincial and territorial beverage programs.

The NWT Single-use Retail Bag Program aims to reduce bag use by 75%. The government used baseline data from Manitoba to generate their own per capita estimates for baseline consumer retail bag use, together with information from retailers and distributors they will be able to monitor performance to date.

¹⁵² Artkis 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation. Prepared for Environment Canada.

¹⁵³ Canada-wide Standard for Dioxins and Furans (CCME 2001), and Canada-wide Standards for Mercury Emissions (CCME 2000).

A report conducted for Environment Canada reviewed operations at waste disposal facilities in Yukon, the NWT and Nunavut and documented waste segregation for products and materials including HHW, electronics, metals (including appliances), tires, wood and compostable materials. Practices varied widely across the territories with at best only half of surveyed facilities segregating some of these waste categories¹⁵⁴.

Disposal: Monitoring and reporting requirements for disposal are typically outlined in the terms and conditions of each water licence.

3.13 Nunavut

Policy Frameworks: Overarching Strategies/Policies for Waste Management

Framework: Nunavut has an Environmental Protection Act (1998, amended 2011) that focuses on preservation, protection and enhancement of the environment. Nunavut does not yet have legislation that pertains directly to solid waste management, nor is there a specific strategy for solid waste management.

Waste Prevention and Reduction-at-Source

There are no waste prevention or waste reduction initiatives in this jurisdiction that target upstream waste prevention issues.

Waste Diversion

EPR: Nunavut does not have any formal EPR programs. However, CCME's CAP EPR explicitly recognizes the unique circumstances of the north with respect to vast distances between small remote communities and long product-supply lines.

Product Stewardship: Nunavut charges a deposit for liquor and beer bottles territory wide, but only have a recovery site in Iqaluit. Most notably, Arctic Co-operatives operates a beverage container recycling program in 23 communities in Nunavut. Arctic Co-operatives Limited is a service federation that is owned and controlled by 31 community-based Co-operative business enterprises that are located in Nunavut and Northwest Territories. Arctic Co-operatives Limited coordinates the resources, consolidates the purchasing power and provides operational and technical support to the community based Co-operatives to enable them to provide a wide range of services to their local member owners in an economical manner. The 31 Co-ops are independently owned and controlled Inuit and Dene businesses. They operate retail facilities, hotels, cable operations, construction, outfitting, arts and crafts production and property rentals. A variety of local community groups are involved in coordinating the recycling program,

¹⁵⁴ Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation, Arktis Solutions, December 10, 2010

which serves as a fundraising endeavor. For each full shipping container collected, the local community group receives \$1,500 to support community benefit projects. To date, communities benefiting have included Arviat, Hall Beach, Iqaluit; Cambridge Bay; and Baker Lake. Prior to Arctic Co-operatives beginning its recycling program, Nunavut was the only Canadian territory or province without a formal recycling program. The program was created in 2011 with the help of a \$40,000 donation from The Co-operators.

Other Diversion: In Nunavut there is no organics waste strategy and community composting is rare. Nunavut has developed detailed guidelines on how ICI and residential generators of used oil and waste fuel, waste lead and leaded paint, and mercury containing products, should recycle or reuse, or safely dispose of these products in the north. Nunavut disposal site operators have completed the development and delivery of a hazardous waste management training program. Guidelines developed for Nunavut all focus on diverting materials from disposal and proper safe management which is to store safely until authorized transfer to hazardous waste facility.

Recovery: EFW

There were no MSW EFW facilities identified in this jurisdiction.

Waste Disposal Approaches

Under the Nunavut Land Claims Agreement, municipalities are entitled to control their own municipal disposal sites. Local environmental and safety standards are determined, in part, by how the land is designated under municipal government development plans (i.e. land use zoning). Co-management boards and agencies have authority for land use planning, and the administration of land. Activities involving the burning and incineration of solid waste may be controlled through the setting of terms and conditions in plans, permits and licenses issued by the Nunavut Water Board and other co-management boards and agencies¹⁵⁵.

In Nunavut, waste disposal facilities processing MSW tend to be above-ground dumps. Each community has their own solid waste disposal facility due to the geographic distances between communities, and lack of road infrastructure. There is no road access for communities in Nunavut. Approximately half of all communities in Nunavut are operating historical dump facilities that were not initially designed by an engineer, and there are no supporting engineering designs or operation and maintenance plans for the facility¹⁵⁶.

Disposal facilities in each community are used for MSW, ICI and CRD, although CRD wastes are sometimes segregated. There has been some effort in Nunavut to reduce the usage of community disposal facilities for ICI wastes, but the facilities are unmanned and anyone has

¹⁵⁵ Government of Nunavut, Department of Environment, 2012. Guideline for Burning and Incineration of Solid Waste

¹⁵⁶ Artkis 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation. Prepared for Environment Canada.

access to them. In 2011 the Government of Nunavut developed a guideline for industrial waste discharges into MSW facilities which includes a process-flow chart to assist industrial generators on proper disposal destinations (i.e. determining if their waste is hazardous or not)¹⁵⁷. There are no solid waste management facilities in Nunavut that monitor or collect LFG.

There are no MSW incinerators in Nunavut. With the exception of Iqaluit, Rankin Inlet, and Repulse Bay, all other communities in Nunavut practice open burning of waste (even though Nunavut has a policy that only non-treated wood, paper, and cardboard are acceptable for open burning).

DISPOSAL SUMMARY for NU:

Quantity Disposed: 27,308 tonnes / year (2010 Artkis Report)

Approximate Number of Operating Landfills: 25 (2010 Artkis Report)

Number of Landfills with LFG Collection for Flaring or Utilization: 0 (2013 data from WMTG)

Performance Measurement Approaches

Since its inception in 2011, 19 sea containers containing approximately 750,000 cans have been shipped out of the territory to be recycled¹⁵⁸.

No information was available on performance measurement for disposal.

¹⁵⁷ Environmental Guideline for Industrial Waste Discharges into Municipal Solid waste and Sewage Treatment Facilities, 2011 includes a process-flow chart to assist industrial generators on proper disposal destinations (i.e. determining if their waste is hazardous or not)

¹⁵⁸ Solid Waste and Recycling News, Dec 10, 2013 issue <http://www.solidwastemag.com/news/co-operators-fund-nunavut-aluminum-recycling-program/1002788357/>

4 Canada-wide Initiatives

4.1 Federal Government Policies or Guidance

The Government of Canada can apply its authorities under the Canadian Environmental Protection Act, 1999 (CEPA 1999) and other applicable laws to waste management when there is a potential for release of toxic substances to the air, land, or water. It is also responsible for the control of waste management activities on federal lands, and the international and interprovincial movement of hazardous waste and hazardous recyclable materials.

As such, there are several departments within the Government of Canada that are engaged, to varying degrees, in work that either directly or indirectly supports the advancement of waste management in Canada. These departments include Environment Canada, Natural Resources Canada, Infrastructure Canada, Statistics Canada, Health Canada, Industry Canada, Public Works and Government Services Canada, Aboriginal Affairs and Northern Development Canada, and Infrastructure Canada, among others. Examples of federal legislation, policies, programs, and activities that relate to waste management are provided below.

Environment Canada

Risk Management

Environment Canada is responsible for administering CEPA 1999 and Canada's Toxic Substances Management Policy. Environment Canada can therefore develop and implement regulations, guidelines, and objectives that apply across the country, to manage the risks of releases of substances, listed as Toxic Substances on Schedule I of CEPA, to the environment. For example, Environment Canada works with Health Canada to conduct State of the Science reports and risk assessments and to develop risk management strategies for toxic substances, such as mercury and PBDEs, which can be found in end-of-life products that are managed at recycling and treatment/disposal facilities.

Under CEPA 1999, Environment Canada also administers the Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations. These regulations are relevant to the HHW component of MSW and to end-of-life products that once no longer intact can be considered hazardous. The purpose of these regulations is to ensure that hazardous waste and hazardous recyclable materials that are transported across international borders (to be exported, imported, or to transit through Canada) are managed appropriately to protect the environment and human health. The regulations also implement Canada's international obligations.

The Government of Canada has also developed the Chemicals Management Plan (CMP), to improve the degree of protection against hazardous chemicals. Under the CMP, the Government of Canada is working closely with health and environmental groups, consumer groups and industry to reduce risks to Canadians and our environment by setting clear priorities for the assessment and management of hundreds of chemicals. This could apply to waste management when there is a potential for release of a toxic substance to air, land, or water. These substances are often managed at waste treatment or disposal facilities, as part of

manufactured items and products, at their end of life. CEPA toxic substances could be released, for example, into the atmosphere from the incomplete combustion of MSW or into water through landfill leachate discharges.

In addition, Environment Canada is responsible for administering the pollution prevention provisions of the Fisheries Act dealing with the deposit of deleterious substances into water frequented by fish. When the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force in July 2012, federal environmental assessment efforts were focused on major projects posing a greater risk to the environment. These projects are defined by the *Regulations Designating Physical Activities* (Project list). However, project types that are not on the Project List may still be subject to an environmental review, pursuant to s.67 of CEAA 2012, which requires that federal authorities ensure that projects on federal and reserve lands south of 60° are not likely to cause significant adverse environmental effects prior to issuing a decision that would enable the project to proceed. This would also be the case in the few areas where CEAA 2012 applies in the North (areas within Nunavut Territory, but excluded from the Nunavut Settlement Area, and the Inuvialuit Settlement Region of the Northwest Territories).

Although no longer subject to a federal environmental assessment, waste management plans for projects on reserve lands may be subject to an environmental review, pursuant to s.67 of CEAA 2012, administered by Aboriginal Affairs and Northern Development Canada.

Development of Best Practices and Tools

Over the last decade, Environment Canada has been active in the development of technical guidance documents and tools such as: Technical Document on Municipal Solid Waste Organics Processing (2013); Technical Document for Batch Waste Incineration (2010); Greenhouse Gas Calculator for Waste Management (2009); Performance Measurement and Reporting for Extended Producer Responsibility Programs: A Guidance Document (2007); and Solid Waste As a Resource: Guide for Sustainable Communities in partnership with Natural Resources Canada and the Federation of Canadian Municipalities (2005).

Environment Canada is currently working with all three Territories to produce a guidance document for the design, construction and operation of northern and remote MSW facilities. In addition, Environment Canada is conducting a feasibility study for composting in northern and remote communities. Both of these projects are expected to be completed in 2014. Environment Canada has also retained a consultant to undertake a study to examine CRD material flows, facilities across Canada, and the potential presence of Chemicals Management Plan substances.

Participation in Domestic and International Policy

On the domestic front, Environment Canada participates in the CCME Waste Management Task Group, along with all thirteen provincial and territorial jurisdictional representatives. The department also co-hosted biennial EPR workshops with various provinces from 2002-2012. For the past three years, Environment Canada has been chairing an informal federal-territorial working group on waste management in the North.

Internationally, Environment Canada acts as the competent authority for the Basel Convention which controls the transboundary movements of hazardous wastes and their disposal and is active in the Partnership for Action on Computing Equipment (PACE). Under the Stockholm Convention, Environment Canada participates in the development of technical guidelines to mitigate the releases of persistent organic pollutants (POPs) from waste management facilities. Environment Canada is a participant in the Organisation for Economic Cooperation and Development's Working Party on Resource Productivity and Waste. The department also participates in the Commission for Environmental Cooperation's (CEC) Working Group on Environmentally Sound Management of Electronic Wastes in North America. Environment Canada leads Canada's participation under the Montreal Protocol on ozone-depleting substances and the Minamata Convention on Mercury.

Funding

Environment Canada administers the EcoAction Community Funding Program which funds projects that protect, rehabilitate or enhance the natural environment, and build the capacity of communities to sustain these activities into the future. Environment Canada also administers the Environmental Damages Fund which provides a mechanism for directing funds received as a result of fines, court orders, and voluntary payments to priority projects that will benefit the natural environment. Waste management projects have been supported by both of these funds.

Statistics Canada

Statistics Canada conducts the following routine surveys in addition to periodic thematic studies such as detailed statistics on composting or electronics for example: Waste Management Industry Survey: Government and Business Sectors; Human Activity and the Environment Survey; Households and the Environment Survey; and Hazardous Waste Management Industry Survey (under development).

Natural Resources Canada

Natural Resources Canada has supported waste management research, policy development and pilot programs where the topic of waste management intersects with energy or metals.

In the past, the Department had a recycling section on its website (now archived) dedicated to recycling information, including a Canadian Metals and Minerals Recycling Database, and government-funded research studies, including: An analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications, 2006; Let's Climb Another Molehill: An Examination of Construction, Renovation and Demolition (CRD) Waste Diversion in Canada and Associated Greenhouse Gas Impact, 2005 (in partnership with Public Works and Government Services Canada, Canada Mortgage and Housing Corporation, Region of Peel, Walker Industries and New West Gypsum Recycling); Background Study on Increasing Recycling of End-of-life Mercury-containing Lamps from Residential and Commercial Sources in Canada, 2005; Scrap Tire Recycling in Canada, Natural Resources Canada CANMET Materials Technology Laboratory, 2005; and Construction and Demolition Waste in Canada, Quantification of Waste and Identification of Opportunities for Diversion from Disposal, 1993 (with Environment Canada).

In 2012, through the Department's Office of Energy Research and Development (OERD) they have contributed approximately \$5 million in funding of a pilot project entitled: Urban Waste to Electricity Demonstration project in Richmond, BC through the Government's Clean Energy Fund¹⁵⁹.

Industry Canada

Industry Canada is responsible for the federal Computer for Schools program which supports the refurbishment and reuse of surplus federal computer equipment and was instrumental in putting concerns about waste electronics on the national agenda.

Aboriginal Affairs and Northern Development Canada (AANDC)¹⁶⁰

Aboriginal Affairs and Northern Development Canada (AANDC) has various responsibilities with respect to waste management on Canada's Aboriginal lands.

In the north, AANDC, along with the Nunavut Water Board, is responsible under the federal Territorial Lands Act and Nunavut Waters and Nunavut Surface Rights Tribunal Act for the management of federal lands and waters, including the impact solid waste may have on the quality of these lands and waters. Activities involving the burning and incineration of solid waste may be controlled through the setting of terms and conditions in plans, permits and licenses issued by the Nunavut Water board and other co-management boards and agencies. South of 60° (primarily), AANDC provides funding and guidance for waste management infrastructure in First Nations communities on Reserve lands.

First Nation Reserves fall under the *Indian Reserve Waste Disposal Regulations 1978* (IRWDR), a regulation under the *Indian Act*. The IRWDR requires the issuance of permits, specifies the land to be used and the manner by which the waste management is exercised. Additionally, most First Nations can pass bylaws and develop community plans to manage land use on reserves, but the federal government has the authority and responsibility to regulate use and to protect the environment of reserve lands.

This differs for First Nations that are operational under the *First Nations Land Management Act* (FNLMA). Under the FNLMA, after a First Nation community's land code comes into force, a First Nation will be able to develop and implement, through First Nations law, an environmental protection regime, including matters related to waste management. These communities are responsible for the implementation and enforcement of their environmental protection regime. Roughly 6% of First Nations have signed on to the FNLMA.

