metrovancouver

Household Organic Waste Diversion and Composting in Metro Vancouver

GHG Reduction Credits for **2017** Climate Action Reporting

May 23, 2018

This report was prepared by the staff of the Air Quality and Climate Change Division of Metro Vancouver, with input from staff of the Solid Waste Services Department.

Questions on the report should be directed to AQInfo@metrovancouver.org or the Metro Vancouver Information Centre at 604-432-6200.

Contact us:
Metro Vancouver
Air Quality and Climate Change Division
4730 Kingsway, Burnaby, BC V5H 0C6
604-432-6200
www.metrovancouver.org

EXECUTIVE SUMMARY

This document provides an overview of the greenhouse gas (GHG) emission reduction calculations for the additional diversion of organic material from the solid waste stream in 2017 (compared to the 2006 baseline), attributable to organics collection programs run by municipalities in the Metro Vancouver region. All municipalities in the region are signatories to the B.C. Climate Action Charter, and as such have made a voluntary commitment to make progress towards carbon neutrality. To balance their carbon inventories, they require "GHG reduction credits" (or "carbon credits") each year from projects such as this one.

Metro Vancouver's Role: The final disposal of municipal solid waste from all municipalities in the region is managed at Metro Vancouver disposal facilities and the Vancouver Landfill located in the City of Delta. Some waste may also be sent to "contingency landfills" in Washington and Oregon as required. Metro Vancouver's Solid Waste Services Department maintains records of the solid waste flows throughout the waste management system, up to and including final disposal at landfills and a waste-to-energy facility. This means that the organization is uniquely positioned to conduct the emission reduction calculations associated with organics diversion. This report has been prepared on behalf of the region's municipalities to fulfill the reporting requirements associated with the Climate Action Charter and the Provincial Carbon Neutral Local Government Program.

Project Overview: This emissions reductions project comprises the collection of municipal organics (yard waste and/or food scraps) through residential "green bin" programs, thereby avoiding methane emissions that would have occurred had the organics undergone anaerobic decomposition in a landfill. Municipalities provide residents with green bins for their household organic material. Municipal fleet vehicles (either owned or contracted) then collect the organics in parallel with the regular household waste and recycling collection programs. The collected organics are brought to a composting facility, where controlled aerobic composting processes ensure that GHG emissions are minimized. Co-benefits of organics diversion include the production of useful compost, reduced volume of waste landfilled, and in some cases production of energy or biofuels.

Baseline and Additionality: The baseline year for this project is 2006. Therefore, a municipality can only receive carbon credits for additional tonnes of organics that are collected in a subsequent year, beyond the amount collected in the baseline year. Although some municipalities have been diverting and composting organic material since before the Climate Action Charter was signed, there have been significant increases in organics collected as existing programs are expanded and some new programs are initiated. There is currently no Provincial or Federal regulatory requirement for municipalities to collect and compost organics.

Methodology and Estimated Emissions Reductions: The project uses the methodology outlined in the Option 1 Project Profile on Household Organics Waste Composting provided by the Green Communities Committee, in conjunction with the accompanying calculator. Metro Vancouver has prepared this report in accordance with the Green Communities Committee's Becoming Carbon Neutral Guidebook. The estimated GHG reductions credits for 2017 are based on the reported additional organics diversion undertaken by municipalities in 2017. **Total GHG reduction credits for all eligible municipalities have been calculated to be 39,752 tonnes CO_2 equivalent, which can be used to balance municipal carbon liabilities for the 2017 reporting year.**

TABLE OF CONTENTS

LIST OF TABLES

1.0 COMPLIANCE WITH GREEN COMMUNITIES CARBON NEUTRAL FRAMEWORK OPTION 1 PROFILE

1.1 Household Organics Waste Composting – Option 1 Profile Summary

Municipal curbside organics collection programs have been successful in diverting increasing quantities of organic waste (yard trimmings and food scraps) from landfills. Organics diversion activities have environmental benefits, including avoided emissions of landfill gas (which contains methane, a potent greenhouse gas). The Provincial Green Communities Committee (GCC) has developed a profile and calculator to allow municipalities to calculate GHG reductions attributable to organics diversion. The resulting carbon credits can be used towards municipal Carbon Neutrality goals, under the Climate Action Charter framework.

