

**REGIONAL DISTRICT OF NANAIMO
REGIONAL SOLID WASTE ADVISORY COMMITTEE MEETING**

**THURSDAY, January 14, 2016, 5:00 PM - 7:30 PM
RDN Board Chambers**

A G E N D A

PAGES

CALL TO ORDER

DELEGATIONS

MINUTES

3-7 Minutes of the Regional Solid Waste Advisory Committee meeting held Nov. 26, 2015.

BUSINESS ARISING FROM THE MINUTES

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REPORTS

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(L. Gardner - Presentation)

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(S. Horsburgh – Presentation)

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(M. Larson - Presentation)

ADDENDUM

SOLID WASTE MANAGEMENT SELECT COMMITTEE MEETING MINUTES

BUSINESS ARISING FROM DELEGATIONS OR COMMUNICATIONS

NEW BUSINESS

ADJOURNMENT

Distribution:

Alec McPherson	Chair, RDN Director	Michael Recalma	Qualicum First Nation
Jim Kipp	Deputy Chair	Chief & Council	Nanoose First Nation
Frank Van Eynde	Member at Large	Chief & Council	Snuneymuxw First Nation
Derek Haarsma	Business Representative	John Marsh	Town of Qualicum Beach
Ed Walsh	Waste Management Industry	Fred Spears	District of Lantzville
Wally Wells	Business Representative	Geoff Goodall	City of Nanaimo
Jan Hastings	Non Profit Representative	Al Leuschen	Ministry of Environment
Jim McTaggart-Cowan	Member at Large	Karen Muttersbach	Environment Canada
John Finnie	Member at Large	Glenn Gibson	Island Health
Craig Evans	Member at Large		
Ellen Ross	Member at Large		
Gerald Johnson	Member at Large		
Michele Green	Member at Large		
Amanda Ticknor	Member at Large		
Michael Tripp	Business Representative		
Stewart Young Jr.	Business Representative		
Larissa Coser	Community Representative		

RDN Staff:

Larry Gardner	Manager, Solid Waste Services, RDN
Sharon Horsburgh	Senior Solid Waste Planner, RDN
Randy Alexander	GM, RCU & Solid Waste Services, RDN
Meghan Larson	Special Projects Coordinator
Jeff Ainge	Zero Waste Coordinator, RDN
Rebecca Graves	Recording Secretary, RDN

For information only:

Regional Board Members: CAO's: Dennis Trudeau (RDN), Brad McRae (District of Lantzville), Debbie Comis (City of Parksville), Daniel Sailland (Town of Qualicum Beach), Tracy Samra (City of Nanaimo)

**REGIONAL DISTRICT OF NANAIMO
REGIONAL SOLID WASTE ADVISORY COMMITTEE MEETING
HELD ON THURSDAY, NOVEMBER 26, 2015
BOARD CHAMBERS**

Present:

Alec McPherson	Chair, RDN Director
Jim Kipp	Deputy Chair, RDN Director
Frank Van Eynde	Member at Large
Derek Haarsma	Business Representative
Jan Hastings	Non Profit Representative
Jim McTaggart-Cowan	Member at Large
Craig Evans	Member at Large
John Finnie	Member at Large
Gerald Johnson	Member at Large
Michele Green	Member at Large
Amanda Ticknor	Member at Large
Larissa Coser	Community Representative
Stewart Young Jr.	Business Representative

Also in Attendance:

Maureen Young	RDN Director
Larry Gardner	Manager of Solid Waste, RDN
Rebecca Graves	Recording Secretary, RDN
Sharon Horsburgh	Senior Solid Waste Planner, RDN
Meghan Larson	Special Projects Coordinator, RDN
Dennis Trudeau	GM, Transportation & Solid Waste Services, RDN

Regrets:

Chief & Council	Nanoose First Nation
Chief & Council	Snuneymuxw First Nation
Glenn Gibson	Island Health
Al Leuschen	Ministry of Environment
Karen Muttersbach	Environment Canada
Michael Recalma	Qualicum First Nation
Fred Spears	District of Lantzville
Michael Tripp	Business Representative
Wally Wells	Business Representative
John Marsh	Town of Qualicum Beach
Ed Walsh	Waste Management Industry
Ellen Ross	Member at Large
Charlotte Davis	City of Nanaimo
Jeff Ainge	Zero Waste Coordinator

CALL TO ORDER

The Chairperson called the meeting to order at 5:03 PM and respectfully acknowledged the Coast Salish Nations on whose traditional territory the meeting took place.

DELEGATES

Darlene Arksey, Administrative Assistant, Woodgrove Centre

D. Arksey gave a verbal presentation on Woodgrove Centre's Corporate Sustainability Policy and their recycling program. In the spring, a company comes to the Centre and performs a waste audit. Woodgrove facilities staff provides education to their retail tenants however, their biggest challenge is trying to get customers, retailers and staff on board with recycling. Retailers are concentrating on selling not sorting recyclables and the majority of stores lack the space for storing recyclables for collection. The Centre has 30 – 95 gallon totes for organics which are changed out twice a week or more if needed. The loading bays have 6 blue bins for recycling and organic bins are available in the back hallways in the food court for tenants to dispose of their organics. Garbage is gathered from retailers and is sorted through, pictures are taken and then the retailers are approached to review what could have been recycled.

J. McTaggart-Cowan asked if she is aware of the recycling efforts in other malls.

D. Arksey responded she is unsure of the level of recycling at Nanaimo North and Country Club Mall.

C. Evans questioned if the expansion plans for Woodgrove Centre include resolving the lack of space or storage issue?

D. Arksey explained that the Centre is not expanding but renovating which includes new tile and lighting changes, etc.

J. Hastings questioned if it was mandatory or optional for the businesses to recycle?

D. Arksey replied that the Centre tries to make it mandatory when new leases are signed. There are strict rules but enforcement doesn't occur as they don't have the staff to enforce.

J. Hastings enquired if one of the options was to have local government regulate businesses and what do you think it should look like to be useful?

D. Arksey replied that the attitude is that once the recycling is put into the Centre's bins it is no longer the retailer's responsibility and even if legislation was put into place it would be hard to enforce. The fact that the Centre's diversion rate has increased shows improvement.

D. Haarsma enquired if their shopping mall in Alberta was actually recycling or landfilling?

D. Arksey commented she wasn't sure but would find out and forward that information to him.

J. McTaggart-Cowan commented that his observation on EPR is that it is not working because the retailers are part of the production side and EPR is producer responsibility not consumer responsibility. The retailers aren't recognizing that part of their business is to manage materials put out there that end up as waste.

J. Kipp stated that Nanaimo malls are large generators of waste and have the potential to recycle more and should be receiving assistance from the City or the region.

Larissa Coser, Zero Waste Nanaimo

L. Coser from Zero Waste Nanaimo provide a Presentation on how Zero Waste works and the Zero Waste Hierarchy. Some principles and practical steps towards zero waste include:

1. Adopt the Zero Waste definition of ZWIA
2. Establish targets and a timeline
3. Engage the whole community
4. Demand decision makers manage resources not waste
5. Educate residents, businesses and visitors
6. Build Residual Separation and Research Facilities
7. Develop New Rules and Incentives to move towards ZW
8. Remove government subsidies for wasting
9. Support Zero Waste Procurement
10. Expand Zero Waste Infrastructure
11. Challenge Businesses to lead the way to Zero Waste.

L. Coser described Zero Waste in Action which includes community engagement and education within businesses, waste management at events, product and packaging information for the public and being the voice of Zero Waste to local government. Industrial, commercial and institutional sectors produce more than half of our waste and one question is how can we change the behavior of these large waste generators and help them get to Zero Waste? This would include waste audits, toolkits, Green Teams, Industry experts and consultants and education that supports regulations & bans.

G. Johnson questioned what cost would the community be willing to bare to achieve zero?

L. Coser replied that 69% surveyed were willing to pay more and if we know our goal is zero waste we know how to target our resources.

G. Johnson mentioned he believes we should be looking at introducing a grant application process for community groups and other organizations like Zero Waste Nanaimo, and consider it as a recommendation.

J. McTaggart-Cowan questioned what rules are there within the RDN to make sure the RDN is only purchasing recyclable/returnable items and avoiding generating waste?

D. Trudeau replied that the RDN does not have a formal purchasing policy for purchasing recycled/returnable items but rather our polices ensure, on the financial side, that we are giving value to the taxpayers and making sure we use the competitive bid process.

J. Kipp commented that zero waste has always been a vision for the community and it is an ethical decision to aim for 100% waste diversion.

L. Coser questioned if it would be possible to put a vote forward on using zero waste as a road map for the decisions made in the Committee?

A discussion ensued around the topic of zero waste and how it should be included in the future Solid Waste Management Plan.

D. Trudeau advised the committee that a staff report will be prepared outlining the RDN's current zero waste plan and brought forward to the next meeting.

MINUTES

MOVED J. McTaggart-Cowan, SECONDED G. Johnson, that the minutes from the meeting of the Regional Solid Waste Advisory Committee regular meeting held November 26, 2015, be adopted. CARRIED

J. McTaggart-Cowan requested that his comment regarding adding a status quo option for the in the electronic polling exercise be reflected in the November 5, 2015 minutes.

L. Gardner commented that minutes would be amended accordingly.

BUSINESS ARISING FROM THE MINUTES

G. Johnson conducted some independent research on glass recycling in the US and shared the following findings with the committee: glass is being used as a component in aggregate, in concrete and asphalt and also as glass pellets for sandblasting. G. Johnson requested that the RDN do further research and find similar ways to use recycled glass content.

A. McPherson noted that the RDN does not have a highway facility and this research would fall under Ministry of Transportation's jurisdiction.

COMMUNICATIONS/CORRESPONDENCE

MOVED G. Johnson, SECONDED J. McTaggart-Cowan, that the following communications / correspondence be received. CARRIED

NextUse Presentation to RDN Letter July 2015.

Residual Management Scope of Work Staff Report Nov. 2015.

Solid Waste Management Plan Community Consultation Summary Report.

UNFINISHED BUSINESS

REPORTS

Technical Memorandum: Share Shed Programs at Regional District of Nanaimo Solid Waste Facilities. (S. Horsburgh)

S. Horsburgh introduced a slide presentation on Share Shed programs at Regional Waste Facilities. Share Sheds give customers the opportunity to set aside items in good condition for re-use by others instead of landfilling as this may result in higher waste diversion.

Installing Share Sheds would have a number of short term costs including site preparation, engineering, buildings and signage and capital costs at the two facilities could be approximately \$13,000. It is estimated that annual operating costs could be approximately \$190,000 per annum for the two sites.

The RSWAC made the following comments on the presentation:

- agreed that a Share Shed type program is an excellent idea but not to be located at regional facilities.
- Nanaimo already has other options provided by social service organizations in the community.
- A share Shed at a Regional facility should not be operated by the RDN but possibly operated by a non-profit organization.

**Technical Memorandum: EPR Materials at Regional District of Nanaimo Solid Waste Facilities.
(M. Larson)**

M. Larson presented a slide presentation on the RDN introducing EPR recycling program at the Regional Landfill and CRTS for products such as packaging, cell phones, & batteries.

Currently, there are several for-profit and non-profit depots in the Nanaimo and Parksville areas where EPR items are accepted. Taking on EPR at the regional facilities could negatively impact revenue at these facilities that depend on the materials collected from EPR programs. Collection rebates are offered by some programs, and help to offset the costs of providing this service.

The introduction of EPR programs at the sites would have a number of short term costs including site preparation, engineering, new equipment, buildings and signage. The preliminary cost is estimated at \$250,000 to accommodate increased recycling. Over the long term there would be additional labour costs in providing two additional personnel. It is estimated that there would be an additional cost of \$380,000 per annum to staff the expanded recycling at both regional facilities.

Discussion on this item will take place at the next RSWAC meeting under unfinished business.

ADDENDUM

J. McTaggart-Cowan introduced the topic of challenges with source separation faced by the IC&I sector that hasn't been addressed. Given the nature of the size of the sector the need for a report with solid statistics on categories, breakdowns of the IC&I sector, and classes of the groups involved is needed.

L. Gardner replied that staff report is currently developing a report and it will be sent out in advance for the next meeting.

D. Haarsma's comments on the IC&I sector will be presented at a future meeting.

SOLID WASTE MANAGEMENT SELECT COMMITTEE MEETING MINUTES

NEW BUSINESS

ADJOURNMENT

MOVED J. McTaggart-Cowan, SECONDED G. Johnson, that this meeting be adjourned.

CHAIRPERSON

TO: Larry Gardner
Manager, Solid Waste

DATE: January 5, 2016

FROM: Sharon Horsburgh
Senior Solid Waste Planner

MEETING: RSWAC, January 14, 2016

FILE: 5365-00

SUBJECT: Jurisdictional Scan Regarding Waste Diversion Programs

RECOMMENDATION

That the Regional Solid Waste Advisory Committee (RSWAC) receive this report for information as part of the 2015 Solid Waste Management Review Process.

PURPOSE

This report has been prepared in response to the RSWAC's request for information on other jurisdiction's accomplishments with regard to waste diversion. The report also considers how the Regional District of Nanaimo's (RDN) waste diversion performance measures up to other jurisdictions globally.

BACKGROUND

The report gives a high level overview of solid waste programs and waste diversion achievements of Edmonton, San Francisco, Europe and the UK. Further the report discusses significant deviation in calculation methodologies and also draws some conclusions on the RDN's relative performance.

Jurisdictional Overview

- **EDMONTON** - The Edmonton Waste Management Centre (EWMC), owned by the City of Edmonton, is a unique collection of advanced waste processing and research facilities. The City of Edmonton is currently diverting over 50% of residential waste from landfill primarily through recycling and composting using a mixed waste Materials Recycling Facility (dirty MRF). Residual waste suitable for their Waste to Biofuels and Chemicals Facility will enable the City to increase that diversion rate to 90%. Other key elements of their program include:
 - Residential Blue Bag collection of recyclables
 - Residential waste is contracted by the City; commercial waste is through private haulers
 - EWMC drop off fee for householders is \$60/tonne and \$20 minimum charge
 - EWMC drop off fee for commercial waste is \$90/tonne and \$40 minimum charge
 - Monthly residential curbside collection cost is \$43/household and \$27.95/multi-family.
- **SAN FRANCISCO** – In 2012, San Francisco reported an 80% diversion rate of all waste generated in the City. This was achieved through source reduction, reuse, recycling and composting programs.

Under the City of San Francisco’s Mandatory Recycling and Composting Ordinance (Appendix 1), the City has a contract with Recology as the sole provider of garbage and recycling collection for both residential and commercial sectors. This Ordinance compels mandatory recycling and composting with fines (\$100) for non-compliance. Waste generators are encouraged to divert recyclable and compostable materials to avoid penalties. To incentivize source separation the contractor (Recology) is paid based on the volume of materials recovered for recycling and composting. Under this scheme, Recology receives an exclusive permit to collect residential & commercial refuse. To support mandatory waste diversion, material bans are strictly enforced and carry financial penalties. The City uses funds generated from disposal fees to finance its Zero Waste Programs. For a Summary of Zero Waste policies please see Appendix 2. These programs have helped San Francisco to achieve an 80% waste diversion rate which is the highest in North America.

- **EUROPE** – Table 1 below lists the following ten European Countries having highest municipal waste diversion:

Country	2004 Diversion	2014 Diversion
Germany	56%	64%
Austria	59%	59%
Belgium	57%	57%
Switzerland	50%	50%
Netherlands	47%	49%
Sweden	45%	48%
Luxembourg	41%	47%
United Kingdom	23%	46%
Denmark	34%	45%
Iceland	16%	43%

Data Source: Eurostat. Municipality Waste Statistics.

In a recent briefing the European Environmental Agency reported the following:

“There is a clear link between increasing recycling rates and declining rates of landfilling. In countries with high municipal waste-recycling rates, landfilling declines much faster than the growth in recycling, as waste management strategies usually move from landfill towards a combination of recycling and incineration, and in some cases also Mechanical-Biological Treatment (MBT).

Almost without exception, the better-performing countries in terms of recycling have a wider range of measures and instruments in place than poorer-performing countries. Measures include landfill bans on biodegradable waste or non-pre-treated municipal waste; mandatory separate collection of municipal waste types, especially bio-wastes; and economic instruments such as landfill and incineration taxes and waste collection fees that strongly encourage recycling. Although the key drivers behind better municipal waste management are clearly EU and national policies and targets, regional and local policies within countries also play a significant role in the process.

Turning waste into a resource will require full implementation of waste legislation and additional efforts to reduce waste generation in absolute terms, removal of barriers to recycling, and limiting landfill to residual (i.e. non-recyclable and non-recoverable) waste”.¹

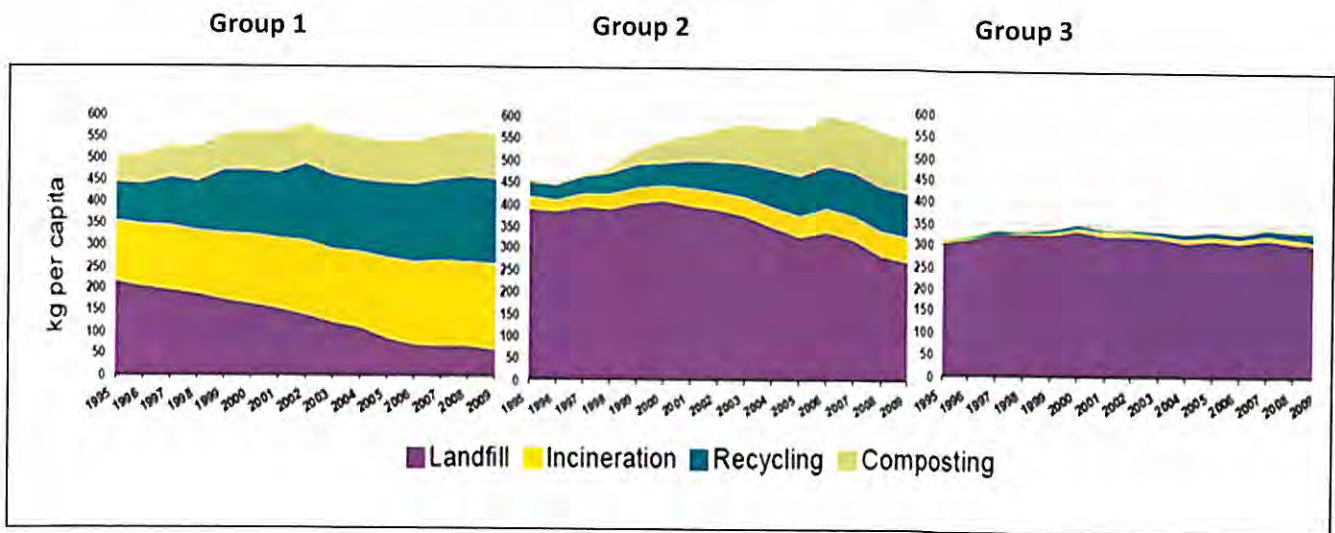
¹ The European Environmental Agency briefing last modified on May 6, 2015

In the European Commission’s 2011 Eurostat Report: *Generation and Treatment of Municipal Waste*, (Appendix 3) grouped European countries based on the shares of incineration and materials recovery. The three groups are:

- Group 1: Incineration >25% and recycling and composting >25%
 - Group 2: Incineration <25% and recycling and composting >25%
 - Group 3: Incineration <25% and recycling and composting <25%
- [Note that Group 3 represents primarily eastern European countries.]

