The Workbook

Helping Local Governments Understand How to be Carbon Neutral in their Corporate Operations

9/24/2010

The Workbook v.2

The first version of this workbook was released at the Union of British Columbia Municipalities annual convention in September 2009. The intention at the time was to present the Traditional Services and seek feedback on the boundaries and descriptions. Based on the feedback we received the workbook has undergone revisions which should help clarify and streamline the process.

Workbook v.2 continues to be a living document in that it is draft and subject to future amendments. We look forward to the comments and questions which local governments submit and further refinement of this guidance document.

Throughout this document minor changes and updates have been made. However, the majority of the amendments are located in the descriptions of the Traditional Services near the end of the document. There you will find answers to commonly asked questions and clarifications around scope.

Carbon Neutral Working Group

To date 179 local governments have signed the BC Climate Action Charter committing to the goal of being carbon neutral in their corporate operations by 2012. The significant uptake of this voluntary Charter demonstrates the leadership role that local governments in BC are willing to take on.

Under the Climate Action Charter the joint Provincial Government - UBCM Green Communities Committee (GCC) was created to support local governments in planning and implementing climate change initiatives. The Carbon Neutral Working Group (the working group) was established to advise the GCC in carrying out this mandate with respect to corporate carbon neutrality.

The GCC and the working group collaborated to produce this workbook which is intended to support local governments as they begin working on becoming carbon neutral in their corporate operations. The working group, with the support of the GCC, developed a BC local government specific draft definition of carbon neutral corporate operations. This workbook will give you greater insight with respect to what corporate carbon neutrality is, provide you with interim guidance and clarify the data collection process.

What is Carbon Neutral?

Carbon neutral refers to reducing a local government's greenhouse gas emissions as much as possible and balancing the remaining emissions through the purchase of qualified offsets or GHG reduction projects[1].

There are four key steps to carbon neutrality:

- Measure
- Reduce, ,
- Offset, and
- Report.

Typically the first step is to measure corporate emissions. This step will help local governments understand the source of their corporate emissions and allow them to develop meaningful reduction strategies. Measuring corporate emissions is a multi-step process which includes: understanding what needs to be measured, identifying the sources of emissions that need to be counted, and collecting data on energy and fuel consumption. This energy and fuel consumption data is then entered into a measurement system that converts it into greenhouse gas (GHG) emissions, providing the local government with a measure of its total corporate GHG emissions. The Green Communities Committee is currently implementing a pilot project to test a common measurement tool called SMARTTool that could be used by all BC local governments.

The next step is to take action to reduce emissions by developing strategies to improve energy efficiency and reduce fuel consumption. For practical tips, advice and best practices on how to reduce corporate GHG emissions visit the *BC Climate Action Toolkit Website* at: www.toolkit.bc.ca. It is important to remember that reduction activities not

[1] The criteria for a local government GHG reduction project are currently under consideration by the GCC.

only reduce emissions but also save money and local governments should be considering and implementing new reduction strategies and activities on an ongoing basis in order to ensure that they are maximizing their emission reductions and the related cost savings.

Even after reducing fuel/energy consumption, a local government is still likely to produce some GHG emissions and must take the third step to offset the remaining corporate emissions to become carbon neutral. In order to achieve carbon neutrality the local government must balance their emissions with either purchased offsets or through GHG reduction projects. Once the corporate emissions are balanced with offsets or GHG reductions a local government has achieved carbon neutrality. The Green Communities Committee is currently developing a framework to help define and guide local government offset investments and GHG reduction projects.

The fourth step to achieving carbon neutrality is to report on the GHG emissions produced, offsets purchased or GHG reduction projects undertaken in order to demonstrate a local government has achieved carbon neutrality. Every effort will be made to ensure that reporting requirements are streamlined and harmonized with existing local government reporting requirements to minimize the administrative burden.

Why does carbon neutrality matter?

In order to build resilience, and protect themselves from escalating energy costs, local governments can anticipate and mitigate climate change by reducing their reliance on fossil-fuel based energy resources.

Sustainable energy resources offer a secure efficient supply and fiscal certainty. Sustainable energy sources such as geothermal heat, wind or solar power are not subject to long term price volatility and substantial cost increases that non-renewable energy sources are. As a result, sustainable energy uses will be the norm in the future.

What emissions will be measured and how?

There are six greenhouse gases (GHGs): carbon dioxide (CO_2) methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). References to GHG emissions are referring to the release of these gases into the atmosphere.

Currently, the simplest way to measure GHG emissions is to track energy consumption data and then convert the energy data into emissions. Local governments will **not** be expected to track each type of gas or do any complex conversions.

