

CANADIAN TIRE CORPORATION - BUSINESS SUSTAINABILITY  
**CORPORATE AND SUPPLY CHAIN ENVIRONMENTAL FOOTPRINT**

**EXECUTIVE SUMMARY**

In 2011, Canadian Tire completed its most recent carbon and energy footprint, enabling a view to the implications of projects implemented since the business sustainability strategy was launched.

**Results and Key Highlights**

The energy productivity of operations, specifically related to product transport and buildings, has increased dramatically during the first three years of the Business Sustainability Strategy. For product transport, energy use per tonne-km of product transported decreased by 26.2%, enabling the energy and carbon footprint of product transportation to be reduced by 9.0% despite a 22.5% increase in tonne-km of product shipped. For buildings and operations, energy use per square metre of real estate decreased by 17.9%, enabling the energy and carbon footprint of buildings and operations to be reduced by 9.4% despite a 9.3% increase in functional square footage. These productivity improvements translate directly to reduced operating costs, conveying an immediate competitive benefit.

The corporate and supply chain footprint totals 2.9 million tonnes CO<sub>2</sub>-eq. As illustrated in Figure One, only two percent of Canadian Tire’s footprint is based on operations owned and controlled by the Corporation with the remainder related to third-party product manufacturing, transport service providers, and stores operated by dealers and franchisees.

Regardless of the type of greenhouse gas emissions (scope 1, 2 or 3), the Business Sustainability Strategy at Canadian Tire is best served by examining the source of emissions associated with our three key segments of the value chain. As illustrated in Figure Two, this value chain includes product composition and manufacturing retail products (82% of emissions); product transport (11% of emissions) and buildings/operations (7% of emissions). For details refer to Table One to Five on the following pages.

FIGURE ONE - FOOTPRINT BY CONTROL

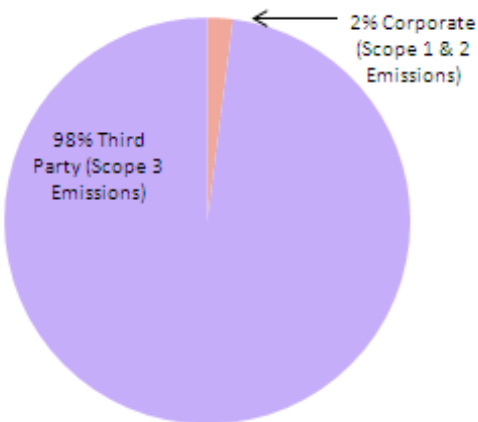
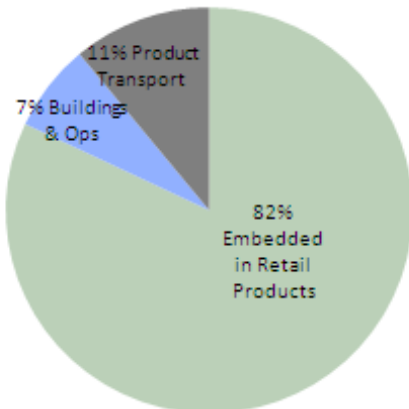


FIGURE TWO - FOOTPRINT BY VALUE CHAIN SEGMENT



In total, the energy and carbon footprint of the business's extended value-chain increased 1.6% between 2007 and 2010, despite a 4.4% increase in consolidated revenue and an increase in overseas product sourcing. The growth in the total enterprise footprint was mainly due to increased GHG emissions within the supply chain from product manufacturing.

### **Continuous Improvement**

Business Sustainability Accounting was incorporated into the Corporate Finance department in 2011. This team implemented several enhancements to improve data accuracy, completeness and measurement processes as well as expanded the Corporate Accounting Policy Manual to include directives on business sustainability measurement and reporting in accordance with the principles set out by the WRI/WBCSD GHG Protocol and International Financial Reporting Standards (IFRS).

Additionally, Canadian Tire's Internal Audit Services completed an audit to assess whether processes were adequately designed and operating effectively to manage risks related to the accuracy and completeness of data disclosed in sustainability reporting. The scope of the audit included full year environmental footprint reporting and business sustainability project reporting for Q3 and Q4 2011. Three non-material issues were identified related to data audit trail, file security and gap disclosure, of which two were closed in December with the third to be closed out in 2012.

