

## Appendix D The Climate Registry Reporting Requirements

(May 2010)

### 1. Background on The Climate Registry

The Climate Registry is a nonprofit organization that provides meaningful information to reduce greenhouse gas (GHG) emissions. The Climate Registry establishes consistent, transparent standards throughout North America for businesses and governments to calculate, verify and publicly report their carbon footprints in a single, unified registry.

Members of The Climate Registry are the businesses and governments that commit to reporting their entity-wide GHG emissions according to the requirements of The Climate Registry's voluntary reporting program. For information on how to become a Member of The Climate Registry please email [info@theclimateregistry.org](mailto:info@theclimateregistry.org).

The Climate Registry's board of directors consists of representatives of each state, province, territory, and Native Sovereign Nation that has committed to endorse The Climate Registry's voluntary entity-wide GHG registry, encourage entities in their jurisdictions to become Members of The Climate Registry, and incorporate The Climate Registry's GHG quantification methodologies into any future mandatory GHG reporting programs or GHG emissions reduction programs in their jurisdictions.

Registry Members are afforded many benefits and services including:

#### **The Climate Registry's Reporting Software**

Only The Climate Registry's Members have full access to The Climate Registry's reporting software, which is designed to allow for streamlined reporting and calculation of GHG emissions.

#### **Training Opportunities**

Web-based trainings sessions are held regularly and cover how to build an inventory, user trainings for The Climate Registry's reporting software, and forming a GHG emissions reduction plan. Other educational opportunities for Members include access to regional events and science and technology-focused study trips.

#### **Reporting Helpline**

Registry staff is available to help answer reporting questions at (866) 523-0764 and [info@theclimateregistry.org](mailto:info@theclimateregistry.org).

#### **Reporting Materials**

Printed copies of The Climate Registry's General Reporting Protocol (GRP) and General Verification Protocol (GVP) are distributed to new Members when they join The Climate Registry.

For more information about The Climate Registry, please refer to The Climate Registry's website: [www.theclimateregistry.org](http://www.theclimateregistry.org).

### 2. How to use this Protocol

If you are a local government Member of The Climate Registry, as defined below, you are required to follow the guidance found in this appendix in addition to the guidance found in the program-neutral Local Government Operations (LGO) Protocol. Where there are differences between the program-neutral LGO Protocol and this appendix, Registry Members are required to adhere to the guidance in this appendix.

The program-neutral LGO Protocol, together with this Registry-specific appendix, is consistent with The Climate Registry's reporting requirements and ensures that local government Members report their GHG emissions in a manner that is consistent with all other Registry Members.

If a local government is reporting GHG emissions from sources governed by a different Registry industry-specific protocol, the local government must defer to that industry-specific protocol when reporting the relevant emission sources. For example, any local government with a municipal electric utility within their organizational boundary must report the GHG emissions from electricity generation and transmission and distribution losses as directed by The Climate Registry's Electric Power Sector (EPS) Protocol.

If you have questions regarding what protocols to use for your emissions reporting, please call (866) 523-0764 or email [help@theclimateregistry.org](mailto:help@theclimateregistry.org).

### 3. Definition of a Local Government Member

For The Climate Registry's voluntary reporting program, a local government Member is defined as:

**A general purpose government at the village, town, city, municipality, county or regional district<sup>34</sup> level, excluding single purpose special districts<sup>35</sup> or other similar agencies that may overlay general purpose government agencies.**

Any entity that qualifies as a local government Member must report its GHG emissions according to the guidelines in the program-neutral LGO Protocol and Registry-specific appendix.

### 4. The Climate Registry's Program Requirements

Below is a brief outline of The Climate Registry's reporting requirements. The Climate Registry's program requirements are described in detail in The Climate Registry's GRP which can be downloaded at: <http://theclimateregistry.org/downloads/GRP.pdf>.

#### 4.1. Annual Reporting

The Climate Registry requires annual reporting and verification of GHG emission data on a calendar year basis. For more information on annual emission reporting see The Climate Registry's GRP, Section 1.4.

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<sup>34</sup> Only regional districts that serve as the general purpose government in areas not incorporated into a municipality are local governments in The Climate Registry's voluntary reporting program.

<sup>35</sup> This is a type of district that only serves one or a few special purposes and does not provide a broad array of services.

#### **4.2. Geographic Boundaries**

The Climate Registry requires that, at a minimum, Members must report emission sources in Canadian provinces and territories, Mexican states and U.S. states and dependent areas. Members must also indicate if any facilities are located in lands designated to Native Sovereign Nations that are represented on The Climate Registry's board of directors. For more information on geographic boundaries see The Climate Registry's GRP, Chapter 2.

#### **4.3. Gases to be Reported**

The Climate Registry requires Members to report the following GHGs from anthropogenic sources: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). In addition, The Climate Registry requires the reporting of CO<sub>2</sub> emissions from biomass combustion. These biogenic emissions must be reported separately from anthropogenic emissions to remain policy neutral. For more information on gasses to be reported see The Climate Registry's GRP, Chapter 3.

#### **4.4. Organizational Boundaries**

Local government Members of The Climate Registry must define their organizational boundary according to a control consolidation methodology. Control can be defined as operational control or financial control. Local government Members may also elect to additionally report according to an equity share consolidation methodology, however once a Member begins to report according to the equity share consolidation methodology, it must continue to do so annually. For more information on consolidation methodologies see the text box below. To learn more about organizational boundaries see The Climate Registry's GRP, Chapter 4.