Work is currently underway to develop a simple tool which will help local governments convert energy and fuel consumption data into GHG emissions. This work includes a Pilot with 21 BC local governments to test a web-based measurement tool called SMARTTool. The intention of the Pilot is to see if SMARTTool will work for local governments and enable them to measure their GHG emissions in an efficient and cost effective manner. The Pilot is expected to be completed towards the end of 2010. For more

information on Pilot please contact: LoisLeah.Goodwin@gov.bc.ca

Why get started now?

For many 2012 seems a long way off, for others it feels like it is right around the corner. Whether you are a local government which subscribes to the "long way off" or "fast approaching" viewpoint there are benefits to understanding and capturing data on energy consumption in the short-term.

Reducing corporate emissions will save money. Some investments will save money immediately others may have a longer payback period. For example, investments in energy retrofits for buildings may have significant upfront costs and it may take several years before the money saved from reduced energy costs equals the amount which was initially invested. However, after the payback period the building will continue to be more efficient and continue to have lower energy costs associated with it. Alternatively, there are investments which have a much shorter payback period such as retrofitting traffic and street lighting with more efficient lighting technology.

Local governments are directly or indirectly paying for energy used in the delivery of services in their communities. Consequently, reducing energy consumption will have a direct benefit to the bottom line because if you consume less you will pay less. Getting started on capturing energy consumption data will help you understand where the best emission reduction opportunities are. In turn, this will help you reduce costs sooner.

Taking on the management of your own emissions can be a powerful catalyst in inspiring greenhouse gas emission reductions within your community. Taking a leadership role in corporate reductions and communicating your success can spark interest in the local government work being done to reduce community-wide emissions. It can also focus the attention of community members on how they can reduce their own emissions.

Exercising Leadership, Strengthening Performance

Taking action to reduce emissions in local government operations is an opportunity to improve efficiency, reduce energy costs, and strengthen overall performance and service delivery. A government's own operations are a small component of a community's total emissions; however, local government leadership plays a pivotal role in building knowledge that leads to much deeper emission reductions.

What criteria did the working group use to develop the definition of corporate operations?

In developing the draft definition the working group considered the following points:

- Equity between local governments based on the services offered,
- Credibility of the system when compared with internationally recognized protocols, and
- Capacity and ease of administration.

Looking for your feedback

Even with the broad representation of local governments on the working group it is expected that the process of capturing data based on the draft definition will reveal issues.

If you decide to begin tracking your emissions now your experience can provide valuable information. The GCC would like to know what tools and resources local governments feel are needed, or would assist, in fulfilling their carbon neutral commitments. The GCC is looking for feedback as it continues to refine the definition of carbon neutrality prior to 2012.

You can send your comments to: LoisLeah.Goodwin@gov.bc.ca

Corporate operations based on a "Traditional Services" model

The Carbon Neutral Working Group felt that equity amongst all local governments was best served by defining carbon neutrality in relation to those services that are most commonly provided by the majority of local governments. The working group referred to these common services as "traditional services".

Traditional Services:

- Administration and Governance
- Drinking, Storm and Waste Water
- Solid Waste Collection, Transportation and Diversion
- Roads and Traffic Operations
- Arts, Recreation and Cultural Services
- Fire Protection

By focusing the definition of corporate operations on a traditional services model it ensures that the vast majority of local governments are counting and offsetting the same emissions. Different carbon accounting systems measure carbon emissions based on different principles. A fundamental principle for the traditional services model is equity. As a result, the traditional service definition focuses less on *who* delivers the service and more on *what* service is delivered.

More detailed explanations of the services are provided later in the workbook, along with typical energy sources associated with each of the services.

What traditional services emissions are included?

Within the traditional service sectors not all emissions will be captured. Any emissions related to the operation and maintenance of traditional services are included. Emissions related to new construction, business travel, employee commuting and materials are not included.

We don't have that service!

Not all local governments offer the same services. In circumstances where a traditional service is not provided directly or indirectly (provided on behalf of a local government by a subsidiary or contractor) by a local government then the local government does not need to consider the service in its corporate operations and there are no emissions for the local government to track.

Guidance in relation to subsidiaries: default approach

The emissions related to a traditional service operated by many subsidiary organizations of a local government are also included. For these purposes, a

subsidiary organization is an organization that, under Generally Accepted Accounting Principles, is included in the local government's financial statements, through full or proportional consolidation or through consolidation on a modified equity basis. A local government's financial statements will typically identify these subsidiary organizations, and the basis of consolidation for each.

Emissions for traditional services operated by subsidiary organizations that are fully consolidated or that are consolidated on a modified equity basis are included in the local government's carbon neutral operations.

For those organizations that are included in the financial statements on a proportional consolidation basis, the local government would include a proportionate share of the emissions related to a traditional service operated by the organization, using the same proportion for emissions as are used for financial statement purposes.