### **Details**

The following pages include:

- A breakdown of Canadian Tire's corporate and supply chain footprint, listing both total and intensity values, the level of confidence and the recalculation of the baseline year;
- A disclosure of gaps;
- A glossary of terms identifying definitions, operational boundaries and data sources; and,
- The calculation factors used.

**TABLE ONE – TOTALS**

		2010 GHG Emissions	Energy Use	Eq. to Powering Canadian Homes for a year	Baseline GHG Emissions	% Change	Comments
		tCO <sub>2</sub> e	GJ		tCO <sub>2</sub> e		
<b>By Segment of the Value-Chain:</b>							
<b>Embedded in Products (2)</b>	3rd Party Product Manufacture (A)	2,401,622	34,546,264	326,216	2,303,169	<b>4.3%</b>	Mainly due to an increase in offshore sourcing and increased units shipped compared to 2007.
	Canadian Tire Fleet (B)	10,122	144,432	1,364	5,558	82.1%	Achieved by upgrading fuel efficiency of CTC fleet, bringing significant portion of 3rd party road transport in-house, utilizing more ocean and rail transport, implementing numerous cube volume efficiency projects, and retail product right-sizing (reducing the size of products and packaging)
<b>Product Transport (3)</b>	3rd Party - Road (C)	167,054	2,401,267	22,675	205,783	-18.8%	
	3rd Party - Rail (D)	37,633	486,095	4,590	35,986	4.6%	
	3rd Party - Ocean (E)	92,627	1,196,447	11,298	88,549	4.6%	
	3rd Party - Air (F)	1,669	25,251	238	3,812	-56.2%	
	Sub Total	309,105	4,253,493	40,165	339,688	<b>-9.0%</b>	
<b>Buildings &amp; Operations (4)</b>	Corporate Offices & DCs (G)	20,674	476,862	4,503	21,325	-3.1%	Significant reductions from CTR and CTP stores. Projects included lighting retrofits, central energy management installations, HVAC replacements, construction of 39 energy Smart Stores, thermostat management system installations, and demand hot water system installations.
	Corporate Vehicles (Non-shipment) (H)	3,676	52,299	494	2,846	29.2%	
	Corporate Stores (I)	27,176	377,424	3,564	25,527	6.5%	
	Dealer, Franchise, Agent Stores (J)	147,011	2,732,068	25,799	171,708	-14.4%	
	3rd party operated DCs (K)	15,234	168,328	1,589	14,451	5.4%	
Sub Total	213,771	3,806,981	35,949	235,857	<b>-9.4%</b>		
<b>TOTAL</b>	<b>Corporate and Supply Chain</b>	<b>2,924,498</b>	<b>42,606,737</b>	<b>402,330</b>	<b>2,878,714</b>	<b>1.6%</b>	
<b>By Scopes (5):</b>							
(B+G+H+I)	Scope 1 (Corp. locations & vehicles fuel combustion)	32,256	556,381	5,254	27,078	19.1%	Increase mostly due to the increased use of the CTC fleet and increased number of corp. PS locations.
	Scope 2 (Corp. locations electricity use)	29,392	494,637	4,671	28,179	4.3%	Increase mostly due to PS increased number of PS locations.
(A+C+D+E+F + J+K)	Scope 3 (Non-corp. energy use)	2,862,850	41,555,720	392,405	2,823,457	1.4%	3rd party transport and CTR and CTP energy decreases compensate for the Product's segment energy increase.
<b>TOTAL</b>	<b>Corporate and Supply Chain</b>	<b>2,924,498</b>	<b>42,606,737</b>	<b>402,330</b>	<b>2,878,714</b>	<b>1.6%</b>	