The population is fairly evenly distributed within the three groups, each representing roughly 200 million inhabitants. The following graphs show the per capita waste management distribution for each of the three groups.

Figure 1. Per Capita Waste Generation and Treatment of Municipal Waste



Eurostat concluded that several Group 1 countries had introduced measures to limit landfilling resulting in an increase in recycling, composting and incineration and, for Group 2, such measures have been introduced to a lesser degree.

There are also success stories on a smaller regional basis such as the waste diversion achievements of Capannori in Italy. In 2012, this 47,000 person community achieved an 82% diversion of municipal (household) waste and the 2011 per capita disposal rate for household waste was 146 kg/person/year. Their success is largely the result of a ‘Pay As You Throw’ waste tariff, where the frequency of collection per household is measured using microchips in stickers on residual waste bags, scanned by a reader on the collection vehicle. The tariff incentivized better separation and prevention, driving up local source separation. Capannori also introduced a reuse center which provided training for unskilled labour and

diverted 93 tonnes of material in 2012. They have also introduced a tax incentive for the sale of bulk products as well as education campaigns aimed at reducing the use of disposable products.

Variations in Waste Calculation Methodologies

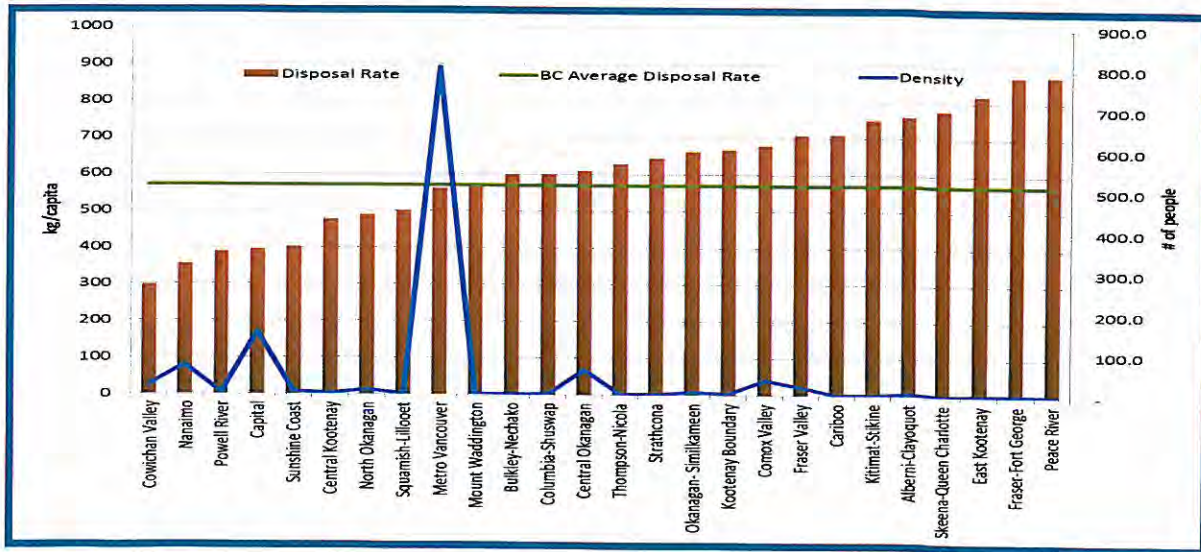
1. Methodology in BC and Canada

In British Columbia, the Ministry of Environment (MOE) has established the waste/diversion methodology and data is compiled using a Waste Diversion Calculator. The objective of this tool is to provide a transparent and consistent measurement for waste diversion and disposal in BC. This reporting procedure simply focuses on municipal solid waste (MSW) disposal only and does not attempt to calculate the recycled or diverted component. The MOE use waste disposal data provided by regional districts to determine disposal rates. Waste Disposal Calculator reports on all MSW that is accepted at authorized disposal sites within their boundaries, whether they are owned and/or operated by the regional district, a municipality or the private sector, as well as waste exported from their regional district.

For clarity, MSW is defined as waste from residential, commercial, institutional, demolition, land clearing or construction sources. It does not include hazardous waste, biomedical waste, agricultural waste, motor vehicles or components, contaminated soil, liquid waste (biosolids), landfill cover material, and materials recovered for beneficial use with a landfill site such as construction, renovation and demolition (CR&D) material used as road base or chipped and used for cover.

The BC Waste Disposal Calculator is consistent with Statistics Canada Waste Management Industry reporting requirements. Statistics Canada distributes surveys to the Government Sector nationally. Therefore, Canadian statistics on waste disposal/diversion are generally considered comparable. Population numbers are taken from the annual BC Stats Sub-Provincial Population Estimates.

Figure 2: 2012 Kilograms disposed of per Capita and disposal Rates in BC Regional Districts



As indicated in Figure 2, the 2012 per capita disposal rate ranges from 297 kg to 871 kg, and the average disposal rate in BC is 570 kilograms per capita. The RDN has achieved a waste diversion rate of 68 % and per capita waste disposal rate of 347 kilograms per capita. This is the second lowest in BC.

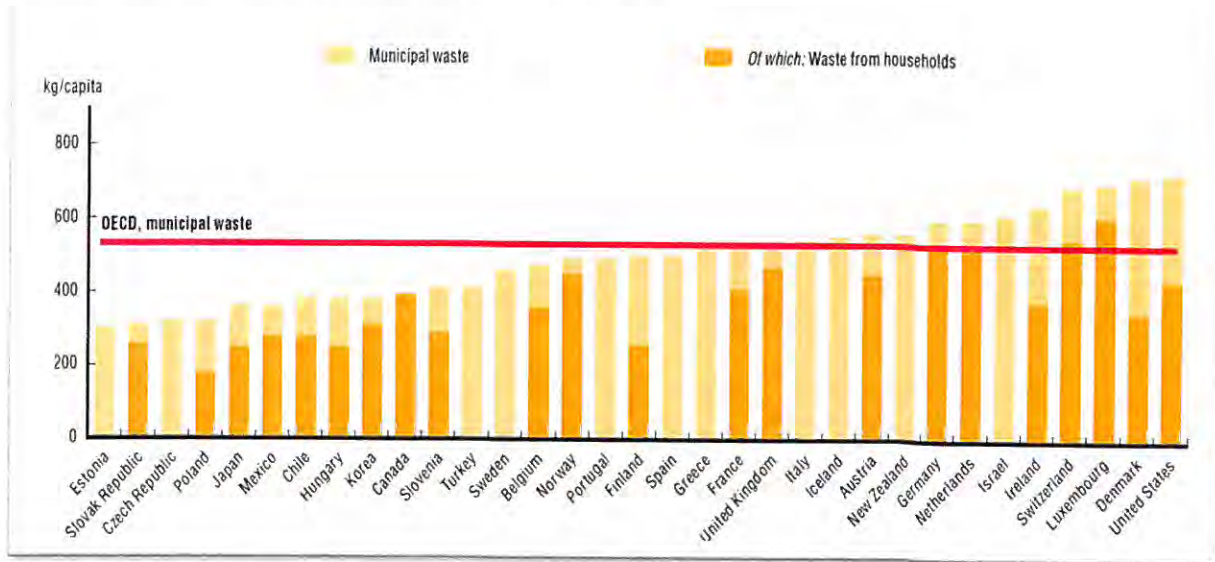
The City of Edmonton is currently diverting over 50% of residential waste from landfill primarily through recycling and composting using a MRF system. Currently, a system of two bags is used to residential curbside collection. A black bag is used to separate single stream material for recycling and a blue bag is used to separate compostable materials. The Waste to Biofuels and Chemicals Facility will enable the City to increase that diversion rate to 90%.

2. Organization for Economic Development (OECD) Countries – Waste Diversion

The OECD, to which Canada and the United States belong, defines municipal solid waste as waste collected by or on behalf of municipalities. It includes household waste originating from households and similar waste from small commercial activities, office buildings, institutions such as schools and government buildings and small businesses that treat or disposal of waste at the same facilities used for municipally collected waste (“Municipal Waste”, in Environment at a Glance 2013: OECD Indicators, OECD Publishing. <http://dx.doi.org/10.1787/9789264185715-15-en>).

In effect, OECD disposal reporting is limited primarily to residential waste with some commercial and institutional wastes, while Statistics Canada reports on all sources of waste including industrial and CR&D wastes. The discrepancy is evident in the 2013 OECD report as indicated in the following Figure 3 below:

Figure 3: Municipal Waste Generation per Capita 2011



Data Source: “Municipal Waste”, in Environment at a Glance 2013: OECD Indicators <http://dx.doi.org/10.1787/9789264185715-15-en>.

As indicated in Figure 3, when ICI and CR&D wastes are excluded from the Statistics Canada disposal reporting data, Canada’s residential waste disposal rate was 390 kg per capita compared to Japan at 250 kg per capita and the United States at 440 kg per capita.

The European Environmental Agency notes¹ in the Eurostat, please see Appendix 3, municipal waste constitutes only around 10% of total waste generated in Europe. It also recognizes: “Improvements in waste data and harmonization of national reporting methodologies are required, as uncertainties relating to the comparability of national data is a barrier to assessment of progress and the effectiveness of policy measures.”

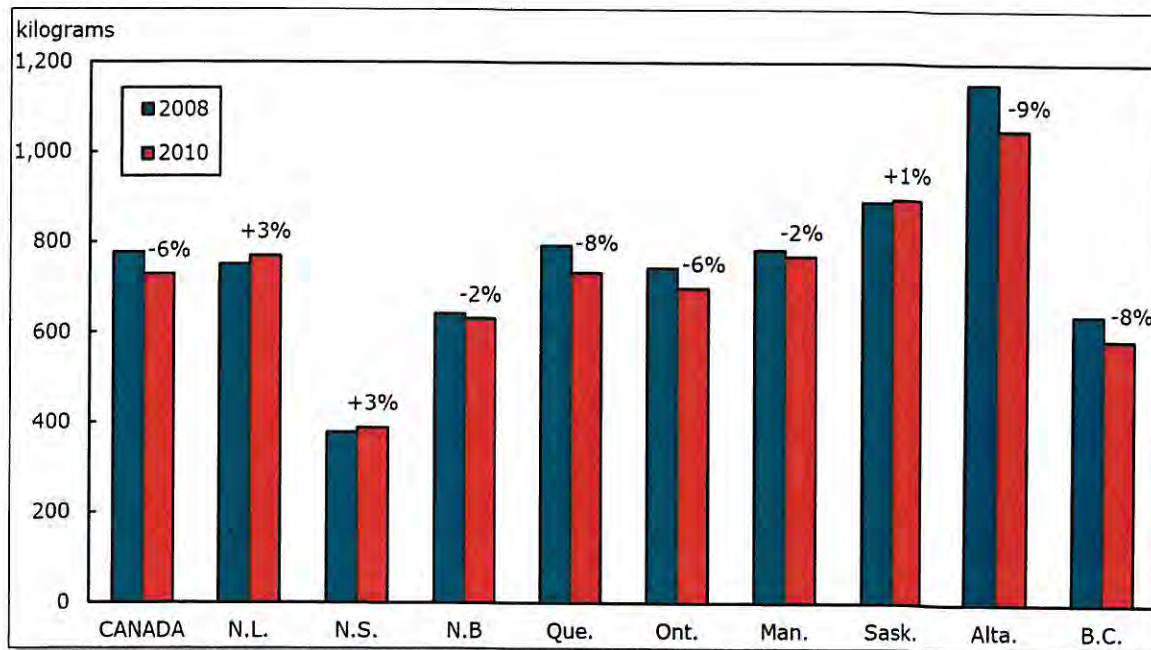
There is also limited comparability between Statistics Canada and the US EPA waste reporting data in that the US EPA definition of municipal solid waste does not include industrial or CR&D wastes. The only reporting system that is somewhat comparable to Statistics Canada, (and therefore the BC Waste Disposal Calculator) is the State of California’s CalRecycle system which reports on solid waste disposed by all sources (residents, businesses, institutions, self-haul, construction and demolition sites, military bases, government agencies etc.).

Disposal statistics should be viewed with caution as jurisdictions may vary calculation methodology to meet local market conditions. For example, CalRecycle notes that when defining “per capita disposal” it is the total annual disposal, in pounds, from a jurisdiction divided by total industry employment in a jurisdiction. They also include qualifiers that where the per capita disposal rate does not reflect the jurisdiction’s reduction, they can use an alternate method, and, where a jurisdiction is predominated by commercial or industrial sources, they may alternately calculate the per capita disposal. As a result, CalRecycle states: *“Remember that each jurisdiction is unique! Each one has its own 50 percent equivalent per capita disposal target, different demographics and industrial bases. You may be used to comparing your diversion rate with other jurisdictions in the region, but because the per capita disposal calculation is unique to each jurisdiction, it is impossible to compare targets and disposal rates across jurisdictions.”*

3. RDN’s Waste Diversion Performance

Due to the variables in waste calculation methodologies as discussed in the previous section, it is impossible to undertake a direct global comparison of the RDN’s diversion performance. Comparisons within Canada can be considered valid and some inferences can be made with other jurisdictions. Figure 4 below presents per capita disposal rates for Canadian provinces.

Figure 4: Per Capita Disposal of Waste for Canada and Selected Provinces, 2008 and 2010



Data Source: Statistics Canada Waste Management Industry Survey: Business and Government Sectors 2010

Although only somewhat comparable numbers, California averaged a municipal disposal rate of 712 kg per capita in 2012. The BC average for the same period was 570 kg per capita. The City of San Francisco which claims to have the highest waste diversion in the country disposed of 482 kg per capita in 2012. The RDN's disposal rate was 347 kg per capita for the same period.

Table 2 below lists the 10 European countries with the highest diversion rate. The generation and diversion numbers are sourced from the European Environment Agency¹ and the disposal figures using the two sourced values. The European Environment Agency notes that municipal waste only accounts for around 10% of the waste stream and, as such, the disposal figures in Table 2 in could be as much as 10 times higher. Such a high disposal amount is certainly erroneous and again points to the variances in methodologies. Nevertheless, comparing the RDN's total waste disposal rate of 347 kg/capita to only a portion of the waste stream to the European countries list, suggest the RDN's rate is lower than the average rated for any of these countries. No doubt there are European communities such as Capannori in Italy that far exceed national averages for diversion.

Table 2. Top 10 European countries with the highest waste diversion rate.

	2012 per capita Generation (kg)	2012 % Diversion	2012 per Capita Disposal (kg)
Germany	611	64%	220
Austria	552	59%	226
Belgium	456	57%	196
Switzerland	694	50%	347
Netherlands	551	49%	281
Sweden	462	48%	240
Luxembourg	662	47%	351
United Kingdom	472	46%	255
Denmark	668	45%	367
Iceland	338	43%	193

ALTERNATIVES

There are no alternatives for this report.

FINANCIAL IMPLICATIONS

This report is presented for information only and therefore has no financial implications.

STRATEGIC PLAN IMPLICATIONS

This report was prepared to provide information to RSWAC as part of the Regional District's Solid Waste Management Review Process.


SUMMARY/CONCLUSIONS


This technical memorandum is intended to provide an overview of zero waste programs in other communities and metrics used to assess performance. Based on the comparison of other jurisdictions it is evident that early adopters of Zero Waste Programs such as the RDN, San Francisco and Capannori are

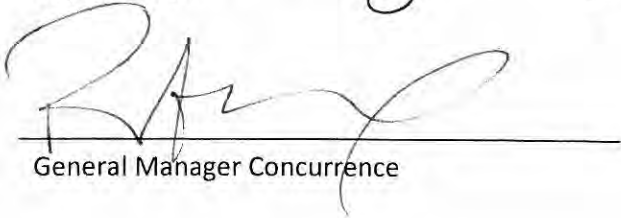
leaders in achieving high diversion and low per capita waste disposal rates. There are many commonalities amongst the programs such as ongoing education efforts, material bans and high cost waste disposal.


Communities globally are implementing initiatives to target organics to achieve the high diversion rates. Many communities (e.g. Edmonton) have made source separation less of a priority with the emphasis on energy recovery of the waste to achieve high levels of waste diversion. Communities that focus on source separation and that are targeting the highest diversion rates are moving beyond voluntary waste diversion and are either implementing regulatory instruments (e.g. mandatory waste separation and fines) or a monetary incentives (e.g. "pay as you throw") which drive high levels of diversion.

With the exception of Canadian jurisdictions, it is virtually impossible to derive valid comparisons of waste disposal rates from elsewhere in the world. Findings of this jurisdictional scan do suggest that the RDN has one of the lowest disposal rates within the developed nations of the world.


Report Writer


Manager Concurrence


General Manager Concurrence


A/CAO Concurrence



San Francisco Mandatory Recycling and Composting Ordinance

Everyone in San Francisco is required to keep their recyclables, compostables, and trash separate.

The City and your refuse service provider (typically Recology) offer a variety of free services and assistance including kitchen composting pails, consultations, bin labels, signs, commercial building toolkits, educational materials, multi-lingual trainings, and more.

**For help setting up permitted collection service and other assistance, call:
Recology Sunset Scavenger (415) 330-1300 or Recology Golden Gate (415) 626-4000.**

Businesses

Property owners/managers, including of apartments, condos, TICs, food establishments, and events are required to provide color-coded, labeled bins in convenient locations: blue for recycling, green for composting, and black for trash. Education must also be provided to tenants, employees, contractors, and janitors on what goes in each bin.