Guidance in relation to subsidiaries: alternative approach

Local governments may choose to follow the default approach for reporting GHG emissions from subsidiary organizations as outlined above. Alternatively, local governments may create their own agreement on how they will share the emissions related to the subsidiary organization. However, the agreement must be unanimous amongst the participating local governments and must result in 100 percent of the GHG emissions being reported.

Calculating emissions for proportionately consolidated organizations: default approach

A Recreation Centre is jointly owned by three local governments: Red, Blue and Purple. The Recreation Centre is included in each of their financial statements. As a proportionately consolidated organization the ownership is divided so that 10% shows on the financial statement of local government Red, 40% on local government Blue, and 50% on local government Purple.

As a result, local government Red is responsible for 10% of the emissions, local government Blue is responsible for 40% of the emissions, and local government Purple is responsible for 50% of the emissions. The local governments are proportionately responsible for the ownership of the organization and its emissions.

How do we begin tracking emissions?

- Understand what the Traditional Service Areas are and what services your local government provides;
- Gather information from your energy providers and assess which energy accounts (for example BC Hydro, Fortis, Pacific Northern Gas and/or Teresan accounts) are providing energy to a traditional service area;
- Identify which subsidiary organizations provide traditional services and request energy consumption data from these organizations on the amount of energy used to provide the service;
- Identify which emissions from contracts providing traditional services are included and request

energy consumption data from these service providers (for example the gas consumption of vehicles used to collect solid waste); and

- As you negotiate new contracts or enter into renewal discussions on existing contracts, consider including clauses in the contract with respect to emission reductions and provision of consumption data by the contractor.

Guidance in relation to contracted services

Some emissions for services operated on behalf of local governments by contractors will be included in the corporate emissions profile. This will apply to new contracts or upon contract renewal. The types of contracts which would be included would be those which have reasonably identifiable energy consumption associated with the delivery of a traditional service. For example, emissions related to consultant services such as planning assistance would not be included but emissions from road maintenance contracts would.

The intention is to capture emissions from sources directly related to the traditional service being provided by the contractor. If a local government has a snow removal contract the emissions from the vehicles clearing snow would be captured, but the emissions related to the contractor's corporate office building would not. Similarly, if a partner organization were operating a recreation centre on behalf of a local government the emissions from the recreation centre would be captured, but the corporate offices of the partner organization, and any vehicles used to travel to and from the corporate office to the recreation centre, would not be included.

Feedback on Contracts:
If you are already collecting energy consumption or emissions information from your contractors we would like to learn more from you about the processes you have established to obtain this information.

Feedback from local governments on tracking fuel/energy use data from contractors will be invaluable in developing advisory materials. These materials will include information on which contracts would be included based on a threshold level of fuel or energy use; as well as, how to collect, verify and report data. In addition, further information will be given on the types of contract provisions that local governments could negotiate as they enter into new contracts or contract renewals in the future.

Data collection

This workbook is formatted to allow you to think about each of the traditional services individually; however, it is **not** necessary to collect data for each of service sector separately. Each local government receives information from its energy providers. However, what is included within a single energy account may differ. For example, one local government may have a single hydro account for its primary administration building and another local government may have several hydro accounts for a similar building.
What is important is not how the information is made available but if the energy or fuel used is part of a traditional service.

The workbook includes descriptions and examples of the six traditional service sectors for the purpose of explaining the kinds of infrastructure or activities that would be included in each of the services.

What if one energy account provides energy to more than one service?

For smaller communities in particular this may be the case. For example, a local government may have the administration and recreation staff located in one building. If the building has one BC Hydro account for the provision of heat and light for the building then only count the emissions once. A local government may decide to proportionately divide the account for internal purposes, but for the purposes of the Carbon Neutral commitment the information only needs to be reported once.

To get started begin by gathering all of your energy and fuel data. Next, identify what consumption is related to the delivery of traditional services. Some local governments may find that calculating or excluding small "non-traditional" energy consumption is not worth the time required. If that is the case it may be easier, and more cost-effective, to capture all consumption information.

Eventually, in order to ascertain what your local governments' emissions are the energy consumption data that you collect will need to be converted into greenhouse gas emissions. Local governments will not be required to do any calculations or conversion of energy consumption themselves as this will be done by a data collection tool which is currently under development by the Province in conjunction with the GCC (e,g. SMARTTool which is currently being piloted as previously mentioned in this guidance.). Once developed, the data collection tool will convert the energy consumption into greenhouse gas emissions which are commonly reported as carbon dioxide equivalents or CO_2e. The calculated CO_2e value of the emissions produced by a local government is what is often referred to as a "carbon footprint".