**Consolidation Methodologies**

- **Operational Control:** An entity has **operational control** over an operation if the entity or one of its subsidiaries has the full authority to introduce and implement its operating policies. The entity that holds the operating license for an operation typically has operational control. Local governments reporting according to operational control would be responsible for reporting emissions from 100 percent of the activities of which they had operational control.
- **Financial Control:** An entity has **financial control** over an operation if the entity has the ability to direct the financial policies of the operation with an interest in gaining economic benefits from its activities. Financial control usually exists if the entity has the right to the majority of the benefits of the operation, however these rights are conveyed. Local governments reporting according to financial control would be responsible for reporting emissions from 100 percent of the activities of which they had financial control.
- **Equity Share:** If an entity selects the **equity share** approach, it must report all emissions sources that are wholly owned and partially owned according to its equity share in each. Local governments reporting according to both a control methodology and equity share would report 100 percent of the emissions according to their chosen control methodology and would additionally indicate the percent equity share they had in each operation (in the absence of complex ownership schemes this will typically be 100 percent).

**4.4.1. Example: Determining Operational or Financial Control**

The City of Mount Pleasant owns the Mount Pleasant City Hall and a large office building downtown. It has a partial ownership stake in and operates a municipal landfill and leases a fleet of transit busses.

**City Hall:** The City owns and operates City Hall.

**Downtown Office Building:** The City has contracted out the operation of the office building to a management company. The management company is contractually obligated to implement any necessary health, safety and environmental policies necessary in the building. The City occupies five units of the building as City office space. The City pays the electricity bills for these five units directly to a utility company.

**Municipal Landfill:** The City has partial ownership in a municipal landfill within its geographical boundaries that accepts all waste from the City of Mount Pleasant as well as three other nearby towns. The City is contractually obligated to operate the landfill through its agreement with the other towns that serve on the Municipal Landfill’s Board of Directors, which directs the financial policies of the landfill, and have an ownership stake in the landfill. Mt Pleasant’s neighboring town, Big River, has the majority of votes on the Board of Directors.

**Bus Transit Fleet:** The buses in the fleet are owned by a private company and are leased to the City. The City is responsible for the operation of the fleet including maintenance, obtaining necessary permits, route planning and fueling.

**Operational Control: Organizational Boundary for the City of Mount Pleasant**

Facility	Reporting Requirement under Operational	Reason
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	<b>Control</b>	
City Hall	100% of emissions	The City is directly responsible for all of the emissions generated by City Hall.
Downtown Office Building	Only Scope 2 emissions from electricity use in five city-occupied units	The City does not have operational control of the office building but does have operational control within the 5 units it effectively leases from the management company.
Municipal Landfill	100% of emissions	The City is not responsible for generating all of the waste accepted by the landfill and it shares ownership with other partners. However, the City does have operational control as determined by its contract with the other partners.
Bus Transit Fleet	100% of emissions	Emissions from all leased assets are required to be reported under operational control.

**Financial Control: Organizational Boundary for the City of Mount Pleasant**

<b>Facility</b>	<b>Reporting Requirement under Financial Control</b>	<b>Reason</b>
City Hall	100% of emissions	The City is directly responsible for all of the emissions generated by City Hall.
Downtown Office Building	100% of emissions	The City owns the entire office building and therefore has financial control of all emissions.
Municipal Landfill	0% of emissions	The City does not have financial control because the city of Big River controls the Board of Directors, which sets financial policies for the landfill. If Big River were to report using financial control it would be required to report 100% of the emissions from the landfill.
Bus Transit Fleet	0% of emissions	The city of Mt. Pleasant does not have financial control of the bus transit fleet, as the private company that leases the busses to Mt. Pleasant does instead.

#### **4.5. Operational Boundaries**

The Climate Registry requires all Members to report Scope 1 emissions (all direct emissions from anthropogenic sources), direct CO<sub>2</sub> emissions from biomass combustion, and Scope 2 emissions (indirect emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling). All other indirect emissions may be optionally reported as Scope 3 emissions. For more information on operational boundaries see The Climate Registry's GRP, Chapter 5.

#### **4.6. Facility-level Reporting**

Members are required to report emissions separately for each facility within an entity. A facility is generally defined as a single physical premises or mobile source. Facilities of the same type can often optionally be aggregated. Likewise, mobile sources of similar types can be grouped into mobile fleets, which are treated in the same matter as a single mobile source. For more information on facility-level reporting see The Climate Registry's GRP, Chapter 6.

### **5. Transitional Reporting**

For a Member's first two years of participation in The Climate Registry it may elect to report and verify only a subset of the emissions required to be reported to The Climate Registry. At a minimum, a Member must report all CO<sub>2</sub> emissions from all stationary combustion for all of its operations in at least one state, province or territory. For more information about transitional reporting see The Climate Registry's GRP, Chapter 8.