There is a significant gap between First Nation reserves and Canadian communities elsewhere in

¹⁵⁹ Natural Resources Canada, Energy Sector, Science Programs website
<http://www.nrcan.gc.ca/energy/science/programs-funding/2064>

¹⁶⁰ Previously called Indian and Northern Affairs Canada (INAC)

the degree to which waste regulations protect the environment. The existing *Indian Reserve Waste Disposal Regulations 1978*, are out-of-date and do not reflect the complexity of modern waste management systems. Furthermore, the federal government is not enforcing waste management regulations on more than 3000 waste sites in 614 First Nation Reserves to the same degree that provinces are enforcing regulations on non-federal lands. Other contributing factors to the challenges of waste management on reserves are limited capital budgets and operations and maintenance budgets for maintaining existing sites or developing new engineered sites, municipal transfer stations and recycling programs.

Some of the waste management challenges faced by northern and remote communities are very similar to those faced on First Nation reserves. As such, in the absence of a modern waste management regulation under the *Indian Act*, the technical guidance that Environment Canada is developing for MSW facilities may also be of assistance to AANDC.

Infrastructure Canada

Infrastructure Canada administers the Gas Tax Fund which gives municipalities predictable, long-term funding to help them build and revitalize public infrastructure on a broad range of infrastructure priorities, including waste management. Funded projects include development of recycling centres, waste transfer stations, and modern environmentally sound solid waste management facilities in various communities across Canada including Newfoundland and Labrador, Nunavut, Yukon, and Saskatchewan.

The department also administers the Green Infrastructure Fund which is provided on a cost-shared basis to provinces, territories, local or regional governments, public sector bodies, non-profit organizations and private sector companies. The Fund focuses on large scale, strategic infrastructure projects including seven Québec-based projects that focus on diverting organics from landfill via composting and anaerobic digestion including energy production.

4.2 Canadian Council of Ministers of Environment (CCME)

CCME serves as a principal forum for member jurisdictions (14 provincial, territorial and federal environment departments) to undertake collective action on environmental issues Canada-wide. The Waste Management Task Group is responsible for CCME's waste management work.

As a result of CCME leadership in 1989 all jurisdictions set targets and schedules for the minimization of packaging waste and contributed to a 50% overall reduction in packaging waste disposal by the year 2000. The packaging targets were met four years ahead of schedule; largely through commitments that gave industry the flexibility to determine how best to meet the targets. At the end of 1996 packaging was estimated to represent only 13% of total solid waste¹⁶¹.

¹⁶¹ CCME National Packaging Protocol, 2000 Final Report, pg 1.

Examples of other CCME work on waste management include a range of guidance tools, principles, and workshops to convene stakeholders:

- Code of Practice for Open Air Burning (in development)
- Canada-wide Action Plan for Extended Producer Responsibility, 2009
- Canada-wide Strategy for Sustainable Packaging, 2009
- Inventory of Sustainable Packaging Initiatives and Proposed Approach to Develop Sustainable Packaging Guidelines, 2008
- Extended Producer Responsibility Evaluation Tool and User Guidance, 2008
- Canada-wide Principles for Extended Producer Responsibility, 2007
- National Packaging Workshop, Toronto, 2007
- National Extended Producer Responsibility (EPR) Workshop, 2006
- National Guidelines for Hazardous Waste Landfills, 2006
- Analysis of the Free-Rider Issue in Extended Producer Responsibility Programs, 2006
- Guidelines for Compost Quality, 2005
- Canada-wide Standards for Dioxins and Furans, 2003
- Canada-wide Standards for Mercury Emissions, 2000
- Waste Audit User's Manual: A Comprehensive Guide to the Waste Audit Process, 1996
- Guiding Principles for Packaging Stewardship, 1996
- National Packaging Protocol - 1996 Milestone Report
- Environmental Profiles: Guidelines to Help Industry Meet the Goals of the National Packaging Protocol, 1994
- National Packaging Protocol, 1990

In 2012 CCME completed work with major retailers, the restaurant and food sector, brand owners and the packaging industry which has led to an industry-driven approach to reduce packaging in Canada. Industry partners commit to undertake initiatives that will reduce the amount of packaging destined for landfills, reduce greenhouse gas emissions, and increase recycled content in packaging. In order to measure success, industry commits to creating a baseline by 2014 to measure how much packaging is in the marketplace, by using best available data as well as identifying sources for new data. With this information, industry and government will proceed with discussion of quantitative targets to reduce the environmental footprint of packaging through packaging optimization upon completion of baseline data.

Industry committed to facilitate the development and implementation of a national voluntary design guide by March 31, 2013 for the optimization of packaging through the Packaging Association of Canada PAC NEXT initiative. This design guide was released in May 2013. Industry committed to continue its efforts in eliminating the use of PVC in rigid plastic packaging. Through the packaging baseline, industry will identify how much PVC is in the marketplace, set timeline for its elimination, and develop mechanisms to track progress on an annual basis with reporting on how much PVC remains in rigid plastic packaging and barriers that must be overcome to achieve this objective. Industry will promote best practices and encourage adoption of the design guide to facilitate the elimination of PVC. Industry committed to enhance communication with the Canadian public on industry successes in packaging reduction.

4.3 Canadian Standards Association

The Canadian Standards Association (CSA) is a Canada-wide not-for-profit standards organization which develops standards. CSA publishes standards in print and electronic form and provides training and advisory services. Related to waste, the CSA has developed:

- A “Deconstruction” standard for existing buildings (CSA Z783). This Standard specifies minimum requirements for processes and procedures connected with the deconstruction of buildings at the end of life.
- CAN/CGA-B105-M93 (B149.6) Code for Digester Gas and Landfill Gas Installations: This Code applies to the installation of systems for the production, handling, and utilization of LFG in newly-constructed landfill gas systems, as well as additions to, and the upgrading of, existing systems.
- CSA is currently initiating work with the Ontario Waste Management Association on a province-wide Recycling Process, Audit and Verification Guideline for Ontario.

4.4 Federation of Canadian Municipalities

Green Municipal Fund

The Federation of Canadian Municipalities (FCM) administers **the Green Municipal Fund**, which is a \$550 million endowment from the Government of Canada, to offer grants and low-interest loans for municipal initiatives that generate measurable environmental, economic and social benefits. Cutting GHG emissions is a priority of the Funds, as is improving local air, water and soil quality, and promoting renewable energy. To be eligible for funding in the waste sector, a project must demonstrate the potential to divert at least 50% of MSW from landfill. If a municipality has already achieved a total diversion rate of at least 50%, the project must demonstrate the potential to result in an incremental improvement above 50%. Examples: include reuse programs or centres, recycling programs or centres, composting and other biological programs or centres, or thermal treatment processes (the municipality must already have achieved a waste diversion rate of at least 50% prior to undertaking the thermal treatment project). Projects related to landfill management activities, including landfill construction and expansions, landfill reclamation and landfill gas capture projects related solely to the construction of transfer stations are excluded. Since 2000 the GMF has funded over 120 solid waste management projects including capital projects and feasibility studies¹⁶². In addition, FCM has produced relevant waste management guidance for municipalities: *Solid Waste as a Resource: Guide for Sustainable Communities, 2004*.

FCM was also a joint founding member of the National Zero Waste Council.

¹⁶² Green Municipal Fund website <http://www.fcm.ca/home/programs/green-municipal-fund/funded-initiatives.htm>

First Nations-Municipal Community Infrastructure Partnership Program

Most recently, FCM initiated a **First Nations-Municipal Community Infrastructure Partnership Program (CIPP)**. CIPP improves the ability of adjacent First Nation and municipal governments to partner and improve community infrastructure. CIPP was developed to respond to interest expressed by municipalities and Aboriginal Affairs and Northern Development Canada (AANDC) to improve community infrastructure and build new partnerships with First Nations. CIPP is a joint program between FCM and AANDC, guided by an inter-governmental steering committee of leadership from the Assembly of First Nations (AFN), AANDC, and FCM. CIPP provides guidelines for communities wishing to collaborate on solid waste collection, transfer stations or landfill sites, as such the program has developed a model service agreement template for solid waste. It is meant to act as a guide for organizing a service agreement. To date the service agreements have been used in First Nations communities in BC, Saskatchewan, Manitoba, Québec, and Nova Scotia¹⁶³.

¹⁶³ First Nations-Municipal Community Infrastructure Partnership Program (CIPP) website
<http://www.fcm.ca/home/programs/community-infrastructure-partnership-program/program-resources/service-agreements/solid-waste.htm>

5 Innovative Practices Identified

A brief summary of innovative practices identified is presented below.

5.1 Innovative Practices: Waste Prevention or Reduction and Waste Planning

Zero Waste Business Case Development by the Province of BC: With respect to waste reduction, the BC Ministry of Environment commissioned a report in 2013 on the *Business Case for Zero Waste in BC*. The report makes a comparative evaluation of three MSW diversion scenarios (43%, 62%, and 81%) for waste generated, projecting economic costs and benefits and employment impacts by 2025 for each scenario. The residential, ICI and CRD sectors are the basis for the analysis. Preliminary results indicate a positive business case for moving waste up the pollution prevention hierarchy. This is the only Canadian jurisdiction which has conducted a comprehensive business case analysis for zero waste for the entire province.

Municipal Performance Monitoring to Track Waste Disposal / Diversion Linked to Reduction: Nova Scotia regularly monitors disposal and diversion volumes of every municipality in the province. They have a unique funding formula whereby each municipality can apply for “diversion credits” which means increased funding from the RRFB to use for waste management costs based on the volume they divert from landfill. The province uses a formula that is based on actual disposal volumes, not higher diversion rates, which more accurately measures waste reduction overall (since higher diversion numbers could be associated with higher waste generation). Municipal reporting is required.

Regional Waste Planning: Québec, BC and Nova Scotia require regional waste plans for designated municipal districts/areas. In those provinces, these plans include material-specific diversion targets (including CRD, and other ICI wastes), along with other traditionally recycled materials. The regional areas must also monitor disposal volumes tonnages and report to the province for aggregate reporting (this is voluntary in BC).

5.2 Innovative Practices: Waste Diversion

Evolution of Industry-Developed Harmonized Stewardship Services Agencies: A more cost effective administration option for stewards that sell into multiple jurisdictions is a harmonized stewardship service agency. A few examples already exist:

- The Electronic Product Recycling Association (EPRA) has established product stewardship programs in British Columbia, Nova Scotia, PEI, Ontario, Saskatchewan, Manitoba, Québec, and Newfoundland and Labrador where regulated programs exist. These programs have similar administrative structures, product lines, and recycling fees attached to them.
- The National Used Oil Management Association (NUOMA) operates in BC, Alberta, Saskatchewan, Manitoba, Québec, and New Brunswick.
- The Canadian Stewardship Services Alliance (CSSA) (beginning in 2014) will offer a one-stop-shop for stewards to fulfill their stewardship obligations. CSSA will provide stewards with coordinated administrative and information technology services for PPP recycling programs across four provinces to start, with the potential of new jurisdictions coming online in future years.

Voluntary Industry Full “Closed Loop” Recycling Program within Provincial Borders¹⁶⁴: In 2011, Tim Horton’s Nova Scotia, became the first Canadian quick service restaurant (QSR) chain to implement a “closed-loop” recycling program. Tim Horton’s locations in Nova Scotia implemented recycling units collecting hot beverage cups, lids, napkins and trays. Customers purchasing hot beverages were encouraged to recycle their cups and trays as much as possible. Employees wore T-shirts to drum up consumer interest, donning a picture of a take-out tray with the caption: “In my past life I used to be a cup.” Collection contractors and paper haulers take non-sorted cups and lids to Scotia Recycling Limited, who sorts and compresses recycled products. Next the cups and trays (in bales) are delivered to CKF Inc., a Canadian-owned paper product manufacturer in Nova Scotia, who then processes the bales, moulding them into new trays that can be sold back to Tim Horton’s restaurants. As of 2012, all 156 Tim Horton’s locations in Nova Scotia are participating and other Canadian Tim Horton’s locations are implementing the program. As of year-end 2012, 850 Tim Horton’s restaurants now recycle paper cup products. Multi-level internal and external collaboration was imperative to the project’s success, as was customer insight and cross-company input. Reaching out to community partners and expanding their network put Tim Horton’s in a strategic position to rely on the expertise of unrelated industries, such as waste management and paper manufacturing in the province.

Use of Jurisdiction-wide Landfill Bans to Facilitate Waste Diversion: Nova Scotia and PEI have in place long-standing province-wide landfill bans on a long list of recyclable materials including organics (food waste and leaf and yard waste) for both the residential and ICI sectors. The provincial authorities and designated stewardship organizations (RRFB, and IWMC) have worked with the ICI sector to assist in the transition more than a decade ago. Both jurisdictions have achieved the highest rates of organics diversion in the country. Organics has been identified by many studies as a high portion of the residential / ICI waste stream so these jurisdictions were ahead of the rest when they targeted organics with legislation and supporting infrastructure as well as an education and promotion campaign. Québec is planning a similar organics ban in 2020.

Use of Jurisdiction-wide Funding Formula to Increase CRD Waste Diversion Province-wide: Nova Scotia uses a funding formula that includes CRD waste diversion credits for municipalities (so they receive more funding from the province if they can demonstrate how they have diverted CRD waste from landfill). Halifax has implemented a bylaw to require all CRD waste to be processed at CRD diversion facilities, and other municipalities have implemented similar programs.

¹⁶⁴ Network for Business Sustainability, c/o Ivy Business School, Western University website <http://nbs.net/knowledge/tim-hortons-cup-to-tray-recycling-program/>

5.3 Innovative Practices: Waste Disposal

Regionalization in Waste Disposal: Many jurisdictions have been regionalizing their waste management facilities (Alberta, Manitoba, Québec Nova Scotia, New Brunswick, PEI, Newfoundland and Labrador, Yukon) within the past decade to have fewer centralized facilities which can be more accurately monitored in terms of volume entering the facility as well as environmental impacts of the facility. This allows for cost efficiencies as well as potential sharing of services for some smaller or remote municipalities. In addition, the regionalization trend for disposal facilities could also be used for recycling facilities, as some locations (e.g. Edmonton) have combined disposal and recycling facilities together.

Use of Levies to Fund Waste Management Diversion Infrastructure: Provinces of Manitoba and Québec are using disposal levies to fund new infrastructure such as organics processing facilities across the province (Québec) or other diversion expenses.

Use of Waste-Shed Concept: Halifax Regional Municipality requires (via by-law) CRD waste to be segregated and diverted to one of 16 CRD processing centres, where a regulated target ensures diversion and the CRD waste is prohibited from leaving the municipal boundary for diversion or disposal. This concept might be scalable to other large municipalities in Canada that have issues with waste export, or perhaps jurisdiction-wide for materials where recycling infrastructure is in place and diversion programs established.