**TABLE TWO - INTENSITY VALUES**

	GHG (CO <sub>2</sub> e kg) ratios	2010	Baseline	Change	Energy (GJ) ratios	2010	Baseline	Change
<b>Embedded in Products</b> <sup>(2)</sup>	% of Total	82%	80%	211 bps	% of Total	81%	79%	190 bps
	GHG's per \$1,000 CTR net POS sales	320	314	2%	Energy usage per \$1,000 CTR net POS sales	4.60	4.63	-1%
<b>Product Transport</b> <sup>(3)</sup>	% of Total	11%	12%	-123 bps	% of Total	10%	11%	-96 bps
	GHG's per cubic metre shipped	69	72	-4.0%	Energy usage per cubic metre shipped	0.95	1.00	-5%
	GHG's per tonne-kilometres	0.04	0.05	-26%	Energy usage per tonne-kilometres	0.0005	0.0007	-26%
<b>Buildings &amp; Operations</b> <sup>(4)</sup>	% of Total	7%	8%	-88 bps	% of Total	9%	10%	-94 bps
	GHG's per square metre <sup>(6)</sup>	46	55	-17%	Energy usage per square metre <sup>(6)</sup>	0.8	1.0	-18%
<b>TOTAL</b>	GHG's per \$1,000 CTC consolidated Revenue	326	334	-2.6%	Energy usage per \$1,000 CTC consolidated Revenue	4.7	5.0	-4.9%

**TABLE THREE - LEVEL OF CONFIDENCE**

Value-Chain Segment	2010 achieved level of Confidence	2010 Target level of confidence	2007 achieved level of confidence	Comments
Embedded in Products <sup>(2)</sup>	80%	80%	80%	Error is estimated based on Economic Input/ Output LCA methodology used. Various LCA techniques typically vary by ~20% for analyses of the same product.
Product Transport <sup>(3)</sup>	81%	81%	81%	CTC Fleet-Fuel volume-based methodology estimated error is very low (<1%), with very high quality data and a low emission factor uncertainty (as estimated by Environment Canada Inventory Report, Table A7-1). 3rd Party Fleet-High quality of distance-weight data collected. However, there is a significant spread between distance-weight emission factors estimated by different external sources which are assumed to be ~20% in line with life-cycle studies above. Weighted average is 81%, based on fuel use.
Buildings <sup>(4)</sup>	95%	96%	90%	Error is estimated based on sample statistics for building energy use.
<b>Total</b>	<b>81%</b>	<b>81%</b>	<b>81%</b>	Weighted for energy use.

**TABLE FOUR - 2007 BASELINE YEAR RECALCULATION**

	Revised 2007 GHG's (tCO <sub>2</sub> e)	2007 GHG's as published on 03/2011 (tCO <sub>2</sub> e)	Change	Justifications for recalculation
<b>Embedded in Products</b> <sup>(2)</sup>	2,303,169	2,303,169	0%	No recalculation
<b>Product Transport</b> <sup>(3)</sup>	339,688	445,208	-24%	Recalculation due to (A) change in ocean emission factor to align with the second International Marine Organization GHG study 2009 and (B) change in road emission factor to align with Environment Canada 2009 inventory report.
<b>Buildings &amp; Operations</b> <sup>(4)</sup>	235,857	258,362	-9%	Recalculation due to (A) changes in electricity, natural gas, propane and heating oil emission factors to align with Environment Canada newly released 2009 inventory report; (B) To includes 8 locations and 6 vehicles which were not included in previous inventory but existed in 2007 and (C) To correct data for 59 locations.
<b>TOTAL</b>	<b>2,878,714</b>	<b>3,006,739</b>	<b>-4%</b>	

