

666 Burrard St., Park Place - Vancouver, BC
Greenhouse Gas Inventory Report

October 3, 2011



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1 SUMMARY

This report details the greenhouse gas (GHG) emissions inventory of 666 Burrard St. (Park Place), Vancouver, BC. A GHG inventory lists the sources¹ of GHG emissions and the quantity of emissions released from each source during the reporting period².

Park Place is owned by 1672 Holdings Limited and managed by GWL Realty Advisors (GWL). GWL is registering Park Place in the Canadian Green Building Council's (CaGBC) LEED Canada EB: O&M Program (LEED-EB) and is targeting this rating system's Energy and Atmosphere Credit 6: Emission Reduction Reporting (EA6)³. GWL will use the data from this report to disclose the building's emissions in the CSA CleanStart™ Registry and also as part of Park Place's LEED-EB Credit EA6 (Emissions Reductions Reporting) documentation package.

Loop Initiatives (Loop) is the Agent to Park Place's property management company, GWL, and is responsible for the completion of Park Place's GHG inventory and reporting in accordance with CAN/CSA-ISO Standard 14064-1-06⁴. 3P Analysis and Consulting has been engaged to provide independent third party verification.

This report has been written in accordance with CAN/CSA-ISO Standard 14064-1-06 *Greenhouse Gases - Part 1: Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*. In addition, the World Resource Institute (WRI)/World Business Council for Sustainable Development (WBCSD) Standard: Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard⁵ and CAN/CSA-ISO Standard 14064-3-06 *Greenhouse Gases - Part 3: Specification with Guidance for the Validation of Greenhouse Gas Assertions* have been used as additional resources.

Park Place emitted 2,772 tonnes of CO_{2e} for the August 2010 – July 2011 reporting year. Building emissions accounted for 1,174 tonnes of CO_{2e} while tenant commuting accounted for 1,598 tonnes of CO_{2e}. Direct GHG (Scope 1) emissions from building energy use account for less than 1% of the total reported emissions. Energy indirect GHG (Scope 2) emissions from building energy use account for 42% of the total reported emissions. Other indirect GHG (Scope 3) emissions from

¹ Examples of GHG sources include: boilers (natural gas combustion), electricity production (mixed fossil fuel combustion), etc.

² The reporting period is defined as the one year duration for which the quantity of GHG emissions from all sources is calculated.

³ *LEED Canada for Existing Buildings: Operations and Maintenance 2009 Reference Guide*. 2009, Canadian Green Building Council.

⁴ *CAN/CSA ISO 14064-1 Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*. March 2006, International Standards Organization.

⁵ *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*. March 2004. World Resources Institute and World Business Council for Sustainable Development.

building tenant commuting account for 58% of the total reported emissions. The emissions were calculated from data and other documentation collected from GWL and Halsall Associates (Halsall).

Please refer to Section 5 and Appendix A for Park Place's detailed GHG inventory.

2 ORGANIZATION PROFILE

Park Place, located in Vancouver, BC, and built in 1984, is a 35-storey office tower with 6 levels below grade parking. This building is owned by 1672 Holdings Limited and is managed by GWL.

As reported by Halsall, the office space gross floor area (GFA) is 884,900 ft². This includes:

- 683,500 ft² of occupied office space; and
- 201,400 ft² parking.

As reported by Halsall:

"Primary heating is provided by a steam district plant, transferring heat to the building's hot water loop via two heat exchangers...Primary cooling is provided by two centrifugal Trane chillers...and are original to the building. The smaller of the two chillers is typically used to handle the load during shoulder (non peak) conditions, while the larger is used during peak summer operation.

The office outdoor air supply (OA) is provided by two constant speed, variable inlet vane (VIV) fans...The ground floor and B1 outdoor air supply is provided by ... a constant speed, VIV fan. All dedicated OA fans have a heating and cooling coil.

The outdoor air is distributed to each floor via a dedicated shaft, feeding into the constant volume, constant speed interior fans. The floor recirculation is returned to the interior fan from the ceiling plenum, where it is filtered, cooled and mixed with the outdoor air prior to supplying back to the interior space.

The perimeter is heated and cooled by the VAV system, with a cooling coil at the fan and reheat coils in the VAV boxes. This system is 100% recirculation, with no outdoor air ducted to the perimeter system.

Domestic hot water is provided by a steam district plant, with two separate heat exchangers."

The following figure (Figure 1) shows the breakdown of Park Place's tenants by industry sector.

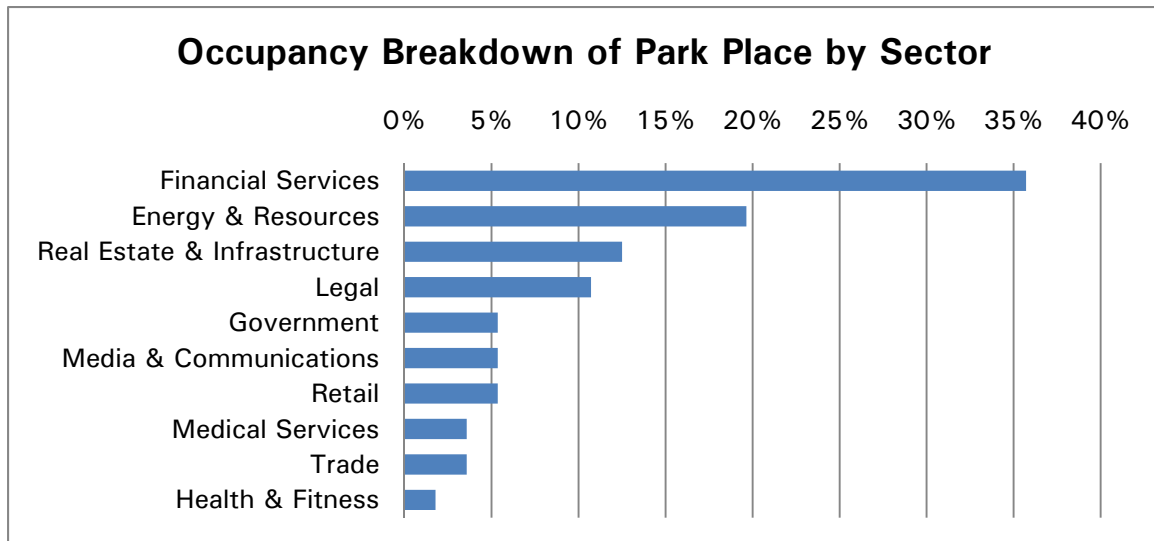


Figure 1: Breakdown of Park Place’s Tenants by Industry Sector

GWL has made a commitment to “greening” this facility, including participating in LEED-EB which evaluates green building performance such as energy and water efficiency and waste management. To achieve LEED-EB credit EAc6, GWL is reporting Park Place’s GHG emissions to the CSA Clean Start™ Registry.

3 GHG INVENTORY DESIGN AND DEVELOPMENT

3.1 Organizational Boundaries

For any GHG inventory, an organizational boundary is used to determine how GHG emissions are accounted for. Typically, one of the following approaches is used⁶:

1. Equity share approach: accounts for GHG emissions based on share of equity in the operation;
2. Financial control approach: accounts for GHG emissions based on the financial control over the operation; or
3. Operational control approach: accounts for GHG emissions based on the control of operations. The organization must report emissions from the sources over which it has operational control.