European Policies and Innovations in Waste Management: European countries are generally regarded as having higher rates of waste diversion and lower rates of waste disposal than is typically reported in Canada. European waste and recycling policy is characterized by a supportive set of environmental and economic instruments which are, when used together, at least part of the reason for the difference in performance. Some of the key instruments which can be seen in various guises in Europe are summarized as follows:

- High landfill tip fees related to site availability, capacity and policy
- Landfill taxes designed to financially support and drive increased waste diversion
- Widespread operation of energy from waste facilities with tip fees often “competitively” priced with landfill disposal
- Fewer more regionalized and engineered disposal sites with higher environmental standards
- National /regional waste strategies, plans and legislation
- Explicit policy linkages made between enhanced waste diversion and resource efficiency and sustainable materials management
- Dedicated public authorities with broad waste reporting, research and diversion enhancement authority, often funded by landfill taxes
- Legislated waste diversion targets and indicators
- Regular reporting on waste diversion and waste diversion
- Less regulatory distinction between residential and non-residential (ICI) sources
- Competitive EPR compliance schemes established by policy or in response to engagement by competition authorities.

5.4 Innovative Practices: Performance Measurement

Third Party Assurance for Extended Producer Responsibility Reporting: The province of BC now requires stewardship agencies to provide third party assurance for certain non-financial information included in annual reports. The assurance applies to recovery rates, collection facilities and end-of-life management of recovered products. A reasonable (high) level of assurance is required, from an accountant with specific qualifications and according to a specific protocol. This is the first such requirement in Canada and will provide valuable information to ministry staff and the public about stewardship agency compliance with applicable legislation.

Use of Third Party Verification at Landfills to Monitor Disposal: Québec uses a third party verification system to monitor waste disposal volumes at all of its landfills. This system is in place largely because of the levy system the province uses so the auditing program verifies both tonnages disposed and levy payments collected. This system will provide provincial regulators with waste disposal tonnage information that is current and accurate across the province.

Industry-Initiated Standardized Performance Measurement for Recycling Programs: The Ontario Waste Management Association (OWMA) has initiated the development of a recycling guideline for the province of Ontario entitled: *Recycling Process, Audit and Verification Guideline for Ontario*. The intention is that the guideline will provide a more consistent framework to define and measure and interpret data at the facility level. The OWMA has partnered with the Canadian Standards Association (CSA) and a volunteer multi-stakeholder working group has been established with federal and provincial representatives to write the Guide. It is envisioned that the guideline will be applicable to a range of waste products and materials including: PPP, organics, textiles, wood, glass, metals, plastics, electrical and electronic equipment, household special waste, tires, and end of life vehicles. The guideline refers to existing federal and provincial regulations and mandatory program requirements (such as occupational health and safety) where required, but focuses on consistent definitions for recycling rates, collection, diversion, and forms the basis for audits, target and goal setting, as well as performance reporting.

Comparative Ranking of Municipal Performance across a Jurisdiction: BC publicly ranks regional districts according to disposal rates. Information is available on-line. The province is developing a common methodology for disposal reporting and verification. The initiative is intended to improve consistency, quality and access for per capita disposal data across the province.

Data Availability of Municipal Waste Management Performance across a Jurisdiction: Since 2003, Ontario requires municipalities, First Nations, and Recycling Associations to complete the Municipal Datacall in order to be eligible for funding for the Blue Box Program. Data on waste diversion activities, including blue box tonnes recycled and operating costs must be reported as well as tonnes collected of regular garbage, organics collection, electronics, HHW, and scrap metal. All data is publicly available on Waste Diversion Ontario's website for all stakeholders to use. This system does not include ICI or CRD waste volumes.

6 Observations, Challenges, and Opportunities Identified in Waste Management

This section presents a high-level analysis of the consulting team's observations of all information collected for this report – including information from a document review, jurisdictional interviews and stakeholder interviews. Where relevant, a few international examples are included and connections are made to the Canadian context where applicable.

Observations, challenges and opportunities are presented in the following sub-sections, drawn from information presented earlier in this report as noted in parenthesis:

- Current Situation-at-a-Glance (Section 2.1)
- Policy Frameworks (Section 2.2)
- Waste Prevention and Reduction Upstream (Section 2.3)
- Waste Diversion (Section 2.4)
- Recovery: Energy From Waste (Section 2.5)
- Waste Disposal (Section 2.6)
- Monitoring and Reporting (Section 2.7)

6.1 Key Observations, Challenges, and Opportunities from Current Situation-at-a-Glance:

- Approximately one-third of all waste disposed in Canada is from the residential sector, while two-thirds are from the ICI sector; the amount of non-residential waste exceeded the amount of residential waste disposal in all jurisdictions surveyed by Statistics Canada;
- From 2000-2010 the Canadian average residential recycling rate increased by 10% (from 23% to 33%) across the country;
- Over the same time period, the non-residential recycling rate has remained stagnant (~20%) according to Statistics Canada data;
- Exhibit 8, page 9 of this report demonstrates that waste management is expensive.
- There is a relationship between money spent by governments overall and the proportion of waste that is diverted from disposal. Local governments in BC, Québec and Nova Scotia had the highest per capita operating expenditures for diversion and corresponding highest waste diversion results.

Opportunities – Big Picture

- The ICI sector (including schools, institutions, office buildings, as well as retailers) is most in need of jurisdictional effort in terms of data tracking, establishing waste prevention and diversion programming requirements for PPP recycling and organics diversion.
- Managing waste is expensive. Further analysis of existing literature on cost-benefit analysis studies that review the economic advantages of spending money on diversion versus disposal is warranted. Further cost-benefit assessments on a Canada-wide scale would be useful (e.g. jobs created by recycling, re-use, reduction and energy recovery, new markets developed, benefits of using used materials rather than new in manufacturing, etc. and overall government expenditures of diversion versus disposal in terms of long term costs).

6.2 Key Observations, Challenges, and Opportunities in Waste Management Policy Frameworks

- The majority of jurisdictions have either an **overarching legislative framework or non-legislative strategy in place** to address waste in the jurisdiction (exceptions: Nunavut, the federal government, and Northwest Territories –which has a strategy pending). Approximately half of jurisdictions also have targeted action plans with parameters for reporting on progress; some utilize legislated targets for either diversion percentages or maximum disposal per capita volumes. This demonstrates that waste management is slowly becoming more of a priority among all provincial and territorial governments.
- Nova Scotia was the first jurisdiction in Canada that focussed on waste management as a priority with the development of a **comprehensive waste management strategy** in 1995. This strategy targeted the organics waste stream for both the residential and ICI sectors, and was complimented with jurisdiction-wide landfill bans for recyclable materials. This strategy was revised in 2011 and includes direction to engage both upstream producers and the ICI sector, specific activity for CRD wastes, targets for diversion, disposal limits, indicators for monitoring progress and reporting, and municipal incentives for disposing less. In addition, Nova Scotia is the only jurisdiction that monitors municipal progress in both diversion and disposal amounts annually. The results have been impressive: Nova Scotia has the lowest per capita disposal rate in the country. This suggests a correlation with having a detailed and comprehensive strategy, specific performance monitoring requirements, and achieving results.
- Only three jurisdictions have waste management policies that include a **maximum upper limit** (Québec, and Nova Scotia) **or target** (Alberta) **for waste disposal per capita**. Only Nova Scotia's target is legislated, and it is the most aggressive target (300 kg/capita by 2015). Alberta's target (648 kg/capita for 2015-16) changes annually in a business plan, and Québec's target (700 kg/capita) is in an Action Plan and requires their organics strategy to be fully implemented before they will be able to achieve the target.

Opportunities in Policy Framework Content

- There is room for improvement in the content of waste policy frameworks (e.g. the content of the strategy, action plan, policy, or regulation) in many Canadian jurisdictions by including legislated targets for waste disposal limits to drive action in waste reduction and diversion. To date, most jurisdictions measure waste diversion only, while this is an important indicator it could mask increases in waste generation overall.
- Waste policy frameworks need to have more direct engagement and requirements for the ICI sector – possibly legislated, or through negotiated agreements.
- Waste policy frameworks should require the need for municipal disposal performance monitoring and ICI disposal monitoring to be reported to jurisdictional authorities to ensure monitoring capabilities at the provincial or territorial level.

6.3 Key Observations, Challenges, and Opportunities in Waste Prevention / Reduction Upstream

- The Vision 2050 - The New Agenda for Business Report¹⁶⁵ by the **World Business Council for Sustainable Development** lays out a pathway leading to a global population of 9 billion people living within the resource limits of the planet. This report spells out the things that must happen over the coming decade to make a sustainable planet possible: material demand, consumption and production are transformed to match the limits of non-renewable resources; closed-loop recycling, making the concept of waste obsolete, is normal business practice, and societies have a circular approach to resources; used products and materials can be reengineered to function again for multiple and distinct purposes or reduced to raw materials for manufacturing other products; greenhouse gas emissions, energy and water use are no longer constraints on the materials industry. Canada has much work to do to achieve the Vision 2050.
- There are organizations in Canada (Zero Waste Canada, National Zero Waste Council) that advocate for a shift towards a more **sustainable global materials and waste management model** - this necessitates a major shift from the prevalent linear consumption model where a product is sold, consumed and discarded (known as “cradle-to-grave”) to a circular model where a product is sold, consumed, collected and re-made into a new product, returned as a nutrient into the environment, or incorporated into global energy flows (known as “cradle-to-cradle”). The National Zero Waste Council is advocating for the development and enhancement of government policy and regulation and other approaches that encourage manufacturers and retailers to redesign products and packaging to reduce material intensity and allow them to be more easily be reused, repaired and recycled.
- There were no initiatives identified in this jurisdictional review that related to provincial, territorial or federal government activity targeting waste prevention upstream at the **manufacturing level**. Uptake of life-cycle approaches by manufacturers is typically driven by a need to maintain trade relations and market access to sell products in certain jurisdictions, or to sell products across borders that meet the most stringent standards. Incorporation of life cycle criteria in codes and standards, such as green building and manufacturing standards, is clearly driven by a company's desire to maintain market access¹⁶⁶. Therefore there is a correlation between government regulation and its potential to drive waste prevention opportunities and Design for Environment (or Design for Reuse, etc.) at the manufacturer stage for a wide range of products.
- **Lack of secondary markets and weak and fluctuating markets** were identified as an important challenge to foster “closed loop” recycling at the manufacturing level. There are signs that some industry sectors (e.g. packaging) are organising themselves

¹⁶⁵ World Business Council for Sustainable Development Vision 2050: The new agenda for business, Materials, p. 30,
¹⁶⁶ ICF Marbek, 2011. Life Cycle Approaches in Canada – Private Sector, Final Report Prepared for the National Round Table of the Environment and the Economy. UNPUBLISHED.

nationally to develop better markets and guidance on this issue. Governments' ability to influence secondary materials markets is limited. In addition, most markets for secondary materials in Canada are part of larger North American and international commodities markets where Canadian influence on prices and material flows is limited.

- Other than manufacturers, large **national retailers** can also have a significant impact by greening the supply chains for the products they sell in the Canadian market. Wal-Mart, for example, has already achieved significant success in greening their supply chain. In 2010, Walmart Canada announced plans to develop a Sustainable Product Index similar to efforts underway in the United States and stated plans to require its suppliers to attach carbon footprint data to their products by 2014. As a first step towards these goals, Walmart Canada undertook a sustainability survey of its suppliers in 2010. In addition, Walmart Canada has also collaborated with Home Depot to optimize waste hauling efficiency in remote and northern areas of Canada. Through this effort, Walmart trucks collect waste from both retailers. Walmart's sustainability initiatives have resulted in reductions in both its environmental impact and operating costs - for example, in 2010 Walmart diverted 85% of its operational waste from landfills. In the United States, Walmart is also collaborating with many different parties as a founding member of The Sustainability Consortium (TSC), a multi-stakeholder organization dedicated to developing tools to improve sustainability across the product life cycle¹⁶⁷. See Walmart's 2012 Corporate Social Responsibility Report for more information.
- In terms of **packaging** design at the manufacturing level, some packaging initiatives in the ICI sector are already underway: as a follow-up to the successful CCME-led National Packaging Protocol achievements from 1990 – 2000 that targeted the ICI sector, the CCME has completed work with major retailers in 2012 such as the restaurant and food sector, brand owners and the packaging industry to drive a new industry-driven approach to reduce packaging in Canada. Industry partners commit to undertake initiatives that will further reduce the amount of non-recyclable packaging and increase recycled content.
- The only waste prevention or reduction initiatives identified at the jurisdictional level were three initiatives that were applied province- or territory-wide, and all three addressed the need to reduce the use of **single-use bags** distributed to consumers (plastic, paper, or biodegradable bags): one legislative initiative in Northwest Territories; one MOU signed between the Government of Alberta and industry for reducing plastic bags; and a general goal in Manitoba to reduce the use of plastic bags. All three initiatives engaged the retail and distribution sectors that engage with consumers.

¹⁶⁷ National Round Table of the Environment and Economy. 2012. Adopting Life-Cycle Approaches for Sustainable Development <http://collectionsCanada.gc.ca/webarchives2/20130322143458/http://nrtee-trnee.ca/canadas-opportunity>

Opportunities Upstream

- Increased Canada-wide **collaboration** between governments and industry stakeholders is vital to achieve changes upstream. This collaboration could happen via the National Zero Waste Council which has members from municipalities, provincial governments, recycling councils, and large retailers. There is an opportunity for governments, individually or through CCME, to capitalize on this momentum and get more involved with the Council activities - possibilities include leading a steering group or working group on data, extending inclusions to other industry stakeholders that wish to participate, contributing funding, etc.
- Potential increased **roles** for provincial, territorial and/or federal governments were identified: influencing product design upstream (e.g. providing incentives such as tax breaks or carbon offset credits to industry when they use recycled content rather than raw materials); support for research and data; support for pilot projects to contribute to industry-readiness (e.g. carpet or mattress recycling); support to secure secondary markets; and greater use of economic instruments (e.g. removal of service taxes for repairing used goods; examination and changes to low landfill tip fees); legislative bans on disposal for easily recyclable materials (e.g. cardboard).
- The U.S. Environmental Protection Agency (EPA) has reported on studies that indicate that EPR is not as successful in driving design change upstream as are **performance-based regulations**. For example, limiting the mercury content in a product might be more effective in reducing emissions of mercury than establishing an EPR program to collect the product to recover the mercury. Provincial and territorial jurisdictions –along with the federal government, could consider if this is an opportunity to drive change upstream.
- There is a potential opportunity to more actively **involve entrepreneurs** at local universities and small businesses in solving recycling issues that could lead to a more closed loop system in any material category. Many universities and colleges across the country offer sustainability / entrepreneurship business programs (e.g. Western University's Centre for Business Sustainability) now which could be a resource for innovation upstream. RRFB in Nova Scotia has been supporting this type of initiative since 1998.