### **6. Historical Reporting**








Members who have been reporting and verifying their emissions as part of a different GHG emissions reporting program can submit emissions data for years that precede their first year of reporting to The Climate Registry into The Climate Registry's database as historical data. All historical data must include at a minimum, entity-level emissions of CO<sub>2</sub> from stationary combustion for all operations in at least one state, province or territory. All historical data must either have been verified according to the requirements of the program the emissions were originally reported to or, if the reported emissions were not verified, The Climate Registry recommends that Members use an ANSI-accredited Registry-recognized Verification Body to verify historical emissions. For more information on historical reporting see The Climate Registry's GRP, Chapter 9.






### **7. Quantifying Emissions**





The program-neutral LGO Protocol was designed to support several GHG reporting programs and the needs of many stakeholders. As a result, the program-neutral LGO Protocol contains some calculation methodologies for quantifying GHG emissions that are not appropriate and therefore not accepted by The Climate Registry for its voluntary reporting program.

The Climate Registry will accept GHG emission data calculated using all calculation methodologies contained within The Climate Registry's GRP and The Climate Registry's relevant industry-specific protocols (unless otherwise stated within the industry-specific protocol). Registry-approved calculation methodologies are provided for each GHG emissions source described within the program-neutral LGO Protocol. Table D.1 below is a summary of The Climate Registry-approved calculation methodologies contained in the program-neutral LGO Protocol.

**Table D.1 Methodologies, Activity Data and Emissions Factors Accepted by The Climate Registry**

Program-neutral LGO Protocol Section	Emission Source	Registry GRP Section	Required Activity Data	Emission Factors	Additional Methods in Registry GRP
Facilities: 6.1.1	Stationary Combustion (CO <sub>2</sub> )	12.2	Known fuel use (meter readings)	Default CO <sub>2</sub> emission factors by fuel type <b>(Tables G.1 &amp; G.2)</b>	
	Stationary Combustion (CH <sub>4</sub> & N <sub>2</sub> O)		Known fuel use (meter readings)	Default CH <sub>4</sub> and N <sub>2</sub> O emission factors by sector and fuel type <b>(Table G.3)</b>	
Facilities: 6.2.1	Electricity Use	n/a	Known electricity use (meter readings/utility bills)	Verified utility-specific emissions factor	
		14.1		U.S.: eGRID subregion default emission factor <b>(Figure G.1, Tables G.7 &amp; G.8)</b> Canada: default emission factors by Province <b>(Table D.2)</b>	
Facilities: 6.2.2.1	Electricity Use (leased space)	14.1	Total building area, area of entity's space, total building annual electricity use, building occupancy rate (from building owner)	Verified utility-specific emissions factor U.S.: eGRID subregion default emission factor <b>(Figure G.1, Tables G.7 &amp; G.8)</b> Canada: default emission factors by Province <b>(Table D.2)</b>	
Facilities: 6.3	Steam and District Heating Purchases	15.2	Known quantity of purchased steam or district heating (meter readings/utility bills), known fuel use (from supplier), and <b>specific boiler efficiency (from supplier)</b>	Measured fuel-specific emission factors <b>(from supplier)</b> Default CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O emission factors <b>(Tables G.1, G.2 &amp; G.3)</b>	
		15.2	Known quantity of purchased steam or district heating (meter readings/utility bills), known fuel use (from supplier), and <b>default total boiler efficiency factor of 75 percent</b>	Measured fuel-specific emission factors <b>(from supplier)</b> Default CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O emission factors <b>(Tables G.1, G.2 &amp; G.3)</b>	
Facilities: 6.4.1	Heat and Power Purchases from a Combined Heat & Power Facility (CO <sub>2</sub> )	15.1	Fuel type and total fuel input for CHP plant (from supplier), total electricity generated from CHP plant based on generation meter readings (from supplier), net heat production from CHP plant (from supplier), and steam/heat and electricity production efficiencies (from supplier or default of 75 percent)	Default CO <sub>2</sub> emission factors by fuel type <b>(Tables G.1 &amp; G.2)</b>	
	Heat and Power Purchases from a Combined Heat & Power Facility (CH <sub>4</sub> , N <sub>2</sub> O)	15.1	Fuel type and total fuel input for CHP plant (from supplier), sector of supplier, total electricity generated from CHP plant based on generation meter readings (from supplier), net heat production from CHP plant (from supplier), and steam/heat and electricity production efficiencies (from supplier or default - <b>Table 6.1</b> )	Default CH <sub>4</sub> and N <sub>2</sub> O emission factors by sector and fuel type <b>(Table G.3)</b>	