**TABLE FIVE - DISCLOSURE OF GAPS<sup>(7)</sup>**

By Scope	Segment of the Value-Chain	Gaps
Scope 1&2	Product Transport (CTC fleet)	No known gaps
	Buildings & Operations	<ul style="list-style-type: none"> <li>• DC backup diesel generators</li> <li>• HFCs and PFCs from refrigeration - Corporate CTP Kiosks sell cold snacks &amp; beverages (average 17 cubic metres per store), 4 Corporate Marks stores have cold weather change rooms, most corporate buildings have employee lunch rooms with fridges. All buildings have HVAC units</li> <li>• 12 Melanie Dr building</li> </ul>
Scope 3	Embedded in Products	<ul style="list-style-type: none"> <li>• Marks products (9.7% of CTC consolidated revenue)</li> <li>• CTP products (18.3% of CTC consolidated revenue)</li> <li>• Cancelled products (0.2% of CTR and PS)</li> </ul>
	Product Transport (3rd party fleet)	<ul style="list-style-type: none"> <li>• Marks (9.7% of CTC consolidated revenue) products transport</li> <li>• CTP (18.3% of CTC consolidated revenue) product transport</li> <li>• Express Auto Parts (2.2% of CTC consolidated revenue) product transport</li> <li>• Legacy (Discontinued IM System) Direct shipments (~1% of direct shipments)</li> <li>• Non-corporate products transport (such as live plants and vending machine beverages)</li> <li>• CTR &amp; PS overseas product transport from product manufacturer to FOB port</li> <li>• Shipping packaging weight such as pallets (less than 10% of total load) in distance/weight calculations</li> <li>• Warehouse transfers</li> <li>• HFC's and PFC's from trucks with refrigerated units shipping to the 14 CTR stores selling cold food, to all CTR stores for seasonal candy and CTP kiosks selling cold snacks &amp; beverages</li> </ul>
	Buildings & Operations	<ul style="list-style-type: none"> <li>• Emission embedded in non-retail products (such as office supplies, store decors, etc), services (such as buildings construction) and non-corporate products (such as live plants and vending machine beverages)</li> <li>• 10 Melanie Dr CTR Return Centre</li> <li>• HFCs and PFCs from refrigeration - 14 CTR stores sell cold food, CTP Kiosks sell cold snacks &amp; beverages (average 17cubic metres per store), most non-corporate stores have employee lunch rooms with fridges. All non-corporate stores have HVAC units.</li> <li>• Non-retail product transport (office supplies, store decors, etc).</li> <li>• Cancelled product return transport</li> </ul>
	Other	<ul style="list-style-type: none"> <li>• Emission from production of fuel and energy purchased</li> <li>• Emissions from waste generated at operations</li> <li>• Business travel and employee commuting</li> <li>• Use of sold products</li> <li>• End-of-life treatment of sold products</li> <li>• Emission associated with investments</li> </ul>

(1) The 2010 Corporate and Supply Chain Environmental Footprint was produced in accordance with the principles from the WBCSD/WRI GHG Protocol and the CTC Environmental Footprint Corporate Directive. The Baseline year chosen for reporting is the 2007.

(2) Values embedded in retail products received by CTC distribution centres, depots, stores or 3rd party warehouses and calculated cradle-to-gate including raw material acquisition & processing, transport to manufacturing site and manufacture of retail products.

(3) Values from product transportation are calculated gate-to-gate including manufacturing vendors (FOB port from overseas) to stores.

(4) Values from Canadian Tire's operations from 1,273 owned and leased locations including offices, distribution centres, and corporate, agents and franchise retail stores within CTC, CTR, PS, CTFS, Marks, and CTP; and 294 vehicles not used for transporting products from vendors to stores.

(5) In accordance with the GHG Protocol, the operational control approach was chosen to report emissions. Scope 1: Direct emissions from the combustion of onsite and mobile fuels, and other sources that occur at, or are associated with facilities and operations controlled by Canadian Tire Corporation. Scope 2: Indirect emissions that occur off-site from the production of energy, such as electricity, which is then purchased for use at facilities and operations controlled by Canadian Tire Corporation. Scope 3: Other indirect emission from the corporation supply chain, such as emissions from non corporate locations, product transport by 3rd party and the product manufacture.

(6) Square metres based on functional area which includes all retail and non-retail areas of stores, offices and distribution centres. For CTP, this includes kiosk building space as well as car wash, canopy and pitstop floor area. For CTR, this includes ground floor coverage, office and service mezzanines.

(7) All known gaps are disclosed as per the WRI/WBCSD GHG Protocol requirements, any exclusions are due to lack of data availability or were deemed non-material by the corporation.