Food vendors that provide disposable food service ware or to-go containers must provide blue, green, and black bins for use by customers and visitors. These must be placed in the establishment, near a main exit.

Residential Property Owners

Property owners may be able to lower their refuse bill by recycling and composting more, and ordering a smaller black trash bin or decreasing frequency of collection.

Recology provides apartment starter kits and pails for kitchen food scrap collection. Food scraps can also be placed in paper milk cartons, paper bags, or wrapped in paper before being placed in green bins.

Renters

Ask property managers to sign up for composting, recycling, and trash service. Renters can report unresponsive managers through the anonymous notification form at SFEnvironment.org/mandatory.

Enforcement

Residents and businesses are required to subscribe for adequate recycling, composting, and trash service and use them properly. The Department of the Environment strives to educate and assist. Fines may be given in cases of non-compliance.



Recycling Theft

It is illegal for a third party to mix or take materials out of the recycling bin provided by your collector. Please report recycling theft at RecologySF.com or by calling (415) 330-1300.



SF Environment
Our home. Our city. Our planet.
A Department of the City and County of San Francisco

SFEnvironment.org/mandatory
(415) 355-3700

SUMMARY OF SAN FRANCISCO'S ZERO WASTE RELATED POLICES

San Francisco Environment, the Commission on the Environment, the Board of Supervisors, and the Mayor have all helped adopt policies to promote or require zero waste practices. Below is a list of the City of San Francisco's zero waste related polices. For more information on any of these specific policies please follow the link: <http://sfenvironment.org/zero-waste/overview/legislation>

City Wide

Resolution Adopting Zero Waste Goal

- Adopted goals of 75 percent landfill diversion citywide by 2010 and zero waste.

Resolution Setting Zero Waste Date

- Set the date of 2020 for zero waste goal.

Mandatory Recycling & Composting Ordinance

- Passed by the Board of Supervisors in June of 2009, this ordinance requires everyone in San Francisco to separate recyclables, compostables and landfill -bound trash.
- Adequate Space for Trash, Recyclable and Compostable Materials
- Provides standards for adequate space requirements and chute design for recycling, composting and trash handling systems.

Producer Responsibility

Producer Responsibility Resolution

- Supports statewide efforts to hold producers responsible for product waste and agencies to include producer responsibility language in city purchasing contracts.
- Producer Responsibility Framework Resolution
- Urges State to enact an extended producer responsibility framework.

Marine Plastic Pollution Producer Responsibility

- Supports a California Statewide producer responsibility program to minimize marine plastic pollution.

Plastic Bag Reduction Ordinance (2007)

- Requires the use of compostable plastic, recyclable paper and/or reusable checkout bags by supermarkets and drugstores.

San Francisco's Extended Bag Reduction Ordinance (2012)

- Requires the use of compostable plastic, recyclable paper and/or reusable checkout bags by all retail establishments starting October 1, 1012 and requires these establishments to charge a minimum of ten cents per bag.

Food Service Waste Reduction Ordinance

- Prohibits the use of Styrofoam or polystyrene foam food service ware and requires the use of food ware that is compostable or recyclable. Learn more with our FAQs.

Cigarette Litter Abatement Fee Ordinance

- Establishes a fee of \$0.20 per pack of cigarettes sold in San Francisco to recover the cost of cigarette litter clean-up from city streets, sidewalks, and other public properties.

Yellow Pages

- Requires Yellow Pages distributors to get the approval, or opt-in agreement of all San Francisco residents before delivering phone book directories.

Construction and Demolition (C&D)

City Government Construction Recycled Content Ordinance

- Requires recycled content materials to be used in public works and improvement projects.

C&D Debris Recovery Ordinance

- Requires C&D projects to use city-registered transporters and processing facilities to increase debris recovery. Learn more about this law with our summary.

C&D Regulations and Forms

- The regulation adopting the C&D Ordinance.

Demolition Notice Ordinance

- Provides notice of demolition to recycling companies.

Disaster Debris Recycling Resolution

- Policy for City Departments to maximize reuse and recycling of debris in the event of a disaster.

Green Building Requirement for City Buildings

- Requires City government construction to manage debris and provide adequate recycling storage space in buildings.

Bottle Filling Stations

- Requires new buildings that have drinking fountains to provide bottle filling stations.

City Government

Resource Conservation Ordinance

- Requires city departments to prevent waste, maximize recycling, buy products with recycled content and appoint a Zero Waste Coordinator to lead these efforts.

Mayor's Executive Order on Recycling and Resource Conservation

- Summarizes existing zero waste legislation, expands on the role of the City's Zero Waste Coordinators and requires defaults on multi function devices to be set to double-sided printing.

Mayor's Executive Order Enhancing Recycling and Resource Conservation

- Requires Departments to purchase 100 percent post-consumer recycled content paper, to reduce paper usage, and to purchase only approved green products.

Mayor's Executive Order on Bottled Water

- Prohibits San Francisco city departments from using public funds to purchase bottled water.

Bottled Water Ordinance

- Restricts the sale or distribution on City property of drinking water in plastic bottles of 21 ounces or less, set City policy to increase the availability of drinking water in public areas, and bar the use of City funds to purchase bottled water.

Environmentally Preferable Purchasing Ordinance

- Requires an environmentally preferable purchasing program for commodities purchased by the City.

Precautionary Purchasing Regulation

- Sets recycled content and other guidelines for commodities regularly purchased by city departments.

Surplus Disposal Ordinance

- Establishes a reuse and recycling hierarchy for redistributing excess city equipment and supplies.

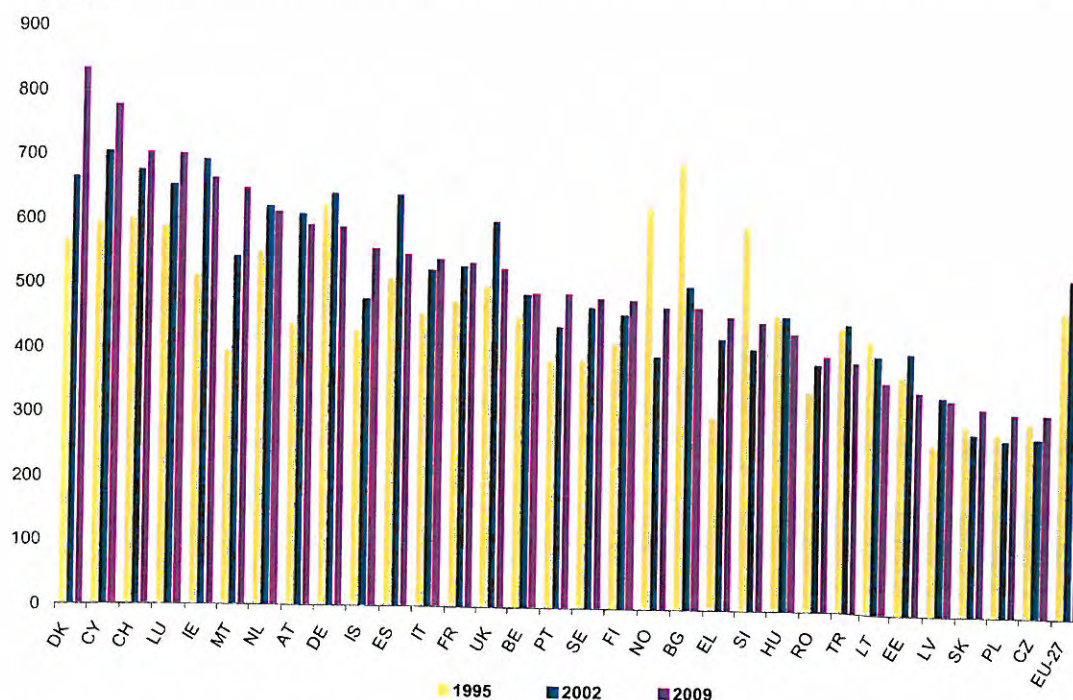
Generation and treatment of municipal waste

Municipal waste generation in Europe has slowed down and stabilised at about 520 kg per capita since 2002

Municipal waste constitutes only around 10% of total waste generated. However, the political emphasis on municipal waste is very high because of its complex character due to its composition, its distribution among many waste generators and its link to consumption patterns.

This publication shows the development of municipal waste generation and treatment from 1995 to 2009. Moreover, it includes an analysis of the evidence on decoupling, i.e. breaking the link between the production of material wealth and the production of waste.

Figure 1: Municipal waste generated by country in 1995, 2002 and 2009, sorted by 2009 level (kg per capita)



Notes: FYR of Macedonia, Croatia and Bosnia and Herzegovina excluded due to the limited data available (only one or two reference years)
Relevant breaks in series:

Sharp decreases for Estonia (2001), Spain (2004), Lithuania (1999), Hungary (2000), Portugal (2002), Slovenia (2002) and Norway (2001).
Sharp increases for Latvia (2002) and Slovakia (2002).

Source: Eurostat (online data code: [env_wasmun](#))

Municipal waste generated by country

Eurostat has been collecting and publishing data on municipal waste since 1995. These data are widely used for comparing municipal waste generation and treatment in different countries, and indicators on municipal waste are used to monitor European waste policies. The data on municipal waste expressed in kilogram per capita are part of a set of indicators which are compiled annually to monitor the EU's sustainable development strategy.

The data presented cover the period from 1995 to 2009 for the 27 EU Member States; for the Candidate Countries Croatia (only 2006 and 2008), the former Yugoslav Republic of Macedonia (only 2008) and Turkey, for the EFTA Countries Iceland, Norway and Switzerland, and the potential candidate country Bosnia and Herzegovina (only 2008 and 2009) data are presented as far as possible.

Figure 1 shows municipal waste generation by country expressed in kilogram per capita. To illustrate the developments, the graph contains the waste amounts generated in 1995, 2002 and 2009. The figure includes the EU-27 aggregates for comparison and the countries are sorted in decreasing order by municipal waste generation in 2009.

The totals of municipal waste generation in 2009 vary considerably, ranging from 831 kg per capita in Denmark to 316 kg per capita in the Czech Republic. The variation reflects differences in consumption patterns and economic wealth of the countries, but also depends greatly on the organisation of municipal waste collection and management. Differences between individual countries exist in particular with regard to the degree to which waste from commerce, trade and administration is collected and managed together with waste from households. In most countries, households generate between 60% and 90% of the municipal waste while the remainder can be attributed to commercial sources and administration.

In 23 of the 31 countries, the amount of municipal waste generated per capita increased between 1995 and 2009, rising steadily in 14 of these countries, with the highest annual growth rates recorded for Malta (3.9%), Greece (3.3%) and Denmark (3.0%). In the remaining nine countries the overall increasing trend was interrupted in the period around 2002. Of these, six countries showed an increase from 1995 to 2002, with the largest annual growth rates being in Austria,

Ireland and Latvia, before the amounts stabilised or declined slightly between 2002 and 2009.

Conversely, three countries (Slovakia, Czech Republic and Poland) report decreasing waste generation for the period from 1995 to 2002 followed by an increase between 2002 and 2008.

Of the eight countries with an overall decrease from 1995 to 2009, only three (Bulgaria, Hungary, Lithuania) showed a decline in both periods before and after 2002. Bulgaria showed the largest reduction with a steady annual decline by 3.0% while in Hungary waste generation did not change significantly throughout the whole period (-0.5% per annum).

In the five other cases the decline was not steady. The figures for Turkey and Germany show a small increase until 2002 by less than 0.5% per annum, followed by annual decreases of 2.0% and 1.2%, respectively. Slovenia and Norway reported larger overall reductions; however, these developments are mainly due to a retrospective reassessment and methodological changes. Thus, the overall trend of these two countries is not assessable.

From 2002 on, the evolution of the methodologies was finalised in most of the countries, so that the waste generation time series of 2002 and later is more accurate and stable than that between 1995 and 2001.

Municipal waste treated in Europe

In the following section, differences in the management of municipal waste are shown and the various countries' treatment strategies are identified on the basis of the reported amounts of municipal waste landfilled, incinerated, recycled and composted. For incineration, the countries are asked for a distinction between incineration with and without energy recovery. However, as no clear classification criteria have been applied so far, the comparability of results among countries and over time remains fairly limited¹. Therefore, the current data allow only analysis of the total amount incinerated.

Table 1 shows the amounts of municipal waste treated in the European Union (EU-27) for the period 1995 to 2009 by treatment method in million tonnes and kg per capita. Figure 2 shows the amounts of waste generated at EU-27 level and the amounts of waste subject to the four treatment categories (landfill, incineration, recycling, composting).

¹ The new Waste Framework Directive now offers in Annex II an energy efficiency criterion that is expected to objectify the classification of incineration facilities and to improve data comparability. The criterion came into force by 12 December 2010. During the next data collection process Eurostat intends to ask the countries to specify from which reference year the energy efficiency criterion will be applied.

Table 1: Municipal waste landfilled, incinerated, recycled and composted in the EU-27, 1995 to 2009

	1995	2009	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Change 1995-2009
million tonnes																
Landfill	141	138	140	137	138	139	135	131	124	117	109	108	106	100	96	-32 %
Incineration	31	32	33	34	36	38	39	41	41	43	47	49	50	50	51	63 %
Recycling	22	23	28	30	37	38	40	46	47	49	51	54	57	59	59	172 %
Composting	13	15	16	18	21	27	28	32	34	36	38	40	42	44	45	239 %
kg per capita																
Landfill	296	290	293	285	287	288	278	269	254	239	221	219	213	201	191	-35 %
Incineration	65	66	70	71	76	79	81	85	84	89	95	99	100	99	101	56 %
Recycling	46	48	58	62	77	78	83	95	97	100	105	109	116	118	118	159 %
Composting	28	31	33	37	44	55	58	65	69	74	78	82	85	88	89	224 %

Source: Eurostat (online data code: [env_wasmun](#))

The 'other treatment' category was calculated as the difference between the sum of the amounts treated and the amounts of waste generated. This difference is caused mainly by those countries that have to estimate the waste generation in areas not covered by the municipal waste collection scheme and thus report more waste generated than treated. Consequently, increased coverage of the population at EU-27 level (89 % in 1995, 97 % in 2009) has led to decreasing 'other treatment'.

In addition, the 'other treatment' category reflects the effects of import and export, weight losses, double-counting of secondary wastes (e.g. landfilling and recycling of residues from incineration), differences due to time lags, temporary storage and increasingly the allocation of pre-treatment such as mechanical biological treatment. This may even lead to a higher amount treated for a certain year. At EU-27 level, all of these effects contribute only marginally and tend to cancel each other out. However, at country level, the effects are considerable, and the treatment shares presented below are therefore always related to the total amounts treated and not to the amounts generated.

In spite of the increase in waste generation in the EU-27, the amounts of municipal waste landfilled have been reduced. In the reference period, the landfilled total in the EU-27 declined by 45.6 million tonnes, or 32 %, from 141.3 million tonnes (296 kg per capita) in 1995 to 95.7 million tonnes (191 kg per capita) in 2009, corresponding to an annual decline of 2.7 %. Since 2002, the landfilled amounts have fallen by as much as 4.4 % per year.

As a result, the share of landfilling in the EU-27 dropped from 68 % in 1995 to 38 % in 2008.

This reduction can partly be attributed to the implementation of European legislation, for instance Directive 94/62/EC on packaging and packaging waste². By the year 2001, the Member States had to recover a minimum of 50 % of all packaging put on the market. With the revised recovery target of 60 % to be achieved by 31 December 2008, a further increase of separately collected packaging waste could be observed.

Furthermore, the implementation of Directive 1999/31/EC on the landfill of waste³, which requires Member States to reduce the amount of biodegradable municipal waste going to landfills to 75 % by 16 July 2006, to 50 % by 16 July 2009 and to 35 % by 16 July 2016⁴, has contributed to this development. This Directive has led to different strategies preventing the organic fraction of municipal waste from being landfilled, namely composting (including fermentation), incineration and pre-treatment such as mechanical-biological treatment (including physical stabilisation).

As a result, the amounts of waste recycled increased from 21.8 million tonnes (46 kg per capita) in 1995 to 59.2 million tonnes (118 kg per capita) in 2009, which corresponds to overall growth by a factor of 2.7 at an annual rate of 7.4 %. The share of municipal waste recycled overall increased from 11 % to 24 %.

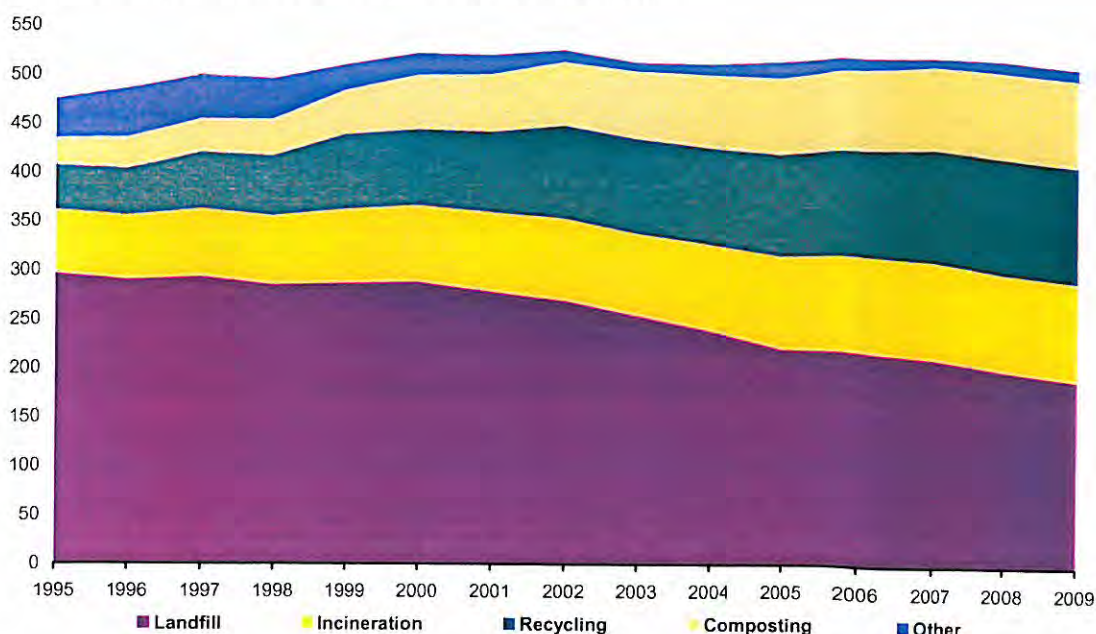
The recovery of organic material by composting is the treatment method that has increased the most.