6.4 Key Observations, Challenges, and Opportunities in Waste Diversion

CAP EPR Phase 1 Materials

- **Harmonization** among neighbouring provinces is being undertaken in numerous Phase 1 materials such as regulated EPR programs for electronics and electrical equipment (via the Electronic Products Recycling Association [EPRA]) and also for used oil, containers and filters (via the National Used Oil Management Association [NUOMA]), and most recently, among PPP programs via the newly formed Canadian Stewardship Services Alliance (CSSA). Among voluntary EPR programs it has also become a trend (e.g. CWTA for cell phones, RMC for refrigerants, and Croplife for pesticides). Harmonization allows stewards to administer programs on a more standardized and coordinated basis across jurisdictions, and share administrative costs. Although responsibilities are often mandated (for regulated programs), these programs are increasingly harmonized in terms of monitoring and reporting. Harmonization is commonly driven by producers' interests in increasing economic efficiencies and economy of scale.
- Many of the CAP EPR **Phase 1** materials are slowly being addressed for the residential sector among most jurisdictions (except in all the territories where not many of the Phase 1 materials are addressed at all, except for beverage containers). Materials where programs are not yet well established in provinces include: **electrical tools, sharps, mercury** (in compact fluorescent lamp bulbs for example) and **lead acid batteries**. Earlier in 2013 Home Depot ended its voluntary nation-wide recycling program for CFLs even though it was well used, but there were concerns about storage of hazardous products in large volumes and associated regulatory requirements. There is no Canada-wide plan for recycling CFLs which contain mercury. The federal government has authority to address toxic products, such as those containing mercury and in 2011 drafted regulations to limit the content of mercury, however to date these have not yet been enacted¹⁶⁸.
- In the **North**, important challenges in Yukon, Nunavut and Northwest Territories to increase diversion include a lack of infrastructure, high costs to start EPR programs because of legacy waste, legislative barriers (federal government has not devolved waste responsibilities in some cases), small populations and out-of-territory purchasing patterns which translate to comparatively lower surcharge income for program operation, and high transportation costs due to remoteness. However, The Arctic Co-operatives Beverage Container Recycling Program has been successfully operating in 23 communities in Nunavut with funding from the Co-operatives. Arctic Co-operatives Limited is a service federation that is owned and controlled by 31 community-based Co-operative business enterprises that are located in Nunavut and Northwest Territories.

¹⁶⁸ In February 2011, Environment Canada published the proposed *Regulations Respecting Products Containing Certain Substances Listed in Schedule 1* to the Canadian Environmental Protection Act, 1999 in the Canada Gazette, Part I to prohibit the use of mercury in most products and to limit the mercury content in some essential products such as mercury-containing lamps, however these regulations have not been passed to date.

- The CAP EPR **Phase 1** programs across jurisdictions primarily target the residential sector rather than the ICI sector which leaves a significant sector not included.
- Residential packaging and printed paper (**PPP**) recycling programs are now widely established across the country via curbside or a depot system (with the exception of Nunavut). Residential access to programs that accept a variety of paper products, metal and aluminum, glass, cartons, and PET plastics are fairly high across the country (with the exception of Nunavut), although the materials accepted in the programs vary widely within and between jurisdictions.
- A challenge to transitioning from municipally-operated PPP programs to a 100% **EPR funded and operated model** where stewardship organizations provide recycling services rather than municipalities for traditional domains such as PPP curbside recycling is that municipalities often already have expensive infrastructure (trucks and multi-material sorting facilities, etc.) plus long-term contracts to service providers. It is possible, for example, that producers may not want to maintain some of the current infrastructure which was commonly developed with local rather than regional or provincial interests in mind. In some jurisdictions such as BC, MRFs are not commonly owned by municipalities although curbside collection equipment commonly is.
- **Beverage** container recycling programs (depot and curbside) are very well established across the country (with the exception of Nunavut), with deposit return programs consistently showing higher return rates compared with curbside programs.
- Most communities do not have coverage for PPP diversion from **streetscape** / public areas (with the exception of BC which will require this in all communities in 2014). Those that have implemented pilot projects for this sub-sector have seen very positive results.
- **Landfill bans** are currently under-utilized to address many Phase 1 materials – only 13% of the Canadian population are located in jurisdictions that use landfill bans for Phase 1 materials¹⁶⁹. This is an under-utilized tool that could be used for specific materials to support existing EPR programs (e.g. batteries of all kinds, electronics, paint, HHSW, and other recyclables including PPP), as well as to target increased diversion of materials which are still in need of diversion programming across most jurisdictions such as electrical tools, sharps, mercury (in compact fluorescent bulbs for example) and lead acid batteries.

¹⁶⁹ CM Consulting, 2013. Recycling Access in Canada. Solid Waste Magazine, Dec 2013 / Jan 2014 issue.

Opportunities for Phase 1 Materials

- **Harmonization** between jurisdictions offers opportunities particularly for smaller jurisdictions (e.g. Atlantic Canada) and northern territories to establish diversion programs together to access economies of scale for program operations, shared infrastructure, and administrative functions. Even large jurisdictions could increase efforts to harmonize programs. This report did not include an infrastructural review to identify specific possibilities, but this could be done by each jurisdiction so they can best identify what programs could be harmonization candidates. Examples:
1. The **National Used Oil Management Association** has only 5 jurisdictional members out of 13. It is reasonable to suggest that efforts to further harmonize the used oil program across the country would make sense as a priority.
 2. **Tire recycling** programs are implemented in almost all jurisdictions (largely product stewardship initiatives) but there is no data available nationally on performance and none of the programs are harmonized. This material might be a good candidate for harmonization given that retailers and manufacturers are engaged, programs are in place already but efforts to harmonize with neighbouring jurisdictions have not yet been explored.
 3. In a jurisdiction such as **Nunavut** with no territory-wide recycling programs, candidate materials to explore for harmonization include well-established programs in neighbouring territories and possibly further exploration with the Arctic Co-operatives Limited - a service federation that is owned and controlled by 31 community-based Co-operative business enterprises located in Nunavut and Northwest Territories. Arctic Co-operatives coordinates the resources, consolidates the purchasing power and provides operational and technical support to the community based Co-operatives to enable them to provide a wide range of services to their local member owners in an economical manner.
 4. **PPP** is moving towards harmonization in three jurisdictions already, therefore it makes sense for jurisdictions to explore further harmonization of PPP. Materials accepted in many PPP programs vary widely among municipalities within jurisdictions. Standardization of designated and collected materials supports regional processing volumes and improves existing infrastructure utilization.
- Given the past experience of CCME's achievements of 50% packaging waste reduction by the year 2000, it might be useful to explore the idea of a renewed effort to develop a **new strategy for waste reduction** in Canada. This type of a strategy would be different from the CAP EPR because it would be broader in scope. Under the CAP EPR, provinces or territories develop EPR programs which tend to target the residential sector, and overall the CAP EPR does not resonate with municipalities or the ICI sector. A broader strategy could: engage municipalities; implement landfill bans; implement CRD diversion programs; require organics diversion from the ICI sector; engage small business, schools, hospitals to recycle designated materials for which diversion programs exist (e.g. electronics, organics, PPP); fully engage the public through a broad-based outreach / education strategy; and investigate possibilities in northern communities via partnering with educational institutions / business sustainability or the Arctic Cooperatives Limited develop solutions for the unique situation in Canada's north.

- Increased **regionalization** (within a jurisdiction) is important for municipalities to share infrastructure and pool collected recyclables to increase volumes. This will make diversion cost-efficient for smaller municipalities, especially in remote communities.
- There are a few remaining gaps in coverage of CAP EPR Phase 1 materials which should be addressed more consistently in all jurisdictions such as **electrical tools, mercury** containing products (e.g. CFLs) **and sharps**.
- **For CFLs in particular**, Natural Resources Canada has set energy efficiency standards for lighting as of January 2014 (which means that current models of 75- and 100-watt incandescent bulbs will no longer meet the standards and will not be sold in Canada, with similar 40- and 60-watt bulb standards to be effective December 31, 2014. There is a potential opportunity for new federal involvement in the development of EPR programs for CFLs because it is likely they are already engaged with producers Canada-wide from the consultation process for the draft regulations and associated regulatory impact analysis. There is a potential opportunity to capitalize on this and work together with producers and provinces and territories on advancing EPR for CFLs across Canada.
- The **ICI sector** is a gap in coverage and potential opportunity for programming by jurisdictions. Jurisdictions could examine the feasibility of requiring PPP recycling and e-waste recycling in designated ICI places of business).
- **Public street-scapes** (sidewalks, parks, arenas, libraries, bus stops, schools, public spaces) should be the next targeted area for jurisdictions to collect PPP. However funding support would be required for infrastructure and services since many municipalities would be challenged to cover this additional cost.
- There is an opportunity to increase diversion of **polystyrene** material since it lags significantly behind the other PPP materials typically collected in Canadian jurisdictions. Currently only 9 Canadian municipalities are recycling polystyrene (Montreal QC, Markham ON, Moncton NB, Dartmouth NS, four BC municipalities and 1 Alberta municipality).
- Increasing use of **landfill bans** for specific Phase 1 materials across an entire jurisdiction is an opportunity currently only realized for a small segment of the Canadian population.

CAP EPR Phase 2 Materials

- Only BC has addressed one material group: large and small appliances. The remainder of the Phase 2 materials are not being addressed by any jurisdictions, although Québec has plans for appliances in 2014. Priority Phase 2 materials for moving forward with EPR include **appliances, carpet, mattresses, and CRD** as the best candidates. These materials are large bulky items that likely represent a significant portion of the waste stream (data unavailable), but more importantly recycling activity is already taking place in selected jurisdictions (BC province-wide for appliances) and via pilot projects (carpets, some CRD material-specific recycling Nova Scotia) or small voluntary initiatives (mattresses in some Québec municipalities).
- **Textiles (clothing) and furniture** do have some informal reuse and recycling activity through the secondary materials market across the country, although no specific data exists to accurately quantify waste issues for these sectors and there is no coordinated industry activity or voice for these sectors to date. Additional data on these sectors is important for jurisdictions to gather in order to assess next steps. Other textiles such as footwear and car seats, as well as broken furniture – are not part of the reuse market and are not recycled. Data on quantities disposed would be useful for these materials to assess next steps.
- Less than half of jurisdictions have specific strategies targeted at **ICI or CRD** wastes; Québec has targets for both sectors, and Nova Scotia has some pilot studies with municipal by-laws in place to divert CRD. Nova Scotia is currently undertaking detailed analysis of the CRD sector. Since CRD is such a non-homogeneous category, *Individual Producer Responsibility* is likely a better approach over collective EPR due to the diverse industry characteristics of the sector and the uniqueness of the product mix. Different recycling technologies exist for each CRD material including concrete, asphalt shingles, carpets, gypsum, and roofing materials – so the materials need to be considered separately when jurisdictions identify priority materials for diversion.
- Environment Canada has recently initiated a process to undertake a comprehensive study of the CRD waste across Canada. This work will quantify **CRD** waste that is currently generated, recovered, and disposed across the country and identify recycling and disposal methods and facilities by province/territory.
- The fact that **landfill tipping fees are low in some Canadian jurisdictions** (and in Nunavut, tip fees are non-existent) **as well as south of the border** promotes disposal rather than diversion. In the absence of provincial or territorial or federal direction (e.g. funding incentive structures, regulatory requirements) some municipalities and ICI waste generators may landfill rather than recycle. In some parts of the country, the low landfill tipping fees can still be higher than tipping fees in adjoining US states, encouraging **export** of ICI wastes with no incentive for reduction or diversion. The approach to exporting ICI wastes could become problematic should US facilities decide to no longer accept Canadian wastes or if the shipment across the international border becomes slow or restricted. This cost structure is also a challenge to increased recycling of **large bulky items** (e.g. mattresses, carpets, broken furniture).

Opportunities for Phase 2 Materials

- Since industry readiness is a key factor in establishing producer responsibility programs, the next materials for developing EPR programs should be **1) appliances; 2) CRD, 3) carpets and 4) mattresses**. In these three material groups industry has demonstrated they are aware of potential EPR programs, in some cases there are pilot projects under way, and in the case of appliances, EPR is well-established in BC. There could be an opportunity for CCME to be involved in developing a model program for a Phase 2 material so that it could be adapted Canada-wide. The next steps would be: to gather baseline data on current disposal quantities; engage industry stakeholders to discuss new stewardship program options and assess industry readiness and technology readiness, etc.; and develop program requirements (e.g., banning specific waste streams such as wood waste).
- With respect to **CRD**, it is such a varied sector with multiple product lines, the building and renovation community should be engaged to discuss which materials should be priority for diversion, the state of recycling technologies available and the next steps. Due to the variety of materials in CRD this is one product group which may not lend itself well to a harmonized approach and might be better to use an individual jurisdictional approach that best targets specific materials and the recycling applications available in each jurisdiction.
- With respect to **carpet diversion**, the ICI sector has the most potential for EPR due to the fact that the carpet fibres often used in ICI buildings are nylon-based and the technology exists to recycle this type of carpet. The ICI sector generates large homogenous volumes at one time when replacements are done on entire floors of buildings. This provides a cost-efficient opportunity to consolidate and ship material for recycling for this sector.
- The Phase 2 materials categories that are not ready to progress with EPR due to lack of data, lack of engagement with industry, and lack of recycling technologies are: **textiles** (clothing, footwear, car seats, linens, etc.), and **furniture**. A first step that jurisdictions could do for these categories would be data gathering (e.g. estimates of quantities reused or disposed jurisdiction wide – estimated from waste audits or municipal landfills, reuse stores or recycling centres), and identification of stakeholders such as recyclers, reuse markets, producers, etc. Initiating a dialogue among key players would be a second step.
- Jurisdictions could review their authority in their jurisdiction for changing **landfill tipping fees** to provide an incentive for diversion – which might vary in each jurisdiction. If they do not have a legal authority, they could embark on a process to discuss tip fee structures in their province or territory with municipalities and private landfill owners with a goal to changing fee structures as a lever to increase waste diversion. With respect to treating municipal solid waste on a waste-shed and finding a disincentive for the practice of MSW exporting – a by-law could be established by most municipal governments that would restrict MSW from being exported to another jurisdiction.
- Increasing use of **landfill bans** for specific Phase 2 materials across an entire jurisdiction is an opportunity to increase diversion once infrastructure is in place. For maximum impact, landfill bans should target the materials where recycling technologies already exist and industry has demonstrated readiness for establishing a diversion program.

Organics

- **Composting** of food and yard waste has seen a 125% increase in diversion Canada-wide from 2000-2010 (access to either curbside or backyard programs for either food or yard waste). This progress has largely been achieved in the residential sector, although Nova Scotia and PEI include the ICI sector in legislated organics diversion. However, when curbside only access to food waste composting is examined - the rate is approximately 40% – largely urban areas of provinces only. Québec is the only province that has developed organics diversion **targets** with accompanying infrastructure support.
- Some organics processing facilities **include paper fibres** as well. Paper fibres can be composted in both large scale centralized composting facilities (e.g. Halifax NS and Ottawa ON), as well as small-scale open windrow composting activities (e.g. Newfoundland and Labrador has demonstrated a successful pilot project involving composting of both paper and food waste using low technology options).
- Typical residential waste composition studies for a Canadian jurisdiction show that food and yard waste represent 40%, paper 26%¹⁷⁰ so **organics remains a significant portion of the waste stream** in communities that are not currently offering composting programs.