CANADIAN TIRE CORPORATION - BUSINESS SUSTAINABILITY  
**2010 CORPORATE AND SUPPLY CHAIN ENVIRONMENTAL FOOTPRINT**

**GLOSSARY OF TERMS**

METRIC	DEFINITIONS AND OPERATIONAL BOUNDRIES	DATA SOURCE
<b>TABLE ONE: CORPORATE AND SUPPLY CHAIN FOOTPRINT - TOTALS</b>		
<b>Embedded in Products</b>	Energy used (GJ)	Energy used in raw material acquisition and processing, transport to manufacturing site and manufacture of retail products. This includes all consumer units of CTR and PS retail products received in a given year by a store, distribution centre or 3rd Party warehouse on CTC's behalf. Shipments include all products received including damaged products and customer returns.
	GHG emissions (CO <sub>2</sub> e. tonnes)	GHG emissions from energy use in raw material acquisition and processing transport to manufacturing site and manufacture of retail products. This includes all consumer units of CTR and PS retail products received in a given year by a store, distribution centre or 3rd Party warehouse on CTC's behalf. Shipments include all products received including damaged products and customer returns.
<b>Product Transport - Canadian Tire Fleet</b>	Energy used (GJ)	Energy used by Canadian Tire owned and leased fleet trucks for the transport of CTR and PS products from manufacturing vendor to the stores. Shipments include all products received including damaged products and customer returns.
	GHG emissions (CO <sub>2</sub> e. tonne)	GHG emissions from energy used by Canadian Tire owned and leased fleet trucks for the transport of CTR-and PS-products from manufacturing vendor to the stores. Shipments include all products received including damaged products and customer returns.
<b>Product Transport - Third-Party</b>	Energy used (GJ)	Energy used by 3rd party vendors to transport CTR and PS-retail products. This includes transport from the manufacturing vendor (overseas is from FOB Point) to the store. Shipments include all products received including damaged products and customer returns.
	GHG emissions (CO <sub>2</sub> e. tonnes)	GHG emissions from 3rd party vendors to transport CTR and PS retail products. This includes transport from the manufacturing vendor (overseas is from FOB point) to the store. Shipments include all products received including damaged products and customer returns.
<b>Buildings and Operations</b>	Energy used (GJ)	Energy used in the operation of Canadian Tire's owned and leased building, equipment, and owned & leased vehicles such as yard trucks, company cars and service vans (excluding product transport captured separately). This includes all operations across Canada including offices, distribution centres, corporate/franchise/dealer/agent stores within CTC, CTR, PS, CTFS, Marks, and CTP. This includes electricity, propane, heat oil, natural gas, and petroleum.
	GHG emissions (CO <sub>2</sub> e. tonnes)	GHG emissions from the operation of Canadian Tire's owned and leased building, equipment, and owned & leased vehicles such as yard trucks, company cars and service vans (excluding product transport captured separately). This includes all operations across Canada including offices, distribution centres, corporate/franchise/dealer/agent stores within CTC, CTR, PS, CTFS, Marks, and CTP. This includes electricity, propane, heat oil, natural gas, and petroleum.
<b>Total Corporate and Supply Chain Footprint</b>	Scope 1 (Corporate)	Direct emissions from the combustion of onsite and mobile fuels, and other sources that occur at, or are associated with facilities and operations controlled by Canadian Tire Corporation.

Scope 2 (Corporate)	Indirect emissions that occur off-site from the production of energy, such as electricity, which is then purchased for use at facilities and operations controlled by Canadian Tire Corporation.
Scope 3 (3rd Party Value-Chain)	Other indirect emission from the corporation's supply chain, such as emissions from non corporate locations (dealer/franchise/agent stores), product transport by 3rd party and product manufacture by 3rd party.
Total Corporate and Supply Chain Footprint	GHG emissions and energy use related to Scope 1, 2, and 3 sources as per the GHG Protocol Initiative.
Equivalent to powering Canadian homes per year	Calculates the equivalent number of average Canadian homes powered for a year related to the energy footprint. Energy used by the average Canadian home includes natural gas, electricity, heating oil, propane and wood use as per Natural Resources Canada, "Survey of Household Energy Use", 2007. Average Canadian annual household energy consumption is calculated as 105.9 GJ.