² *European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste (OJ L 365, 31.12.1994, p. 10), last amended by Directive 2004/12/EC (OJ L 047, 18.02.2004, p. 26)*

³ *Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (OJ L 182, 16.07.1999, p.1), last amended by Regulation 1882/2003/EC (OJ L 284, 31.10.2003, p.1)*

⁴ *The reduction is calculated on the basis of the total amount of biodegradable municipal waste produced in 1995.*

Figure 2: Municipal waste treatment, EU-27, (kg per capita)



Source: Eurostat (online data code: [env_wasmun](#))

This increase corresponds to an annual growth rate of 9.1 %. Recycling and composting together accounted for a share of 42 % in 2009 and have exceeded the landfill share since 2008.

Waste incineration has also grown steadily in the reference period, although not to the extent of recycling and composting. Since 1995, the amounts of municipal waste incinerated in the EU-27 have increased by 19.6 million tonnes or 63.1 %, and accounted for 50.7 million tonnes or 20 % of the total amount treated in 2009. This corresponds to an increase of municipal waste incinerated from 65 kg per capita to 101 kg per capita.

Mechanical-biological treatment as well as sorting of waste are not covered directly as a category in the reporting of municipal waste treatment. These types of pre-treatment require an additional final treatment of the waste. In practice, the amounts delivered to mechanical-biological treatment or sorting should be reported on the basis of the subsequent final treatment steps. However, the way these amounts are allocated to the four treatment categories (incineration, landfilling, recycling and composting) is, on a country scale, considerably different and some countries report only on the first (pre-) treatment step.

As a consequence, the reporting on the current set of variables often requires additional information in order to relate the amounts of municipal waste landfilled, incinerated, recycled and composted to the amounts generated at country level. Therefore, all

percentages presented in the following are related to the total municipal waste treated.

Municipal waste treated by country

Figure 3 and Figure 4 illustrate the huge differences between countries with regard to the state of their waste management systems.

Figure 3 presents the amounts of municipal waste landfilled, incinerated, recycled and composted in 2008 as a percentage of the total amounts treated.

Figure 4 shows the corresponding figures in kilogram per capita. Both are sorted by the percentage of waste amounts landfilled relative to the total amounts treated.

Several countries are very advanced in diverting municipal waste from landfills, often due to the implementation of national measures to reduce landfilling of municipal waste. Switzerland, Germany, the Netherlands, Sweden, Austria, Denmark and Belgium have reported landfill rates below 5 %.

In Sweden and Denmark, there has been a ban on landfilling combustible waste since 2002 and 1997 respectively. The waste has to be recycled, treated by anaerobic digestion or incinerated. This strategy gives these two countries the highest incineration rates for municipal waste in the EU-27, with 49 % and 48 % respectively, matched only by the incineration rate of Switzerland (49 %). These three countries, together

with France, were the only ones with landfill rates below 80%, where the amounts incinerated equalled or exceeded the amounts recycled or composted. Mostly, the countries with low landfill rates had a larger combined share of recycling and composting than incineration.

Landfilling rates in the Netherlands fell in the 1990s as a result of recycling, composting and incineration of municipal waste. A further reduction occurred when the direct disposal of mixed municipal waste was banned as of 2003, resulting in only 4 kg per capita municipal waste directly landfilled in 2009.

In Sweden, the landfilled amounts dropped from 64 kg per capita in 2003 to 7 kg per capita in 2009 after the introduction of a landfill ban on organic material in 2005.

In Germany, landfilling was reduced steadily over the last decade mainly by recycling, mechanical-biological treatment and incineration. A considerable drop in landfilled amounts was due to the landfill ban for untreated municipal waste that entered into force on 30 June 2005.

Similarly, Austria has allowed landfilling only for pre-treated waste since 2004. As a result, the landfill

share decreased from 28% in 2003 to 1% in 2009. The incineration rate increased accordingly from 11% to 29% in the same period. It should be noted, however, that some of the low landfill shares are also due to the exclusion of residues of other operations from reporting.

Landfill shares of between 14% and 17% were reported by Norway and Luxembourg. France, Italy, Finland and the United Kingdom reported amounts being landfilled in the range of 32% to 50%. If categorised by landfill rates, the fourteen countries with the lowest landfill rates belong to the former EU-15.

Among the so-called old Member States, landfill rates in 2008 were highest in Greece (81%), Portugal (62%), Ireland (62%) and Spain (52%).

The highest rates for recycling were reported by Germany (48%, 274 kg per capita), Sweden (36%, 171 kg per capita) and Belgium (36%, 175 kg per capita), whereas Austria (40%, 235 kg per capita) and the Netherlands (28%, 144 kg per capita) reported the largest shares of composting.

Figure 3: Municipal waste treated in 2009 by country and treatment category, sorted by percentage of landfilling, (% of municipal waste treated)

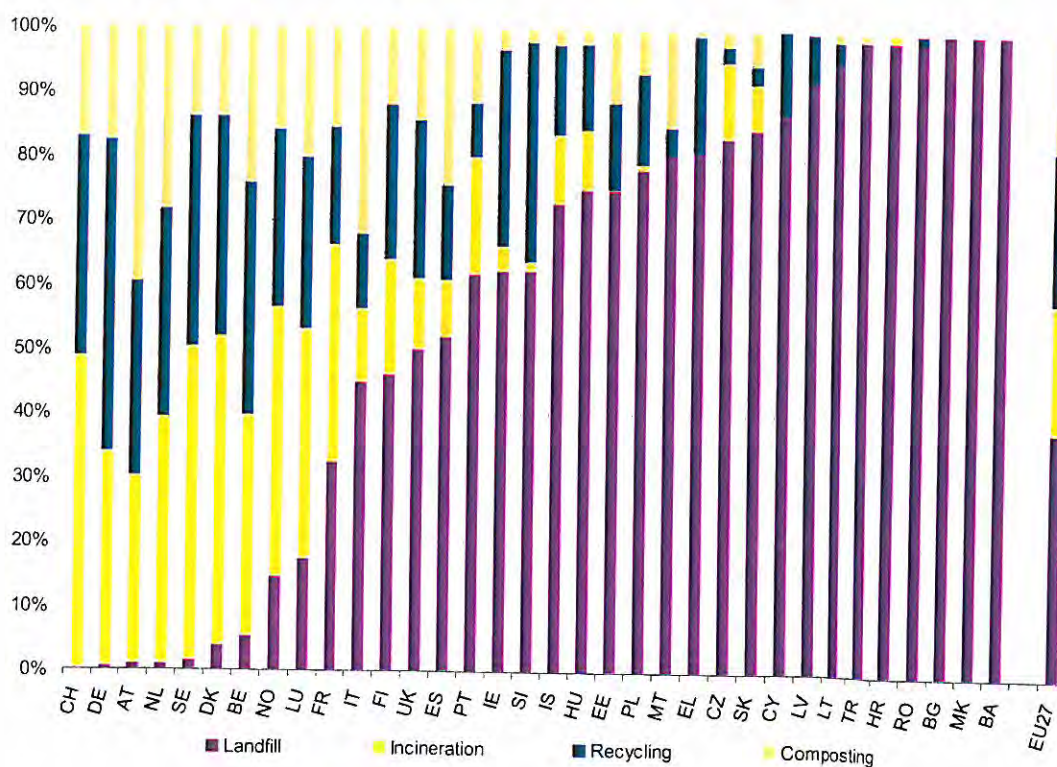
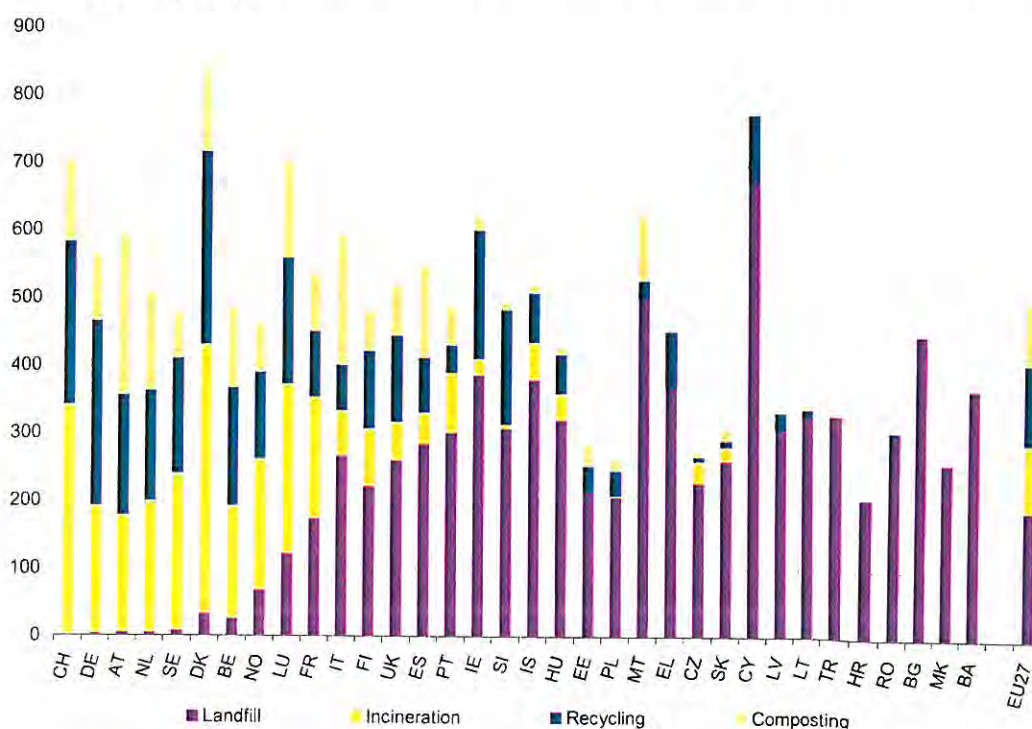


Figure 4: Municipal waste treated in 2009 by country and treatment category, sorted by percentage of landfilling, (kg per capita)



Notes: Malta: data refer to 2006; Croatia and the former Yugoslav Republic of Macedonia: data refer to 2008; Several countries: exports for recycling included; Slovenia: 15-20% imports for recycling included; Italy: mechanical-biological treatment included in composting; Austria, Germany, Netherlands: Only amounts delivered to first treatment, i.e. residues from other processes (e.g. MBT, incineration) not included in landfill

Source: Eurostat (online data code: [env_wasmun](#))

Italy's reported share of composting is the second highest (32%), but national data for 2007⁵ suggest that the Italian figure for composting contains more than 70% amounts treated by mechanical-biological operations. Belgium was among the countries with the largest shares for both recycling (36%) and composting (24%).

Ireland and Greece are the only 'old' Member States without incineration facilities for municipal waste, although Ireland reported 4% of incineration in 2009 which was almost exclusively attributed to co-incineration of refused derived fuel, but also use of wood as a fuel and use of edible oils and fats in biodiesel processing. Ireland has succeeded in reducing the amount of municipal waste going to landfills since 2001 considerably by about 25% thanks to strong progress in recycling.

In the new Member States and the Candidate Countries as well as in Iceland, landfilling is still the predominant waste management option. Landfill rates in these countries range between 62% in Slovenia and

100% in Bulgaria. The situation is further characterised by a low number of waste incineration facilities on the one hand, and collection and recycling schemes that are partly still in their infancy on the other hand.

Incineration of municipal waste is reported by nine of these countries. The contribution of waste incineration to municipal waste management is highest in the Czech Republic (12%, 33 kg per capita), Iceland (11%, 57 kg per capita), Hungary (9%, 41 kg per capita) and Slovakia (7%, 22 kg per capita). In the other Member States the incineration rate is less than 2%.

As could be expected from the figures on waste generation, Figure 4 shows that the amounts treated per capita vary to a large extent. The sorting by percentage of landfilling illustrates the trend that the countries with high landfill rates have generally lower total amounts treated than those with lower landfill rates.

⁵ *Statistiche ambientali. Ambiente e territorio, 2009. Sistemastatistico Nazionale Istituto Nazionale Di Statistica (ISTAT). Annuario n 11, Roma 2009*

Except for Cyprus (775 kg per capita) and Malta (622 kg per capita), all countries displayed on the right side of Figure 4 show total amounts treated of far less than 500 kg per capita.

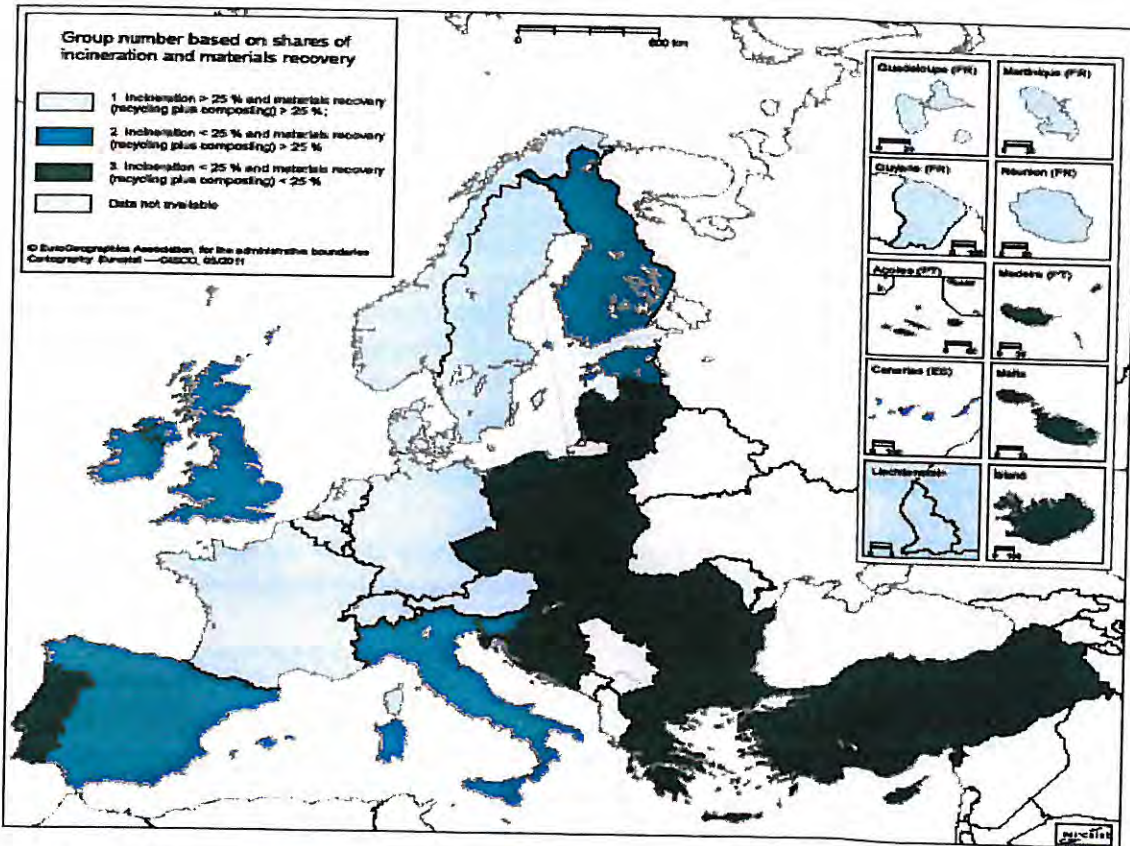
These countries report landfill rates of 75% and more, as shown in Figure 3, whereas of the remaining 18 countries listed on the left side of Figure 4, only a few reported total amounts treated much lower than 500 kg per capita (e.g. Norway and Finland). The high figures for Cyprus and Malta can be attributed to a large share of commercial waste as well as to the impact of tourism, as these countries had by far the highest tourism intensity indicators in Europe in 2006.

Municipal waste treatment strategies

As regards strategies for waste treatment, the European Environment Agency (EEA) offered a reasonable approach for a grouping that takes into account the combined rates of incineration and material recovery (represented as the sum of recycling and composting). The results of this approach were published in 2007, based on data up to reference year 2005⁶.

The rationale of the EEA approach is that countries may follow different strategies to divert waste away from landfills. These strategies are characterised either by a combination of material recovery and incineration or by focusing mainly on material recovery and less on incineration. Either of these two strategies may be seen as quite effective in diverting waste from being landfilled.

Figure 5: Waste treatment strategy by country groups, 2009



Source: Eurostat (online data code: [env_wasmun](#))

Source: Eurostat (online data code: [env_wasmun](#))

⁶ European Environment Agency, 2007, *The road from landfilling to recycling: common destination, different routes*, Copenhagen.

However, if material recovery is supplemented by incineration, a lower level of landfilling may be achieved, because incineration facilities have the advantage of being able to divert streams from being landfilled that may not be used for material recovery but contain a reasonable heat value. In addition, incineration may divert biodegradable material of lower heat value away from landfill after pre-treatment such as stabilisation and/or drying by mechanical-biological or mechanical-physical processes.

Figure 5 shows the results of this approach for the latest data of reference year 2009. The **first group** contains countries that apply a combined strategy with high rates of more than 25 % for material recovery (composting and recycling) as well as incineration.

The **second group** consists of countries where systems for recycling and composting are established to an extent that a high rate of material recovery of more than 25 % is achieved, but incineration rates fall short of 25 %. The **third group** relies mostly on landfilling as a treatment option with equally low rates of less than 25 % for incineration and material recovery.

Note that the percentages in Figure 5 were, in contrast to the EEA publication, calculated in relation to the total amounts treated.

It can be seen that group 1 covers the 10 countries with the lowest landfill rates (Figures 3 and 4). Groups 2 and 3 deviate from the strict order by landfill rate for the reason that Portugal and Iceland, despite landfill rates lower than 75 %, belong to group

3 on account of their low shares for material recovery (both below 20 %), while Estonia reported material recovery of just over 25 % with a higher landfill rate of 75 %. The high landfill rate in Estonia compared to the other two countries is due to the fact that Estonia reported almost no incineration, whereas the remaining two countries diverted shares of between 11 % (Iceland) and 18 % (Portugal) away from landfilling to incineration.