Opportunities in Organics

- Investments in **organics programs** (either high or low tech) provide “the biggest bang for the buck” in terms of opportunities to significantly increase diversion. Low technology windrow composting has been demonstrated to be viable in small or remote communities where it is not cost effective to transport organic waste long distances. The fact that paper fibres can be included in any type of composting activity provides an additional opportunity to increase diversion in small, remote, or northern communities not recycling paper.
- Increased organics diversion in the **ICI sector** in particular represent a significant opportunity to improve diversion rates Canada-wide, produce valuable compost and renewable energy in the case of anaerobic digestion. Infrastructure Canada’s funding programs could be accessed for new infrastructure, provinces and territories could implement low technology composting for small communities.
- Establishing organics **landfill bans** could be the next step in many jurisdictions which have not done so (other than Nova Scotia and PEI who already have implemented such bans).
- Given the **expensive cost of waste management**, including organic waste in many jurisdictions where it is allowed to be disposed in landfill, food waste reduction initiatives

¹⁷⁰ Composting Council of Canada and Green Manitoba presentation deck, “Organics Recycling Programs in Canada”. Webinar August 7, 2013.

should also be explored with the ICI sector.

6.5 Key Observations, Challenges, and Opportunities in Energy Recovery from Waste

- Two jurisdictions have official **energy recovery from waste (EFW) policies**. Alberta includes energy recovery in its Provincial Energy Strategy and Québec includes a biogas from organics digestion (biométhanization program) strategy and EFW criteria in its energy strategies. The province of BC does not favour an EFW approach proposed by a regional district unless that regional district has a target to achieve a 70% diversion rate. Other jurisdictions defer to municipalities, in most cases; however, the facility would need approval from a provincial or territorial authority for construction and operation, so most jurisdictions make these decisions on a case-by-case basis.
- **Cement manufacturing** occurs in BC, Alberta, Ontario, Québec, and Nova Scotia. Use of alternative energy to manufacture cement (e.g. using tires, carpets, MSW, CRD wood waste, CRD asphalt shingles, used oil, non-recyclable plastics) varies from 0% in Alberta to 34% in Québec. In European countries this amount is much higher (e.g. as high as 83% in the Netherlands, 53% in Germany, 38% in Austria)¹⁷¹.
- **Regionalization** can make EFW cost effective. Europe is commonly doing this, and it is happening in southwestern Ontario (4-5 communities investigating EFW together), Durham and York Regions are jointly constructing a new facility and in Alberta 72 municipal entities are forming an association for EFW. By aggregating the waste and the administration, they create an economy of scale that is more cost effective to manage with new infrastructure.
- There is growing interest in the use of waste-to-energy in the form of **bioenergy** facilities, such as large anaerobic digesters, rather than large EFW incinerators. The newer anaerobic technology can be utilized on a smaller scale, and be specifically targeted for the organics waste stream, either MSW or agricultural waste. New smaller bioenergy facilities are planned in BC, Ontario, Québec and Alberta.

Opportunities in Energy Recovery

- Anaerobic biofuel facilities that process organic waste streams and produce fuel (e.g. methane or other) are gaining popularity and provide an opportunity to address organics on a regional basis for smaller or remote communities.
- Some sectors (i.e. cement manufacturing) would like to increase use of MSW as an alternative energy source. Waste streams that can be utilized for energy in this sector include: tires, carpets, MSW, CRD wood waste, CRD asphalt shingles, used oil, utility poles and rail ties, agricultural and forestry residual fibres, non-recyclable plastics, and even bone

¹⁷¹ Cement Industry in Canada 2010 Sustainability Report.
<http://www.cement.ca/images/stories/ENGLISH%20FINAL%202010%20SD%20Report%20Mar17.pdf>

meal. These alternative energy sources could replace coal and coke use. Approval processes need to be updated to allow for these materials to be targeted for use in cement kilns, and waste management policies should be strengthened so that non-recyclable materials such as these can be targeted for cement manufacturing specifically.

- There is an opportunity to increase utilization of LFG from existing large landfills for energy recovery (not just flaring) in jurisdictions that have large landfills (i.e. Ontario, Québec, BC).

6.6 Key Observations, Challenges, and Opportunities in Waste Disposal

- **Incineration** of MSW without energy recovery has been **decreasing** in recent years. With the closure of one of Québec's incinerators there are few remaining in Canada. Conventional incineration technology (without energy recovery) is not on the political agenda of any jurisdiction in Canada with the exception of Yukon or other territories that might consider small mobile incineration facilities for remote northern communities.
- Most jurisdictions have banned hazardous materials from landfill (with the exception of the territories, although they have guidance for source segregation and storage of hazardous materials at disposal facilities). Two jurisdictions (Nova Scotia and PEI) have **banned** from landfills other materials for which there are diversion programs and infrastructure in place, such as organics, on a province-wide basis. Other jurisdictions (Québec) have signalled interest in implementing province-wide landfill bans for other recyclable or compostable wastes so this may grow in the future.
- Only two jurisdictions (Manitoba and Québec) are utilizing province-wide **levies** for waste disposal at landfills to fund diversion programs and infrastructure investments for organics processing. In both cases the levies go into special funds not into general revenue. Both jurisdictions report that the levies are working well in their respective provinces. The successful use of levies often requires a good enforcement strategy and monitoring program to ensure that the levy achieves the intended results¹⁷². Québec uses a third-party verification program for enforcement.
- There is a trend toward **regionalization** in overall waste management planning by many jurisdictions that formerly had many small local landfills in every community. These regional plans and facilities improve the cost effectiveness of the waste management system in a jurisdiction and can serve to improve environmental protection through more cost efficient engineering of landfill sites. Jurisdictions that have done this include BC, Alberta, Saskatchewan, Manitoba, Ontario, Québec, New Brunswick, Nova Scotia, and Newfoundland and Labrador.

¹⁷² Kelleher, Maria. "Landfill Levies" in Solid Waste & Recycling, February 2013 edition.

Opportunities in Waste Disposal

- There is an opportunity to improve waste management in Canada's **Northern Territories** and remote areas of provinces by:
 1. diverting more waste from landfills by requiring segregation of used tires, white goods, end-of-life vehicles, CRD waste, and HHSW in particular, as well as proper storage of hazardous materials;
 2. stopping open burning of mixed waste in any communities where this is still being done;
 3. designing and constructing new landfills to modern standards; and
 4. ensuring that all disposal sites have controlled access.
- Implement better **disposal data monitoring** at facilities in Canada's Northern Territories which is important to obtain an accurate picture of actual disposal quantities.
- This focus of this report was not on researching **best practices at the municipal level** – although some practices were noted, however many municipalities across Canada address waste disposal programs with a variety of innovative ways (e.g. use of bag limits, clear bags, user pay per bag, bag tags, and even by-laws that issue fines for individuals or businesses if they do not participate in recycling programs). These are not consistent within a jurisdiction and there is wide variety of practices in place. There is an opportunity for governments, individually or through CCME, to conduct a municipal best practice review of waste diversion and reducing waste disposal approaches in Canada. Such a research exercise could review innovative practices to identify those that could be scalable province- or territory-wide.
- Jurisdictions could implement **disposal bans jurisdiction-wide** as a complement to mandatory EPR or product stewardship programs that are already in place to ensure diversion. The two jurisdictions that have implemented organics landfill bans have the highest rates of diversion per capita in the country (Nova Scotia and PEI) and the highest rates of organics diversion in particular.
- Jurisdictions that are looking to find **innovative ways to fund new diversion infrastructure** could explore the use of disposal levies as a possible tool for this investment. As demonstrated in Manitoba and Québec, the successful use of levies requires an enforcement strategy and monitoring program to ensure the levy achieves intended results.
- The concept of delegating waste as a material that must be managed within the waste generators' jurisdiction (e.g. the idea of a "**waste-shed**" similar to watershed management) is a new idea being discussed in Metro Vancouver. This would prevent export of waste to American states with low tipping fees, a practice often undertaken by Ontario waste haulers.

6.7 Key Observations, Challenges, and Opportunities in Monitoring and Reporting

- In the review of publicly available performance information for **Phase 1 materials** (Section 2.4), it was found that **good data sources** were available for some well-established regulated programs such as beverage containers, electronics, and used oil (where a jurisdiction was a member of a harmonized program). It was observed that legislated programs are more likely to include monitoring and reporting features, and frequently publish that data publicly. When programs are **regionalized / harmonized** among more than one jurisdiction it is much easier to compare data among jurisdictions because they have the same monitoring metrics, etc. This is true for jurisdictions that are members of EPRA or UOMA. For example, Ontario, Newfoundland and Labrador, Nova Scotia, and all three territories are not members of UOMA so data for those jurisdictions are not available from UOMA.
- It was difficult to find comparable data for **PPP programs** (mixed paper and packaging) across jurisdictions. Some jurisdictions have detailed material-specific data publicly available from the annual data call to municipalities which require municipal reporting. Other jurisdictions monitor municipalities diversion of PPP also but do not make the data publicly available.
- Other materials which **did not have one consolidated source of information** for the material category across Canadian jurisdictions (e.g. non-harmonized programs) include HHSW programs, paint programs, pharmaceuticals/sharps, and tire programs. Many of these programs are likely to have performance information in a different place within each jurisdiction, however not all jurisdictions have it publicly available, and in some cases, they may have it publicly available but track performance differently as in the case of tires (some jurisdictions report on tonnages of rubber diverted, while others report on number of tires diverted). Lack of a national source of diversion or disposal information on many of these materials was identified as a challenge to accurate waste management performance monitoring. Collecting and aggregating national data can be a resource intensive process depending on the methodology used. Also, jurisdictions use different terminology and their programs are not always comparable.
- There is **variability of how jurisdictions monitor municipal disposal and diversion data**. Manitoba and Alberta both utilize the proprietary Re-Trac online reporting tool and data system as part of their waste information management systems, and Alberta conducts voluntary surveys of disposal facilities. Other jurisdictions (Ontario, Nova Scotia, Québec) collect very detailed municipal diversion and disposal data. BC collects disposal data only.
- The lack of **national guidelines** to monitor and track diversion performance is problematic, and leads to inconsistent methodologies across jurisdictions, and even within jurisdictions across different programs. There is a need for consistent definitions for recycling rates, collection rates, diversion rates, and formulas for setting targets, conducting performance auditing, as well as performance reporting.

- Nunavut is the only jurisdiction that **does not do any monitoring** at all of community disposal activity. In Nunavut, only one solid waste disposal facility restricts access and has an attendant, which leaves all other community solid waste facilities accessible by public or private sectors who can dump any materials at all. This is a significant challenge for the territory. In addition, there are still other jurisdictions that also have some remote facilities without weight scales in place (e.g. Saskatchewan, Newfoundland and Labrador) although this is slowly changing.
- For the **Phase 2 materials**, no jurisdiction has recent comprehensive data on tonnages of Phase 2 materials disposed in their jurisdiction (with the exception of BC who is now tracking appliances through their EPR regulation on appliances) so this is a significant data gap nationally for CRD, carpets, textiles, furniture, mattresses, and appliances in most jurisdictions. The Environment Canada study on CRD will hopefully be a first step in addressing this data gap for CRD.
- Lack of a **national organization or current database** dedicated to **Canada-wide waste management data** was identified as a challenge to tracking accurate waste management performance monitoring overall. Stakeholders highlighted problematic issues with the periodic Statistics Canada Waste Management Industry Survey (WMIS), which includes waste haulers only rather than ICI generators, and is always two years out of date. In addition the constraints imposed by the Statistics Act do not allow reporting on data for smaller jurisdictions such as the territories, PEI and Newfoundland and Labrador.

Opportunities in Performance Monitoring and Reporting

- The current work underway by the Ontario Waste Management Association (OWMA) and the Canadian Standards Association (CSA) to develop a recycling guideline for the province of Ontario entitled: *Recycling Process, Audit and Verification Guideline for Ontario*. The intention is that the guideline will provide a more consistent framework to define, measure and interpret data at the facility level. The guideline will be applicable to a range of waste products and materials including: PPP, organics, textiles, wood, glass, metals, plastics, waste electrical and electronic equipment, household special waste, tires, and end of life vehicles. When complete, the guideline could be reviewed for applicability in other jurisdictions.
- To address the deficiencies of the Statistics Canada survey, jurisdictions might need to **require municipal reporting and landfill reporting** (both public and private) to provincial and territorial authorities via legislation or permits. Data reporting initiatives best suited for each jurisdiction should be explored by each jurisdiction in terms of their needs.
- Jurisdictions need to engage in monitoring of **disposal by municipalities**, or at landfills directly so that they can get an accurate picture of disposal quantities and thereby access robust trend information over time. There has been a focus on diversion monitoring, however monitoring only diversion quantities could mask an increase in generation of waste overall.

APPENDIX A: PROVINCIAL/TERRITORIAL FACT SHEETS

This appendix presents 1-page overview of key waste management information for each jurisdiction, where available.

For most jurisdictions, the following sources of information were used to generate the graphs:

Disposal: Statistics Canada CANSIM Table 153-0041, Disposal of waste, by source, Canada, provinces and territories, 2002 - 2010, tonnes, All sources of waste for disposal

Diversion: Statistics Canada CANSIM Table 153-0043 Materials diverted, by type, Canada, provinces and territories, 2002 - 2010, tonnes, All materials diverted

Diversion per capita: 2002 - Statistics Canada Publication 16-201-X, Human Activity and the Environment Table 8.3, Disposal and diversion of waste, by province and territory: Column - Diverted materials per capita 2004, 2006 - Statistics Canada Publication 11-402-X, Table 12.5 Diversion of waste, by province and territory, 2004, 2006: Column - Materials diverted per capita, kg

2008, 2010 - Statistics Canada Pollution and Waste, Disposal and diversion of waste, by province and territory (Diverted materials per capita, kg), 2008 and 2010

Rate of waste diversion to GDP: Gross domestic product, expenditure-based, by province and territory, 1996 to 2010 from Table 9.1 of same title, source CANSIM table 834-0002

Other sources are cited where applicable.

British Columbia

Waste Policy Framework: Regulatory Approach, including EPR and waste management planning by local government.