**TABLE TWO: CORPORATE AND SUPPLY CHAIN FOOTPRINT - INTENSITY VALUES**

Embedded in Products	Percent of corporate and supply chain footprint	GHG emissions and energy usage related to the manufacture of CTR and PS retail products expressed as a percentage of the total combined Corporate and Supply Chain Footprint.
	GHG emissions (CO <sub>2</sub> -eq. kg) and energy usage per \$1000 CTR net POS sales	GHG emissions and energy usage related to the manufacture of CTR and PS retail products expressed per \$1000 CTR and PS net POS sales.
Product Transport	Percent of corporate and supply chain footprint	GHG emissions and energy usage from Canadian Tire and 3rd Party transport for CTR and PS retail products expressed as a percentage of the total combined Corporate and Supply Chain Footprint.
	GHG emissions (CO <sub>2</sub> -eq. kg) and energy usage per cubic metre shipped and tonne-kilometres	GHG emissions and energy usage from Canadian Tire and 3rd party transport for CTR and PS retail products expressed per cubic metre of product shipped and tonne-kilometres.
Buildings and Operations	Percent of corporate and supply chain footprint	GHG emissions and energy usage from Canadian Tire buildings and operations expressed as a percentage of the total combined Corporate and Supply Chain Footprint.
	GHG emissions (CO <sub>2</sub> -eq. kg) and energy usage per sq metre	GHG emissions and energy usage from Canadian Tire buildings and operations expressed per sq metre of the functional area of all Canadian Tire buildings.
Total Corporate and Supply Chain Footprint	GHG emissions (CO <sub>2</sub> -eq. kg) and energy usage per \$1000 net enterprise sales	GHG emissions energy usage from the combined Corporate and Supply Chain Footprint (retail products, product transport, buildings and operations) expressed per \$1000 net enterprise sales.

ADDITIONAL TERMS	
Building functional area	Includes the square metres of all retail and non-retail areas of stores, offices and distribution centres. For CTP, this includes the building (retail kiosk, office, storage, washrooms) floor space as well as car wash, canopy and pitstop floor space. For CTR, this includes ground floor coverage, office and service mezzanines. Parking and landscaping areas are excluded.
CO <sub>2</sub> -eq.	Carbon dioxide equivalent - Expresses all greenhouse gases in the measurement of carbon dioxide by adjusting other types of greenhouse gases - methane, nitrous oxide, sulphur, hexafluoride, hydrofluorocarbons, and perfluorocarbons - to their carbon dioxide equivalent based on their relative Global Warming Potential.
Cradle-to-gate, cradle-to-grave, and cradle-to-cradle life cycle analysis	Cradle-to-Gate is a portion of a product's lifecycle, starting with raw material acquisition and ending at the shipping or receiving gate of a company. Cradle-to-Grave includes a broader life cycle including consumer use and end of life. Cradle-to-cradle is a full life cycle, including the product's transition into a new raw material input.
CTC	Canadian Tire Corporation Limited - the parent company
CTC consolidated Revenue	CTC Consolidated Revenue as reported under CGAAP includes shipments of merchandise, sale of gasoline, sale of goods by corporate-owned stores, royalties from franchisees, interest income and service charges on loans receivable and merchant and interchange fees on credit card transactions. CGAAP was used instead of IFRS to allow for comparison between 2007 and 2010 footprint.
CTFS	Canadian Tire Financial Services Limited - A wholly owned subsidiary of CTC
CTP	Canadian Tire Petroleum - A strategic business unit within CTC
CTR	Canadian Tire Retail - A strategic business unit within CTC
CTREL	Canadian Tire Real Estate Limited - A wholly owned subsidiary of CTC
Cubic metres shipped	Retail products shipped from manufacture location (FOB port for overseas) to store, including damaged products and customer returns.
Dealers/Franchisees, Agents	Refers to business owners, other than CTC that control the operations of retail stores. This includes CTR dealers, Marks franchisees and CTP agents.
DC	Distribution Centre - A warehouse which is stocked with products to be redistributed to retailers.
EAP	A supply chain group within CTR - Express Auto Parts.
EPA	USA Environmental Protection Agency. An agency of the U.S. federal government in charge of protecting human health and the environment, by writing and enforcing regulations based on laws passed by Congress.
FCA/NATC	Freight Carriers Association of Canada and the North American Transport Council
FGL Sports	Formerly Forzani Group Limited. Remained FGL Sports, a wholly owned subsidiary of CTC
FOB	Freight On Board, also known as Free On Board. Specifies which party (buyer or seller) pays for which shipment and loading costs, and/or where responsibility for the goods is transferred. "FOB origin" indicates the buyer pays shipping cost, and takes responsibility for the goods when the goods leave the seller's premises. "FOB destination" designates the seller will pay shipping costs, and remain responsible for the goods until the buyer takes possession.
GHG	Greenhouse gases -Represents one or a combination of the following gases: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), sulphur hexafluoride (SF <sub>6</sub> ) hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).
GHG Protocol	The GHG Protocol Initiative is a multi-stakeholder collaboration facilitated by the World Business Council on Sustainable Development (WBCSD) and the World Resources Institute (WRI) to establish and promote business standards for GHG accounting and reporting. Canadian Tire Sustainability Reporting follows the GHG Protocol Corporate, Project and Value-Chain (Scope 3) Accounting Standards.
GWP	Global Warming Potential - Calculation factor used to measure CO <sub>2</sub> equivalents from different greenhouse gases. A relative measure of how much heat a greenhouse gas traps in the atmosphere.
HVAC	Heating, Ventilation, and Air Conditioning.
IPCC	Intergovernmental Panel on Climate Change - The leading international body for the assessment of climate change established to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.