⁶ *Hot Climate, Cool Commerce: A Service Sector Guide to Greenhouse Gas Management*. May 2009, World Resources Institute.

CAN/CSA-ISO Standard 14064-1-06 Section 4.1 states that the organization may use a different consolidation methodology where specific arrangements are defined by a GHG program or legal contract.

Since LEED-EB evaluates facilities rather than organizations to meet EAc6 requirements, the Park Place facility was used as a physical boundary rather than using any of the organizational boundaries described above. As such, the emissions from the base building equipment and the tenant equipment (including energy and refrigerant GHG emissions) were included in the GHG inventory without taking into consideration whether GWL or the tenants have control or ownership. In addition, since LEED-EB credit EAc6 does not take transportation into consideration, emissions from building-owned or leased vehicles are excluded from the inventory.

3.2 Operational Boundaries

Operational boundaries are defined to prevent double counting of reported emissions. These boundaries can be separated into the following three emission types:

Direct GHG emissions:

Direct emissions within the organizational boundary are released from fuel combustion, HFC emissions, generation of electricity, steam, or heat in equipment, business travel or employee commuting in company owned or leased vehicles.

Energy Indirect GHG emissions:

Indirect GHG emissions are released by the production of electricity, steam and/or chilled water, purchased by the facility users.

Other Indirect GHG emissions:

Other indirect GHG emissions are released from all other activities outside of the organizational boundaries. They may include business travel, employee commuting, third party manufacture of materials and resources, outsourced activities, and transmission and distribution losses from the electricity network.

3.2.1 Direct GHG Emissions at Park Place

Direct GHG emissions released from sources at the facility level include Park Place's emissions from the combustion of natural gas and diesel and the release of refrigerant gases.

Natural gas is supplied by Fortis BC (formerly Terasen Gas). Halsall confirmed that all natural gas use is for the building restaurant's cooking equipment.

As reported by the service provider Trane, two chillers (installed in 1984) containing refrigerant HCFC-123 (R-123) are on site. The chillers have a refrigerant charge of 1,580 lbs and 1,200 lbs (reported by Trane). R-123 is a refrigerant that has been identified as not having a “global warming potential” (GWP) by the UN Intergovernmental Panel on Climate Change (IPCC) and has therefore not been included in the GHG inventory. GWL also reported that there were no PFC’s or SF₆’s in the building.

There are two diesel tanks on site with a total capacity of 1,050 US gallons. The last time these were refilled was in October 2010 and as such, would have been included in the GHG inventory for the 2010-2011 period. For the accounting year, diesel consumption values were provided by GWL.

As transportation emissions are excluded in LEED-EB credit EAac6, GWL-owned vehicles, considered direct GHG emissions, were not included in the GHG inventory.

3.2.2 Energy Indirect GHG Emissions at Park Place

This report includes Park Place’s indirect GHG emissions inventory from electricity and steam.

Electricity at Park Place is purchased from BC Hydro. Consumption is measured from one main meter. As reported by Prism Engineering’s energy breakdown calculations, the building’s electrical end use breakdown is shown in Figure 2.

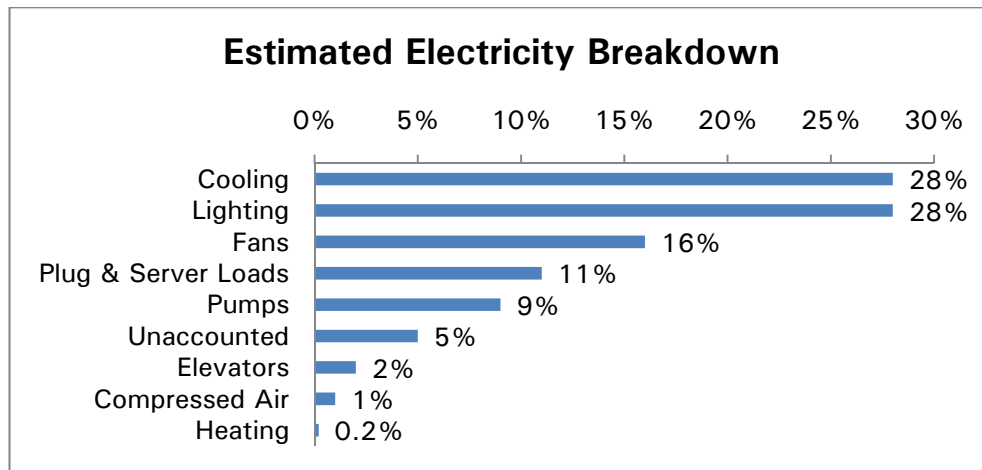


Figure 2: Estimated Electricity Breakdown by End Use

Steam at Park Place is purchased from the Central Heat Distribution Limited. Steam consumption is measured by one meter to Park Place.

Halsall confirmed that steam is only used for domestic hot water and building heating purposes.

3.2.3 Other Indirect GHG Emissions at Park Place

GWL has chosen to include Scope 3 emissions from building tenant commuting in order to achieve an innovation credit for LEED-EB.

In order to include GHG emissions from tenant commuting, GWL collected the following tenant information:

- Weekly number of trips to and from work;
- The distance between home and work; and
- The mode(s) of transportation used for commuting.

Halsall sub-contracted Advitek, a market research company, to conduct a Commuting Survey of Park Place's employees. The survey collected data from 582 employees. This meets the minimum sample size requirement as outlined in the LEED Canada EB: O&M Reference Guide for credit SSc4 (Alternate Transportation). The sample data was then extrapolated over an annual working period of 49 weeks for all 2,165 employees that work at the building.

3.2.4 GHG Removals and Biomass Combustion at Park Place

GHG removals or combustion of biomass are not present at Park Place.

3.3 History of Emissions at Park Place

Emissions were calculated for the time period between August 2010 – July 2011 to meet LEED-EB's 12 month Performance Period requirement.

Since this is the first year that Park Place is calculating its GHG emissions, this GHG inventory becomes the building's "base year"⁷ emissions. Future annual inventories should be compared to this base year to track the results of emissions reduction efforts.

4 QUANTIFICATION

The GHG inventory calculation requires two general types of data. As per CAN/CSA-ISO Standard 14064-1-06 Section 4.3.6, we obtained the appropriate "activity data" and "emission factor" to apply to the following equation:

$$\text{activity data} \times \text{emission factor} = \text{GHG emissions}$$

⁷ The base year is the first reporting period for which a GHG inventory is reported.

Activity data was collected from site utility bills. Emission factors from Canada's National Inventory Report (1990-2009)⁸ were used.

In addition, the LEED program requires the use of an emission factor methodology.

4.1 **Natural Gas**

4.1.1 Activity Data

Activity data for natural gas is based on Fortis BC monthly utility bills. Natural gas consumption is metered and reported by the utility in GJ.

4.1.2 Emission Factor

Loop Initiatives used the National Inventory Report (1990-2009)⁸ natural gas emission factors to calculate Park Place's GHG emissions. BC-specific CO₂ emission factors from Part 2, Annex 8, Table A8-1 were used. Since CH₄ and N₂O emissions are dependent on a specific sector rather than regional fuel properties, national commercial CH₄ and N₂O data from Part 2, Annex 8, Table A8-2 were used.