Program-neutral LGO Protocol Section	Emission Source	Registry GRP Section	Required Activity Data	Emission Factors	Additional Methods in Registry GRP
Facilities: 6.5	District Cooling (Electric-Driven Compressors)	15.3	Known cooling demand (utility bills) and COP of cooling plant (from supplier)	U.S.: eGRID subregion default emission factor (Figure G.1, Tables G.7 & G.8) Canada: default emission factors by Province (Table D.2)	
		15.3	Known cooling demand (utility bills) and default COP by chiller type (Table 6.1)	U.S.: eGRID subregion default emission factor (Figure G.1, Tables G.7 & G.8) Canada: default emission factors by Province (Table D.2)	
	District Cooling (CO <sub>2</sub> from Fuel-Driven Compressors)	15.3	Known cooling demand (utility bills) and COP of cooling plant (from supplier)	Default CO <sub>2</sub> emission factors by fuel type (Tables G.1 & G.2)	
			Known cooling demand (utility bills) and default COP by chiller type (Table 6.1)		
	District Cooling (CH <sub>4</sub> & N <sub>2</sub> O from Fuel-Driven Compressors)	15.3	Known cooling demand (utility bills), COP of cooling plant (from supplier)	Default CH <sub>4</sub> and N <sub>2</sub> O emission factors by sector and fuel type (Table G.3)	
			Known cooling demand (utility bills) and default COP by chiller type (Table 6.1)		
Facilities: 6.6.1 - 6.6.2	Fugitive Emissions from Refrigerants and Fire Suppression Equipment	16.1	Known base refrigerant inventory, purchases, sales, and net increase in total full charge of equipment	n/a	
		16.1	Quantity of refrigerant used to charge new equipment, capacity of equipment, quantity of refrigerant used to service equipment, and quantity of refrigerant recovered from retired equipment	n/a	
Vehicle Fleet: 7.1.1.1 - 7.1.2	Mobile Combustion CO <sub>2</sub> (including biofuels and non-electric alternative vehicles)	13.1	Known fuel use (fuel purchase records)	Published state- or region-specific emission factors Default CO <sub>2</sub> emission factors by fuel type (Table G.11)	
		13.1	Estimated fuel use based on vehicle miles traveled (odometer reading) and vehicle fuel economy	Published state- or region-specific emission factors Default CO <sub>2</sub> emission factors by fuel type (Table G.11)	
Vehicle Fleet: 7.1.3.1 - 7.1.3.2.1	Mobile Combustion CH <sub>4</sub> and N <sub>2</sub> O (highway vehicles, including biofuels and non-electric alternative vehicles)	13.2	Known distance traveled, fuel type, vehicle type and model year	Default emission factors by vehicle type and fuel use based on model year (Table G.12 & G.13)	
		13.2	Estimated distance traveled by fuel use and vehicle fuel economy		
Vehicle Fleet: 7.2	Emissions from non-highway vehicles (CH <sub>4</sub> and N <sub>2</sub> O)	13.2	Known fuel use (fuel purchase records)	Default emission factors by vehicle type and fuel type (Table G.14)	
		13.2	Estimated fuel use based on vehicle miles traveled (odometer reading) and vehicle fuel		

Program-neutral LGO Protocol Section	Emission Source	Registry GRP Section	Required Activity Data	Emission Factors	Additional Methods in Registry GRP
	including biofuels and non-electric alternative vehicles)		economy		
Vehicle Fleet: 7.3	Emissions from Alternative Fuel Vehicles (electric vehicles)	n/a	Known electricity use of vehicle (meter readings/utility bills)	Verified utility-specific emissions factor (in development – see EPS Protocol)	
		14.1		U.S.: eGRID subregion default emission factor (Figure G.1, Tables G.7 & G.8)	
				Canada: default emission factors by Province (Table D.2)	
Vehicle Fleet: 7.4.1	Fugitive Emissions from Motor Vehicle Air Conditioning	16.1	Known base refrigerant inventory, known inventory in storage at the end of the year, purchases, sales, and net increase in total full charge of equipment	n/a	
Power Generation Facilities: 8.1 - 8.2	Stationary Combustion (CO <sub>2</sub> )	12.1	Continuous emissions monitoring (CEMS) in accordance with 40 CFR Part 75	n/a	
		12.2	Known fuel use (meter readings) and measured carbon content of fuels (per unit mass or volume)	Fuel-specific emission factors	
			Known fuel use (meter readings), measured carbon content of fuels (per unit energy) and measured heat content of fuels	Fuel-specific emission factors	
		12.2	Known fuel use (meter readings), measured heat content of fuels and default carbon content of fuels (per unit energy) (Tables G.1 & G.2)	Derived from combined fuel-specific and default carbon content or heat content	
	Known fuel use (meter readings), measured carbon content of fuels (per unit energy) and default heat content of fuels (Tables G.1 & G.2)				
	12.2	Known fuel use (meter readings)	Default CO <sub>2</sub> emission factors by fuel type (Tables G.1 & G.2)		
	Stationary Combustion (CH <sub>4</sub> & N <sub>2</sub> O)	12.2	Continuous emissions monitoring (CEMS) in accordance with 40 CFR Part 75	n/a	
		Periodic direct measurements	n/a		
		12.2	Known fuel use (meter readings)	Default CH <sub>4</sub> and N <sub>2</sub> O emission factors by fuel type and technology (within electricity sector) (Table G.4)	
Power Generation Facilities: 8.3	Scope 2 Emissions from Transmission and Distribution Losses	14.1	Known transmission and distribution losses (meter readings)	Generator-specific emissions factor (if line is not connected to a regional grid)	
		n/a		Verified utility-specific emissions factor	
		14.1		U.S.: eGRID subregion default emission factor (Figure G.1, Tables G.7 & G.8)	
				Canada: default emission factors by Province (Table D.2)	