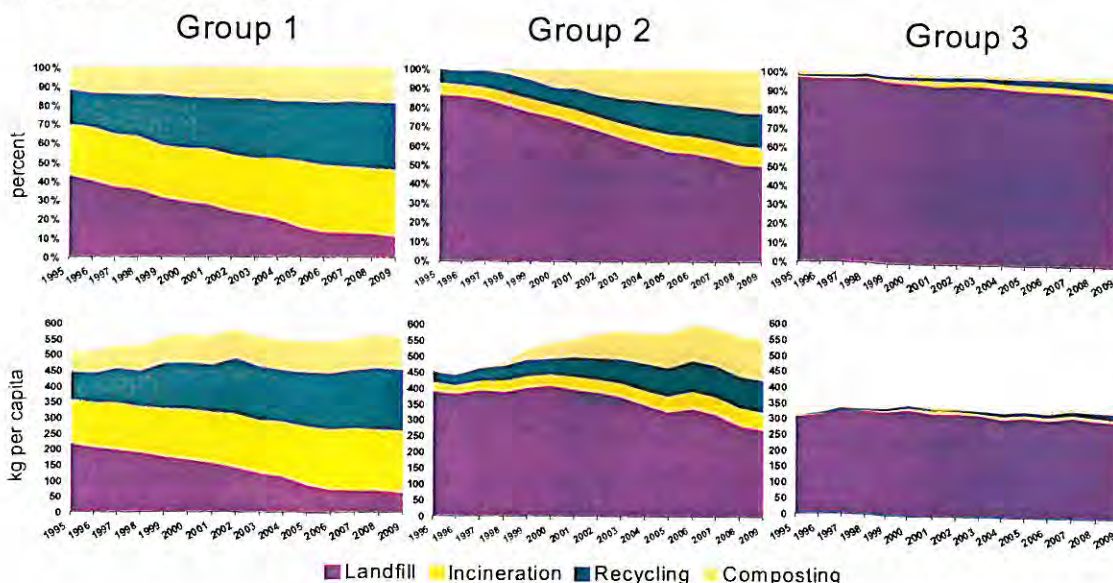
The population is fairly evenly distributed within the three groups, with each group representing roughly 200 million inhabitants, ranging from 181 million (group 2) to 210 million (group 1).

When considering the geographical distribution, group 1 with the 'most advanced' treatment strategy is concentrated in North-Western Europe. The other two groups are located stepwise around group 1 in all directions, except for the eastern direction, where countries belonging to group 3 share direct borders with countries belonging to group 1.

Development of municipal waste treatment strategies since 1995

The developments in respect of waste treatment in the three identified groups of countries are presented in Figure 6. Note that for the evaluation of municipal waste treatment over time group 3 was calculated without the former Yugoslav Republic of Macedonia, Croatia and Bosnia and Herzegovina on account of the limited data available (only one or two reference years).

Figure 6: Development of municipal waste treatment, 1995 to 2009 by treatment groups and category, (% , kg per capita)



The type of treatment is shown as a percentage of total treatment and the treated amounts in kg per capita. The per capita values were calculated as a weighted average over all countries within each group, i.e. the total amounts treated per category were added for all countries per group in million tonnes and divided by the sum of the overall inhabitants per group and year. For better comparison, the graphs were scaled identically.

It can be seen that the figures in kg per capita confirm the finding mentioned above, i.e. that in countries with high landfill rates the total amounts treated in kg per capita in 2009 are lower than in countries with low landfill rates. In 2009, the treated amount per capita was 341 kg in group 3 compared with 554 kg in group 1 and 550 kg in group 2. The developments over time even suggest that the overall increase from 1995 to 2009 was larger in groups 1 (10%) and 2 (22%) than in group 3 (8%). Thus, group 2 shows the largest amounts in 2009 and the largest growth, while for group 3 the opposite is the case.

Groups 1 and 2 show a similar development with regard to the absolute reduction of the percentage landfilled. In group 1, the landfill rate decreased from 42% to 11%. In group 2, the share of waste landfilled fell from 86% to 49%, mainly due to the enormous increase in composting from 1% to 23%. However, this increase must be interpreted with caution as 51% of the value is from composting in Italy, known to contain largely amounts that were in fact treated by mechanical-biological facilities. Group 3 achieved an absolute reduction of 8% (from 97% 1995 to 89% in 2009).

Considering the much lower starting level of group 1 for waste landfilled, the relative reduction of the landfill rates was by far the highest in this group (73%, from 215 to 59 kg per capita). In group 2, the reduction in landfilling amounted to 30% (from 387 in 1995 to 270 kg per capita in 2009), while in group 3, the amounts landfilled in 2009 (302 kg per capita) were almost equal to those in 1995 (304 kg per capita).

Although the total amount of municipal waste treated per capita in 2009 is much higher in group 2 than in

group 3, the per capita amounts of municipal waste landfilled in 2009 are not very different in both groups, with 270 kg and 302 kg per capita respectively. In contrast to this, group 1 countries managed to reduce the already low amounts landfilled in 1995 further until 2009, mainly by recycling and composting with increases overall of 116% and 68%. Progress with regard to material recovery and incineration was low in group 3 in absolute terms and cannot easily be identified in the graph. The largest increase from 1995 to 2009 occurred for recycling by a factor of 8 from 2.4 to 19.3 kg per capita, followed by the amounts incinerated (2.7 to 10.1 kg per capita; factor of 3.7).

The results can be summarised as follows:

In several countries belonging to group 1 national measure were introduced to limit the landfilling of municipal waste, which has most likely contributed to the high increase in recycling, composting and incineration.

Countries belonging to group 2 have set up some measures to divert municipal waste from landfilling, and the trend is pointing into the right direction.

Except for Estonia and Slovenia, all 'new' Member States are in group 3, only limited progress in diverting municipal waste from being landfilled can be observed, however, the generated amounts of municipal waste are notable lower than in the countries of the other two groups.

Greece and Portugal lag behind the development in other 'old' Member States.

Municipal waste generated and economic development in Europe

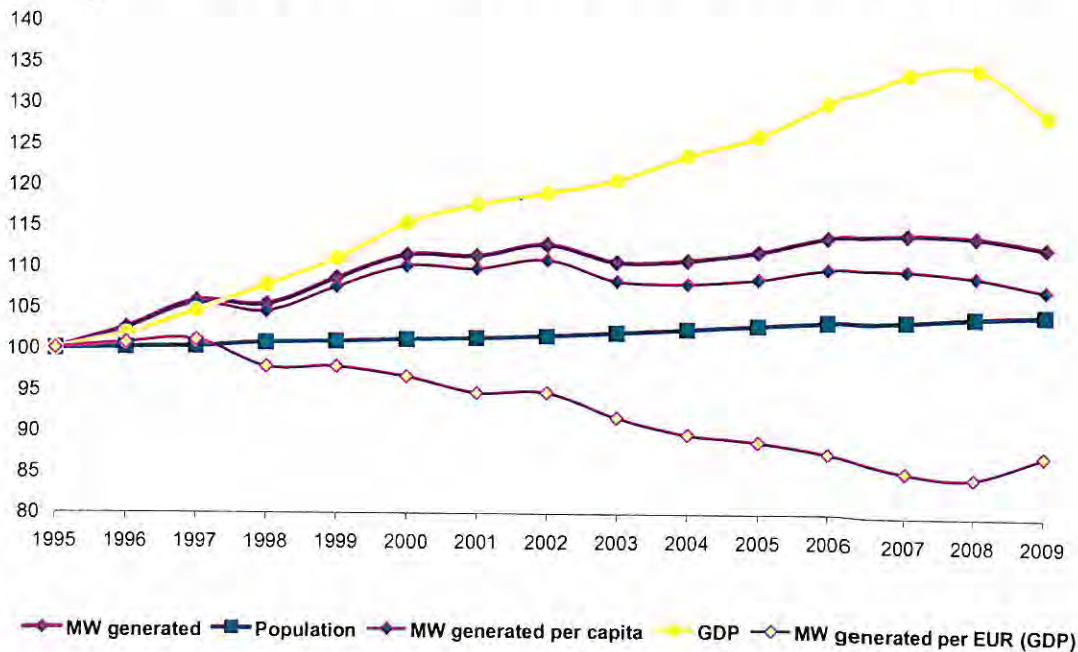
Table 2 shows the data aggregates for the 27 Member States of the European Union (EU-27) for municipal waste generation, population and selected economic parameters.

Table 2: Municipal waste generated, population and GDP in the EU-27 from 1995 to 2009

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Change 1995-2009
Municipal waste [million tonnes]	227	232	240	239	246	253	252	256	251	251	254	258	260	259	256	13 %
Municipal waste [kg per capita]	474	486	500	496	510	523	521	526	514	513	516	522	523	519	512	8 %
Municipal waste [kg per EUR]	28	29	29	28	28	27	27	27	26	25	25	25	24	24	25	-12 %
Population [million]	477	478	479	481	482	483	484	486	488	490	492	494	496	499	500	6 %
GDP [10 ¹² EUR]	8	8.1	8.4	8.6	8.9	9.2	9.4	9.5	9.6	9.9	10.1	10.4	10.7	10.8	10.3	29 %

Source: Eurostat (online data codes: [env_wasmun](#), [demo_qind](#), [nama_gdp_k](#))

Figure 7: Municipal waste generated, population and GDP in the EU-27 from 1995 to 2009, (1995=100)



Source: Eurostat (online data codes: [env_wasmun](#), [demo_qind](#), [nama_gdp_k](#))

Gross domestic product (GDP) is used as an economic parameter and a driver of municipal waste generation. The table shows municipal waste generated in tonnes as well as per capita. The development since 1995 is illustrated in Figure 7.

Since 1995, the generation of municipal waste in the EU-27 has shown a steady increase until 2002. In this period, municipal waste generation grew by 29.1 million tonnes, or 13 %, from 226.5 million tonnes to 255.6 million tonnes. This corresponds to an average annual growth rate of 1.7 %. In 2003 and 2004, this growth trend was interrupted, which can to some extent be attributed to the changes of methodology and classifications which reportedly took place in many countries in the period around 2002.

This decrease was followed by a further rise from 2004 to 2007 by 8.1 million tonnes, to 260.0 million tonnes, followed by a decrease in 2008 (258.9 million tonnes) and another in 2009, to 256 million tonnes.

Up to 2002, the increase in waste generation exceeded the population growth. Accordingly, the population-related indicator on municipal waste generated also increased. The indicator grew at an average rate of 1.5 % per year from 474 kg per capita in 1995 to 526 kg per capita in 2002. In 2003 the indicator fell to 514 kg per capita. The subsequent increase to 523 kg per capita in 2007 did not raise the indicator above the level of 2002. Up until 2009, the

indicator decreased to 512 kg per capita, i.e. approximately to the level of 2004.

The drop in 2009 after steady growth from 2003 to 2008 was also observed in many countries' series. It was explained by the positive economic development in this period until 2008 followed by the 2009 decline.

At the EU-27 level, GDP shows an increasing trend with an annual growth rate of 2.3 % in the period from 1995 to 2008. Annual economic growth thus clearly exceeded that of municipal waste generation in the same period (1.0 %). Particularly between 2002 and 2008, economic growth was much higher than that of municipal waste generation (0.2 %). The relation between economic development and municipal waste generation is illustrated by the line MW generation per EUR (GDP), i.e. a moderate decline until 2002 by 0.8 % per annum and a sharp decline by 1.8 % per annum between 2002 and 2008. In 2009, the economic decline was even sharper than that of waste generation, leading to an increasing value back to the level of 2006 (24.8 kg per EUR).

These figures are not yet sufficient to conclude that municipal waste generation in the European Union has reached its peak. This is particularly true because the aggregates for 2009 are to some extent based on provisional data or estimates. Nevertheless, the figures do indicate that municipal waste generation in the European Union has slowed down since 2002.

Methodological Notes

Data source

All the data presented here were collected by Eurostat. Since the beginning of the 1990s Eurostat has conducted surveys on European waste data using the OECD/Eurostat-Joint Questionnaire as the main source. Starting from 2004 as the first reference year, [Regulation \(EC\) No 2150/2002](#) on waste statistics replaced in principle the data collection based on the Joint Questionnaire. In order to maintain the time series and to offer consistent data in an international context outside the EU (OECD, UN), the small set of variables on municipal waste presented in this publication is still collected annually on the basis of a subset of the OECD/Eurostat Joint Questionnaire.

The data were extracted from the Eurostat database on 12 April 2011. Average Population values (extracted on 21 April 2011) were used to calculate kilogram per capita. For the GDP, again extracted on 21 April 2011, the data were used in Euro as chain-linked volumes, reference year 2000 (at 2000 exchange rates).

Definitions

The municipal waste classification is based on the definitions for the section on Waste in the OECD/Eurostat Joint Questionnaire, briefly summarised below (more extensive information is available in the [SDMX Metadata sheet on municipal waste](#)).

Municipal waste consists of waste collected by or on behalf of municipal authorities. The bulk of the waste stream originates from households, though similar wastes from sources such as commerce, offices, public institutions and selected municipal services are also included. It also includes bulky waste but excludes waste from municipal sewage networks and municipal construction and demolition waste.

The term 'municipal' is used in different ways reflecting different waste management practices. Differences between countries are to some extent the result of differences in the coverage of these similar wastes.

Incineration means thermal treatment of waste in a waste incineration plant as defined in Article 3(4) or co-incineration as defined in Article 3(5) of [Directive 2000/76/EC](#) on the incineration of waste. It includes incineration with and without energy recovery.

Landfilling is defined as deposit of waste into or onto land and temporary storage of over one year on permanent sites.

Recycling is defined as any reprocessing of material in a production process that diverts it from the waste stream, except reuse as fuel.

Composting is defined as a biological process that submits biodegradable waste to anaerobic or aerobic decomposition and that results in a product used on land or for the production of growing media.

MW generated / MW collected: The data refer to the amount of municipal waste generated. In countries with complete (national) coverage of their municipal waste collection scheme the total of municipal waste generated is equal to the total of municipal waste collected. Some countries do not cover the whole territory with a collection scheme. These countries have added an estimation of the waste generated in the areas not covered. Only Lithuania was not able to offer such estimation for the latest data. The Lithuanian data only refer to municipal waste collected.

Country groupings and order of countries

Country groupings:

EU-27: Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom

EFTA Countries: Iceland, Norway, Switzerland (Liechtenstein is included in the data of Switzerland)

Candidate Countries: Croatia, the Former Yugoslav Republic of Macedonia, Turkey and Bosnia and Herzegovina (potential candidate)

Countries' Abbreviations

BE	Belgium	CY ²⁾	Cyprus	SI	Slovenia
BG	Bulgaria	LV	Latvia	SK	Slovakia
CZ	Czech Republic	LT	Lithuania	FI	Finland
DK	Denmark	LU	Luxembourg	SE	Sweden
DE	Germany	HU	Hungary	UK	United Kingdom
EE	Estonia	MT	Malta	HR	Croatia
IE	Ireland	NL	Netherlands	MK	The former Yugoslav Republic of Macedonia (FYR)
EL	Greece	AT	Austria	TR	Turkey
ES	Spain	PL	Poland	IS	Iceland
FR ¹⁾	France	PT	Portugal	NO	Norway
IT	Italy	RO	Romania	CH ³⁾	Switzerland
				BA	Bosnia and Herzegovina

Notes:

1. Data include the overseas departments (département d'outre-mer or DOM) Martinique, Guadeloupe, Réunion and French Guiana
2. Data for Cyprus refer only to the area under effective control of the Government of the Republic of Cyprus
3. Data include Liechtenstein

Further information

Eurostat website: <http://ec.europa.eu/eurostat>

Data on 'Environment statistics':

<http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/data/database>

Select 'Waste statistics'

Further information about on 'Environment statistics'

<http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/introduction>

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E-mail: eurostat-mediasupport@ec.europa.eu

European Statistical Data Support:

With the members of the 'European statistical system', Eurostat has set up a network of support centres in nearly every Member State and in some EFTA countries.

Their role is to provide help and guidance to Internet users of European statistics.

Contact details for this support network can be found on the Eurostat website at:

<http://ec.europa.eu/eurostat/>.

All Eurostat publications can be ordered via the 'EU Bookshop':

<http://bookshop.europa.eu/>.

The SIF was prepared in cooperation with Volker Küchen from ARGUS GmbH, Berlin, Germany

Manuscript completed on: 30.06.2011

Data extracted on: 21.03.2011

ISSN 1977-0316

Catalogue number: KS-SF-11-031-EN-N

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TO: Larry Gardner
Manager, Solid Waste

DATE: January 5, 2016

FROM: Sharon Horsburgh
Senior Solid Waste Planner

MEETING: RSWAC, January 14, 2016

FILE: 5365-00

SUBJECT: RDN's Zero Waste Plan

RECOMMENDATION

That the Regional Solid Waste Advisory Committee (RSWAC) receives this report for information as part of the 2015 Solid Waste Management Review Process.

PURPOSE

At the November 26, 2015 Regional Solid Waste Advisory Committee (RSWAC) meeting, it was requested that a report be prepared explaining the Regional District of Nanaimo's (RDN) Zero Waste Plan.

BACKGROUND

The RDN's Zero Waste Plan is described in Section 6 of the 2004 Solid Waste Management Plan (SWMP) and is attached as Appendix 1. The SWMP is a long-term vision of how the Regional District will manage its solid waste, including diversion and future disposal needs. The RDN prepared their first SWMP in 1988 and amended that plan in 1996 to include a "3Rs Plan". In 2003, the RDN reviewed the status of the 1996 3Rs Plan and found that most of the programs and policies in the 3Rs Plan had been implemented and the diversion rate in the RDN increased from 45% in 1998 to 57% in 2003. This increased diversion came about despite the fact that two major elements of the plan, an in-vessel composting facility and a construction/demolition waste recycling facility were not constructed.

In 2002, the RDN Board adopted "zero" as the waste diversion target, meaning that the RDN will continuously strive to reduce the amount of waste requiring disposal. In addition, Policy 4H of the RDN's Regional Growth Strategy (adopted June 2003) states: *"The RDN agrees to pursue a solid waste management approach that concentrates on creating less waste, with the ultimate long term goal of eliminating the need for waste disposal (i.e. a "Zero Waste" approach)".* To reflect this new goal, the updated 3Rs Plan was named the Zero Waste Plan. The Zero Waste Plan outlines how the RDN plans to continue reducing the quantity of waste disposed.