The natural gas emission factor units are in metric tonnes of emission per m³.

4.2 **Refrigerant R-123**

4.2.1 Activity Data

Activity data for refrigerant R-123 has not been included in this report since it has not been identified by the UN's IPCC as having a GWP and is therefore not required to be reported.

4.2.2 Emission Factor

Loop Initiatives used the ISO-14064-1:2006 Annex C refrigerant global warming potential (GWP) factors for Park Place's GHG calculations. The refrigerant GWP factor is a quantity without a physical unit.

⁸ *National Inventory Report (1990-2009) Greenhouse Gas Sources and Sinks in Canada*. 2011, Environment Canada GHG division.

4.3 Diesel

4.3.1 Activity Data

Activity data for diesel is based on 2010 consumption reports that GWL has provided. GWL has confirmed that their usage schedule for the diesel generator was similar for the reporting year.

4.3.2 Emission Factor

Loop Initiatives used the National Inventory Report (1990-2009)⁸ diesel emission factors. The calculations used CO₂, CH₄ and N₂O emission factors from the National Inventory Report's Part 2, Annex 8, Table A8-4.

The diesel emission factor is measured in metric tonnes emission per L.

4.4 Electricity

4.4.1 Activity Data

Activity data for electricity is based on BC Hydro monthly utility bills. Electricity is provided through one main meter to Park Place Electricity consumption is metered and reported on by the utility in unadjusted kWh and adjusted kWh. As required by Energy Star and consequently the LEED-EB Program, unadjusted kWhs were used for this GHG inventory.

4.4.2 Emission Factor

Loop Initiatives used the National Inventory Report (1990-2009)⁸ electricity emission factors. 2008 values were used as the 2009 values are still preliminary.

As GWL is reporting on only one facility in B.C. the calculations used provincial CO₂, CH₄ and N₂O emission factors from the National Inventory Report's Part 3, Annex 13, Table A13-11.

The electricity emission factor is measured in metric tonnes emission per kWh.

Published electricity grid emission factors do not account for Transmission and Distribution (T & D) losses. As per the Greenhouse Gas Protocol, companies that purchase electricity from a T & D grid but do not own any part of the system should not include T & D losses in a scope 2 inventory. For this reason, T & D losses have not been included in the calculations for Park Place.

4.5 **Steam**

4.5.1 Activity Data

Activity data for steam is based on Central Heat Distribution Limited monthly utility bills. Steam is provided through one main meter to Park Place. Steam consumption is metered and reported by the utility in pounds (lbs).

4.5.2 Emission Factor

Central Heat Distribution Limited provided Loop Initiatives with an emission factor for steam. The emission factor was derived from 2010 data. The data was provided in kg CO_{2e}/Mlbs. A breakdown of CH₄ and N₂O was not provided.

4.6 **Building Tenant Commuting**

4.6.1 Activity Data

Activity data was provided by Advitek, a market research company that was sub-contracted by Halsall to conduct a Commuting Survey of Park Place's tenants.

4.6.2 Emission Factors

Loop Initiatives use the National Inventory Report (1990-2009)⁸ for vehicle emission factors and the World Resource Institute Compilation of Emission Factors used in the Cross-Sector Tool for bus, subway, train and taxi emissions.

For car emissions, Light-Duty Gasoline Vehicles, Tier 1 emission factors were used for CO₂, CH₄ and N₂O. They were taken from Part 2, Annex 8, Table A8-11.

For light rail emissions, CO₂, CH₄ and N₂O emission factors were taken from the Mobile-Public Transport tab on the WRI Compilation of Emission Factors used in the Cross-Sector Tool, Table 13.

For bus, rapid transit, and ferry emissions, CO₂, CH₄ and N₂O emission factors were taken from the BC Ministry of Environment (2011), Methodology for Reporting BC Public Sector Greenhouse Gas Emissions. Refer to Appendix B for summary of data collection sources and emission factor sources.

5 GHG INVENTORY COMPONENTS

5.1 Emissions

5.1.1 Building Emissions

The total emissions from building energy direct and indirect GHG emissions sources during the reporting year are 1,174 tonnes of CO₂e. Building electricity, natural gas, diesel and steam account for 100% of the Park Place's reported emissions. The breakdown as shown in Figure 3:

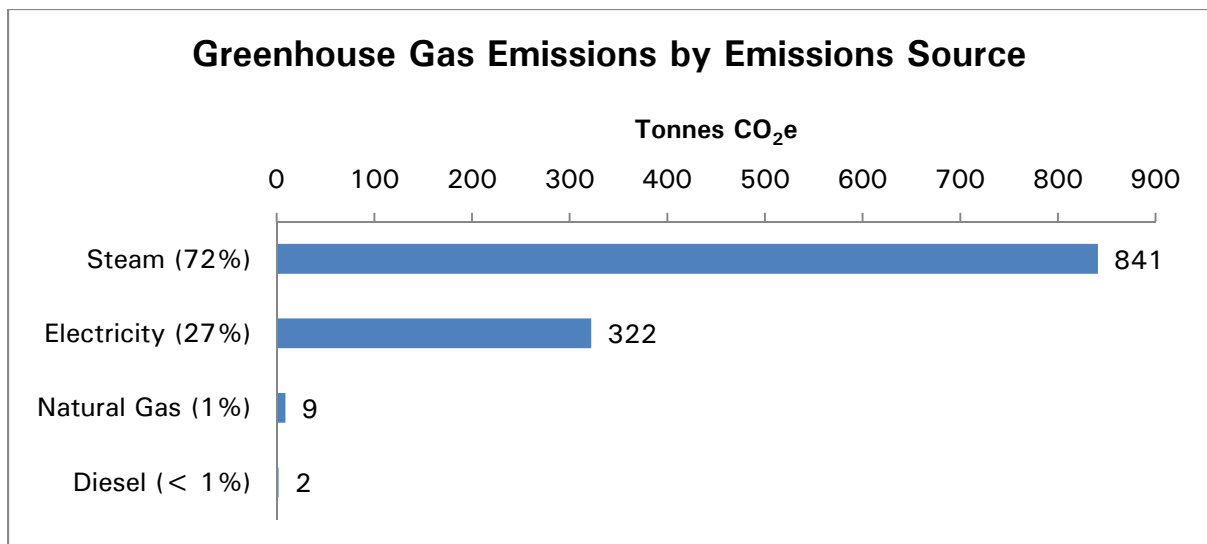


Figure 3: Emissions from Building Energy Use
Annual GHG emissions from building energy use are 1,174 tonnes CO₂e

CO₂ emissions account for almost 100% of the total GHG emissions, while CH₄ and N₂O emissions are negligible (they account for less than 1% of total GHG emissions). However, to meet CAN/CSA-ISO 14064-1-06⁹ requirements, they have been included in the greenhouse gas inventory.

Refer to Figure 4 for the monthly energy consumption.

⁹ CAN/CSA ISO 14064-1 Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. March 2006, International Standards Organization.