Although local governments will not need to do any calculations or conversions of energy consumption into CO_2e some local governments may find that the process of collecting energy data will be followed closely with a desire to know the actual amount of greenhouse gas emissions produces as a result of energy use. Understanding the sources of emissions is an important part of identifying and planning where to reduce emissions.

Quick Scope Guide	
IN SCOPE: Counts as part of corporate footprint	OUT OF SCOPE: Does not count as part of corporate footprint
Traditional Services	Airports
Contracts for Traditional Services	Court Houses
Fuel used for Vehicles, Machinery and Equipment used in a Traditional Service	Buildings owned by the Province or the SUCH sector (covered by Carbon Neutral legislation)
Energy used in buildings in which a Traditional Service is housed (building ownership does not matter)	Landfills and buildings and equipment located at the landfill for the purposes of operating the landfill or processing waste
Fleet vehicles	Janitorial services
Staff vehicles which are used for the delivery of a Traditional Service	Buildings and/or equipment owned by a local government but used for a purpose which is *not* considered a Traditional Service
Tourism Centres	Staff Commuting
Maintenance	Staff Travel
	Construction
	Materials
	Processing of waste, recyclables or organics

Service Area:

Administration and Governance

This service category includes the local government buildings used for administration, governance, planning and economic development; as well as, activities associated with the provision of these services. For example, the energy used to execute a regulatory responsibility, such as travel required to conduct building inspections, would be included.

Buildings and Other Structures

In this category it is necessary to capture energy consumption data from the buildings where administration, planning, governance and economic development staff are housed.

Vehicles, Equipment and Machinery

The vehicles included in this category include those used by parking commissionaires, building inspectors and other vehicles used by administration staff and any vehicles used by staff who work for subsidiary organizations. For most local governments the vehicles in this category are most likely small municipal vehicles such as cars and small trucks.

Frequently Asked Questions:

Q Is a tourism centre considered part of "economic development"?

A Yes, a tourism centre is considered part of economic development and therefore is within the traditional services boundaries and must be counted.

Q Energy used to execute a regulatory responsibility is included. What does this mean?

A Fuel consumed by a vehicle used to execute a regulatory responsibility such as bylaw enforcement would be considered in scope and that fuel would need to be counted.

Q If staff use their own cars instead of a fleet vehicle do I need to count their fuel consumption?

A Yes, in essence the staff person is contracting the use of his/her car to the local government. If fuel consumption is not readily available it is possible to collect information on the type of vehicle (e.g. mid-sized car), fuel type and kilometres travelled. This information is likely already captured when staff submit expense forms for vehicle use. Note that "travel" is excluded.

Q How do I know how much fuel each vehicle uses?

A There are two ways in which to capture vehicle related emissions. The first is to report on the type of vehicle and the kilometres travelled in a year. With this information an estimation can be made on the GHG emissions related to the vehicle. The other option is to report on fuel use. This data may not be recorded

on a per vehicle basis but by a gas card which is attributed to a particular work group. The data does not need to be presented on a per vehicle basis.

Q Who is responsible for the emissions of Regional District staff who do work on behalf of Municipalities?

A Regional Districts are responsible for the emissions related to housing and transporting their staff even if those staff are doing work on behalf of a Municipality.

Q If we hire consultants to work on our Official Community Plan or Regional Growth Strategy do we count the emissions associated with their travel to our offices or to various municipalities?

A Emissions related to travel are considered outside the corporate boundaries. Additionally, for short travel between local governments for the purposes of meetings and consultation those emissions are also considered out of scope because fuel consumption is not a significant part of the service delivery.

Q What do we do if we do not have building energy consumption data?

A If energy consumption data is not readily available it is possible to use the square footage of the building and the primary use (e.g. offices) to estimate consumption.

Q What if we lease out part of a building, or multiple buildings, to another entity?

A If the service being provided is not a traditional service then you do not need to report it. For example, some local governments own buildings which are used for subsidized housing. The local government owns the space but it is being used for a non-traditional service and therefore is excluded.

Service Area:

Drinking, Storm and Waste Water

In this category it is necessary to capture energy consumption data related to the operation and maintenance of drinking, storm and waste water systems including, but not limited to:

- Water intakes, wells, reservoirs and dams,
- Water treatment facilities,
- Water distribution systems,
- Wastewater collection systems,
- Wastewater treatment systems, and
- Stormwater collection and treatment systems.

Buildings and Other Structures

This service area will include buildings and other structures as well. The energy consumption of all buildings and structures utilized for the operation and maintenance of the drinking, storm and waste water systems must be captured. For example, record the amount of energy used to provide heat and/or light for pump stations.