The project profile on Household Organics Waste Composting (the Profile) provides guidance on estimating the amount of greenhouse gas (GHG) emissions that can be reduced by diverting household organic waste into a centralized community composting system rather than sending it to a landfill. When organic waste is placed in a landfill, methane emissions occur gradually over 100+ years as the material decays (Baseline Emissions). In contrast, placing the same amount of organic waste in a centralized composting facility involves a rapid aerobic decay that generates far fewer emissions within a single year (Project Emissions). So when organic material is composted instead of going to a landfill, there is a reduction of emissions that would have occurred at the landfill in the future. The project profile and accompanying organics diversion calculator (the Calculator) provides an accounting approach to quantifying these reductions over time in each year that they would have occurred. GHG reduction credits are allocated to the year in which the organics diversion occurred.

1.2 Baseline Year and Project dates

The baseline year is 2006 and any additional organics diversion (i.e. the amount beyond that which was collected in the baseline year) that occurred post signing of the Climate Action Charter (September 2007) is eligible for credits. This Project Report accounts for additional organics diverted by municipal governments between January 1 and December 31, 2017, and calculates credits that apply to the 2017 reporting year based on the GCC Household Organic Waste Composting project profile.

1.3 Project Eligibility Statement

Metro Vancouver asserts that the 2017 Project Report for the crediting period meets all eligibility requirements of the BC Green Communities Committee's (GCC) "Becoming Carbon Neutral Guidebook".

Project Eligibility Requirements:

1. Emission reductions are outside the local government corporate emissions boundary, as defined in the Carbon Neutral Workbook:
    - Emissions associated with solid waste disposal sites (including landfills and composting facilities) are outside the corporate boundary, according to the Workbook.

2. Emission reductions have occurred before they are counted:
    - The emission reductions being claimed for 2017 are associated with additional organics diversion activities that have occurred by the end of that year. The GCC Organics Diversion calculator uses a BC landfill-specific methane generation model to determine the avoided methane emissions due to diversion over the 100 year period after the year in which the diversion occurred.

3. Emission reductions are credibly measured:
    - Option 1 (GCC Supported Projects) are considered to meet this Project Eligibility Requirement. Emission reductions have been calculated using the Organics Diversion Calculator provided by the Green Communities Committee.

4. Emission reductions projects are beyond business as usual (BAU): projects must have started after September 26, 2007; must not be required to fulfill a federal or provincial government's legislated or regulatory requirement; and meet one of three tests (financial, other barriers or common practice):
    - Option 1 (GCC Supported Projects) are considered to meet this Project Eligibility Requirement.
    - There is currently no Provincial or Federal regulatory requirement for municipalities to collect and compost organics. Metro Vancouver has been working with its member jurisdictions to implement an organics disposal ban that aims to encourage additional food scraps recycling in the region. Since this ban is at the local government level, it does not affect the additionality of this project.

5. Accounting of emission reductions is transparent:
    - This report provides details of the emission reduction accounting.

6. Emission reductions are counted only once:
    - Metro Vancouver has calculated the emission reductions from municipal organic waste diversion based on the regional waste flow data that it is responsible for collecting (and validating) from the municipalities in the region. The emission reductions claimed in this report have not been previously committed or sold as emission reductions.

7. Project proponents have clear ownership of all emission reductions:
    - The local governments claiming emission reductions under this profile assert that they have exclusive rights to the legal and commercial benefits of reductions associated with municipal organic waste diversion. Metro Vancouver makes no claim of ownership to the emission reductions associated with municipal diversion of organic waste.

1.4 Contact Information

Contact information for the Project Designate and Project Developer are provided in Tables 1 and 2 below.

Table 1 Project Designate Contact Information

Contact Name and Title:	Roger Quan, Director, Air Quality and Climate Change
Company:	Parks, Planning and Environment Department Metro Vancouver
Roles and Responsibilities:	Project Designate
Address:	4730 Kingsway, Burnaby, BC V5H 0C6
Telephone:	604-436-6770
E-mail:	Roger.Quan@metrovancouver.org

Table 2 Project Developer Contact Information

Contact Name and Title:	Joshua Power, Policy Analyst, Air Quality and Climate Change
Company:	Parks, Planning and Environment Department Metro Vancouver
Roles and Responsibilities:	Project Plan Developer
Address:	4730 Kingsway, Burnaby, BC V5H 0C6
Telephone:	604-216-3262
E-mail:	Joshua.Power@metrovancouver.org

2.0 PROJECT DESCRIPTION

2.1 GHG Assertion

This Project Report summarizes the regional household organic waste diversion activities, as reported to Metro Vancouver by the Municipalities, during the crediting period from January 1 to December 31, 2017. Project activity in 2017 resulted in a total GHG emissions reduction of **39,752 tonnes CO_2 equivalent.**