The Zero Waste Plan was developed by undertaking the following steps:

- (I) review the existing 3Rs Plan to identify what elements of that plan should be retained and carried forward to become part of the Zero Waste Plan;
- (II) identify new waste reduction opportunities by:
 - reviewing waste diversion initiatives undertaken in other North American jurisdictions that are considered "leading edge";
 - interviewing waste management coordinators in BC and across Canada; and
 - brainstorming RDN-unique ideas;
- (III) develop a menu of components for possible inclusion in the Zero Waste Plan using the initiatives identified in the first two steps;

- (IV) present the menu of possible components to the Regional Solid Waste Advisory Committee (RSWAC) to obtain their feedback; and
- (V) develop a draft Zero Waste Plan based upon RSWAC's and staff input.

As a result of this process, the following components were adopted in the approved 2004 Solid Waste Management Plan.

Ongoing Programs

- Compost Education Program
- School Education Program
- Zero Waste Promotion and Education
- Illegal Dumping Program Expanded Disposal Bans
- Waste Composition Study
- Waste Stream Licensing and Technical Assistance
- Curbside Food and Yard Waste Collection Study
- Yard Waste Composting at RDN Disposal Facilities
- Recycling at RDN Disposal Facilities
- Residential Curbside Garbage and Recycling Collection

New Programs 2005-2007

- Single Family Organics Collection Pilot
- C/D Market Study
- User Pay Review
- RDN Internal Zero Waste Policy
- Single Family Organics Collection Program

In 2013, a review of the current SWMP was initiated with the Stage 1 review, the Existing System Report. The report concluded that the RDN has fully implemented the key components of its 2004 SWMP, including residential food waste collection and banning commercial food waste from landfill disposal. Participation in these programs has resulted in the region diverting 68 per cent of its waste for composting and recycling and achieving a 350 kilogram per capita landfill disposal rate, one of the lowest in Canada.

DISCUSSION

The RDN and its member municipalities, residents and businesses have led the way in reducing the amount of garbage that is landfilled. In 1991, the RDN introduced Canada's first user pay residential garbage collection system. Since then, the RDN and its partners have expanded curbside recycling programs, banned paper, metal, commercial food waste, clean wood waste and other recyclable materials from the landfill, and successfully promoted composting throughout the region.

In the fall of 2012, as a first step in updating the RDN's SWMP, the RDN conducted a waste composition study of the waste sent to the Regional Landfill to determine what types of waste continue to be landfilled and by which sector. The data from the study indicates that roughly 35% of the waste currently landfilled could be composted and 20% could be recycled.

Some of the milestones the RDN has achieved on the road to Zero Waste include:

- 1989 - Residents and businesses divert 10% of solid waste from the landfill.
- 1995 - Recycling, reuse and recycling initiatives divert 26% of solid waste from the landfill.
- 2000 - The RDN and its municipal partners divert 57,000 tonnes of material from the landfill or 54% of the total waste generated in the region, exceeding the 50% target set by the provincial government.
- 2002 - The RDN adopts Zero Waste as its long-term waste diversion target.
2004 - The RDN prepares an updated Solid Waste Management Plan which sets an interim goal of diverting 75% of the region's waste from the landfill by 2010. *[Note that this diversion target included biosolids which are no longer accounted for in the diversion/disposal calculations.]*
- 2005 - The RDN bans commercial food waste from the landfill. A commercial food waste diversion program involving businesses and organizations diverts more than 6,000 tonnes of food waste and organic compostables annually from the landfill.
- 2007 - The RDN and its municipal partners launch a residential food waste collection pilot project that will provide the information needed to develop a region-wide program.
- 2010 – Introduction of region wide food waste curbside collection program.
- 2012 – The region achieved a 68% diversion rate and a per capita waste generation rate of 347 kilograms.
- 2012 - Waste Composition Study was completed.
- 2013 -Stage One - Existing System Report.
- 2013 - Begin to review the 2004 SWMP.

To support the RDN's Zero Waste Plan, the RDN's SWMP includes eight guiding principles and they are as follows:

1. *The consumption of material and energy resources is set at a level that is ecologically sustainable.*
2. *The regional solid waste stream is reduced to the greatest extent possible, in accordance with the hierarchy of reduce, reuse, and recycle, and consistent with local resources and the nature of the regional solid waste stream.*
3. *The goal of environmental policy is to not exceed the capacity of the environment to accept waste and the strategies for achieving that goal cautiously anticipate the environment's capacity.*
4. *Individuals and firms are enabled to make environmentally sound choices about consumption of resources and generation of waste through provision of appropriate information, including user-pay and market-based incentives, wherever possible.*
5. *Reduction policies and strategies are developed through public consultation in a cooperative manner between government, private enterprise and community stakeholders. This may entail more flexibility in existing procedures and the setting precedents. The cost effectiveness of any strategy will be based on full accounting of costs and benefits, both monetary and non-monetary.*
6. *The strategies and policies promote community development whenever possible.*
7. *All parties must have equal access to relevant information and the opportunity to participate effectively throughout the process.*
8. *Openness and trust between stakeholders are the keys to a successful process.*

The RDN is unable to achieve all these goals alone, however, the RDN has been actively promoted these concepts through participation on policy making committees of various national, provincial and regional organizations such as the Solid Waste Association of North America, AVICC, National Zero Waste Council, the Recycling Council of BC, Coast Waste Management Association and Zero Waste Nanaimo. All of these organizations are multi-stakeholder groups that have a good track record of influencing senior government policy. Zero Waste is a very active subject of discussion in all of these groups.

The RDN's existing solid waste management system is diverse and reflects a mature waste management system. The key components of the existing waste management system are:

- Zero waste has been adopted as the waste diversion target – meaning that the RDN will continuously strive to reduce the amount of waste requiring disposal;
- Curbside collection of garbage, kitchen scraps and recyclables for all single-family homes;
- User pay waste management fees for both the landfill and the curbside collection services;
- A policy of banning materials from disposal as garbage once a stable alternative use is identified;
- An organics diversion strategy that enables the diversion of both residential and commercial food and yard waste;
- A Construction/Demolition Waste Strategy that banned the disposal of clean wood waste to drive the development of a recycling industry for waste from construction and demolition activities;
- A Waste Stream Management Licensing system that ensures private waste management facilities operate at a high standard; and
- A comprehensive Illegal Dumping Prevention Strategy.

A number of the key components of the waste management system are discussed in more detail below.

Zero Waste

The RDN's Zero Waste concept is worth highlighting. There are many significant challenges with the implementation of Zero Waste as many aspects are beyond local government's regulatory jurisdiction. For example, local government does not have the authority to regulate products or packaging such as design for environment, end of life return of product, bans or minimum recycled content. However, in these areas, the RDN is proactive and assists with the dissemination of information as well as participating on policy setting committees as noted previously.

Organics Diversion Strategy

The cornerstone of the RDN's 2004 SWMP was the diversion of organic waste from landfilling. The 2004 waste composition study indicated organic waste represented 47 % of the RDN's residential waste stream by weight and 40% of the ICI waste stream. Therefore, diverting organics was determined to be the single most effective means of increasing diversion of waste from landfilling. The 2012 Waste Composition Study showed that the total waste stream organics dropped from 178 kg/person in 2004 to 123 kg/person in 2012. There remains significant opportunity for further organics diversion.

Construction/Demolition Waste Strategy

In February 2007, the Regional Board approved a Construction/Demolition (CD) Waste Strategy. Key initiatives in the strategy include:

- Increasing the tipping fee for clean wood waste at RDN Solid Waste Facilities to create incentives to divert this material to licensed recycling facilities;
- Effective January 1, 2008, the RDN put a ban on disposal of clean wood waste in the Regional Landfill and roll-off containers of wood waste at RDN Solid Waste Facilities; and
- Arranging contracts with third party wood waste recycling facilities to manage wood waste received at the Regional Landfill and Church Road Transfer Station from small self-haulers.

As a result of the strategy, there are currently several CD waste management facilities in the RDN and clean wood waste is no longer buried as garbage in the Regional Landfill.

Construction, demolition and renovation projects generate a wide range of materials, most of which are reusable or recyclable. These include concrete, asphalt, wood, gypsum wallboard, metal, cardboard, asphalt roofing and plastic. The RDN promotes diversion of these materials through disposal bans on cardboard, gypsum (drywall), metal and wood, and high tipping fees on loads of CD waste arriving at the Regional Landfill.

The majority of CD waste is recycled or used as a fuel substitute. The following materials are managed as follows:

- Wood waste is chipped and used as hog fuel at pulp mills on Vancouver Island and in Washington State;
- Drywall (gypsum) is recycled;
- Metal is recycled;
- Concrete and asphalt are recycled; and
- Asphalt shingles are recycled for road base applications.

There is also significant reuse of building materials and fixtures through salvage operations and retail stores such as Demxx and Habitat for Humanity's ReStore.

Waste Stream Management Licensing Bylaw

RDN Bylaw No. 1386, 2004 requires solid waste management facilities operating in the RDN to maintain a Waste Stream Management License (WSML). A similar bylaw is in place in the Cowichan Valley Regional District. The authority to license and regulate solid waste facilities is given to regional districts through BC's Environmental Management Act and the RDN's licensing bylaw was enacted under the 2004 SWMP.

The RDN's licensing Bylaw No.1386 was established to fulfill the following objectives:

1. Create a high standard of operation for waste management facilities.
2. Encourage and protect legitimate waste management operations.
3. Establish a reporting system for the flow of waste materials within the RDN.
4. Protect and enhance the waste reduction rate achieved.
5. To provide a level playing field.

In the RDN, there are currently 13 facilities that hold Waste Stream Management Licenses and five applications are under review.

RDN Waste Stream Management License Holders (as of July 2015)
1. Schnitzer Steel Pacific
2. Parksville Bottle & Recycling Depot
3. Nanaimo Organic Waste (formally ICC)
4. Progressive Waste (formally BFI) Nanaimo Recycling Facility
5. Emterra Environmental
6. Earthbank Resource Systems
7. Alpine Disposal & Recycling (ADR)
8. Pacific Coast Waste Management (PCWM)
9. DBL Disposal Services Ltd. (formally Porter Wood Recycling Ltd.)
10. DBL Disposal Service Ltd.
11. Progressive Waste (formally BFI Canada), Springhill
12. Cascades Recovery Inc.
13. Coast Environmental Services
RDN Waste Stream Licenses (In Progress)
14. Haarsma Waste Solutions
15. Gabriola Island Recycling Organization
16. Nanaimo Recycling Exchange
17. ABC Metal Recycling
18. MacNutt

Illegal Dumping Prevention Strategy

The RDN has implemented an Illegal Dumping Prevention Strategy and works collaboratively with community groups. The key components of the program include prevention of illegal dumping through education; funding the clean-up of illegal dumpsites; waiving of landfill tipping fees and illegal dumping surveillance and enforcement activities. The program cost is approximately \$100,000 annually.

Education & Outreach

Both the RDN and the City of Nanaimo undertake promotion and education related to solid waste management. The RDN has information related to the solid waste management planning, bylaws and zero waste programs on the Solid Waste and Recycling pages of the RDN’s website. The RDN and the City of Nanaimo distribute approximately seven Zero Waste/Solid Waste related newsletters each year to homes across the region. The RDN contracts the Nanaimo Recycling Exchange to provide a zero waste school education program, which provides free classroom workshops to schools throughout the RDN. It is estimated that the RDN spends approximately \$200,000 annually on education.

ALTERNATIVES

There are no alternatives for this report.

FINANCIAL IMPLICATIONS

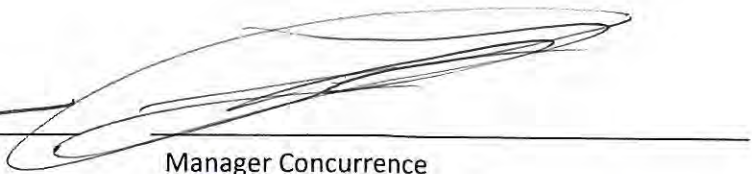
This report is presented for information purposes only therefore there are no financial implications.


SUMMARY/CONCLUSIONS


In 2002, the RDN Board endorsed the adoption of a Zero Waste Plan for inclusion in the Solid Waste Management Plan. Since that time, the RDN has introduced a number of strategies and policies, and has taken action, to reduce the amount of waste being landfilled. The RDN is considered a leader in North America with respect to its Zero Waste programs.

Through community cooperation and support, the RDN has achieved 68% waste diversion and an annual per capita disposal rate of 347 kilograms. According to the Province of BC 2012 Waste Diversion Calculator, this is one of the lowest disposal rates in Canada. Furthermore, the RDN and Cowichan Valley Regional Districts are believed to have the lowest per capita disposal rates in the world. With a continued promotion of Zero Waste concepts, there is expected to be continued improvements that will meet the future needs of the RDN.


Report Writer


Manager Concurrence


General Manager Concurrence


A/CAO Concurrence

Solid Waste Management Plan

6. Zero Waste Plan

In April 2003, the RDN reviewed the implementation status of their 1996 *3Rs Plan* as a first step in updating this component of the Solid Waste Management Plan. Most of the programs and policies in the 3Rs Plan were implemented and the diversion rate in the RDN increased from 45% in 1998 to 57% in 2003. This increased diversion came about despite the fact that two major elements of the plan, an in-vessel composting facility and a construction/demolition waste recycling facility were not constructed.

In 2002 the RDN adopted “zero” as their waste diversion target, meaning that the RDN will continuously strive to reduce the amount of waste requiring disposal. In addition, Policy 4H of the RDN’s Regional Growth Strategy (adopted June 2003) states: *The RDN agrees to pursue a solid waste management approach that concentrates on creating less waste, with the ultimate long term goal of eliminating the need for waste disposal (i.e. a “Zero Waste” approach).* To reflect this new goal, the updated 3Rs Plan is called the *Zero Waste Plan*. The Zero Waste Plan outlines how the RDN plans to continue reducing the quantity of waste disposed.

The Zero Waste Plan was developed by undertaking the following steps:

- (I) review the existing 3Rs Plan to identify what elements of that plan should be retained and carried forward to become part of the Zero Waste Plan;
- (II) identify new waste reduction opportunities by:
 - reviewing waste diversion initiatives undertaken in other North American jurisdictions that are considered “leading edge”;
 - interviewing waste management coordinators in BC and across Canada; and
 - brainstorming RDN-unique ideas;
- (III) develop a menu of components for possible inclusion in the Zero Waste Plan using the initiatives identified in the first two steps;
- (IV) present the menu of possible components to the Regional Waste Advisory Committee (RWAC) to obtain their feedback; and
- (V) develop a draft Zero Waste Plan based upon RWAC’s and staff input.

This section briefly describes each component of the Zero Waste Plan. The components are organized into two sections:

1. **Ongoing Programs** –programs that were part of the 1996 3Rs plan, were implemented and continue to operate, including programs identified in the annual budget for 2004;
2. **New Programs** – programs that have new diversion potential that will be implemented in 2005 to 2007 upon adoption of this Solid Waste Management Plan.

final draft

Solid Waste Management Plan

All costs are presented in 2004 dollars.

Solid Waste Management Plan

◆ On-Going Programs 2004

Program	Budget
<p>Compost Education Program</p> <p>The Zero Waste compost education program has several components, including:</p> <ul style="list-style-type: none"> • enhance, maintain and promote demonstration gardens; • promote usage of the yard waste management educational materials available on the RDN's website; • conduct spring and fall seminars on composting, grasscycling, zero waste landscaping, natural garden and lawn care, etc. Partnering with local garden centres that sell backyard composters and native plants will be explored. 	<p>\$5,000</p>
<p>School Education Program</p> <p>Continue contracting out design and delivery of a primary school program that focuses on the concept of zero waste.</p>	<p>\$15,000</p>
<p>Zero Waste Promotion and Education</p> <p>The Zero Waste Promotion and Education program contains the following elements:</p> <ul style="list-style-type: none"> • Continue and enhance current zero waste information initiatives including the web site, newsletters and participation in community events. • Maintain funding to the Recycling Council of BC for operation of the hotline. Promote the hotline to RDN residents and businesses. • Continue annual financial support to Recycling Council of BC for their ICI waste exchange service. Promote this service to RDN businesses and institutions. • Maintain and print the Zero Waste (recycling) directory and the online directory on the RDN web site and ensure data is up to date through annual reviews of the listings. Promote directory and reuse awareness, particularly with customers that bring reusable goods to RDN disposal. • Continue television advertising on Shaw Cable. • Promote to all sectors the availability of Zero Waste tools, particularly those available on the web such as the Recycling Directory, Zero Waste Business Tool Kit, Zero Waste Landscaping Tips, and Composting Information. Additional tools will be accessed from other jurisdictions and, with permission, modified for use in the RDN. 	<p>\$58,500</p>

Solid Waste Management Plan

Program	Budget
<p>Illegal Dumping Program</p> <p>The Illegal Dumping Program includes surveillance and enforcements activities as well as on-going clean-up of illegal dumping sites and free disposal (tipping fees are waived) for community clean-up events. To encourage community clean-ups, groups that undertake these activities will be recognized in the RDN newsletter or other media.</p>	<p>\$63,000</p>
<p>Expanded Disposal Bans</p> <p>International Composting Corporation (ICC) opened their private composting facility in Nanaimo in April 2004. Consequently, in accordance with RDN Board policy, organic waste from commercial generators (e.g. grocery stores, institutions, and restaurants) will be banned at the Regional Landfill and Church Road Transfer Station in the fall of 2004.</p> <p>Implementation of the ban would involve a “ramp up” period of increasing enforcement starting with advanced notice of upcoming ban, then notices (rather than financial penalties) for the first months of the bans implementation, and eventually implementing financial penalties that are double the tipping fees for loads containing banned materials.</p> <p>In addition, yard waste and products covered under province-wide stewardship programs will also be banned, as opportunities to divert these materials are readily available in the RDN.</p>	<p>\$24,000</p>
<p>Waste Composition Study</p> <p>Conduct a waste composition study to estimate the quantity of recyclable materials remaining in the waste stream and the source of those materials (residential, ICI or DLC). This study will assist in focusing waste diversion programs and policies where they will have the greatest impact.</p>	<p>\$25,000</p>
<p>Waste Stream Management Licensing Technical Assistance</p> <p>To support the implementation of the Waste Stream Management Licensing Bylaw (which is ultimately intended to enhance diversion in the RDN), technical assistance will be required on an annual basis to prepare site specific operating plans and requirements</p>	<p>\$15,000</p>