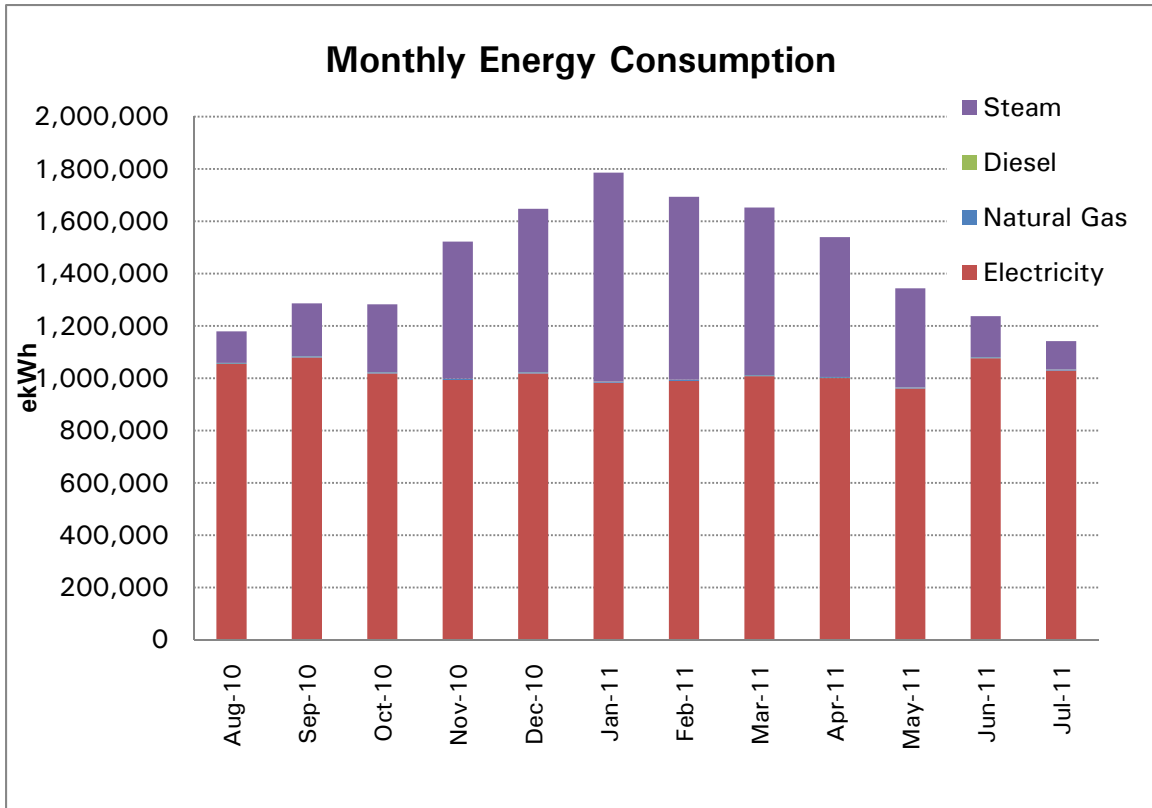


Figure 4: Monthly Energy Consumption by Energy Source
 Annual Energy Consumption is approximately 17,316,000 ekWh

With a carbon intensity of 1.7 kg CO₂e/ ft², Park Place’s carbon footprint is slightly higher than the average of other Vancouver commercial buildings in Loop’s building performance database. The carbon intensities of comparable buildings in the database range between 0.3 kg CO₂e/ ft² and 4.1 kg CO₂e/ft², averaging at 1.6 kg CO₂e/ ft² (Figure 4).

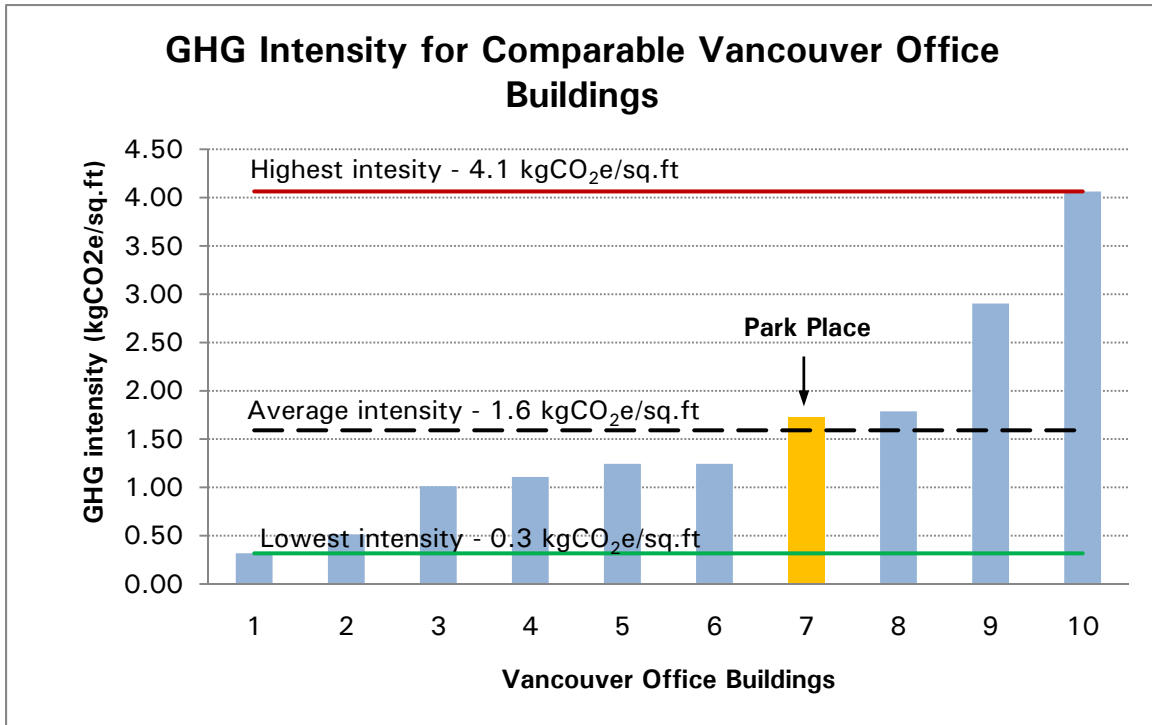


Figure 5: GHG Intensity for Comparable Vancouver Office Buildings¹⁰

5.1.2 Tenant Commuting Emissions

Employee commuting at Park Place results in the emission of 1,598 tonnes of CO₂e per year, equating to an annual emissions intensity of 0.7 tonnes CO₂e per full time employee. Figures 6 and 7 illustrate commuting breakdowns with respect to distance travelled and greenhouse gases emitted. While tenants commuting via Skytrain accumulate the largest commuting distance (41%), they emit the lowest amount of emissions after cycling/walking (2%). Cars, on the contrary, emit the most amount of emissions (61%), while contributing to 25% commuting travel distance.

¹⁰ Halsall Associates/Loop Initiatives Building Performance database (2006-2011). Data is not weather normalized. Intensity is calculated using the Energy Star™ definition of gross floor area.