Province-Wide Diversion Programs

Legislated EPR Programs

Beverage containers
Electronics – audio-visual and telecom, cell phones, computers and accessories, tools, TVs, large and small appliances
HHSW – batteries, corrosives and irritants, flammables, pesticides, aerosols, mercury lamps and other mercury products, paint, pharmaceuticals, solvents
Automotive – lead acid batteries, tires, used oil, filters and containers, glycol
PPP (May 2014)

Voluntary EPR Programs

Packaging – milk containers

Other Diversion

- Municipally funded and operated organics programs

Planned EPR Programs

CRD (2017)
Furniture, textiles, carpet (2017)

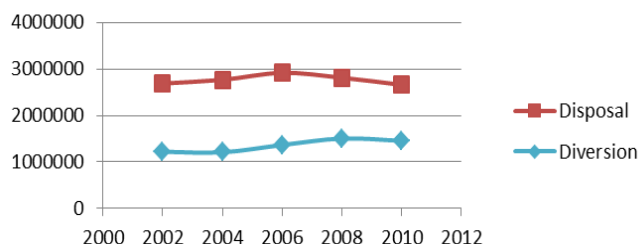
Energy Recovery from Waste Approach: No legislation on EFW, guidance is not to approve EFW plants unless a min. 70% diversion has been targeted. Currently 1 large EFW MSW facility, 1 large organics EFW facility, with biofuel facility planned.

Disposal: No province-wide landfill bans in effect.

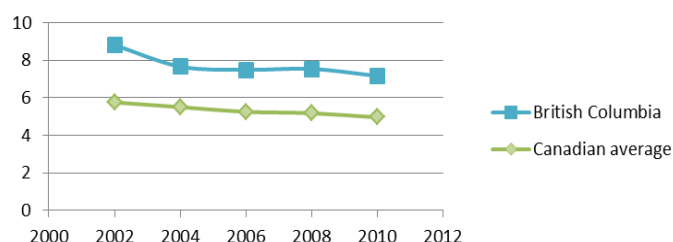
Number of landfills operating (est.) = 92, 8 with LFG recovery.

Comparative Statistics: Statistics Canada data

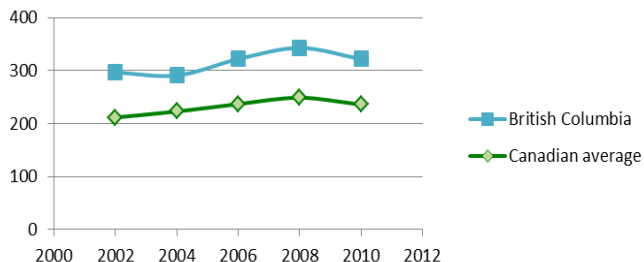
**Disposal and diversion,
British Columbia, 2002 - 2010
(tonnes)**



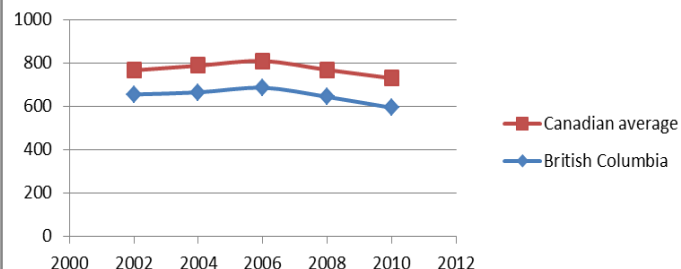
**Ratio of waste diversion to GDP,
in %, 2002 - 2010
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2010
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



Alberta

Waste Policy Framework: Regulatory Approach, with supporting Strategy: a roadmap for waste reduction and management (2007). Product Stewardship approach to date, consultation in 2013 proposed the enabling of EPR and designating materials under an EPR approach.

Province-Wide Diversion Programs

Voluntary EPR Programs

- Cell phones
- Pharmaceuticals (ENVIRx)
- Batteries (Call2Recycle)
- Pesticides/fertilizers and containers (CleanFARMS)
- Plastic Bag Program – voluntary agreement with industry

Product Stewardship Programs – Legislated

- Packaging – milk containers
- Packaging – beverage containers
- Electronics – computers, accessories and IT equipment, TVs
- HHSW – paint
- Automotive – tires; used oil, oil containers and filters

Other Diversion Programs

- Municipally funded and operated PPP programs
- Municipal HHSW programs
- Municipal leaf and yard waste collection programs and some source separated organics

Considered EPR Programs

- Multi-material packaging and printed papers
- HHSW – corrosives and irritants
- HHSW – aerosols
- HHSW – mercury lamps and other mercury products
- HHSW – solvents

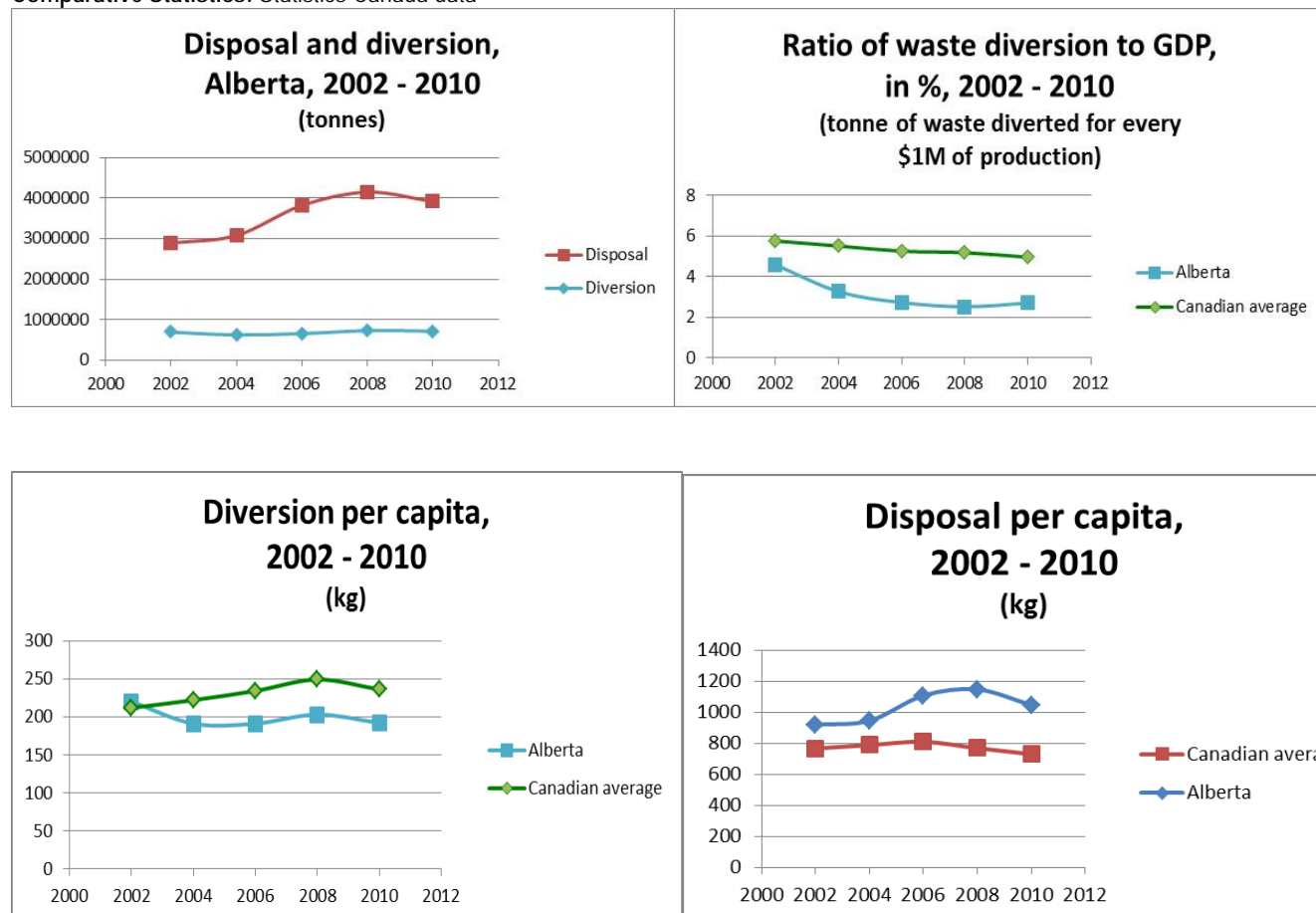
Considered PS Programs

- Electronics – audio-visual and telecom
- Electronics – tools
- Electronics – appliances
- Used Oil changes – considering adding other automotive containers (windshield washer fluid, glycol and diesel exhaust fluid containers.)

Energy Recovery from Waste Approach: AB is the only jurisdiction in Canada that has a province-wide Code of Practice for Energy Recovery Facilities. In addition, EFW is part of their provincial Energy Strategy. 1 large MSW EFW facility, 420 small EFW facilities.

Disposal Approach: No province-wide landfill bans in effect. Number of landfills operating (est.) = 136, with 4 LFG recovery.

Comparative Statistics: Statistics Canada data



Saskatchewan

Waste Policy Framework: Regulatory Approach, new strategy pending.

Province-Wide Diversion Programs: Mainly EPR approach, with some Product Stewardship programs.

Legislated EPR Programs

- Electronics – audio-visual and telecom
- Electronics – computers, accessories and IT equipment
- Electronics – TVs
- HHSW – paint
- Automotive – used oil, oil containers and/or filters, glycol

Voluntary EPR Programs

- Packaging – milk containers
- Electronics – cell phones
- Household hazardous/special wastes – batteries
- HHSW – pharmaceuticals
- Pesticide Containers (CleanFARMS)

Product Stewardship Programs

- Packaging – beverage containers
- Automotive – tires

Other Diversion Programs

- Municipal PPP programs -curbside fee for service or through depots
- Some municipal leaf and yard waste programs.

Planned / considered EPR Programs

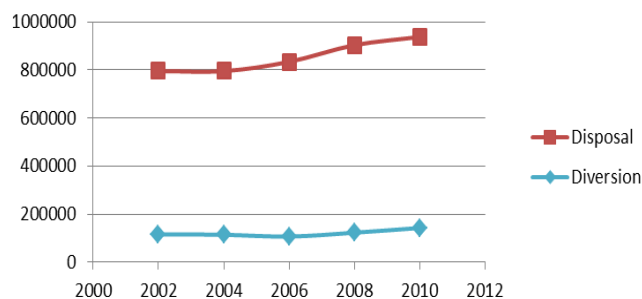
- PPP (2014)
- HHSW – corrosives and irritants, aerosols, mercury lamps and other mercury products
- HHSW – sharps and syringes, solvents
- Agricultural plastics (e.g., grain bags, silage and bale wrap, plastic twine and net wrap)

Energy Recovery from Waste Approach: No official policy on EFW, no EFW facilities identified or planned.

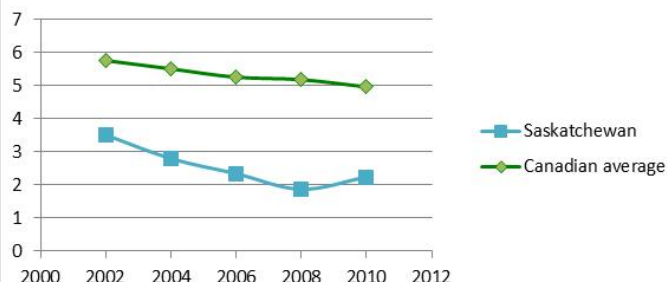
Disposal Approach: No province-wide landfill bans in effect. Number of landfills operating = 338, with 2 LFG recovery. Many landfills are not equipped with weigh-scales so disposal monitoring is an issue.

Comparative Statistics:

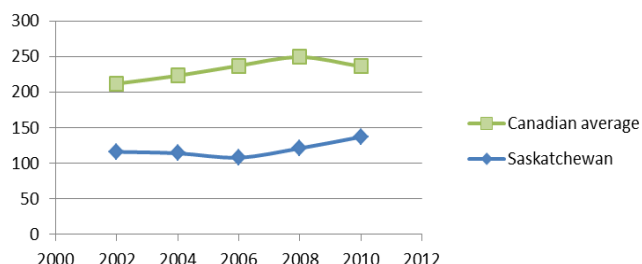
**Disposal and diversion,
Saskatchewan, 2002 - 2010
(tonnes)**



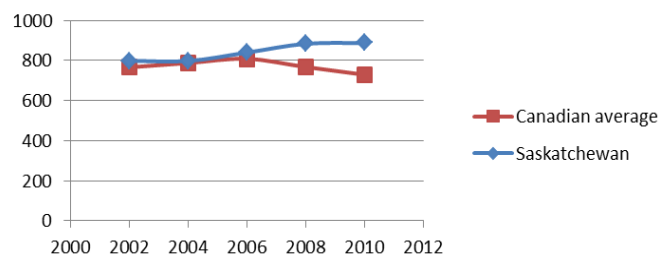
**Ratio of waste diversion to GDP,
in %, 2002 - 2010
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2010
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



Manitoba

Waste Policy Framework: Legislative, with supporting Strategy (2012). Also a Waste Reduction and Pollution Prevention (WRAPP) Fund that supports projects that focus on reducing and diverting waste, including CRD, organics and composting; and implementing better waste management practices.

Province-Wide Diversion Programs: EPR approach

Legislated EPR Programs

- Packaging – beverage containers
- Electronics – audio-visual and telecom, cell phones, computers, accessories and IT equipment, TVs, appliances (microwaves only)
- HHSW – batteries, corrosives and irritants, aerosols, mercury lamps and other mercury products, paint, pharmaceuticals, solvents, gasoline, pesticides/fertilizers and containers
- Automotive – batteries, tires, used oil, oil containers and/or filters, other (e.g. glycol)

Shared Responsibility

- PPP
- Packaging – milk containers

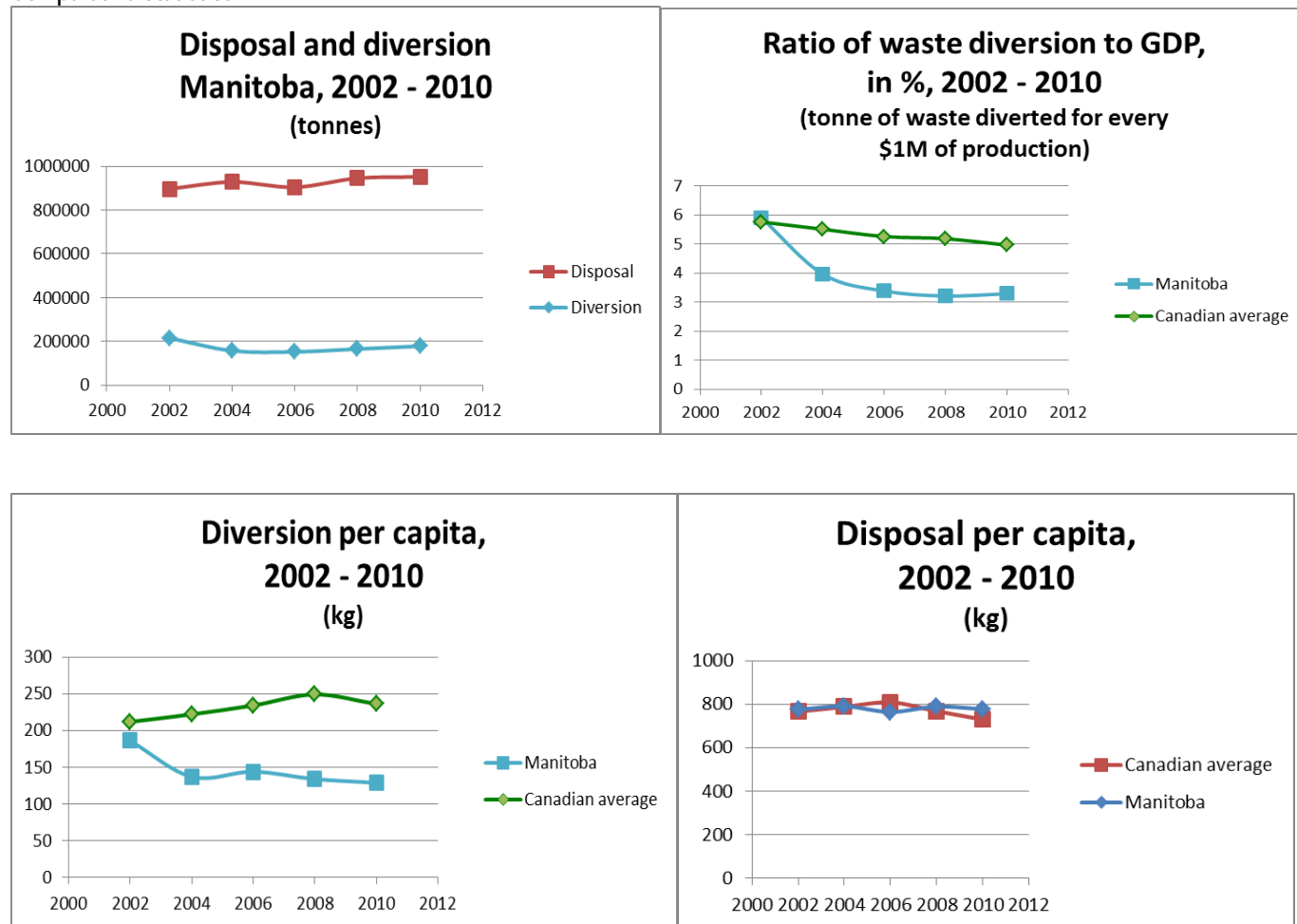
Other Diversion Programs

- Tomorrow Now strategy supports organics diversion
- Municipal leaf and yard waste programs

Energy Recovery from Waste Approach: No official policy on EFW, no EFW facilities identified or planned.