Solid Waste Management Plan

Program	Budget
<p>Curbside Food and Yard Waste Collection Study</p> <p>Organic waste collection could divert food waste, non-recyclable paper products and other organic waste materials in addition to providing yard waste removal service to residents in the RDN curbside collection service area. Based on a 2002 CRD waste composition study, approximately 45% of the residential waste stream is compostable. In the RDN, if only half of the residential-based organic waste is diverted through an organics collection program, 5,600 tonnes of waste would be diverted from the landfill annually. This study will research collection methods and successes in other North American jurisdictions</p>	<p>\$10,000</p>
<p>Yard Waste Composting at RDN Disposal Facilities</p> <p>To ensure an on-going opportunity to dispose of yard waste, the RDN will continue to accept source-separated yard waste at the landfill and transfer station. The drop-offs are for self-haul customers (small loads). Yard waste is transferred to private composting facilities. The tipping fee at the RDN facilities is based on the market cost of composting. Drop-off opportunities are promoted by RDN and municipalities. (Note: The cost associated with this program is directly related to volumes received at the RDN's facilities.)</p>	<p>\$268,000</p>
<p>Recycling at RDN Disposal Facilities</p> <p>The RDN provides the opportunity for self-haul customers at the disposal facilities to recycle batteries, appliances, propane tanks, fluorescent light tubes, scrap metal, tires, gypsum (at CRTS), cardboard, paper, glass, and metal and plastic food and beverage containers.</p>	<p>\$161,500</p>
<p>Residential Curbside Garbage and Recycling Collection</p> <p>Continue with residential garbage and recycling collection programs including strict can limits and comprehensive range of recyclable materials including rigid plastic containers. Provide service to approximately 23,000 households.</p>	<p>\$1,766,970</p>

Solid Waste Management Plan

◆ **New Programs 2005 - 2007**

2005	Budget
<p>Single Family Organics Collection Pilot</p> <p>Design and conduct a pilot organics collection program. Conduct pre and post surveys with participants and measure actual diversion. This pilot would address the feasibility of organics collection for some or all of the residents on the curbside collection program and help to refine the final program design.</p>	\$82,000
<p>C/D Market Study</p> <p>Conduct an analysis of the local market capacity for wood waste and construction/demolition wastes to determine the viability of a ban on all or a portion of this waste.</p> <p>In the event that a private sector C/D processing facility is established, licensed and operational by 2005 the C/D market study will not be done.</p>	\$10,000
2006	Budget
<p>User Pay Review</p> <p>Before tendering next curbside contract, re-assess feasibility of going to full user pay or a subscription-based system for garbage collection. A full user pay program would provide users with a financial incentive to further reduce waste and reward those households that already have achieved significant waste reduction. If viable, a “pay-as-you-throw” request for proposal or tender would be designed for the new curbside waste collection contract (scheduled to begin in 2007).</p>	\$20,000
<p>RDN Internal Zero Waste Policy</p> <p>Using existing municipal models, develop an internal Zero Waste Policy to ensure that the environmental impact of RDN purchasing and operations of the RDN is minimized. Environmental purchasing policies developed by other municipalities, such as the City of Richmond, will be used as a template.</p>	\$4,000

Solid Waste Management Plan

2007	Budget
<p>Single Family Organics Collection Program</p> <p>Based on the results of the curbside yard and food waste collection study undertaken in 2004 as well as the pilot collection project undertaken in 2005, a full single family curbside collection program could be implemented in 2007 based on the results of the tender process undertaken in 2006.</p> <p>The costs presented for full program implementation are rough estimates of a household organic waste collection program (food waste and soiled paper). Yard waste collection is not included at this time since not all households may require this service. The types of organic wastes collected, collection method and frequency, and composting facility tipping fees have not yet been defined. This cost estimate includes only the households serviced by the RDN although it is assumed that the City of Nanaimo will also consider implementing a similar program if it is found to be cost-effective.</p>	<p>Start-up costs (one-time): \$97,000</p> <p>On-going annual costs: \$460,000</p>

Zero Waste Plan Summary

i. Diversion Potential

The diversion potential of the Zero Waste Plan ranges from an *additional* diversion of 4% in 2004 to an additional 41% in 2009, as shown in Table 6-1. Although many of the programs listed in the plan do not contribute directly to diversion, they are believed to be essential to supporting existing and planned zero waste initiatives and without them the diversion potential of the other programs could not be realized. Upon full implementation, the RDN could achieve an *overall* diversion rate of 76%.

Table 6-1 Zero Waste Plan New Diversion Potential

Year	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)
New Programs						
Expanded Disposal Bans	4	13	24	31	34	34
Waste Composition Study						
Construction/Demo Waste Market Study						
Single Family Organics Collection				5	5	5
User Pay Review						
RDN Internal Zero Waste Policy						
New Diversion (based on 2003 baseline)	4	13	24	38	39	39
Total Cumulative Diversion (based on 2003 baseline of 57%)	59	63	68	75	76	76

Solid Waste Management Plan

ii. Costs

Table 6-2 shows the annual cost for the Zero Waste Plan from 2004 to 2009.

Table 6-2. Zero Waste Plan Costs

Year	2004	2005	2006	2007	2008	2009
Ongoing Programs						
Residential Curbside Garbage and Recycling Collection*	\$ 1,766,970	\$ 1,802,309	\$ 1,838,356	\$ 1,875,123	\$ 1,912,625	\$ 1,950,878
Illegal Dumping Program	\$ 63,000	\$ 63,000	\$ 63,000	\$ 63,000	\$ 63,000	\$ 63,000
Recycling at RDN Disposal Facilities	\$ 161,500	\$ 161,500	\$ 161,500	\$ 161,500	\$ 161,500	\$ 161,500
Yard Waste Composting	\$ 268,000	\$ 165,000	\$ 165,000	\$ 165,000	\$ 165,000	\$ 165,000
Zero Waste Promotion and Education	\$ 58,500	\$ 58,500	\$ 58,500	\$ 58,500	\$ 58,500	\$ 58,500
School Education Program	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Compost Education Program	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
New Programs						
Expanded Disposal Bans	\$ 24,000	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
Centralized Composting Facility	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Waste Composition Study	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -
Curbside Organics Collection Study	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -
Single Family Organics Collection Pilot	\$ -	\$ 82,000	\$ -	\$ -	\$ -	\$ -
Single Family Organics Collection	\$ -	\$ -	\$ -	\$ 557,000	\$ 460,000	\$ 460,000
WSML Technical Assistance	\$ 15,000	\$ 10,000	\$ 10,000	\$ 5,000	\$ 5,000	\$ 5,000
CD Waste Market Study	\$ -	\$ 10,000	\$ -	\$ -	\$ -	\$ -
User Pay Review	\$ -	\$ -	\$ 10,000	\$ -	\$ -	\$ -
RDN Internal Zero Waste Policy	\$ -	\$ -	\$ 4,000	\$ -	\$ -	\$ -
Total Cost per Year	\$ 2,411,970	\$ 2,372,809	\$ 2,330,856	\$ 2,905,623	\$ 2,846,125	\$ 2,884,378

* based on 2% estimated annual contract cost increase

iii. Staffing

The Zero Waste Plan is to be implemented with the RDN's existing solid waste staff complement. As needed, research, studies and some services will be contracted out.

TO: Larry Gardner
Manager, Solid Waste

DATE: January 7, 2016

FROM: Meghan Larson
Special Projects Coordinator

MEETING: RSWAC, January 14, 2016

FILE: 5365-00

SUBJECT: Multi Family and IC&I Collection in the RDN

RECOMMENDATION

That the Regional Solid Waste Advisory Committee (RSWAC) receives this report for information.

PURPOSE

To provide background on the current state of Multi-Family and Industrial, Commercial and Institutional (IC&I) sector collection in the RDN and to estimate additional waste diversion potential from this sector.

BACKGROUND

The IC&I sector represents 63% of landfilled waste at the Regional Landfill. Examples of waste generators in this sector include businesses, industries, or commercial operations including stores, offices, hotels, hospitals, schools, restaurants, construction companies, factories etc., and the Multi-Family housing sector. In the Regional District of Nanaimo (RDN) the IC&I sector (including Multi-Family) is serviced by private waste haulers. However, for the purpose of this report Multi-Family waste collection will be examined separately from the rest of the IC&I sector even though the waste is collected together by most haulers.

When comparing the 2004 RDN waste composition study with the study completed in 2012, the amount of waste disposed at the Regional Landfill from the IC&I sector has remained relatively static at approximately 33,239 MT, while the overall percentage of the waste stream coming from the IC&I sector has increased from 56% of waste disposed at the Regional Landfill in 2004 to 63% of waste disposed at the Regional Landfill in 2012.

Multi-Family Housing Sector

As indicated in Table 1, the residential housing sector consists of the following types of housing: single family housing which includes single family detached homes, duplexes and fourplexes (75%), Townhouses and Mobile Home Parks (12%) and Apartments (13%)¹. Townhouses, Mobile Home Parks and Apartments are typically referred to as Multi-Family housing. Service delivery to the Multi-Family sector is primarily by the private sector. In the RDN, Multi-Family waste is estimated to be 8% of the IC&I waste received at the Regional Landfill and is approximately 20% of the residential solid waste generated in the region (not including self-haul waste).

¹ Estimates based on data from 2012 RDN Multi-Family Housing Diversion Strategy Progress Report

Table 1: Regional Distribution of Housing Units by Type, 2012

Area	Single Family			Townhouses/MHPs			Apartments			Municipal Collection	Private Collection
	%	Garbage	Recycling/FW	%	Garbage	Recycling/FW	%	Garbage	Recycling/FW	%	%
City of Nanaimo	67%	CON	CON	13%	Private	Private	19%	Private	Private	67%	32%
Electoral Areas	92%	RDN	RDN	8%	RDN	RDN	0%	Private	Private	100%	0%
COP	59%	RDN	RDN	24%	RDN	RDN	16%	Private	Private	83%	16%
Town of Qualicum Beach	84%	TQB	RDN	13%	TQB	RDN	3%	Private	Private	97%	3%
District of Lantzville	97%	RDN	RDN	3%	RDN	RDN	0%	-	-	100%	0%
Region Wide	75%	-	-	12%	-	-	13%	-	-	80%	20%

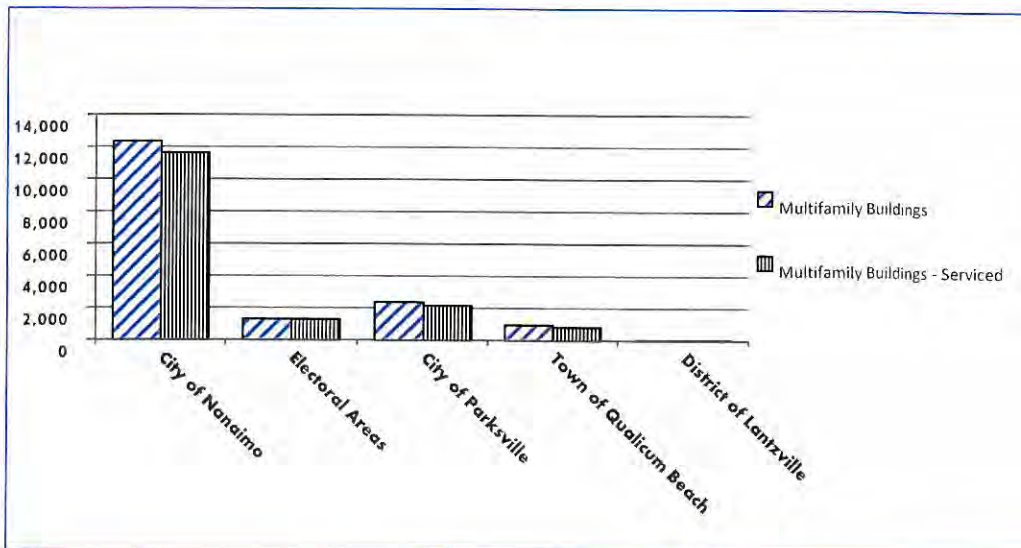
Multi-Family Diversion Strategy

Since 1991, the RDN has progressively banned materials from landfill disposal as local recycling and processing facilities became available. Banned household items include recyclable paper, cardboard, metal and, most recently in 2010, household plastic containers (i.e. empty HDPE and LDPE plastic containers from residential premises including milk jugs, margarine and yogurt containers and dish soap and laundry detergent bottles).

In 2008, the RDN launched a Multi-Family Recycling Program which was designed to increase waste diversion through source separation of recyclable material at multi-family buildings. This was an information program working collaboratively with key stakeholders such as; private haulers, property owners and managers and strata council representatives. Staff met frequently with haulers and consulted with property owners and managers as well as strata council representatives through letters and onsite visits.

The fieldwork involved face to face meetings with building owners to verify onsite recycling services throughout the RDN. Based on observations through these onsite visits, staff concluded that in 2012 94% of multi-family housing buildings had access to on-site recycling services (not including organics) that was equivalent to those provided to the single-family housing as presented in Figure 1.

Figure 1: Multi-Family Buildings with On-site Recycling Services, 2012



As indicated in Figure 1, the Multi-Family Recycling Program significantly improved access to recycling services in the multi-family housing sector. However, the 2012 waste composition study shows that there are still improvements that could be made (see Figure 2). For comparison purposes, the waste composition for the residential curbside is presented in Figure 3. Based on the 2012 Waste Composition study, paper and plastic still made up 31% of the multi-family waste stream. Comparatively, the same materials make up 21% of the residential curbside waste steam. This data suggests that, in 2012, although there was a high level of access (i.e. 94%) to multi-family on-site recycling facilities, there is significant opportunity to increase diversion.

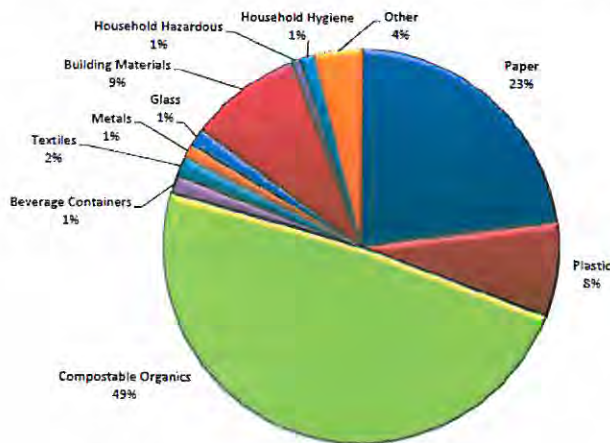


Figure 2: Multi-Family Waste Composition (2012)

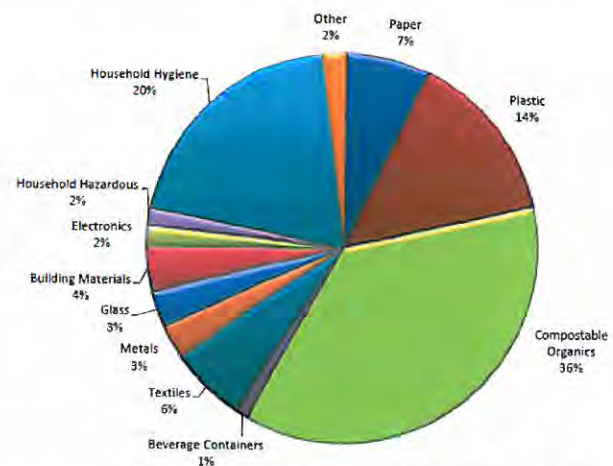


Figure 3: Curbside Residential Waste Composition (2012)

Since the work undertaken in 2012, the Ministry of Environment has amended the provincial Recycling Regulation to include Printed Paper and Packaging (PPP) generated from the residential sector as a stewardship material. Multi-Family housing is included in the residential sector per the recycling regulation, however participation in the stewardship program’s collection side relies on haulers to sign on with the stewardship agency and not all have. At present the Ministry has approved one stewardship plan for residential PPP, however a second plan with a focus on Multi-Family is currently with the Province for consideration; if approved this additional plan may result in increased recycling opportunities for this housing sector.

Furthermore, the greatest diversion opportunity continues to be with the compostable organics which make up almost half the waste stream from this housing sector.

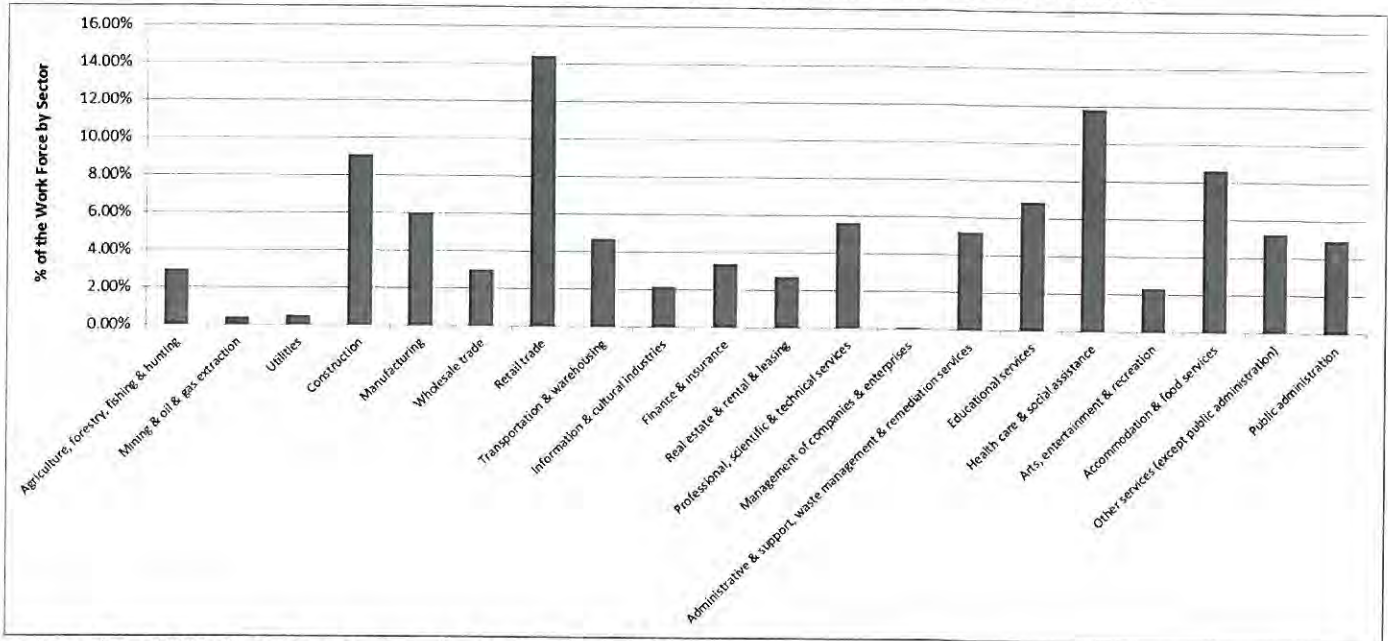
Challenges to achieving a high degree of source separation in the multi-family sector include inconvenience, cost, available space for separation and often a lack of a site champion to promote diversion. Appendix A presents a list of challenges and limitations that hinder diversion in both the multi-family and ICI sectors.