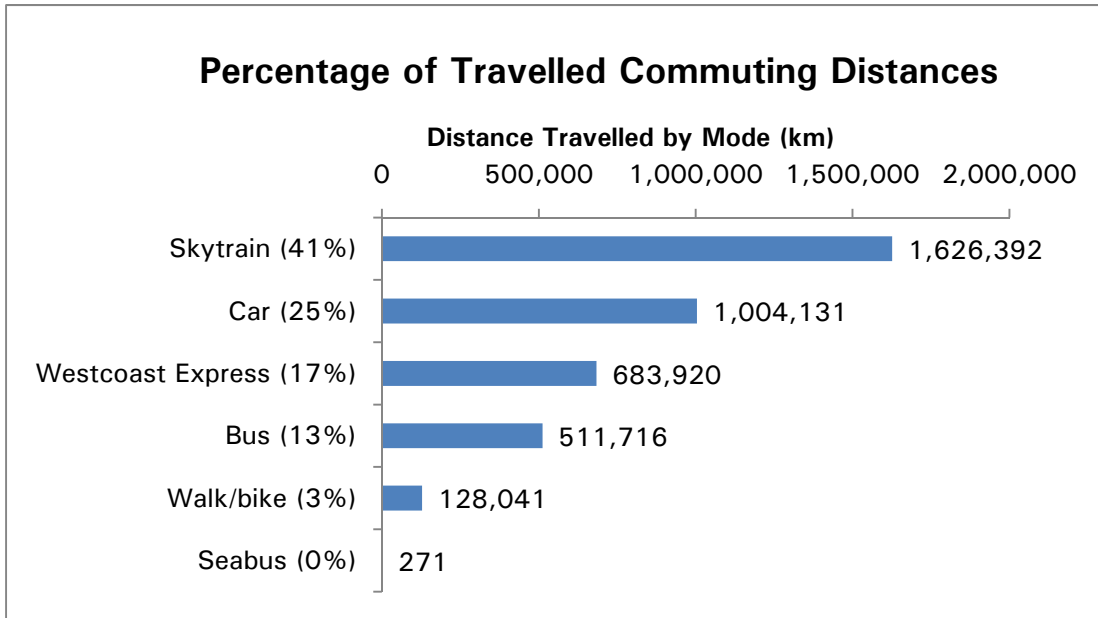


Figure 6: Percentage of Travelled Commuting Distances

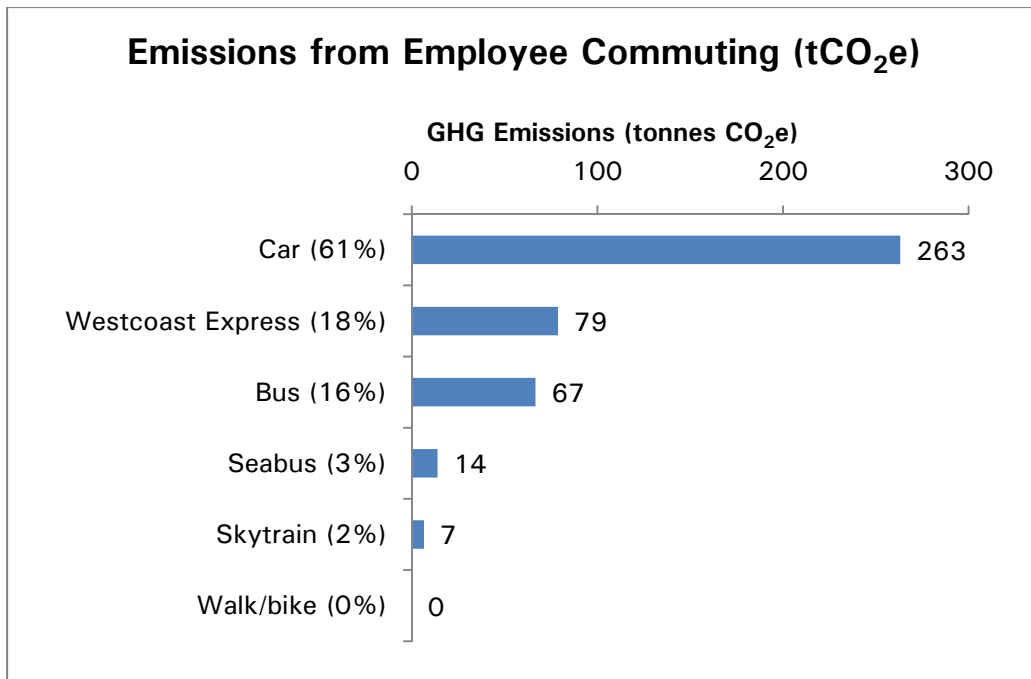


Figure 7: Emissions from employee commuting

Employee commuting is responsible for 58% of the total greenhouse gas emissions at Park Place. In the following figure (Figure 8) Scope 3 emissions are related to employee commuting, whereas Scope 1 and 2 both related to building energy use.

This proportion of Scope 3 emissions is consistent with other organizations' GHG inventories, which include building and employee commuting emissions in their inventories.

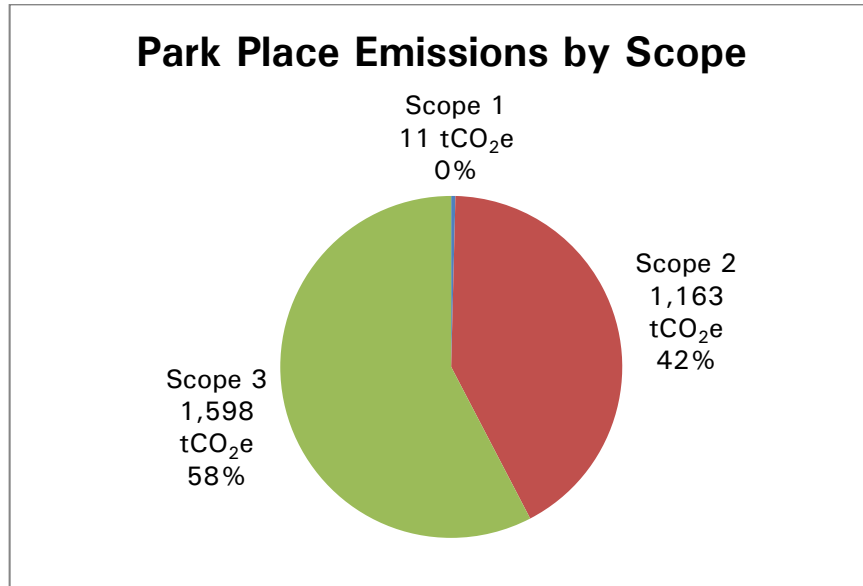


Figure 8: Breakdown of Emissions by Scope

5.2 Activities to Reduce GHG Emissions

GHG reduction strategies for this facility are planned to focus on energy measures. The building increased its GHG emissions with 131 tonnes of CO₂e (13%) between the August 2010-July 2011 reporting year and the previous 12 month period. Halsall confirmed this was likely due to issues with the building steam system that has since been fixed.