Program-neutral LGO Protocol Section	Emission Source	Registry GRP Section	Required Activity Data	Emission Factors	Additional Methods in Registry GRP
<b>Power Generation Facilities:</b> 8.4.1	SF <sub>6</sub> Emissions from Electricity Transmission and Distribution	E.5	Known base SF <sub>6</sub> inventory in storage, known inventory in storage at the end of the year, purchases, sales, and change in total nameplate capacity of equipment	n/a	
<b>Solid Waste Facilities:</b> 9.3	Estimation Methodologies	Local governments in the U.S. must use the calculation methodologies and defaults in Chapter 9 of the program-neutral LGO Protocol when reporting emissions from solid waste disposal facilities to The Climate Registry. Local governments in Canada or Mexico should also use the methodologies in Chapter 9 of the program-neutral LGO Protocol and can refer to the default factors in Section 8.2.1 of Appendix D to calculate emissions from solid waste disposal facilities.			
<b>Wastewater Treatment Facilities:</b> 10.3.1	CH <sub>4</sub> Emissions Estimation Methodologies	Local governments in the U.S. must use the calculation methodologies and defaults in Chapter 10 of the LGO Protocol when reporting emissions from wastewater treatment facilities to The Climate Registry. Local governments in Canada or Mexico should also use the methodologies in Chapter 10 of the program-neutral LGO Protocol and can refer to the default factors in Section 8.3.1 of Appendix D to calculate emissions from wastewater treatment facilities.			
<b>Wastewater Treatment Facilities:</b> 10.3.2	N <sub>2</sub> O Emissions Methodologies				

### 7.1. Solid Waste Disposal Facilities

Local government Members in the U.S. must use the calculation methodologies and default factors in Chapter 9 of the program-neutral LGO Protocol when reporting emissions from solid waste disposal facilities to The Climate Registry. Local governments in Canada or Mexico must also use the methodologies in Chapter 9 of the program-neutral LGO Protocol and can refer to the default factors below to calculate emissions from solid waste disposal facilities. Local governments may also use site-specific information and calculation methodologies to calculate emission from solid waste disposal facilities provided they are verifiable.

Although some uncertainty remains around emissions calculation methodologies for solid waste disposal facilities, the methodology included in the program-neutral LGO Protocol was heavily vetted by a workgroup of local government stakeholders and will ensure consistency in reporting emissions from solid waste disposal facilities across local governments. As certainty increases in this field, The Climate Registry and the other LGO Protocol developing partners will integrate internationally accepted methodologies into the program neutral LGO Protocol.

#### Box 9.1 How to Estimate Annual Waste in Place (WIP)

Obtain population estimates from the Statistics Canada or Mexico's National Institute of Statistics, Geography and Informatics for the jurisdiction(s) depositing waste in your landfill for all years for which you have missing waste data.

#### Table 9.2 Primary Equations from FOD Model

All defaults provided in this table are applicable for all sources in North America.

#### Tables 9.3 & 9.4 Default Waste Characterization

Members with sources in Canada and Mexico may use the IPCC Default Waste Characterization in place of country-specific data:

**Table D.2: MSW Composition by Percentage for North America**

Food Waste	33.9%
Paper/cardboard	23.2%
Wood	6.2%
Textiles	3.9%
Rubber/leather	1.4%
Plastic	8.5%
Metal	4.6%
Glass	6.5%
Other	9.8%

Source: IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5: Waste, Chapter 2, Table 2.3, 2.12, (2006).

#### Table 9.5 Default k Values

In place of Table 9.5, Members with sources located in Canada may use the following k Values when using the FOD model:

**Table D.3: MSW Landfill k Value Estimates for Each Canadian Province**

Province/Territories	k
Alberta	0.012
British Columbia	0.082
Manitoba	0.019
New Brunswick	0.062
Newfoundland & Labrador	0.078
Nova Scotia	0.077
Northwest Territories	0.005
Nunavut	0.005
Ontario	0.045
Prince Edward Island	0.060
Quebec	0.056
Saskatchewan	0.010
Yukon	0.001
Source: Environment Canada, Greenhouse Gas Division, e-mail exchange from Craig Palmer, March 3, 2009.	

Members with sources located in Mexico may calculate and appropriate default k value based on site specific waste characterization data and the following default IPCC k values:

**Table D.4: MSW Landfill k Value Defaults from IPCC**

Type of Waste		Climate Zone							
		Boreal and Temperate (MAT ≤ 20°C)				Tropical (MAT > 20°C)			
		Dry (MAP/PET < 1)		Wet (MAP/PET > 1)		Dry (MAP < 1000 mm)		Moist and Wet (MAP ≥ 1000 mm)	
		Default	Range	Default	Range	Default	Range	Default	Range
Slowly degrading waste	Paper/textiles waste	0.04	0.03 - 0.05	0.06	0.05 - 0.07	0.045	0.04 - 0.06	0.07	0.06 - 0.085
	Wood/straw waste	0.02	0.01-0.03	0.03	0.02-0.04	0.025	0.02-0.04	0.035	0.03-0.05
Moderately degrading waste	Other (non-food) organic putrescible / Garden and park waste	0.05	0.04 - 0.06	0.1	0.06 - 0.1	0.065	0.05 - 0.08	0.17	0.15 - 0.2
Rapidly Degrading waste	Food waste/ Sewage sludge	0.06	0.05 - 0.08	0.185	0.1 - 0.2	0.085	0.07 - 0.1	0.4	0.17 - 0.7
Bulk Waste		0.05	0.04 - 0.06	0.09	0.08 - 0.1	0.065	0.05 - 0.08	0.17	0.15 - 0.2
Source: IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5: Waste, Chapter 3, Table 3.3, 3.17, (2006).									