Marks	A wholly owned subsidiary of CTC
Net GOR	Gross operating revenue excludes retail sales from non corporate stores and is net of customer returns and discounts
Net POS sales	Retail (Point-of-Sale) sales net of customer returns and discounts
PS	PartSource - A strategic business unit within CTC (specialty automotive stores)
Tonne-kilometres	Distance travelled from manufacturing vendor (overseas is from FOB point) to stores in kilometres multiplied by product and its related equipment weight in kilograms. Used in the calculation of the product transportation carbon footprint.
WBCSD	World Business Council for Sustainable Development - A CEO-led, global association of some 200 companies dealing exclusively with business and sustainable development, providing companies a platform to explore sustainable development, share knowledge, experiences and best practices.
WRI	World Resource Institute - A global environmental think tank that works with governments, companies, and civil society to build solutions to urgent environmental challenges.

1. Emission Factors

PRODUCT TRANSPORT

Distance-Weight Based

**Water**  
Source: IMO, Second GHG Study 2009, table 9.1 p.151, table 3.7 page 49, figure 2.3 p.30

	Kg of Gas /ton-mile	Kg of Gas /tonne-km	GWP	Kg of CO <sub>2</sub> eq /tonne-km
CO <sub>2</sub>		0.0166	1	0.016600000
CH <sub>4</sub>		0.0000022	25	0.000055000
N <sub>2</sub> O		0.0000007	298	0.000208600
To convert tonne-km into kg of CO <sub>2</sub> eq, multiply by :				0.0168636

**Rail**  
Source: EPA Climate Leaders, Optional Emissions from Commuting, Business Travel and Product Transport, May 2008, table 7, page 12

	Kg of Gas /ton-mile	Kg of Gas /tonne-km	GWP	Kg of CO <sub>2</sub> eq /tonne-km
CO <sub>2</sub>	0.0252000	0.0172606	1	0.017
CH <sub>4</sub>	0.0000020	0.0000014	25	0.000
N <sub>2</sub> O	0.0000006	0.0000004	298	0.000
To convert tonne-km into kg of CO <sub>2</sub> eq, multiply by :				0.0174173

**Air**  
Source: EPA Climate Leaders, Optional Emissions from Commuting, Business Travel and Product Transport, May 2008, Table 8, page 12