2.2 Data and Calculations

2.2.1 Organic Waste Diversion Data

Metro Vancouver's Solid Waste Services Department receives information from municipalities on solid waste diversion activities annually, including tonnes of municipal solid waste (MSW), recycling and organics (yard trimmings and food scraps) collected by municipal programs. These data are combined with data from Metro Vancouver's transfer stations, private recycling processors, extended producer responsibility (EPR) stewards and both regional final disposal sites (Vancouver Landfill and the Waste to Energy Facility), as well as "contingency landfills" (facilities in the US), to provide a complete picture of waste management activities in the region.

The critical factor determining whether a municipality receives carbon credits is whether they collected (i.e. diverted) additional organics in 2017, above and beyond the amount collected in the 2006 baseline year. Attachment A provides the diverted organics by municipality, as reported to Metro Vancouver by

the municipal solid waste coordinators, for 2017 compared to the baseline year, and the proportion that is eligible for carbon credits (in 2017) based on the GCC's additionality criteria. Local Governments maintain auditable records of their organics diversion programs, including the quantity of organic waste collected in 2006 (the "baseline year") and each year since that time, whether food scraps collection was included in the program, and the type of composting facility that receives the diverted organics.

2.2.2 Regional Approach to Carbon Credits

Metro Vancouver and its member municipalities have worked collaboratively to develop a regional approach to calculating carbon credits related to organics diversion because such an approach provides collective benefits, including data accuracy/integrity, the efficiency with which the process is conducted, and also because it reduces the likelihood that any municipality in the region will have a geographic advantage. This regional approach has been endorsed by Metro Vancouver's Regional Engineers Advisory Committee's Climate Protection Subcommittee and Solid Waste Subcommittee, and has been agreed to by the Green Communities Committee.

The organics diversion calculator spreadsheet requires information about the final disposal of municipal solid waste (MSW) in order to determine avoided emissions. Only organic waste diverted from landfills are eligible to earn credits, whereas organic waste that is diverted from a Waste to Energy facility does not. Metro Vancouver has the Provincially-delegated responsibility (*BC Environmental Management Act*) for the management of all of the municipal solid waste for the region, whether it is dropped off at a Metro Vancouver transfer station or direct-hauled to a disposal facility.

Given the complexities of the solid waste management system in the Metro Vancouver region, individual municipalities do not decide which final disposal facility their municipally-collected solid waste would go to – this decision is based on system efficiencies related to the operations of the transfer stations and disposal facilities. Likewise, tipping fees are based on system-average costs, and are the same throughout the region. Individual municipalities generally cannot stipulate or trace where the solid waste they collect is disposed of. The only three exceptions are the City of Vancouver, the City of Delta and the City of Richmond, each of which uses the Vancouver Landfill as their exclusive disposal site for municipally collected waste.

The proportions of waste sent to each of the final disposal facilities is shown in Table 3, below. For municipalities other than Vancouver, Delta, and Richmond, the average fractions of municipally collected solid waste sent to the final disposal facilities have been calculated using 2017 waste flow data for those municipalities in the region. In 2016, Metro Vancouver stopped sending waste to Cache Creek Landfill. In 2017 some municipal solid waste from the region was sent to two "contingency landfills" in the US (Washington and Oregon). Since the contingency landfills are out of region, no GHG reduction credits are being claimed for the diversion of household organics from final disposal in these facilities.

Table 3 Proportions of Municipally-collected Waste Sent to Each of the Final Disposal Facilities for the Region

Year	WTEF	VLF	Contingency Landfills	Applies to:
2017	0.0%	100%	0.0%	Vancouver, Delta and Richmond
2017	35.5%	47.6%	16.9%	All other Metro Vancouver municipalities

Note: WTEF = Waste to Energy Facility (Burnaby); VLF = Vancouver Landfill;
Contingency Landfills are located in Washington and Oregon.

2.2.3 Using the Green Communities Organics Diversion Calculator

The Provincial Calculator was used to calculate the carbon credits by municipality, by year. In accordance with guidance from the Province, the ratio of food scraps to yard trimmings in the additional diverted household organic waste was assumed to be 50:50. The composting facilities used by Municipalities in Metro Vancouver during the Project Period are all categorized as "Forced Aeration Compost (Optimized)".

