



Carbon Trading and the Proposed Landfill Gas Regulations



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What is Carbon?

- Short form for Carbon Dioxide equivalents (CO_2e)
- 6 gases that cause a greenhouse effect have different GWPs
- CO_2 is most common (1 GWP), also methane (21 GWP)

The Carbon Market

- Where buyers and sellers of carbon credits meet
- Global in nature
- 1.6 B tonnes CO₂e, \$35 B in 2006
- 50% vol. increase for 2007
- Majority in Europe for compliance
- Project-based (Clean Development Mechanism (CDM), voluntary)

How do Carbon Offset Projects Work?

- A project that reduces GHGs (carbon) emissions over a period of time
- Not business as usual (minimum: not required by regulation; more stringent)
- Baseline – what would have happened without the project (need rules to determine, what is the project boundary)

How do Carbon Offset Projects Work?

- Can you measure the emission reduction?
- Can a third party verify the emission reduction (protocols)?
- CDM – project based carbon credits – strict rules are applied
- Voluntary market – wild west – multiple sets of rules

GHG Facts: Canada/Ontario

- 596 MT CO₂e in 1990
- 747 MT CO₂e in 2005
- 25.3 % increase
- Ontario 207 MT in 2005 (28% of Canadian total)

GHG Facts : Waste

➤ National Inventory for Waste includes:

1. Solid Waste Disposal on Land
2. Wastewater Handling
3. Waste Incineration

GHG Facts

- Solid Waste Disposal on Land
 - 1990 22 MT CO₂e (3.7% of National total)
 - 2005 28 MT CO₂e (3.3% of National total)

- Ontario 6.8MT CO₂e (3.3%) in 2005 from landfills

- Ontario landfilled 6 m tonnes in 2005

Trends in MSW in Canada

	2000 (kg/cap/year)	2002 (kg/cap/year)	2004 (kg/cap/year)
MSW Generated	952	970	1017
MSW Diverted	199	225	245
MSW Disposed	752	760	772
% Diversion Canada	21	23	24
% Diversion Ontario		23	29
% Diversion Residential		30	42

Climate Change and Greenhouse Gases

GHG Emissions from Recycling Compared to Landfill Disposal (tonnes CO₂e per tonne)

Material	GHG Factor
Newsprint	(1.53)
Fine paper	(4.38)
Cardboard	(3.54)
Other paper	(3.98)
Aluminium	(6.51)
Steel	(1.20)
Copper wire	(4.11)
Glass	(0.12)
HDPE	(2.29)
PET	(3.64)
Other plastic	(1.82)
Food scraps	(1.04)
Yard trimmings	0.09
White goods	(1.48)
Personal computers	(1.61)
Televisions	(0.24)
Microwaves	(1.28)
VCRs	(0.97)
Tires	(3.31)

Values in the table are expressed as carbon dioxide equivalents (CO₂e), which is the standard measurement for global warming potential. Values should be interpreted in the following way: For every one tonne of newsprint recycled, 1.53 tonnes of CO₂e are avoided. Where the emission values are shown as negative, an enlargement of a carbon sink (the opposite of an emission) has occurred.

Climate Change and Greenhouse Gases

Residential Sector, Projected GHG Emissions (Rounded tonnes CO₂e)

Material	Recovery Scenarios		
	Low (36%)	Medium (44%)	High (54%)
Newsprint	(282,000)	(451,000)	(653,000)
Fine paper	(140,000)	(225,000)	(325,000)
Cardboard	(170,000)	(272,000)	(394,000)
Other paper	(542,000)	(888,000)	(1,255,000)
Glass	(9,000)	(15,000)	(21,000)
Ferrous	(64,000)	(103,000)	(149,000)
Nonferrous	(82,000)	(131,000)	(189,000)
HDPE	(25,000)	(39,000)	(57,000)
PET	(36,000)	(58,000)	(84,000)
Other plastics	(102,000)	(163,000)	(236,000)
Food waste	(524,000)	(838,000)	(1,212,000)
Yard waste	45,000	73,000	105,000
Total	(1,931,000)	(3,090,000)	(4,470,000)

Climate Change and Greenhouse Gases

Projected GHG Emission Reductions (*tonnes CO₂e*)

Sector	Low (36%)	Medium (44%)	High (54%)
Residential	1,931 K	3,090 K	4,470 K
IC&I	2,471 K	3,952 K	5,717 K
CR&D	165 K	266 K	384 K
Total	4,567 K	7,308 K	10,571 K

Numbers are rounded. Some residual error is present.

Compost or Landfill

- 10,000 t of organics to landfill or compost facilities
- Alberta Protocol on a windrow facility results in carbon credit of 14,000 t
- Same tonnage in landfill run through GasSim model results in 8,000 t generated
- With landfill collection 6,000 t captured 2,000 t escaping

Summary

- If regulated carbon trading for landfill gas and compost facilities would essentially be eliminated in Ontario
- From a climate change perspective do we need to shift the focus from back end solutions to front end planning?

Questions/Comments



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