Some of the past major GHG reduction strategies include:

- Lighting Retrofits (2009-2010)
- Close Floor Outdoor Air Dampers during Unoccupied Period (2009)
- Change OAU-1 and OAU-2 Heating Coil Pump Operation (2009)
- Change OAU-1 and OAU-2 Supply Air Temperature Control (2009)
- Decrease Heating Water Temperature Reset Setpoint (2009)

Prism Engineering prepared a LEED retro-commissioning plan in which several strategies for energy conservation have been recommended. GWL has not yet decided which measures will be implemented in the future. Table 2 indicates the potential emissions savings of a sample of the suggested strategies.

Table 1: Carbon Saving Strategies

Building Performance Parameter	Estimated Emissions Savings	Activity Unit
Lighting Retrofits	9	t CO ₂ e
Repair HE-1 Steam Valve and Modify Hot Water Program Code	38	t CO ₂ e
Release SAT Setpoint Override on Makeup Units OAU-1 and OAU-2	59	t CO ₂ e
Re-Implement Mixed Air Damper Control for OUA-3	85	t CO ₂ e
Relamp Tenant Space Downlighting	8	t CO ₂ e
Annual Carbon Savings Implementation	199	t CO₂e

5.3 Estimation of Uncertainty¹¹

Table 3 presents our opinion of the level of uncertainty related to this GHG inventory. Our opinion of uncertainty is based on *Table 3: Certainty Ranking for Common Emission Sources*, found in "Measurement and Estimation Uncertainty of GHG Emissions" by the Greenhouse Gas Protocol Initiative.

Table 2: Uncertainty Ranking

Major Emission Category	Certainty Ranking
Natural Gas	High – The meter is calibrated and verified by Fortis BC. Natural gas emission factors are less dependent on location and are almost always standard and accurate. Uncertainty may be derived from fluctuations in measurement equipment.
Refrigerant	High – Refrigerant leakage has not been included since R-123 is a refrigerant that has been identified as not having a GWP by the UN's IPCC.
Diesel	Fair - Annual bills for diesel top-up between 2007-2010 were provided by GWL. Similar usage patterns were observed for these years. To obtain an estimate of monthly usage it was assumed diesel consumption was evenly distributed throughout the year.

¹¹ *Measurement and Estimation Uncertainty of GHG Emissions*. 2003, The Greenhouse Gas Protocol Initiative.

Electricity	Fair – The emission factor is based on an annual provincial grid average, containing multiple fuel sources such as hydro, biomass and natural gas.
Steam	Fair – the emission factor was provided by the steam provider. Calculations and limitations of the data are unknown.
Employee Commuting	Fair – The survey data included a 27% sample of employees. The emission factors are based on Provincial, National and North American average data from the WRI, Canada’s National Inventory Report, and BC Ministry of Environment.

6 GHG INVENTORY QUALITY MANAGEMENT

6.1 GHG Information Management

In an effort to maintain a credible GHG inventory, roles and responsibilities were assigned to ensure consistency, accuracy, completeness, transparency and conformance with CAN/CSA-ISO Standard 14064-1-06.

Name	Role	Company
Frank Vecchio	Senior Property Manager, Park Place & Commerce Place	GWL Realty Advisors ¹²

Responsibilities:

- To provide Halsall/Loop with required energy data (via utility bills);
- To provide Halsall with refrigerant data information; and,
- To approve and sign the CSA CleanStart™ Registry application form.

Name	Role	Company
Graeme Scott	Project Principal	Halsall Associates ¹³
Andre Harrmann	Project Manager	Halsall Associates
Lori Matos	Project Associate	Halsall Associates

Responsibilities:

- To provide Loop Initiatives with required energy data (via utility bills); and,
- To provide Loop Initiatives with refrigerant data information.

¹² GWL Realty Advisors is the Owner’s Representative

¹³ Halsall is the LEED-EB Consultant for Park Place

Name	Role	Company
Francisca Quinn	Project Director	Loop Initiatives
Jia Shin	Project Manager	Loop Initiatives
Mark Bessoudo	Project Analyst	Loop Initiatives

Responsibilities:

- To request and analyze received activity data for acceptable accuracy, to collect appropriate emission factors and perform GHG calculations; and,
- To produce a report consistent with both the CSA CleanStart™ Registry requirements and CAN/CSA-ISO Standard 14064-1-06.

Name	Role	Company
Evan Jones	Independent Verifier	3P Analysis and Consulting

Responsibilities:

- To verify that Loop Initiatives' 14064-1 report meets CSA CleanStart™ Registry requirements and CAN/CSA-ISO Standard 14064-3-06; and,
- To issue a verification statement.

6.2 Document Retention and Record Keeping

The following activities, conducted by the property management company, maintain credible GHG inventory and reporting:

- GWL compiles a record of Park Place's utility bills and maintains them through spreadsheet tracking. This has a dual purpose in that it tracks both energy and operating costs; and,
- This is the first year that GWL will calculate and register Park Place's greenhouse gas emissions. This inventory contains emission factors, CSA Baseline Year activity data, refrigerant history, GHG emissions and other important information. GWL should keep this GHG inventory report for their records, should they choose to register Park Place or other organizations within Park Place next year with the CSA CleanStart™ Registry.

7 ORGANIZATION'S ROLE IN VERIFICATION ACTIVITIES

Evan Jones from 3P Analysis and Consulting was engaged to provide independent third party verification as per CAN/CSA-ISO Standard 14064-3-06. The verification is to be completed at a reasonable level of assurance.

Loop Initiatives prepared for Park Place's verification by:

- Engaging a third party verifier to provide a reasonable level of assurance;
- Agreeing to verification objectives, scope, materiality and criteria with the verifier;

- Reviewing each section using the CSA Registry checklist; and
- Using an internal review process for quality control for the inventory and the document.

Third party verification is required by LEED EB. This provides an impartial and objective review of the reported GHG emissions.

Reporting content summary for declarations to the CSA standard is presented in Appendix C.

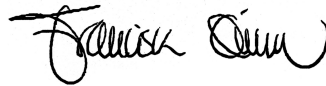
We hope this report meets your expectations and will assist GWL in successfully managing your ongoing efforts to reduce GHG emissions. Loop Initiatives would be pleased to contribute further if you wish, by proceeding with a GHG reduction plan.

Please do not hesitate to contact us at (416) 644-0625.

Yours truly,
LOOP INITIATIVES



Jia Shin, M.Sc.(Eng.), P.Eng., LEED AP
Project Manager



Francisca Quinn, M. Sc.
Project Director

APPENDIX A – GREENHOUSE GAS INVENTORY

1 Scope 1 and 2 Emissions

**Table A1.1 – Summary by Source Greenhouse Gas Inventory
(August 2010 to July 2011) – Base Year**

Source and Fuel	Quantity of Activity	Activity Unit	Emissions (t CO ₂ e)
DIRECT GHG EMISSIONS			
Natural Gas			
Aug-10	308	m ³	0.6
Sep-10	380	m ³	0.8
Oct-10	370	m ³	0.8
Nov-10	386	m ³	0.7
Dec-10	378	m ³	0.7
Jan-11	348	m ³	0.7
Feb-11	380	m ³	0.7
Mar-11	383	m ³	0.7
Apr-11	364	m ³	0.7
May-11	356	m ³	0.7
Jun-11	372	m ⁴	0.7
Jul-11	359	m ⁵	0.7
Total Natural Gas	4,384	m³	8.5
Diesel			
Aug-10	73	L	0.2
Sep-10	73	L	0.2
Oct-10	73	L	0.2
Nov-10	73	L	0.2
Dec-10	73	L	0.2
Jan-11	73	L	0.2
Feb-11	73	L	0.2
Mar-11	73	L	0.2
Apr-11	73	L	0.2
May-11	73	L	0.2
Jun-11	73	L	0.2
Jul-11	73	L	0.2
Total Diesel	872	L	2.4