**Table 9.6 Total Organic Degradable Carbon per Waste Type (TDOC)**

Members with sources in Canada and Mexico may use the IPCC default values for TDOC in place of country-specific data:

**Table D.5: Total Organic Carbon per Waste Type (TDOC) for North America**

Food Waste	15%
Paper/cardboard	40%
Wood	43%
Textiles	24%
Rubber/leather	39%
Plastic	NA
Metal	NA
Glass	NA
Other	NA
Source: IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5: Waste, Chapter 2, Table 2.4, 2.14, (2006).	

**Table 9.7 Default Decomposable Anaerobic Fraction (DANF)**

Members with sources in Canada and Mexico may use the IPCC default values for DANF of the TDOC per waste type. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories specifies that for all waste types the recommended default value is 0.5.<sup>36</sup>

**Sections 9.3.2 and 9.3.3 CH<sub>4</sub> Destruction Efficiency Default**

Members with sources in Canada may use the default factor of .99 that is provided in Chapter 9. Although it was developed by U.S. EPA, it is the factor used by Environment Canada in their National Inventory Report.<sup>37</sup>

**7.2. Wastewater Treatment Facilities**

Local government Members in the U.S. should use the calculation methodologies and default factors in Chapter 10 of the program-neutral LGO Protocol when reporting emissions from wastewater treatment facilities to The Climate Registry. Local government Members in Canada or Mexico should also use the methodologies in Chapter 10 of the program-neutral LGO Protocol and can refer to the default factors below to calculate emissions from wastewater treatment facilities. Local governments may use site-specific information and calculation methodologies to calculate emission from wastewater treatment facilities provided they are verifiable.

Although some uncertainty remains around emissions calculation methodologies for wastewater treatment facilities, the methodology included in the program-neutral LGO Protocol was heavily vetted by a workgroup of local government stakeholders and will ensure consistency in reporting emissions from wastewater treatment facilities across local governments. As certainty increases in this field, The Climate Registry and the other LGO Protocol developing partners will integrate internationally accepted methodologies into the program neutral LGO Protocol.

**7.2.1 Default Factors for Canada and Mexico**

<sup>36</sup> IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 3, 3.13 (2006).

<sup>37</sup> Environment Canada National Inventory Report 1990 – 2006, Annex 3, p. 400 (2008).

#### Box 10.2 CH<sub>4</sub> Emissions from Aerobic Systems

If Members in Canada or Mexico, who are under different environmental regulations than Members located in the U.S., operate wastewater treatment systems with significant CH<sub>4</sub> emissions, they should use the methodology found in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 5 Chapter 6.2.<sup>38</sup>

#### Equations 10.1 and 10.2 (Stationary Emissions from Incomplete Combustion of Digester Gas) Defaults

Local government Members in Canada and Mexico should use the default inputs in equations 10.1 and 10.2 when calculating emissions from the incomplete combustion of digester gas.

#### Equations 10.3 and 10.4 (Process Emissions from Wastewater Treatment Lagoons) Defaults

Local government Members in Canada should use the default inputs in equations 10.3 and 10.4 to quantify emissions from wastewater treatment lagoons with the following exceptions:

$$\begin{aligned} \text{BOD}_5 \text{ load} &= 0.050 \\ \text{Bo} &= 0.22 \end{aligned}$$

Source: Environment Canada National Inventory Report 1990-2007 Annex 3.5.2.

Local government Members in Mexico should use the default inputs in equations 10.3 and 10.4 to quantify emissions from wastewater treatment lagoons with the following exception:

$$\text{BOD}_5 \text{ load} = 0.040$$

Source: IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 6, 6.2 (2006)

#### Equations 10.5 and 10.6 (Fugitive Emissions from Septic Systems) Defaults

Local government Members in Canada should use the default inputs in equations 10.5 and 10.6 to quantify fugitive emissions from septic systems with the following exceptions:

$$\begin{aligned} \text{BOD}_5 \text{ load} &= 0.050 \\ \text{Bo} &= 0.22 \end{aligned}$$

Source: Environment Canada National Inventory Report 1990-2007 Annex 3.5.2.

Local government Members in Mexico should use the default inputs in equations 10.3 and 10.4 to quantify fugitive emissions from septic systems with the following exception:

$$\text{BOD}_5 \text{ load} = 0.040$$

Source: IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 6, 6.2 (2006)

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<sup>38</sup> [http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5\\_Volume5/V5\\_6\\_Ch6\\_Wastewater.pdf](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_6_Ch6_Wastewater.pdf)

#### Equations 10.7 and 10.8 (Process Emissions from WWTP with or without Nitrification/Denitrification) Defaults

Local government Members in Canada and Mexico should use the default inputs in equations 10.7 and 10.8 to quantify process emissions from wastewater treatment plants with or without nitrification/denitrification.