Vehicles, Equipment and Machinery

The vehicles, equipment and machinery included in this category include those used in the operation and maintenance of the drinking, storm and waste water systems. This would include vehicles used for site inspections, water metre readers, heavy machinery for maintenance or repair, and watershed monitoring. Equipment used for the storage, disinfection and treatment of drinking, storm and waste water treatment is included as are emergency power generators.

Frequently Asked Questions:

Q Is the collection of waste heat from sewer lines in scope?

A No.

Q Do I need to calculate the emissions which come from the wastewater?

A The emissions which come from the wastewater itself do not need to be captured or calculated as part of a local government's corporate footprint.

Service Area:

Solid Waste Collection, Transportation and Diversion

In this category capture energy consumption data related to the collection, transportation and diversion of solid waste. This includes recyclables and composting but does not include the operation of landfills and disposal sites.

Buildings and Other Structures

The buildings associated with the collection, transportation and diversion of solid waste include buildings used to house vehicles and staff as well as transfer stations recycling storage facilities, and buildings at yard and garden waste stations.

Vehicles, Equipment and Machinery

The vehicles included in this category include heavy machinery, dump trucks, garbage, recycling and leaf collection vehicles, and other vehicles associated with the provision of these services. Some of the equipment and machinery that may be included are compactors, chippers, and crushers.

Frequently Asked Questions:

Q How do determine who is responsible for the emissions?

A The local government who is responsible for the service is responsible for the emissions. The service bylaw should indicate who is responsible for providing the service. In some areas it is owned by the Regional District and it is their responsibility: in other areas a Municipality may be responsible for the garbage collection and transport to the transfer station but the Regional District is responsible for the transfer station and the transportation of the waste to the landfill.

Q How far is the transportation of solid waste tracked?

A The transportation of solid waste is tracked until the local government is no longer responsible for the waste. In the example given above the Municipality is only responsible for the waste until it is taken to a transfer station owned by a Regional District. However, if the Municipality owned the transfer station then they would be responsible for it until it left the transfer station.

Q How do we capture emission data if we do not offer garbage collection?

A Some local governments don't collect solid waste and don't contract solid waste collection. Instead, private citizens either take their waste to a designated site or contract a solid waste collector to provide this service. In either of these instances the local government is not involved in the service delivery and therefore is not responsible for capturing related emission data.

Q Are emissions from the operation of the landfill in scope?

A No, only those emissions associated with the collection, transportation and diversion are in scope. As a result, energy/fuel consumption associated with the operation of a landfill or emissions which result from the landfill itself are not included.

Service Area:

Roads and Traffic Operations

In this category capture energy consumption data related to the operation and maintenance of roads and traffic operations. This service area includes operation of roads, trails, street lights and signals, bike lanes, sidewalks and parking lots as well as maintaining these facilities (including such things as routing repair, maintenance, and snow removal etc).

Buildings and Other Structures

The buildings associated with the operation and maintenance of roads and traffic operations include buildings used to house vehicles and staff; as well as, traffic lights and signals and structures related to traffic lights and signals and their controls.

Vehicles, Equipment and Machinery

The vehicles included in this category include snow removal vehicles, all terrain vehicles, road sweepers, salting/sanding vehicles, vehicles used for line painting, patching and other road maintenance activities. Equipment and machinery could include, but is not limited to, lawn mowers, hedge trimmers, and weed eaters.

Frequently Asked Questions:

Q How do I know if roadwork is maintenance or construction?

A Construction work is an infrequent, usually costly, activity that provides benefit for several years and maintenance is an annual expense associated with maintaining the asset. Public Sector Accounting Board (PSAB) 3150 refers to Tangible Capital Assets (TCAs) and the **construction** or betterment of these TCAs are often **capitalized** over a longer period of time. Conversely, **maintenance** is part of the **annual expenses** associated with the service or assets and necessary to maintain the integrity of the service or asset. For example, widening, lengthening or resurfacing a road may all be capitalized expenses. If they are capitalized expenses then those projects are construction. However, filling potholes, painting new lines, and clearing debris off the roads are likely reoccurring expenses which are not capitalized and therefore considered maintenance. Only activities related to maintenance are counted for the purposes of carbon neutral as construction is excluded.

Q What if we contract out our road maintenance?

A Any Traditional Services which are contracted out are still considered part of a local government's corporate emissions. The information which you need to collect is that related to the fuel consumed in the provision of the service. Therefore, you do not need to collect information on the energy use of the contractor's buildings only the fuel consumed by the vehicles.

Service Area:

Arts, Recreation, Parks and Cultural Services

This category includes parks, swimming pools, recreations centres, arenas, art galleries, museums, planetariums, cemeteries (grounds), libraries and theatres. Capture all the energy consumption data related to the operation and maintenance of these various services.