Disposal Approach: No province-wide landfill bans in effect. Number of landfills operating = 195, with 3 LFG recovery. Since 2009, MB has had a Waste Reduction and Recycling Support (WRARS) levy of \$10/tonne on MSW disposed of in MB landfills.

Comparative Statistics:



Ontario

Waste Policy Framework: Legislative, focus on diversion. 2013 proposed a new Waste Reduction Act and supporting strategy

Province-Wide Diversion Programs: Mixed approach, some EPR, some shared responsibility, some product stewardship

Legislated EPR Programs

- Electronics – audio-visual and telecom, cell phones, computers, accessories and IT equipment, TVs
- HHSW – batteries (single use), paint and solvents, pharmaceuticals, sharps and syringes, pesticides & fertilizers and containers, pressurized containers
- Automotive – tires, oil containers and filters, glycol (anti-freeze/ coolant)

Considering legislated EPR changes to designate materials in the ICI sector for PPP

Shared Responsibility

- PPP (all beverage packaging, all other packaging, and printed paper)

Product Stewardship Programs

- Packaging – liquor and wine containers
- HHSW – other mercury products,, rechargeable batteries, portable fire extinguishers, fluorescent bulbs and tubes.

Other Diversion Programs

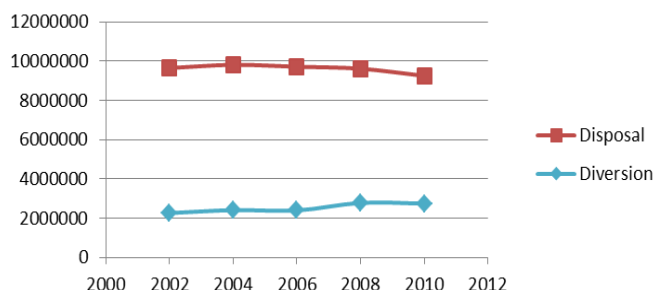
Municipalities > 5000 people required to collect leaf and yard waste
Municipally funded and operated organics programs

Energy Recovery from Waste Approach: Energy from waste is considered waste disposal and is not counted towards diversion. Facilities approved on a case-by-case basis, however biogas, biomass, and LFG are included in the Ontario Green Energy Act (Ministry of Energy). ON has three approved EFW facilities, 1 operational facility. 2 smaller bioenergy facilities are planned to treat organics, sewage sludge, and wood waste.

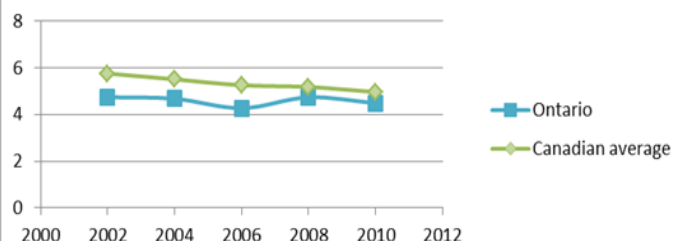
Disposal Approach: No province-wide landfill bans in effect. Number of landfills operating = 880, with 28 LFG recovery.

Comparative Statistics:

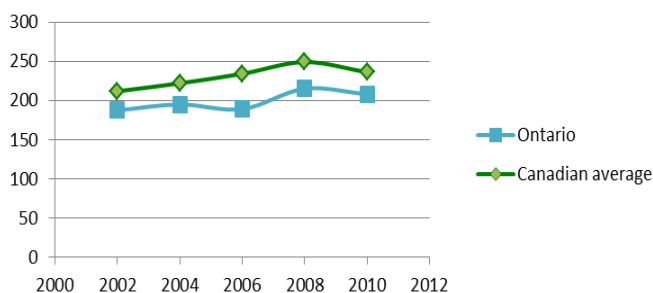
**Disposal and diversion,
Ontario, 2002 - 2010
(tonnes)**



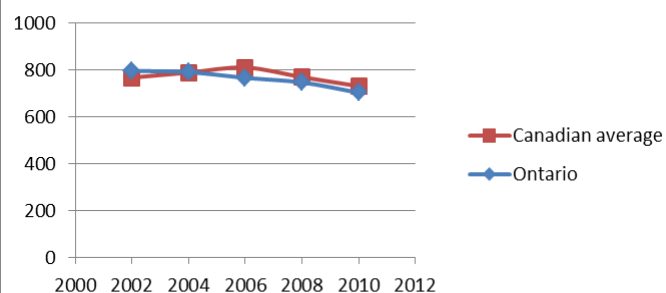
**Ratio of waste diversion to GDP,
in %, 2002 - 2010
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2010
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



Québec

Waste Policy Framework: Legislative with supporting policy (2011) and action plan (2011-2015)

Province-Wide Diversion Programs: Mixed approach, some EPR, some shared responsibility, some product stewardship

Legislated EPR Programs

- Electronics and cell phones
- HHSW – batteries, paint, mercury lamps and other mercury products
- Automotive – used oil, oil containers and/or filters, glycol

Voluntary EPR Programs

- HHSW - pesticides/fertilizers and containers
- HHSW – pharmaceuticals

Shared Responsibility

- PPP
- Packaging – milk containers

Product Stewardship Programs

- Packaging – beverage containers
- Automotive – tires

Other Diversion Programs

- Solid Waste Management Action Plan (2011-2015) sets targets for organics diversion
- Planned ban on all organics from landfill by 2020

Considered / Planned EPR Programs

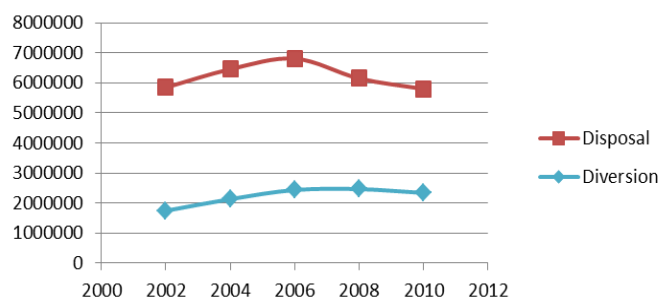
- HHSW – corrosives and irritants,, aerosols, solvents

Energy Recovery from Waste Approach: Strategy to develop organics biogas EFW projects. There is one large EFW facility in QC, the Kativik Regional Government is planning on conducting a feasibility study for a small scale incinerator for the north. Quebec's landfill and incineration regulation specifically includes technology designed for smaller EFW facilities. Criteria are under development for EFW incinerators, pyrolysis chambers, gasifiers, plasma ovens, industrial ovens, and boilers.

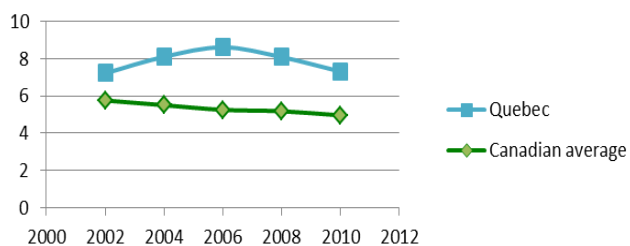
Disposal Approach: Currently no province-wide landfill bans in effect, but some are planned: QC will ban paper and cardboard from landfill in 2013, wood in 2014, and food waste in 2015. Number of landfills operating = 104, with 16 LFG recovery. Levy system in place.

Comparative Statistics:

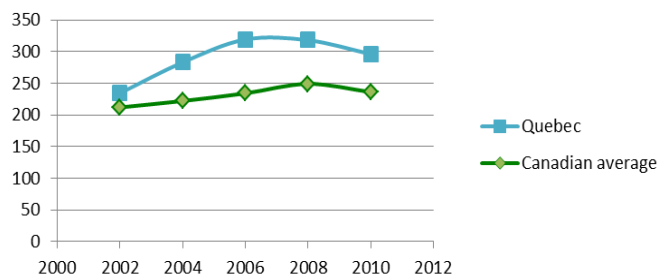
**Diversion and disposal,
Quebec, 2002 - 2010
(tonnes)**



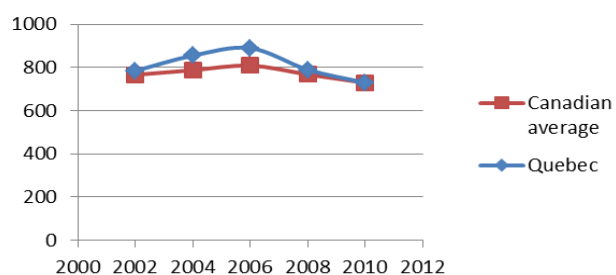
**Ratio of waste diversion to GDP,
in %, 2002 - 2010
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2010
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



New Brunswick

Waste Policy Framework: Legislative

Province-Wide Diversion Programs: EPR approach, with some product stewardship programs

Legislated EPR Programs

- HHSW – paint
- Automotive – used oil, oil containers and/or filters, glycol

Voluntary EPR Programs

- Electronics – cell phones
- Household hazardous/special wastes – batteries
- HHSW – pharmaceuticals

Product Stewardship Programs

- Packaging – beverage containers
- Automotive – tires

Other Diversion Programs

- Some municipally funded and operated organics programs
- PPP

Considered / Planned EPR Programs

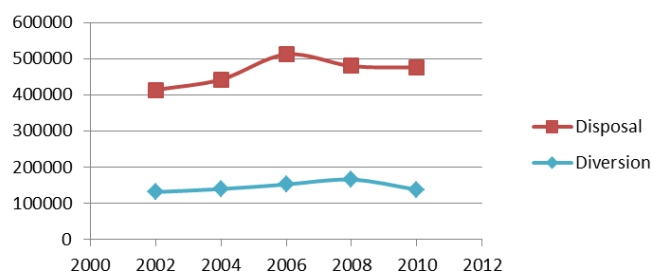
- Electronics – audio-visual and telecom
- Electronics – computers, accessories and IT equipment
- Electronics – TVs
- Multi-material packaging and printed papers

Energy Recovery from Waste Approach: No official policy on EFW, no EFW identified.

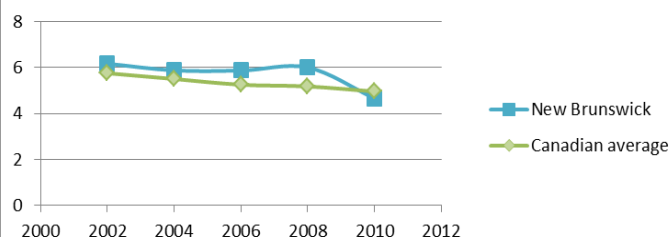
Disposal Approach: Regionalized waste management approach. Number of landfills operating = 6 with 6 LFG recovery.

Comparative Statistics:

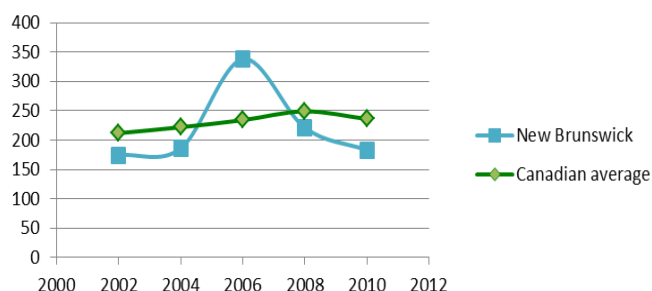
**Disposal and diversion,
New Brunswick, 2002 - 2010
(tonnes)**



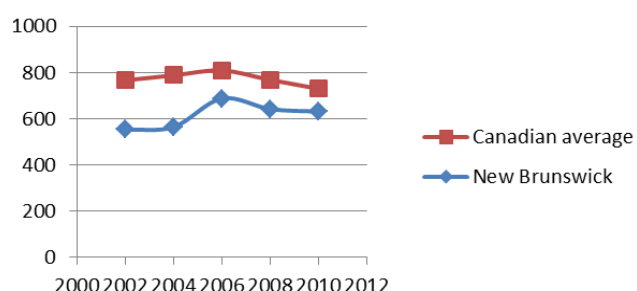
**Ratio of waste diversion to GDP,
in %, 2002 - 2010
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2010
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



Nova Scotia

Waste Policy Framework: Legislative with supporting Solid waste resource strategy 2011

Province-Wide Diversion Programs: Combination EPR and Product Stewardship, targeting both residential and ICI.