#### Equations 10.9 and 10.10 (Process Emissions from Effluent Discharge to Rivers and Estuaries) Defaults

Local government Members in Canada should use the default inputs in equation 10.9 to quantify process emissions from effluent discharge to rivers and estuaries with the following exceptions:

$$\text{EF effluent} = 0.01$$
$$\text{Total N Load}^1 = 0.016$$

Source: Environment Canada National Inventory Report 1990-2007 Annex 3.5.2 except: <sup>1</sup>The default total nitrogen load value is derived based on the following default values from Statistics Canada Food Statistics, Catalogue No. 21-020 X Table 6: Total nutrients available adjusted for losses from the Canadian food supply (26.29 kg/person-year) x default fraction of N in protein (0.16 kg N/kg protein) x factor for non-consumed protein added to water (1.4)/days per year (365.25) = 0.016 kg N per person per day.

Local government Members in Mexico should use the default inputs in equations 10.3 and 10.4 to quantify process emissions from effluent discharge to rivers and estuaries with the following exception:

$$\text{Total N Load} = 0.020$$

Source: The default total nitrogen load value is derived based on the default value for average protein intake per person per year from the Food and Agriculture Organization Statistical Yearbook 2004 Issue 1, Web Edition: (33.24 kg/person-year) x default fraction of N in protein (0.16 kg N/kg protein) x factor for non-consumed protein added to water (1.4)/days per year (365.25) = 0.020 kg N per person per day.

### 7.3. Other Process and Fugitive Emissions

The process and fugitive emission calculation methodologies cited in Chapter 11 of the program-neutral LGO Protocol can be found, in their entirety, in Appendix E of The Climate Registry's GRP.

### 7.4. Simplified Estimation Methods

Complete reporting to The Climate Registry requires Members to report 100 percent of their entity-wide GHG emissions in North America. GHG emissions should be calculated using The Climate Registry-approved methodologies described in The Climate Registry's GRP (as well as in Table D.1 above). However, in order to reduce the reporting burden for small sources of GHG emissions, The Climate Registry allows for the use of alternative, simplified estimation methods for any combination of individual emission sources and/or gases, provided that the emissions from these sources and/or gases are less than or equal to five percent of a Member's total emissions (i.e., the sum of Scope 1 and Scope 2 emissions on a CO<sub>2</sub> equivalent basis). Emissions

calculated using simplified estimation methods must be reported to The Climate Registry. For more information on simplified estimation methods see The Climate Registry's GRP, Chapter 11.

## 8. Local Government Profile Information

As a sector, local governments encompass great variety in size and budget, as well as the number and type of services they provide in their jurisdictions. In order to highlight the factors that may have an impact on a local government's GHG emissions, The Climate Registry requires the reporting of the local government profile information listed below:

- Size (square miles)
- Population (based on best available data at the time of reporting)
- Annual Budget (can be based on either fiscal year or calendar year)
- Services Provided (see checklist below)

<input type="checkbox"/> Water treatment	<input type="checkbox"/> Mass transit (buses)	<input type="checkbox"/> Airport
<input type="checkbox"/> Water distribution	<input type="checkbox"/> Mass transit (light rail)	<input type="checkbox"/> Seaport/shipping terminal
<input type="checkbox"/> Wastewater treatment	<input type="checkbox"/> Mass transit (ferries)	<input type="checkbox"/> Marina
<input type="checkbox"/> Wastewater collection	<input type="checkbox"/> Schools (primary/secondary)	<input type="checkbox"/> Stadiums/sports venues
<input type="checkbox"/> Electric utility	<input type="checkbox"/> Schools (colleges and universities)	<input type="checkbox"/> Convention center
<input type="checkbox"/> Fire Protection	<input type="checkbox"/> Solid waste collection	<input type="checkbox"/> Street lighting and traffic signals
<input type="checkbox"/> Police	<input type="checkbox"/> Solid waste disposal	<input type="checkbox"/> Natural gas utility
	<input type="checkbox"/> Hospitals	<input type="checkbox"/> Other

- Employees (FTE)
- Climate Zone<sup>39</sup>
- Heating and Cooling Degree Days

### 8.1. Indicators

Local government Members of The Climate Registry are encouraged to report any applicable indicators found in section 13.1.2.4 of the program-neutral LGO Protocol. Indicators provide relevant information about the activities of your local government's operations and give a general sense of your general GHG emission efficiency from a range of different perspectives.

### 8.2. Information Items

As indicated in section 4.3 of this appendix, you must report CO<sub>2</sub> emissions from biomass (an optional information item in the program-neutral portion of the LGO Protocol). However, if you additionally optionally report the remaining information items found in section 13.1.2.5 of the program-neutral LGO Protocol you will demonstrate your commitment to data transparency and your environmental leadership. You are further encouraged to report any additional data or information you believe would be helpful for your stakeholders to review with your emission report.

## 9. Report Using The Climate Registry's Reporting Software

<sup>39</sup> U.S. climate zone information can be found at: [http://www.eia.doe.gov/emeu/cbecs/climate\\_zones.html](http://www.eia.doe.gov/emeu/cbecs/climate_zones.html). Canada climate information is available from: <http://oee.nrcan.gc.ca/residential/personal/windows-doors/climate-zones.cfm?attr=4>.

Members must report their entity-wide GHG emissions to The Climate Registry using The Climate Registry's reporting software, Climate Registry Information System (CRIS), which is designed to help Members calculate and report their GHG emissions. CRIS also generates a public emission report for each Member's annual emissions. This report allows Members of The Climate Registry to compare emissions profiles with other Members.