Buildings and Other Structures

The buildings associated with the arts, recreation and cultural services include buildings such as swimming pools, recreations centres, arenas, art galleries, museums, planetariums, libraries and theatres as well as any structures used to house equipment and vehicles related to these services.

For services shared with another jurisdiction emission distribution, refer to the example in the text box on page eight of this document.

Vehicles, Equipment and Machinery

This category includes vehicles such as zambonis, bucket trucks, fleet vehicles, lift trucks and all terrain vehicles. The equipment and machinery includes lawn mowers, hedge trimmers, park maintenance equipment, and equipment required to maintain pool facilities or arenas.

Frequently Asked Questions:

Q How do I know if work on a building is maintenance or construction?

A Please refer to the answer on maintenance and construction under "Roads and Traffic Operation".

Q Libraries are identified as being a traditional service but there are different types libraries: integrated public libraries, municipal libraries, regional libraries. Are all libraries to be included in the corporate footprint and how do we know if we are responsible for the emissions?

A You will need to include the emissions related to the library if it is consolidated into your financial statements. If it is not included in your financial statements then you do not need to include it.

Q Do I need to count how much coolant is used by our local government?

A A decision has been made to exclude air conditioning in vehicles from the corporate basket; however, many local governments have arenas which require the use of coolants. The Province is currently exploring how and if coolant consumption could be captured in a simple and straightforward manner. It should

be noted that most coolants have very high global warming potentials and therefore have a significant and negative impact on the climate. If you have a system which is leaking coolant it would be best to repair it and possibly switch to a more climate friendly coolant blend.

Q How do I get energy information if the building is owned by the Province?

A Buildings which are owned by the Province or a Public Sector Organization (PSO)[ii] do not need to be reported by local governments. These buildings are already being counted as per the legislation which mandated carbon neutrality in these sectors for 2010.

[ii] PSOs are: Schools, Universities, Colleges, Hospitals and Crown Corporations.

Service Area:

Fire Protection

This category includes fire suppression, inspection, education, and outreach. Capture all the energy consumption data related to the provision of fire protection services and maintenance related to the services. If a voluntary fire department is operating a fire protection service on behalf of the local government then emissions from that service would also be included.

Buildings and Other Structures

The buildings associated with fire protection include fire halls and other buildings and structures used to house equipment and vehicles related to fire protection services.

For services shared with another jurisdiction emission distribution, refer to the example in the text box on page six of this document.

Vehicles, Equipment and Machinery

The vehicles included in this category include fire trucks, water trucks, inspection and education vehicles and any other vehicles used in the provision of fire protection services. The equipment and machinery include pumping for hydrants, water storage and auxiliary power generation.

Frequently Asked Questions:

Q Do local governments have to capture energy data from volunteer fire departments?

A Yes, local governments need to get data on vehicle fuel consumption and building energy consumption from all fire departments.

Q Do local governments need to get data on fuel use of firefighters' personal vehicles?

A Commuting to work is not included in the corporate emissions. Therefore, if a firefighter drives to the fire hall for a shift or directly to a fire the fuel consumption is not included as it is considered "commuting". However, if firefighters use their personal vehicles for regular work related travel such as going to a school to run an educational session and expense that travel then those emissions are to be included.

Q Are municipal fire halls and volunteer fire halls both included and is the same data captured?

A Yes.

Appendix

This table is subject to change and should not be viewed as final. However, you may find it useful as you start planning your emission reduction activities.

Prior to calculating the greenhouse gas emissions you may need to convert your energy data into the appropriate unit of measurement.

This website can help you convert your energy from unit of measurement to another: http://www.onlineconversion.com/energy.htm.

Direct Emission Factors for Mobile Sources (Fleet)

Fuel Type	Emission Factor[iii] tCO2e / L
Car - Biodiesel	0.002518271
Car - Diesel	0.002732271
Car - Ethanol 10	0.00226212
Car - Gasoline	0.00234112
Car - Natural Gas	0.00295904
Car - Propane	0.00153212
Light Truck - Biodiesel	0.002518628
Light Truck - Diesel	0.002732628
Light Truck - Ethanol 10	0.00229023
Light Truck - Gasoline	0.00236923
Light Truck - Natural Gas	0.00295904
Light Truck - Propane	0.00153212
Heavy Duty - Biodiesel	0.00247694
Heavy Duty - Diesel	0.00269094
Heavy Duty - Ethanol 10	0.002273428
Heavy Duty - Gasoline	0.002352428
Heavy Duty - Propane	0.00153212
Marine - Marine Diesel	0.00300715
Marine - Marine Gasoline	0.00233676
Motorcycle - Gasoline	0.00233235
Off Road - Biodiesel	0.00279315
Off Road - Diesel	0.00300715
Off Road - Gasoline	0.0023612
unspecified Car - Diesel	0.002732271
unspecified Car - Ethanol 10	0.00226212
unspecified Car - Gasoline	0.00234112
unspecified Car - Natural Gas	0.00295904
unspecified Car - Propane	0.00153212
Aviation Gasoline	0.0024595
Aviation Turbo Fuel	0.00260698