The key inputs to the calculator were:

- The regional proportion of MSW sent to each of the final disposal sites in 2017, as determined by Metro Vancouver; this applies to all municipalities except City of Vancouver, City of Delta and the City of Richmond (Table 3, above);
- The landfill gas (LFG) collection efficiency for the Vancouver Landfill. According to the guidance in the GCC Organics Diversion Profile, in 2016 and in subsequent years, landfill collection efficiencies are set at 75% to ensure alignment with the Provincial Landfill Gas Management Regulation. For comparison purposes, the reported LFG collection efficiency (based on modeled LFG generation and actual LFG collection data) for the landfill is also shown.

Table 4 2017 Landfill Gas Collection Efficiency for Vancouver Landfill

Year	VLF [a]
2017 (calculator setting)	75%
2017 (reported)	74.4%

[a] Vancouver Landfill 2017 Annual Report (March 2018)

The factors presented in Tables 3 and 4 were used in the Organics Diversion Calculator[1] to determine the GCC carbon credits from diverting one tonne of additional organic waste from disposal at the three facilities (Table 5) to optimized (forced aeration) composting facilities. This "carbon credit factor" (i.e. amount of credits per tonne organics diverted) changes over time, primarily because the proportion of waste sent to each final disposal facility changes each year due to operational priorities. (Prior to 2016, the factors were also influenced by annual improvements to the landfill gas collection systems at the two landfills, but the collection efficiency is now fixed in the calculator at 75%).

[1] The calculator and accompanying profile are available at: http://www.toolkit.bc.ca/resource/becoming-carbon-neutral-workbook-and-guidebook

Table 5 GCC Carbon Credits (tonnes CO_2e) per tonne of diverted organic waste.

Year	GCC Carbon Credits (tonnes) per tonne of diverted organics	Applies to:
2017	0.494	Vancouver, Delta and Richmond.
2017	0.235	All other Metro Vancouver municipalities.

Using the factor for 2017 presented in Table 5, the number of carbon credits available to each municipality for the 2017 reporting year was calculated, and these are presented in the table in Attachment B. The number of new GCC carbon credits available in 2018 and future years will depend on the amount of eligible organics diversion activity in those years and the 2018 inputs to the calculator.

3.0 OWNERSHIP OF CREDITS

The member municipalities of Metro Vancouver are solely responsible for the household organics diversion programs in their jurisdictions, and are hence identified as the owners of the corresponding GHG reduction credits. GHG reduction credits are similar to market "carbon offsets" but cannot be bought, sold or traded. Individual municipalities will choose whether to include these credits in their final Carbon Neutral Reports as part of the Climate Action Revenue Incentive Program. Metro Vancouver does not claim rights to the credits associated with this organics diversion GHG reduction project.

4.0 REFERENCES AND SUPPORTING DOCUMENTS

B.C. Climate Action Toolkit. "Carbon Neutral Local Government". Available at:
http://www.toolkit.bc.ca/resource/becoming-carbon-neutral-workbook-and-guidebook

Green Communities Committee. 2012. "Becoming Carbon Neutral: A Guidebook for Local Governments in British Columbia". Version 3, July 2014. Available at:
http://www.toolkit.bc.ca/sites/default/files/BecomingCarbonNeutralGuideV3.pdf

Green Communities Committee. 2012. "The Workbook. Helping Local Governments Understand How to be Carbon Neutral in their Corporate Operations ". Available at:
http://www.toolkit.bc.ca/sites/default/files/CarbonNeutralWorkbook.V2_noapdcs_03.12_0.pdf

Green Communities Committee. 2015. "Green Communities Carbon Neutral Framework Option 1 Profile: Organic Waste Composting". Available at:
http://www2.gov.bc.ca/assets/download/6522E05039704742A6DA531A8C3C88D6

Province of British Columbia. 2007. "Climate Action Charter". Available at:
http://www.cscd.gov.bc.ca/lgd/library/BC_CLIMATE_ACTION_CHARTER.pdf

APPENDIX A: TONNES OF COMPOSTABLE ORGANIC MATERIAL DIVERTED

Table 6 Mass of Household organics (tonnes) diverted by Metro Vancouver Municipalities in 2017, compared to 2006 baseline organics.

Please note: this table does not show GHG reduction credits (see Table 7 for credits).