Legislated EPR Programs

- Electronics – audio-visual and telecom, cell phones, computers, accessories and IT equipment, TVs
- HHSW – paint

Voluntary EPR Programs

- HHSW – pharmaceuticals, sharps and syringes, batteries

Shared Responsibility

- Packaging – milk containers

Product Stewardship Programs

- Packaging – beverage containers
- Automotive – oil, tires

Other Diversion Programs

- Solid Waste Resource Management Strategy – mandatory source separation, landfill bans and organics diversion in both residential and ICI sectors
- Support for municipal recycling programs through waste diversion funding credits

Considered / Planned EPR Programs

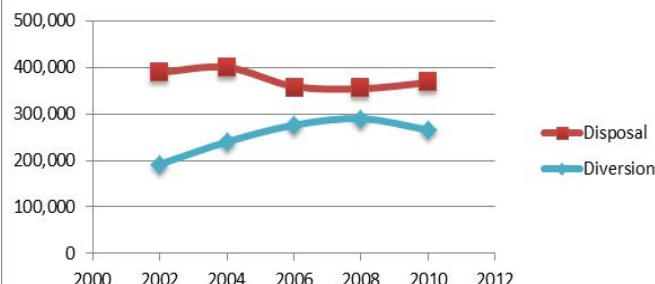
- PPP
- HHSW – mercury lamps and other mercury products
- HHSW – corrosives and irritants
- HHSW – aerosols
- Automotive – other (eg. glycol)

Energy Recovery from Waste Approach: No provincial policy on EFW, no EFW facilities planned in province.

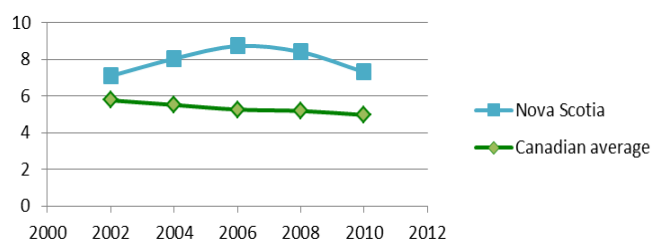
Disposal Approach: Numerous province-wide landfill bans on recyclables and organics, for residential and ICI sectors. Diversion of CRD priority via municipal funding formula. Regionalized waste management approach. Number of landfills operating = 26 with 2 LFG recovery.

Comparative Statistics:

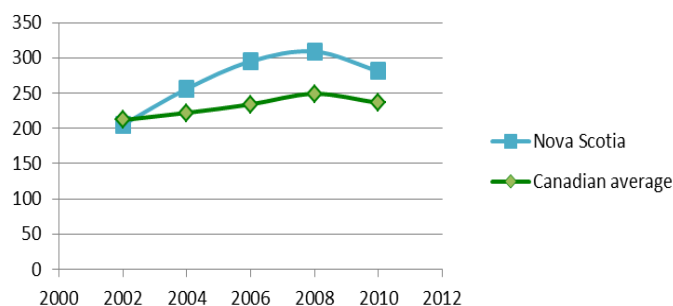
**Disposal and diversion,
Nova Scotia, 2002 - 2010
(tonnes)**



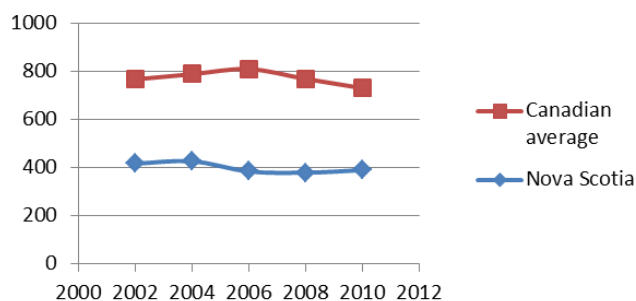
**Ratio of waste diversion to GDP,
in %, 2002 - 2010
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2010
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



Prince Edward Island

Waste Policy Framework: Legislative, with Strategy under development.

Province-Wide Diversion Programs: EPR approach, some product stewardship programs

Legislated EPR Programs

- Electronics – audio-visual and telecom, cell phones, computers, accessories and IT equipment, TVs
- HHSW – paint

Voluntary EPR Programs

- HHSW – pharmaceuticals

Product Stewardship Programs

- Packaging – beverage containers
- HHSW – batteries, corrosives and irritants, aerosols, solvents, mercury fluorescent tubes
- Automotive – tires, used oil
- Appliances

Other Diversion Programs

- Island wide waste diversion managed through the Island Waste Management Corporation, no municipal involvement.
- Mandatory organics source-separation collection program targets both residential and ICI sectors.

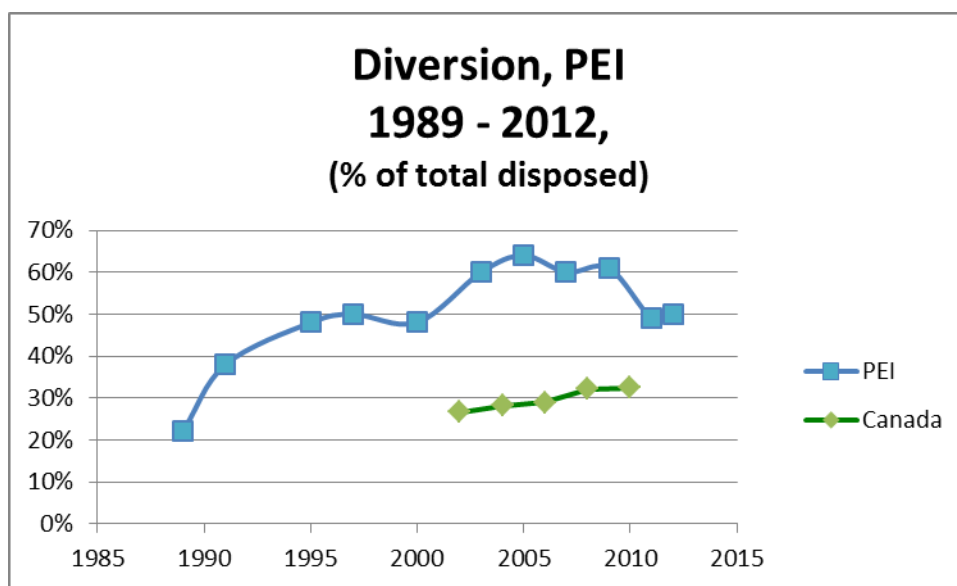
Considered / Planned EPR Programs

- PPP
- HHSW – other mercury lamps and other products
- HHSW – pharmaceuticals
- Automotive – batteries
- Automotive – oil containers and/or filters

Energy Recovery from Waste Approach: No provincial EFW Strategy, but there is 1 large EFW facility. No others planned.

Disposal Approach: Number of landfills operating = 5 with 0 LFG recovery. Province-wide landfill bans on organics, collection is required for both residential and ICI sectors.

Comparative Statistics: IWMC Annual Reports and PEI SOE Reports



Newfoundland and Labrador

Waste Policy Framework: Legislative, with supporting strategy (2002; strategy goals revised in 2007 with funding commitment and implementation plan)

Province-Wide Diversion Programs:

Legislated EPR Programs

- Electronics – audio-visual and telecom, cell phones, computers, accessories and IT equipment, TVs
- HHSW – paint

Voluntary EPR Programs

- HHSW – pharmaceuticals

Product Stewardship Programs

- Packaging – beverage containers
- Automotive – oil containers and/or filters
- Automotive – tires

Other Diversion Programs

- Voluntary residential backyard composting programs in some communities.
- Voluntary milk container recycling and industry compensation for the program in 1 region.

Considered / Planned EPR Programs

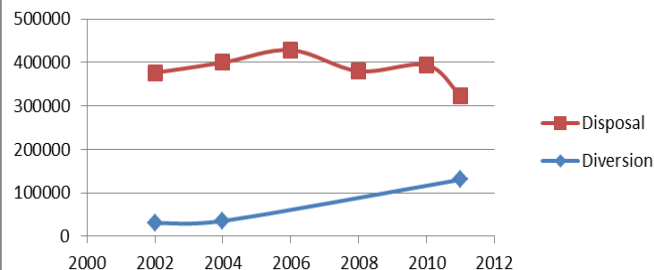
- Multi-material packaging and printed papers
- Household hazardous/special wastes – batteries
- HHSW – corrosives and irritants
- HHSW – aerosols
- Automotive – other (eg. glycol)

Energy Recovery from Waste Approach: No provincial EFW policy, no EFW facilities current or planned.

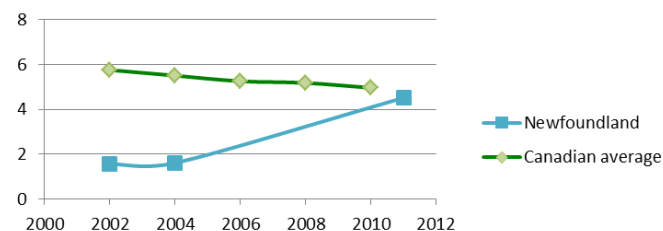
Disposal Approach: Regionalized approach to waste management. No province-wide bans in effect. Number of landfills operating = 88 with 1 LFG recovery.

Comparative Statistics:

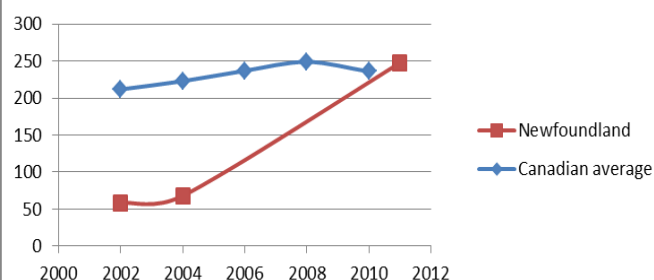
**Disposal and diversion,
Newfoundland, 2002 - 2011
(tonnes)**



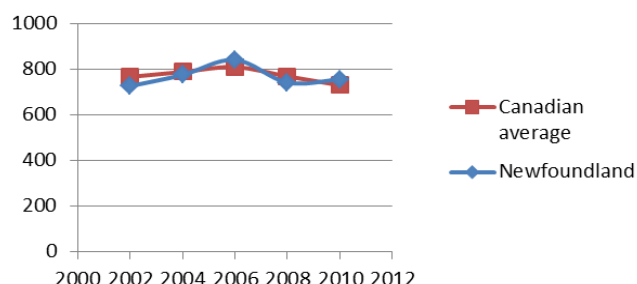
**Ratio of waste diversion to GDP,
in %, 2002 - 2011
(tonne of waste diverted for every
\$1M of production)**



**Diversion per capita,
2002 - 2011
(kg)**



**Disposal per capita,
2002 - 2010
(kg)**



Yukon Territory

Waste Policy Framework: Legislative, with a Solid Waste Action Plan (2010) that focuses on integrating waste disposal, recycling and waste reduction. In 2013 the Department of Community Services established a Solid Waste Working Group which has the objective of providing a venue for the Yukon government and municipal governments to work together to improve solid waste management in Yukon communities. They have undertaken research and analysis, and are a central point to distribute information to municipalities.

Territory-Wide Diversion Programs: Primarily product stewardship approach.

Voluntary EPR Programs

- Electronics – cell phones
- HHSW – pharmaceuticals
- HHSW – sharps/syringes

Legislated Product Stewardship Programs

- Packaging – beverage containers
- Automotive - tires

Other Diversion Programs

- Waste Reduction and Recycling Initiative (WRRI) funds small-scale projects
- Territory-wide education campaign about recycling and composting in 2013
- PPP depots in some communities

Waste Reduction Initiative:

- There is a Waste Reduction and Recycling Initiative (WRRI) from the Department of Community Services that has funding available for small projects that reduce the generation of waste.

Energy Recovery from Waste Approach: No EFW approach identified.

Disposal Approach: Partial regional approach to waste management. The Territorial government remains the owner and operator of the majority of community solid waste facilities, but 8 municipalities operate their own disposal sites. There is an open burning ban effective 2012 that prohibits open burning of MSW. There is 1 small incinerator/gasifier in the most northern area of the territory. Number of Operating Disposal Sites = 29. Number of Landfills with LFG Collection = 0

Comparative Statistics:

DISPOSAL SUMMARY for YT: (Artkis Report 2012, using 2006 Statistics Canada data)

Total materials disposed: 25,245 tonnes / year

Northwest Territories

Waste Policy Framework: Legislative, with supporting strategy under development. Unique framework: several settled land claims but they have not all been devolved, so the transfer of responsibilities for the management of land (and waste) from the federal government is in the process. Currently either federal government is authority, or five land and water boards of the Northwest Territories.

Territory-Wide Diversion Programs: Product Stewardship approach

Voluntary EPR Programs

- Electronics – cell phones

Legislated Product Stewardship Programs

- Packaging – milk containers
- Packaging – beverage containers

Other Diversion Programs

depot drop-off PPP program in Yellowknife

Guidelines on diverting special wastes from landfill

Waste Reduction Legislated Program

Single Use Retail Bag Program, mandatory surcharge Territory-wide

Considered / Planned Product Stewardship or EPR Programs

- Electronics – audio-visual and telecom, computers, accessories and IT equipment, TVs

Energy Recovery from Waste Approach: No EFW policy for this territory, no EFW facilities current or planned.

Disposal Approach: Each community has a solid waste management facility. Some include disposal and storage receptacles for back-hauling recyclables. Number of Operating Landfills = 33/ Number of Landfills with LFG Collection= 0

Comparative Statistics:

DISPOSAL SUMMARY for NT: (Artkis Report 2012, using 2006 Statistics Canada data)

Total materials disposed: 42,884 tonnes / year (NO INFORMATION ON TOTAL AMOUNT DIVERTED)

The NT beverage deposit program began with a 75% recovery target but is now achieving a rate of 88% (2011/2012) recovery.

Nunavut

Waste Policy Framework: No legislation, policy or strategy that pertains directly to solid waste management reduction or diversion. Under the Nunavut Land Claims Agreement, municipalities are entitled to control their own municipal disposal sites. Local environmental and safety standards are determined, in part, by how the land is designated under municipal government development plans. Territorial government has limited authority.

Territory-Wide Diversion Programs: Primary approach is on environmental protection at solid waste facilities by diverting hazardous wastes from disposal.

Voluntary EPR Programs

- HHSW – Pharmaceuticals
- The Arctic Co-operatives Beverage Container Recycling Program operates in 23 communities in Nunavut with funding from the Co-operatives. Arctic Co-operatives Limited is a service federation that is owned and controlled by 31 community-based Co-operative business enterprises that are located in Nunavut and Northwest Territories. Arctic Co-operatives Limited coordinates the resources, consolidates the purchasing power and provides operational and technical support to the community based Co-operatives to enable them to provide a wide range of services to their local member owners in an economical manner.

Other Diversion Programs

- Environmental protection guidelines for: lead and lead paint; waste paint; mercury containing products; glycol, asbestos; solvents; batteries

Energy Recovery from Waste Approach: There are no large MSW incinerators in NU. With the exception of Iqaluit, Rankin Inlet, and Repulse Bay, all other communities in NU practice open burning of waste (even though NU has a policy that only non-treated wood, paper, and cardboard are acceptable for open burning).

Disposal Approach: Each community has a solid waste management facility. Most facilities include only disposal, with source-separation of hazardous materials that are stored on site for transport to hazardous waste facility. Number of Operating Landfills = 25. Number of Landfills with LFG Collection = 0

Comparative Statistics:

Disposal data/estimates (Artikis 2010): 27,308 tonnes / year.