ENERGY INDIRECT EMISSIONS			
Electricity - Mixed Sources			
Aug-10	1,054,800	kWh	27.8
Sep-10	1,080,000	kWh	28.5
Oct-10	1,018,800	kWh	26.9
Nov-10	993,600	kWh	26.3
Dec-10	1,018,800	kWh	26.4
Jan-11	982,800	kWh	25.9
Feb-11	990,000	kWh	26.2
Mar-11	1,008,000	kWh	26.6
Apr-11	1,000,800	kWh	26.4
May-11	961,200	kWh	25.4
Jun-11	1,076,400	kWh	28.4
Jul-11	1,029,600	kWh	27.2
Total Electricity	12,214,800	kWh	322.0
Steam			
Aug-10	344,880	lbs	20.1
Sep-10	577,080	lbs	33.7
Oct-10	741,120	lbs	43.2
Nov-10	1,497,600	lbs	87.3
Dec-10	1,784,400	lbs	104.1
Jan-11	2,284,080	lbs	133.2
Feb-11	1,997,880	lbs	116.5
Mar-11	1,830,120	lbs	106.7
Apr-11	1,527,960	lbs	89.1
May-11	1,080,520	lbs	63.1
Jun-11	447,540	lbs	26.1
Jul-11	308,460	lbs	18.0
Total Steam	14,421,640	lbs	841.1
TOTAL BUILDING EMISSIONS			1,174.0
CARBON INTENSITY	1.7 kgCO_{2e}/sq.ft.		
	0.5 tCO_{2e} / Occupant		

**Table A1.2 – Summary by Emission Type Greenhouse Gas Inventory
(August 2010 to July 2011) – Base Year**

Source and Fuel	Quantity of Activity	Activity Unit	CO ₂ Emissions	CH ₄ Emissions	N ₂ O Emissions
DIRECT GHG EMISSIONS					
Natural Gas					
Breakdown Conversion	4,384	m ³	8 tCO ₂	0 tCH ₄	0 tN ₂ O
CO ₂ e emissions	8	tCO ₂ e	8 tCO ₂ e	0 tCO ₂ e	0 tCO ₂ e
Diesel					
Breakdown Conversion	872	L	2 tCO ₂	0 tCH ₄	0 tN ₂ O
CO ₂ e emissions	2	tCO ₂ e	2 tCO ₂ e	0 tCO ₂ e	0 tCO ₂ e
ENERGY INDIRECT EMISSIONS					
Electricity - Mixed Sources					
Breakdown Conversion	12,214,800	kWh	318 tCO ₂	0 tCH ₄	0 tN ₂ O
CO ₂ e emissions	322	tCO ₂ e	318 tCO ₂ e	2 tCO ₂ e	3 tCO ₂ e
Steam					
Breakdown Conversion	14,421,640	Mlb	841 tCO ₂	0 tCH ₄	0 tN ₂ O
CO ₂ e emissions	841	tCO ₂ e	841 tCO ₂ e	0 tCO ₂ e	0 tCO ₂ e
TOTAL Breakdown Conversion			1,169 tCO₂	0 tCH₄	0 tN₂O
TOTAL CO₂e emissions	1,174	tCO₂e	1,169 tCO₂e	2 tCO₂e	3 tCO₂e

2 Scope 3 Emissions

**Table A2.1 – Summary by Commuting Type Greenhouse Gas Inventory
(August 2010 – July 2011, Based on survey May 2011) – Base Year**

Commuting Type	Quantity of Activity	Activity Unit	Emissions (tCO ₂ e)
Bus	511,716	km	66.6
Rapid Transit (SkyTrain)	1,626,392	km	7.1
Rail (West Coast Express)	683,920	km	78.8
Car Highway	326,953	km	63.3
Car City	677,177	km	199.9
Ferry	271	km	13.8
TOTAL Emissions (582 employees)			429.5
TOTAL Emissions per FTE			0.7
TOTAL Emissions (2165 employees)			1597.9

3 Combined Emissions

**Table A3.1 – Summary by Scope Greenhouse Gas Inventory
(August 2010-2011)**

Emissions Scope	Emissions (t CO_{2e})	Proportion of emissions
Scope 1 (Direct Energy)	10.9	0.4%
Scope 2 (Energy Indirect)	1,163.1	42.0%
Scope 3 (Other Indirect)	1,597.9	57.6%
TOTAL emissions	2,771.8	100%

APPENDIX B – ACTIVITY DATA AND EMISSION FACTORS

1 ACTIVITY DATA

Activity data was collected by Loop Initiatives using the methodology summarized in Table B1.

Table B1 – Activity Data

Activity Data	Collection Methodology
Natural Gas	Halsall submitted Park Place’s Fortis BC monthly utility bills to Loop Initiatives on behalf of GWL.
Refrigerant	Halsall provided the number of chillers and their respective refrigerant charge as well as a statement indicating no PFC’s or SF ₆ on the premises. This was provided to Loop Initiatives on behalf of GWL. Note the type of refrigerant used by the chillers is a refrigerant that has been identified as not having a GWP by the UN’s IPCC.
Diesel	Halsall submitted 2010 diesel usage data to Loop Initiatives on behalf of GWL along with confirmation that usage habits had not changed since then.
Electricity	Halsall submitted Park Place’s BC Hydro electricity monthly utility bill to Loop Initiatives on behalf of GWL.
Steam	Halsall submitted Park Place’s Central Heat Distribution Ltd.’s monthly utility bills to Loop Initiatives on behalf of GWL.
Employee Commuting	Halsall provided building tenants’ employee commuters data on behalf of GWL. The data was provided as results of a Commuting Survey conducted by Advitek, a market research company. An annual working schedule of 5 days/week and 49 weeks/year was used in order to account for vacation time and statutory holidays.

2 EMISSION FACTORS

Table B2 summarizes the emission factors and sources used in the calculations completed for the GWL Park Place GHG inventory.