	2006 [1]	**2017**	
Municipality	Reported Baseline Organics (tonnes)	Reported Diverted Organics (tonnes)	Eligible Organics (tonnes)
Anmore	0	308	308
Belcarra	0	65	65
Bowen Island	50	561	511
Burnaby	9,634	20,670	11,036
Coquitlam	4,612	15,948	11,336
Delta	5,732	12,319	6,587
Langley City	504	1,992	1,488
Langley Township	3,433	13,355	9,922
Lions Bay	0	218	218
Maple Ridge	0	0	0
New Westminster	0	5,161	5,161
North Vancouver City	1,152	2,936	1,784
North Vancouver District	4,511	8,721	4,210
Pitt Meadows	0	2,426	2,426
Port Coquitlam	3,186	6,448	3,262
Port Moody	1,200	3,014	1,814
Richmond	7,783	20,920	13,137
Surrey [2]	17,962	22,663	4,701
Vancouver	17,700	49,000	31,300
West Vancouver	3,184	5,193	2,009
White Rock	0	1,589	1,589
Total Eligible Organics:			**112,864**

[1] The "Baseline" year for organics diversion is 2006. Eligible organics are the additional amount in the project year above and beyond the baseline amount.

[2] City of Surrey reported diverting a total of 62,848 tonnes of household organics in 2017. However, since the municipality implemented a new organics collection program in 2012, and are pursuing emission offsets related to that program, they have chosen only to include their "2017 baseline" organics (22,663 tonnes, according to their calculations), to use for the GCC local emission reduction program. This ensures that there is no “double counting” of diverted organics or associated emission reductions.

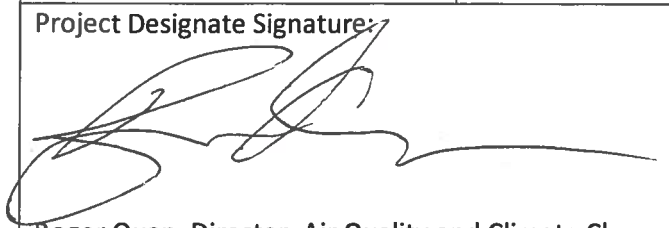
APPENDIX B: MUNICIPAL CARBON CREDITS

Table 7 Green Communities Organics Diversion Carbon Credits by Municipality, 2017 (tonnes CO_2e)

This table gives the GHG reduction credits that can be claimed by each municipality.

Municipality	**2017 Credits** (tonnes CO_2e)
Anmore	72
Belcarra	15
Bowen Island	120
Burnaby	2,595
Coquitlam	2,666
Delta	3,255
Langley City	349
Langley Township	2,333
Lions Bay	51
Maple Ridge	0
New Westminster	1,213
North Vancouver City	419
North Vancouver District	990
Pitt Meadows	570
Port Coquitlam	767
Port Moody	426
Richmond	6,492
Surrey	1,105
	0
Vancouver	15,469
West Vancouver	472
White Rock	373
Total:	**39,752**

APPENDIX C: GREEN COMMUNITIES FRAMEWORK SELF-CERTIFICATION FORM FOR OPTION 1 PROJECT – HOUSEHOLD ORGANIC WASTE COMPOSTING IN METRO VANCOUVER

Project Proponent Information	
Name of Local Government Project Proponent(s)	*Project Developer:* Metro Vancouver *Local Governments Claiming Reductions:* Municipalities in the Metro Vancouver Region
Project Designate appointed to sign off on the Self-certification Form	Name: Roger Quan Title: Director, Air Quality and Climate Change Phone: 604-436-6770 Email: Roger.Quan@metrovancouver.org
Project Developer Contact	Name: Joshua Power Title: Policy Analyst, Air Quality and Climate Change Phone: 604-216-3262 Email : Joshua.Power@metrovancouver.org
Project Information	
Project Report Title	Municipal Organic Waste Diversion and Composting in Metro Vancouver: Greenhouse Gas Emission Reductions and Credits for 2017 Climate Action Reporting [*X*] Copy of Project Report attached
Timing and Amount of reductions being claimed	GHG emission reductions of **39,752 tonnes CO_2 equivalent** are claimed from this project, from activities between January 1 and December 31, 2017.
Certification that the required work occurred	[*X*] I declare that the project work required to achieve the GHG reductions from this project as estimated by the project profile used, actually occurred during the years in which they are identified, and will be claimed in 2017 as per the Project Eligibility Requirements outlined in Appendix 1 of the *Becoming Carbon Neutral* Guidebook.
Self Certification: Authorization and Sign off	
Project Designate Statement	I declare that the information provided in this self-certification form is to the best of my knowledge correct and complete.
Project Designate Signature:  Roger Quan, Director, Air Quality and Climate Change	Date: May 23, 2018