[iii] The use of electricity and fossil fuels results in greenhouse gas emissions. The emission factors column provides data on the amount of greenhouse gases emitted for each unit of electricity or fossil fuels used

Direct Emissions Factors for Stationary Sources (Buildings and Equipment)

Fuel Type	Measurement	Emission Factor tCO2e
Natural Gas	GJ	0.05030000000
Natural Gas (m3)	m3	0.00192749600
Propane (L)	L	0.00154426434
Heating Oil #2 (L)	L	0.00273519436
Diesel Fuel (L)	L	0.00278929325
Marine Diesel (L)	L	0.00300690696
Heating Oil #5 (L)	L	0.00314509775
Gasoline (L)	L	0.00236121340
Steam	GJ	0.07738550000
Steam (lbs)	lbs	0.00021281013

Machinery/Equipment	Energy Type	Number	Total Fuel
Auxiliary Generator			
Pumping Station			
Hedge Trimmer			
Lawn Mower			
Other			

Below is an example of a gas statement that a local government received. This statement is for one account at one building. This statement provides you with everything you need to understand how much gas one account has consumed.

If this building is within the scope of "traditional services" then the gas used must be included in your calculations for your corporate emissions.

To understand your annual gas use you must first find the year that you want the data for and the consumption data. In 2007, 1234 Gas Road used approximately1144.6 gigajoules (GJ) of gas. This number is not exact because the billing period does not correspond to the start and end of the year.

Terasen Gas - Vancouver Island

Commercial & Industrial Marketing
16705 Fraser Highway, Surrey, B.C. V4N 0E8
Tel: (604) 576-7139 E-mail: commercial.energy@terasengas.com Fax: (604) 576-7122

Natural Gas Consumption History

Customer: **Municipal Building**
Service Address: 1234 Gas Road

Customer Number: 3333333 Premise Number: 555555
Meter Number: 4444444.0

Current Rate: TGVI Large Commercial 1

Annual Cons'n: 1,266.1 GJ / 365 Days
Daily Peak: 8 GJ

Prepared by: GW
Terasen Gas Contact:
Phone:
E-mail:

Approximate Annualized Cost for the annual consumption above, based on rates in effect at April 1, 2008 Rate LCS-1: $16,771

Notes:
Approximate Costs (if shown) are based on current Rate in effect at Billing Date.
Costs may vary due to billing period crossovers and other factors.
Costs do include Basic Monthly Charge. Taxes & Franchise Fees are Not included.
We believe this data to be correct and accurate, however Terasen Gas assumes no liability for errors or omissions. Actual billing data shall prevail.

Billing Date	Days	Cons'n (GJ)	Approx. Cost
20-Mar-08	29	155.2	$1926
20-Feb-08	29	178.7	$2209
22-Jan-08	33	173.5	$2146
20-Dec-07	28	172.2	$2130
22-Nov-07	29	132.3	$1651
24-Oct-07	33	66.4	$859
21-Sep-07	30	57.1	$747
22-Aug-07	30	51.7	$682
23-Jul-07	32	64.5	$836
21-Jun-07	29	58.3	$762
23-May-07	30	68.5	$884
23-Apr-07	33	87.7	$1115
21-Mar-07	29	141.5	$1762
20-Feb-07	29	135.5	$1689
22-Jan-07	33	108.9	$1370
20-Dec-06	28	79.7	$925
22-Nov-06	30	87.3	$1008
23-Oct-06	47	107.7	$1290
06-Sep-06	34	69.8	$818
03-Aug-06	29	63.1	$745
05-Jul-06	29	62.0	$733
06-Jun-06	33	73.6	$859
04-May-06	30	86.6	$1000
04-Apr-06	32	89.0	$1026
03-Mar-06	28	91.4	$1053

Here is a short, modified version of a BC Hydro statement for 2008. The important elements with respect to corporate emissions are the location (location could be a building, water pump, traffic signal box or something else), billing year (in this case 2008), and energy consumption (how much electricity, kilowatt hours (kWh), was used at that location in 2008).