The program-neutral LGO Protocol contains reporting guidance that specifies a template for local governments using the LGO Protocol. Registry local government Member's automatically generated emissions reports will mirror the structure of the template in Chapter 13 of the program-neutral LGO Protocol.

## **10. Third-Party Verification**

In order to establish a high level of environmental integrity in the GHG emission data The Climate Registry collects, The Climate Registry requires that all emission reports are verified by a Climate Registry-recognized Verification Body. Third party verification is defined as an independent expert assessment of the accuracy and conformity of a Member's emission report based on the reporting requirements contained in The Climate Registry's GRP, applicable industry-specific protocols and the verification requirements described in the General Verification Protocol (GVP). It is highly recommended that all Registry Members review Chapter 19 of The Climate Registry's GRP to gain a thorough understanding of The Climate Registry's verification requirements.

### **10.1. Materiality**

Verification Bodies use the concept of materiality to determine if omitted or misstated GHG emissions information will lead to significant misrepresentation of a Member's reported emissions. The Climate Registry defines significant in this case as five percent of a Member's direct (Scope 1) and indirect (Scope 2) emissions. Therefore, a Member's direct and indirect emissions must both be deemed to be absent of material misstatements for a verification body to issue a positive verification statement. For more information on materiality, see The Climate Registry's GRP Section 19.4.

### **10.2. Verification Process**

#### **10.2.1. Select an Accredited Verification Body**

The Climate Registry maintains a list of recognized Verification Bodies on its website ([www.theclimateregistry.org](http://www.theclimateregistry.org)). Every Registry Member will need to enter into a contract with an accredited Verification Body to conduct verification services. The Climate Registry recommends that local governments follow their normal procurement process for this service and solicit proposals from at least two Verification Bodies. For more information on selecting a Verification Body, see The Climate Registry's GRP, Chapter 19 and the additional resources on The Climate Registry's website ([www.theclimateregistry.org/verification/verifiers.html](http://www.theclimateregistry.org/verification/verifiers.html)).

#### **10.2.2. Assess Conflict of Interest**

Prior to finalizing a contract with a Verification Body, The Climate Registry requires all Verification Bodies to submit a Case Specific Conflict of Interest (COI) Assessment Form to ensure that the relationship between the Verification Body and the Member is objective (not conflicted). The Verification Body must then await The Climate Registry's confirmation of the COI Assessment prior to finalizing the verification contract.

The COI Assessment Form evaluates the potential conflict between a Member and its selected Verification Body. Verification contracts **may not** be finalized until The Climate Registry authorizes a Verification Body to proceed. For more information on COI Assessment, see The Climate Registry's GRP, Section 19.2.

### 10.2.3. Conduct Verification Activities

The heart of The Climate Registry's verification process lies in conducting the verification activities. While this process is customized for each reporting Member, Verification Bodies will develop a verification plan, implement the verification plan and conduct core verification activities. The five core verification activities involved in the verification effort are:

- Assessing conformance with The Climate Registry's requirements,
- Assessing completeness of the emission report,
- Performing risk assessment based on review of information systems and controls,
- Select a sample/developing a sampling plan, and
- Evaluating GHG information systems and controls and emissions estimates against verification criteria.

Following the completion of the verification activities, the Verification Body will complete the required verification documentation and discuss their findings with the Member.

For more information on verification activities see The Climate Registry's GRP, Chapter 19.

### 10.2.4. Complete Verification Documentation

Upon completion of the verification activities, a Verification Body will provide the Member two documents; a Verification Report and a Verification Statement. The Verification Report is an in-depth review of the verification of a Member's emissions report. This document is typically shared only between a Verification Body and a Member.

The Verification Statement documents the verification activities and outcomes. The Member must submit this document to The Climate Registry. The Climate Registry makes this document available to all stakeholders upon completion of the verification process.

For more information on verification documents see The Climate Registry's GRP, Section 19.7.

### 10.2.5. Repeat Verification Cycle Annually

The Climate Registry requires annual verification of all GHG data. However, if a Member's management systems and/or emission sources do not change from year to year, then The Climate Registry allows Verification Bodies to use their professional judgment to determine the appropriate level of verification assessment in order to issue a Verification Statement with reasonable assurance for that Member's stated emissions.

The Climate Registry allows for a five-year verification cycle, which permits a streamlined verification process in the second through fifth years of the cycle, assuming a Member does not experience any significant changes to their organizational structure or GHG emissions. For more information on The Climate Registry's verification cycle, see The Climate Registry's GRP, Section 19.5.

## 11. Public Emission Reports

All Registry Members' verified annual emission reports are accessible to the public through The Climate Registry's website. These reports describe each Member's annual emissions and serve as useful tools for various stakeholders, such as regulators, non-governmental organizations, and the general public, to better understand reporting Members' GHG emissions over time.

As reports for local government Members will mirror the template in Chapter 13 of the program neutral LGO Protocol, local government Member's emissions will be represented in a transparent manner that will demonstrate the breadth of services each local government provides. Local governments are additionally encouraged to upload any additional information that helps to demonstrate activities that contribute to GHG emissions as well as initiatives and policies that are intended to help to reduce GHG emissions from local government operation or the local government's jurisdiction. Any additional information submitted to The Climate Registry with your emissions information will be linked to your emissions report and will be available for public review.

For information on public emission reports, see The Climate Registry's GRP, Chapter 20.