IC&I Sector

In the RDN, the IC&I sector is fully serviced by private waste haulers. Figure 4 provides an overview of the labour force in the Regional District by category with Retail Trade, Construction, and Health Care and Social Assistance being the top ranked employers in the Region.

In large part due to a successful Construction and Demolition (C&D) Waste Diversion Strategy, IC&I waste disposal in the RDN is largely generated from small and large businesses, industry, grocery stores, restaurants, multi-family residences and schools. Further discussion on the C&D Waste Diversion Strategy is not included in this discussion and will be presented to the RSWAC in a separate report.

Figure 4: Regional Distribution of Labour by Categories in Parksville and Nanaimo



Based on 2006 Stats Canada data for Parksville and Nanaimo

Commercial Food Waste Diversion Strategy

In 2004, the RDN waste composition study found that food waste and compostable paper comprised from the IC&I waste sector made up 21.6% of the waste disposed at the Regional Landfill. Following the opening of the International Composting Corporation (now Nanaimo Organic Waste) in June 2005, the RDN banned commercial food waste at the region’s solid waste facilities. Commercial food waste includes raw and cooked food and other compostable organic material from commercial and institutional premises.

Extensive consultation preceded the commercial food waste and organics disposal ban with follow-up site visits to over 200 businesses and organizations. Under Bylaw 1531, landfill disposal of compostable organic waste from a commercial or institutional facility is not permitted. It was expected that this prohibition on organic waste being received at the landfill and transfer station would be the catalyst for commercial and institutional facilities to have food waste diversion systems in place.

Figure 5 shows the results from the 2012 RDN waste composition study for the IC&I sector. The compostable organics category (estimated at 26.2% of the total waste disposed at the Regional Landfill disposed) consisted of food scraps (28%), yard waste (7%) and compostable paper products (6%).

The compostable organics from the IC&I sector made up 26.2% of the waste stream in 2012 as compared to 21.6% in 2004. However, with a changing waste stream, the efficacy of the Commercial Food Waste Diversion Strategy is better gauged by considering the change in per capita tonnage of compostable organics in the waste stream and this amount dropped from 95.5 kg/capita to 91.2

kg/capita between 2004 and 2012 respectively. These findings show that the current strategy has only realized modest success and there is significant opportunity for additional organics diversion in the IC&I sector. Furthermore, there is still a significant diversion opportunity with paper and plastic components.

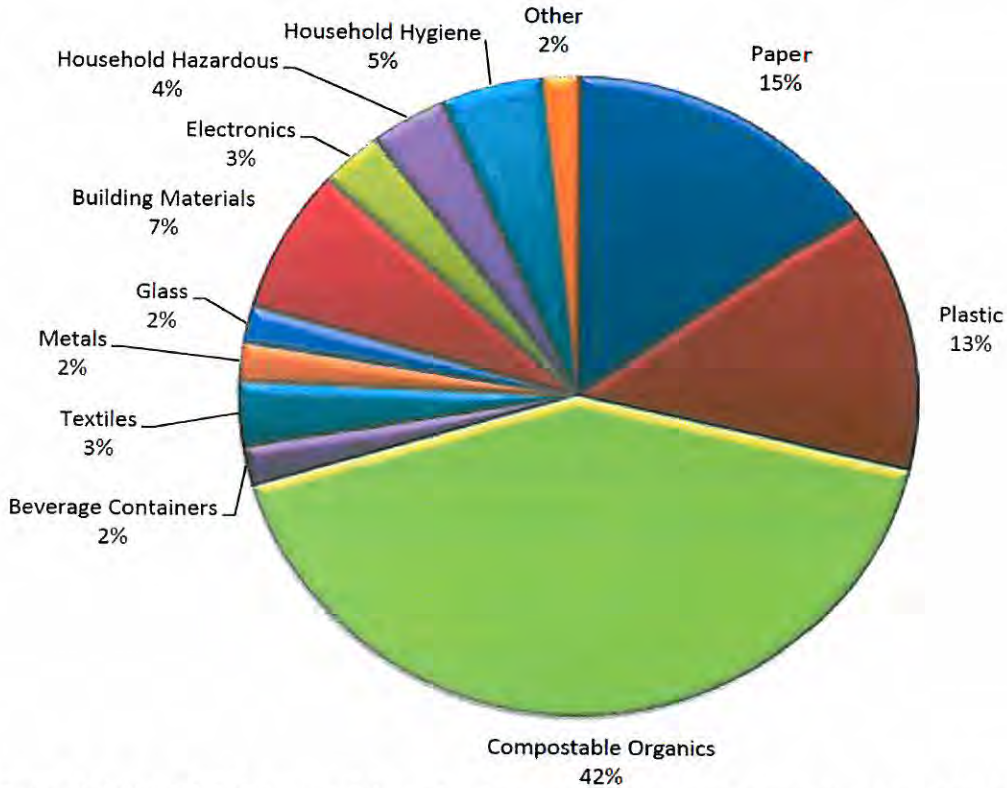


Figure 5: Industrial, Commercial, Institutional Waste Composition in the RDN (2012)

IMPACT ON DIVERSION

Based on the 2012 RDN Waste Composition Study, four material categories characterize approximately 77% of the IC&I waste stream: compostable organics, paper, plastic and building materials as shown in Figure 5. That means that there is an estimated 36% of waste disposed at the Regional Landfill that consists of compostable organics and paper from the IC&I sector that are banned from landfill disposal.

It is clear from the 2012 RDN Waste Composition Study that a large component of compostable organics is still not being diverted from landfill, with only a modest reduction in per capita disposal (from 95.5 kg/capita in 2004 to 91.2 kg/capita in 2012) (refer to Appendix B).

Table 2 shows IC&I weights of compostable organics diverted from landfill disposal from 2007-2015. There are a number of factors affecting these numbers however it is important to recognize that the amount of commercial organics diverted within the RDN has not increased despite the current Commercial Organics ban.

Table 2: IC&I Sector Organics Diversion in the RDN

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Weight (tn)	3,408	4,103	3,550	3,187	3,371	3,711	3,566	3,332	3,380

Enforcement

As mentioned previously in this report, the primary mechanism to motivate the diversion of recyclables and organics is by virtue of bans at the landfill and transfer station (refer to Appendix C for full list of existing landfill bans in the RDN). The RDN has encouraged voluntary compliance and has reserved the application of fines to the most egregious cases.

Since 2010, fines have been imposed on 65 separate occasions for recyclables in mixed solid waste. These have primarily been for metal and cardboard being in the waste. Few fines have been issued for commercial organic waste and possibly no fines imposed for household plastic containers. Details of the occurrences as well as pre-2005 data is available in the RDN archives but were un-researched at the time of this report. Anecdotally, landfill staff report that there are seldom significant amounts of banned materials in individual loads, offences on food waste and recyclables in mixed solid waste are applied only when there is contamination of 10% or more in the load.

There are a number of challenges with the current enforcement strategy as follows:

1. No Requirement for Source Separation – Although the landfill ban was intended to drive source separation, there is no actual requirement for the waste producer to make the effort.
2. Enforcement Transferred to the Waste Hauler – Fines are applied to the waste hauler depositing banned material. In theory, the cost can be transferred back to the waste producer but in practice this does not happen (i.e. fear of alienating customers, unable to pinpoint source of contamination due to mixing of loads).
3. Encourages Waste Export – The relative value of the Canadian and US dollar is currently a barrier to waste export to the US. As well, there are also private Canadian for-profit landfills. The imposition of fines on haulers does further increase the potential of waste export to locations that do not impose such restrictions. Should this happen, no waste diversion would likely be achieved.
4. Bans Apply to Different Sectors - Food waste is banned from the commercial sector while plastic containers are banned from households. Waste from different sectors is often collected in the same truck making enforcement in these cases virtually impossible.

IC&I Diversion Strategy

Table 3 looks at two scenarios for increasing diversion in the IC&I and Multi-family sectors.

Scenario 1: Increased Education/Enforcement at Regional Facilities

The RDN continues to work within the current regulatory authorities under the existing SWMP to improve IC&I organics and recycling diversion. This may include:

- Increase education and awareness
- Increase enforcement of current landfill bans at the landfill and transfer station

It is expected that the Multi-Family and IC&I sector would experience a marginal increase in diversion though additional outreach and that diversion would increase commensurate with increased enforcement of the landfill bans and issuing of fines. This approach runs the risk of increasing waste leakage where private haulers opt to haul waste out of district in order to bypass landfill bans. It is estimated that such an approach could remove as much as 20% of the recyclable materials and organics that still remain in the waste stream.

Scenario 2: Additional Regulatory Authority

Through the SWMP the RDN requests additional authorities to further drive diversion of recycling and organics within the IC&I and Multi-Family sectors. This could include:

- Mandatory Waste Collection
- Waste Hauler Franchising
- Waste Haulers as Agents
- Waste Source Control

This scenario provides for the introduction of economic and regulatory tools that encourage diversion. It is estimated that this approach could remove as much as 50-70% of the recyclable material and organics that remain in the waste stream.

Table 3: IC&I Sector Diversion Potential in the RDN

Target Material	2012		Scenario 1			Scenario 2					
	Waste Stream %	Amount in Waste Stream (MT)	If 20% is diverted			If 50% is diverted			If 70% is diverted		
			Amount in Waste Stream (MT)	Waste Stream %	Diversion Potential of Total Waste Stream	Amount in Waste Stream (MT)	Waste Stream %	Diversion Potential of Total Waste Stream	Amount in Waste Stream (MT)	Waste Stream %	Diversion Potential of Total Waste Stream
Paper	9.5	5,049	4039	7.6%	0.6%	2525	4.7%	1.5%	1515	2.8%	2.1%
Plastic	8.4	4,432	3546	6.6%	0.5%	2216	4.2%	1.3%	1330	2.5%	1.9%
Metal	4.8	2,864	2291	4.3%	0.3%	1432	2.7%	0.9%	859	1.6%	1.2%
Compostable Organics	26.2	13,879	11103	20.8%	1.7%	6940	13.0%	4.2%	4164	7.8%	5.8%
Total	48.9	26,224	20,979	39.3%	3.1%	13,112	24.6%	7.9%	7,867	14.8%	11.0%

Note: Scenario 1: 20% increase in diversion of available materials.
 Scenario 2: 50% to 70% increase in diversion of available materials.
 All estimates based on 2012 total waste generation of approximately 167,000 MT; 53, 319 MT disposed and 68% overall diversion

FINANCIAL IMPLICATIONS

Scenario 1 Increased Education/Enforcement at Regional Facilities	1 new FTE or equivalent at \$80,000/year including benefits to oversee the new IC&I diversion strategy. \$20,000/year in administrative costs to run the program. \$100,000/year for increased enforcement
Scenario 2 Additional Regulatory Authority	No financial estimate is available at this time as cost projections would be dependent on the type of additional regulatory authority which was granted.

REGULATORY AUTHORITY

If Scenario 2 is the preferred option additional regulatory authorities would need to be requested under the new SWMP.

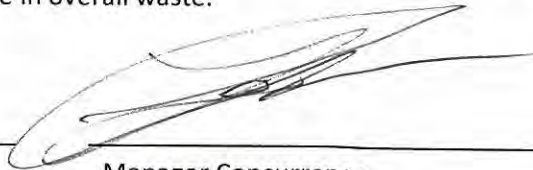
SUMMARY/CONCLUSIONS

The IC&I and Multi-Family sectors waste streams contain significant amounts of recyclable material and compostable organics. This is despite landfill bans being in place for various recyclable materials and commercial organics starting in 1991. These sectors provide the greatest opportunity for further waste diversion in the RDN.

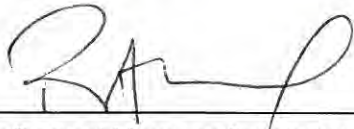
The RDN has done outreach to promote diversion in these sectors and has largely relied on voluntary compliance with the landfill bans and applying fines in the most egregious cases. It is believed that an increased effort in both outreach and enforcement consistent with the current strategies can achieve a moderate increase of about 3% in overall waste diversion. It is also believed that the provision of authorities available through the SWMP can provide additional regulatory and economic tools to drive very high levels of diversion up to a 10% increase in overall waste.



Report Writer



Manager Concurrence



General Manager Concurrence



A/CAO Concurrence

Appendix A: Common Challenges in the IC&I Sector Identified for Waste Diversion

Challenge as identified by: <i>Waste Haulers</i>	Limitation to Diversion
Single stream/co-mingled recycling capacity is limited. ICI businesses do not have access to the co-mingled materials recycling facility (MRF).	Haulers can only offer source separated recycling opportunities to their customers – usually cardboard or mixed paper. The material limitation also limits the amounts of materials that can be diverted
Cost to establish and maintain a recycling program is more than the cost for a single mixed waste stream service. Not all haulers for Multi-Family are involved in the PPP stewardship agency (MMBC) so not same level of service available throughout the region.	Customers expect recycling services to be provided for free or at a considerably reduced rate. Some even expect to be paid for their recycling efforts. If these expectations are not met then disposal alternatives are more fiscally attractive for the waste generator.
Not enough space available for the storage of separated materials (i.e. paper)	The amount and type of recycling that can occur onsite is limited by the space available for the collection and storage infrastructure.
Need to have a single point of contact on the client side who is also a “waste champion”	Without someone being responsible for the recycling programs on the client side, recyclable materials such as cardboard, paper, etc. still end up in the waste stream.
Inability of haulers to pinpoint contamination in a load due to multiple stops on each route to fill up the truck	The lack of ability to track where contamination comes from in the load makes it difficult to impose penalties or even offer feedback to those waste generators who are not participating properly in the programs.
Each customer has very different and unique needs	The need to customize programs for each client creates difficulties in offering efficient programs which in turn limits the haulers’ ability to collect and handle more types and volumes of materials for diversion.

Challenge as identified by: <i>Multi-Tenant building managers including shopping centres</i>	Limitation to Diversion
Lack of clear understanding of roles, responsibilities and fund allocations for common infrastructure	With an unclear assignment of roles, responsibilities and accountability, programs tend not to materialize or function well in multi-tenant buildings. Similarly, the infrastructure used for a common good (such as waste rooms) tends not to receive the funding or priority it requires for maintenance and improvement.
High staff turnover rates for those most likely to be on the front lines of waste management tasks means a loss of program continuity	Lack of training and/or standardized programs makes separating waste seem difficult and may lead to increased contamination rates and decrease in participation in recycling programs.
Lack of overarching regulations to incentivize/force generator responsibility for waste and participation in programs	Independent tenants of a building may have their own waste diversion policies and targets but their ability to meet them may be hindered if the waste infrastructure is provided on a whole building basis and does not meet their needs.

Challenge as identified by: <i>Educational Institutions</i>	Limitation to Diversion
The cost of "extra service" waste management programs is borne by the individual schools and facilities	Schools needing to make budget cuts may look to downsizing or eliminating waste diversion programs as a way to save money.
Lack of available infrastructure to recycle comingled recyclables and organics	Being limited to material specific recycling opportunities (i.e. paper) because of a lack of processing infrastructure in the region has limited the programs the schools can offer for waste diversion activities.

Appendix C: Landfill Bans

Schedule 'C'

"Prohibited Waste"

The following gaseous liquids and municipal solid wastes are not acceptable for disposal at a Solid Waste Management Facility and include, but are not limited to:

1. At the Regional Landfill:
 - (i) Biomedical Waste;
 - (ii) Commercial Organic Waste;
 - (iii) Concrete or asphalt pieces, or rocks greater than 0.03m³ or 70 kg;
 - (iv) Corrugated Cardboard;
 - (v) Drums;
 - (vi) Garden Waste;
 - (vii) Gypsum;
 - (viii) Hazardous Waste;
 - (ix) Household Plastic Containers;
 - (x) Ignitable Wastes;
 - (xi) Land Clearing Waste;
 - (xii) Liquids, except as permitted herein;
 - (xiii) Metal;
 - (xiv) Motor vehicle bodies and farm implements;
 - (xv) Municipal Solid Waste that is on fire or smouldering;
 - (xvi) Radioactive Waste;
 - (xvii) Reactive Wastes;
 - (xviii) Recyclable Paper;
 - (xix) Stewardship Materials;
 - (xx) Special waste, as defined in the *Special Waste Regulation* (British Columbia) except asbestos ;

- (xxi) Tires;
- (xxii) Wood Waste

2. At Church Road Transfer Station: (i)

- Biomedical Waste;
- (ii) Commercial Organic Waste;
- (iii) Concrete or asphalt pieces, or rocks greater than 0.03m³ or 70 kg;
- (iv) Controlled Waste;
- (v) Corrugated Cardboard;
- (vi) Garden Waste;
- (vii) Gypsum;
- (viii) Hazardous Waste;
- (ix) Household Plastic Containers; (x)
Ignitable Wastes;
- (xi) Land Clearing Waste;
- (xii) Liquids, except as permitted herein;
- (xiii) Metal;
- (xiv) Motor vehicle bodies and farm implements;
- (xv) Municipal Solid Waste that is on fire or smouldering;
- (xvi) Radioactive Waste;
- (xvii) Reactive Wastes;
- (xviii) Recyclable Paper;
- (xix) Special waste, as defined in the *Special Waste Regulation* (British Columbia) except asbestos;
- (xx) Stewardship Materials;
- (xxi) Tires;
- (xxii) Wood Waste.