Table B2 – Emission Factors

Emission Source	Emission Factor	Source of Emissions Factor
Natural gas (Carbon Dioxide) (B.C.)	1,916 g/m ³	Canada's National Inventory Report, 2011, Part 2, Annex 8, Table A8-1
Natural gas (Methane) (B.C.)	0.037 g/m ³	Canada's National Inventory Report, 2011, Part 2, Annex 8, Table A8-2
Natural gas (Nitrous Oxide) (B.C.)	0.035 g/m ³	Canada's National Inventory Report, 2011, Part 2, Annex 8, Table A8-2
Electricity (Carbon Dioxide) (B.C.): 2008	26 g CO ₂ /kWh ¹⁴	Canada's National Inventory Report, 2011, Part 3, Annex 13, Table A13-11 (most recent year: 2008)
Electricity (Methane) (B.C.): 2008	0.007 g CH ₄ /kWh ⁴	Canada's National Inventory Report, 2011, Part 3, Annex 13, Table A13-11 (most recent year: 2008)
Electricity (Nitrous Oxide) (B.C.): 2008	0.0007 g N ₂ O /kWh ⁴	Canada's National Inventory Report, 2011, Part 3, Annex 13, Table A13-11 (most recent year: 2008)
Steam (Carbon Dioxide Equivalent): 2010	5832 g/Mlb	Gerald Mitton, Controller, Central Heat Distribution Ltd., Vancouver. 604-688-9584
Diesel (Carbon Dioxide) (Canada): 2009	2663 g/L	Canada's National Inventory Report 1990-2009, Annex 8, written in 2011
Diesel (Methane) (Canada): 2009	0.133 g/L	Canada's National Inventory Report 1990-2009, Annex 8, written in 2011
Diesel (Nitrous Oxide) (Canada): 2009	0.4 g/L	Canada's National Inventory Report 1990-2009, Annex 8, written in 2011
Car (Carbon Dioxide - includes city and highway)	2,289 g/L	National Inventory Report 1990-2009, Annex 8, A8-11, written in 2011 (most recent year: 2009)
Car (Methane - includes city and highway)	0.23 g/L	National Inventory Report 1990-2009, Annex 8, A8-11, written in 2011 (most recent year: 2009)
Car (Nitrous Oxide - includes city and highway)	0.47 g/L	National Inventory Report 1990-2009, Annex 8, A8-11, written in 2011 (most recent year: 2009)
Bus (Carbon Dioxide Equivalent)	130.2 g/km	BC Ministry of Environment (2011). Methodology for Reporting BC Public Sector Greenhouse Gas Emissions

¹⁴ The emission factor for electricity production in B.C. is 26 g CO_{2e}/kWh. This value was increased by 8% to account for transmission and distribution losses (Reference: "The Report of the National Advisory Panel on Sustainable Energy Science and Technology – Version 1", by NRCan, 2006).

Emission Source	Emission Factor	Source of Emissions Factor
Rapid Transit - Skytrain (Carbon Dioxide Equivalent)	4.37 g/km	BC Ministry of Environment (2011). Methodology for Reporting BC Public Sector Greenhouse Gas Emissions
Rail (Carbon Dioxide)	114.95 g/km	WRI compilation of emission factors used in the cross-sector tool V1.0 July 2009
Rail (Methane)	1.24 g/km	WRI compilation of emission factors used in the cross-sector tool V1.0 July 2009
Rail (Nitrous Oxide)	1.30 g/km	WRI compilation of emission factors used in the cross-sector tool V1.0 July 2009
Ferry (Carbon Dioxide)	2,583 g/L	BC Ministry of Environment (2011). Methodology for Reporting BC Public Sector Greenhouse Gas Emissions
Ferry (Methane)	0.15 g/L	BC Ministry of Environment (2011). Methodology for Reporting BC Public Sector Greenhouse Gas Emissions
Ferry (Nitrous Oxide)	1.1 g/L	BC Ministry of Environment (2011). Methodology for Reporting BC Public Sector Greenhouse Gas Emissions
Carbon Dioxide Conversion (100-yr)	1	CAN/CSA ISO 14064-1 Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. Annex C. March 2006, International Standards Organization.
Methane Conversion (100-yr)	21	
Nitrous Oxide Conversion (100-yr)	310	

APPENDIX C – STANDARD REPORTING DECLARATION

1 REPORTING INFORMATION

The following table provides a summary of the reporting information required by CAN/CSA-ISO Standard 14064-1-06 provided in the “declaration” column is GWL’s assertion for Park Place’s inventory.

Note: This GHG inventory report is the first GHG inventory report issued from GWL for Park Place

Table C1 – Reporting Information

No.	CSA Reporting Requirement	Declaration
A	Description of the reporting organization.	GWL is the property management company for Park Place GWL is registered in the Canadian Green Building Council’s LEED-EB Program and is targeting LEED-EB Energy and Atmosphere credit 6: Emission Reduction Reporting. As part of GWL initiative to green this 35-floor facility, they are reporting the Park Place greenhouse gas (“GHG”) emissions with the CSA Registry. Park Place emits GHGs through their use of natural gas, electricity, steam, and diesel. The total gross floor area of the building is approximately 683,500 ft ² (excluding parking) and the building occupancy is approximately 2,165 people.
B	Person responsible	Francisca Quinn, Project Director and Agent to Frank Vecchio, Senior Property Manager at Park Place
C	Reporting period covered	August 2010 – July 2011
D	Documentation of organizational boundary.	“Physical facility approach” defined by the LEED-EB Canada Energy and Atmosphere credit 6 Emissions Reduction Reporting Program; this is a different consolidation methodology than typically defined, but is still within CSA/ISO14064-1 guidelines.
E	Direct GHG emissions, quantified separately for each GHG, in tonnes of CO ₂ e.	See Appendix A.
F	A description of how CO ₂ emissions from the combustion of biomass are treated in the GHG inventory.	Not applicable to this inventory.
G	If quantified, GHG removals, quantified in tonnes of CO ₂ e.	Not applicable to this inventory.

No.	CSA Reporting Requirement	Declaration
H	Explanation for the exclusion of any GHG sources or sinks from quantifications.	This inventory includes all energy indirect GHG emissions. GHG sinks are not applicable to this inventory.
I	Energy indirect GHG emissions associated with the generation of imported electricity, heat or steam, quantified separately in tonnes of CO _{2e} .	See Appendix A.
J	The historical base year selected and the base-year GHG inventory.	Base year: August 2010 – July 2011 This base year for the CSA CleanStart Registry was chosen due to the performance period requirements of the Canadian Green Building Council LEED-program. It is a starting point for potential future GHG inventories. See Appendix A for the CSA CleanStart Registry's base year GHG emission summary.
K	Explanation of any change to the base year or other historical GHG data, and any recalculation of the base year or other historical GHG inventory.	Not applicable to this inventory.
L	Reference to, or description of, quantification methodologies including reasons for their selection.	Calculations are based on GHG activity data multiplied by GHG emission factors.
M	Explanation of any change to quantification methodologies previously used.	Not applicable to this inventory.
N	Reference to, or documentation of, GHG emission or removal factors used.	See Appendix B for details.
O	Description of the impact of uncertainties on the accuracy of the GHG emissions and removals data.	Uncertainties in calculations include error margins in emissions factors and measured activity data. Emission factors were determined by the most local and credible source available at the time of reporting. Activity data is based on utility bills received by Halsall from GWL. Refrigerant data is based on total refrigerant charge received from GWL and default leakage rates. Based on these sources, the level of uncertainty is assumed to be fair.

No.	CSA Reporting Requirement	Declaration
P	A statement that the GHG report has been prepared in accordance with ISO Standard 14064-1.	This report has been prepared in accordance with the following standard: CAN/CSA-ISO Standard 14064-1-06 - Part 1: Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.
Q	A statement describing whether the GHG inventory, report or assertion has been verified, including the type of verification and level of assurance achieved	Evan Jones at 3P Analysis and Consulting will provide third party verification for this GHG inventory report and will provide a reasonable level of assurance. See the third party verification report for further details.