Location	Acct	NAICS	Billing	Total Revenue	Energy Consumption	GST	PST	Tax	Total Charge
5762 ALTA LAKE RD		9130	2008	776.72	9,968	38.83	54.36	93.19	869.91
WHISTLER CEMETARY		2213	2008	6,789.30	94,556	339.46	475.24	814.70	7,604.00
2200 TAYLOR WAY		9130	2008	448.68	5,518	22.44	31.41	53.85	502.53
2149 LAKE PLACID RD		5620	2008	4,717.04	65,459	235.85	330.20	566.05	5,283.09
2025 KAREN CRS		5620	2008	538.09	6,714	26.90	37.68	64.58	602.67
FUNCTION JUNCTION		9130	2008	2,928.78	40,207	146.43	205.02	351.45	3,280.23
MILLARS POND TRL LGTS		4880	2008	272.25	3,005	13.60	19.08	32.68	304.93
2773 CHEAKAMUS WAY		5620	2008	104.30	659	5.21	7.30	12.51	116.81
2399 CHEAKAMUS WAY		5620	2008	2,176.88	29,559	108.85	152.39	261.24	2,438.12
3333 CARLETON WAY		5620	2008	731.82	9,446	36.60	51.23	87.83	819.65
3021 ST ANTON WAY		5620	2008	655.71	8,405	32.78	45.91	78.69	734.40
2101 WHISTLER RD		2213	2008	694.14	8,831	34.71	48.58	83.29	777.43
2008 NITA LN		5620	2008	292.83	3,336	14.64	20.49	35.13	327.96
2003 NORDIC PLACE PUMP		9130	2008	176.32	1,676	8.82	12.33	21.15	197.47
3030 BLUEBERRY DR		5620	2008	2,577.18	35,334	128.85	180.41	309.26	2,886.44
4313 VILLAGE GATE BLV		4880	2008	3,062.86	41,760	153.13	214.40	367.53	3,430.39
4420 VILLAGE LN		5620	2008	1,385.13	18,531	69.26	96.95	166.21	1,551.34
TOWN CENTER LOT B		5310	2008	17,528.62	251,600	876.43	1,227.00	2,103.43	19,632.05

How one local government is assessing the energy consumption of some of their key buildings:

Building	Size (ft2)	Electricity						Propane						TOTALS					
		Cost (yr)		Consumption (GJ)		Emmisions (CO2e)		Cost		Consumption (GJ)		Emmisions (CO2e)		Cost		Consumption (GJ)		Emmisions (CO2e)	
		Total	per sq. ft.	Total	per sq. ft.	Total (t)	per sq. ft	Total	per sq. ft.	Total	per sq. ft.	Total (t)	per Sq. ft	Total	per sq. ft	Total	per sq. ft	Total (t)	per sq. ft (kg)
Meadow Park Sports Centre	64,749	$ 155,097.92	$ 2.40	10,881.2	0.168	78.30	1.21	$ 218,748.67	$ 3.38	10,139.38	0.157	616.78	9.53	**$373,846.59**	**$ 5.77**	**21,020.59**	**0.32**	**695.08**	**10.73**
Waste Water Treatment Plant	37,667	$ 172,150.46	$ 4.57	11,497.1	0.305	89.94	2.39	$ 93,784.50	$ 2.49	3,658.80	0.097	222.56	5.91	**$265,934.96**	**$ 7.06**	**15,155.94**	**0.40**	**312.51**	**8.30**
Public Works Yard Bldgs	35,291	$ 39,062.38	$ 1.11	2,461.5	0.070	19.26	0.55	$ 37,233.80	$ 1.06	1,440.80	0.041	112.84	3.20	**$ 76,296.18**	**$ 2.16**	**3,902.34**	**0.11**	**132.10**	**3.74**
Public Safety Building	21,890	$ 29,710.56	$ 1.36	1,826.5	0.083	14.29	0.65	$ 9,029.53	$ 0.41	209.40	0.010	12.74	0.58	**$ 38,740.09**	**$ 1.77**	**2,035.90**	**0.09**	**27.03**	**1.23**
Municipal Hall	17,975	$ 16,013.35	$ 0.89	702.9	0.039	5.50	0.31	$ 16,668.07	$ 0.93	350.00	0.019	21.29	1.18	**$ 32,681.42**	**$ 1.82**	**1,052.86**	**0.06**	**26.79**	**1.49**
Spring Creek Fire Hall	6,019	$ 4,340.92	$ 0.72	191.7	0.032	1.50	0.25	$ 10,997.74	$ 1.83	426.50	0.071	25.94	4.31	**$ 15,338.66**	**$ 2.55**	**618.17**	**0.10**	**27.44**	**4.56**

This local government has captured data on electricity and propane consumption. They have used this data to determine energy use based on square footage per building. This is not something that is necessary to do. However, it is an example of how the data can then be used to better understand how energy consumption differs per building.

The important information from this chart is as follows: the buildings for which the energy consumption data is captured, and the electricity and propane consumption for the buildings.