	Kg of Gas /ton-mile	Kg of Gas /tonne-km	GWP	Kg of CO <sub>2</sub> eq /tonne-km
CO <sub>2</sub>	1.5270000	1.0459101	1	1.046
CH <sub>4</sub>	0.0000417	0.0000286	25	0.001
N <sub>2</sub> O	0.0000479	0.0000328	298	0.010
To convert tonne-km into kg of CO <sub>2</sub> eq, multiply by :				1.0564012

**Road (Third-Party and CTC fleet)**  
Source: EPA Climate Leaders, Optional Emissions from Commuting, Business Travel and Product Transport, May 2008, table 6, page 11

	Kg of Gas /ton-mile	Kg of Gas /tonne-km	GWP	Kg of CO <sub>2</sub> eq /tonne-km
CO <sub>2</sub>	0.297	0.2034285	1	0.203
CH <sub>4</sub>	0.0000035	0.0000024	25	0.000
N <sub>2</sub> O	0.0000027	0.0000018	298	0.001
To convert tonne-km into kg of CO <sub>2</sub> eq, multiply by :				0.2040395

BUILDINGS & OPERATIONS

**Energy Electricity**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 3, Table A13-1 to A13-12, page 44  
2009 Grid Emission Factors g of gas/KW.h

	Canada	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC	NWT	GWP
CO <sub>2</sub>	180	20	1	850	545	2	100	5	710	880	24	44	1
CH <sub>4</sub>	0.009	0.0002	0.0000	0.03	0.02	0.0003	0.01	0.0001	0.03	0.03	0.006	0.002	25
N <sub>2</sub> O	0.003	0.0004	0.0000	0.01	0.01	0.0001	0.002	0.0001	0.02	0.02	0.0006	0.01	298
To convert KW.h into kg of CO <sub>2</sub> eq, multiply by:													0.181119

**Natural Gas**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, page 191 and 192, table A8-1 and A8-2  
Marketable - Commercial - kg of gas /m<sup>3</sup>

	Canada	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC	NT	GWP
CO <sub>2</sub>	no average is provided by EC - should we use province specific?	1.891	N/A	1.891	1.891	1.878	1.879	1.877	1.820	1.918	1.916	2.454	1
CH <sub>4</sub>		0.000037	N/A	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	25
N <sub>2</sub> O		0.000035	N/A	0.000035	0.000035	0.000035	0.000035	0.000035	0.000035	0.000035	0.000035	0.000035	298
To convert m <sup>3</sup> into kg of CO <sub>2</sub> eq, multiply by:													1.902355

**Propane**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-3, page 192. All other uses

	g of Gas /L propane	Kg of Gas /L propane	GWP	Kg of CO <sub>2</sub> eq /L propane
CO <sub>2</sub>	1510	1.51	1	1.510
CH <sub>4</sub>	0.024	0.000024	25	0.001
N <sub>2</sub> O	0.108	0.000108	298	0.032
To convert L of Propane into kg of CO <sub>2</sub> eq, multiply by :				1.542784

**Corporate Vehicles Diesel**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, table A8-11, page 196  
LDOTs, Moderate Control

	g of Gas /L diesel	Kg of Gas /L diesel	GWP	Kg of CO <sub>2</sub> eq /L Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.068	0.000068	25	0.002
N <sub>2</sub> O	0.210	0.00021	298	0.063
To convert L of Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.727280

Fuel Based

**Water**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-11, page 196. Diesel Ships

	g of Gas /L marine diesel	Kg of Gas /L marine diesel	GWP	Kg of CO <sub>2</sub> eq /L marine Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.15	0.00015	25	0.004
N <sub>2</sub> O	1.1	0.0011	298	0.328
To convert L of Marine Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.994550

**Rail**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-11, page 196. Diesel Trains

	g of Gas /L diesel	Kg of Gas /L diesel	GWP	Kg of CO <sub>2</sub> eq /L Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.15	0.00015	25	0.004
N <sub>2</sub> O	1.1	0.0011	298	0.328
To convert L of Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.994550

**Air**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-11, page 196. Aviation Turbo Fuel

	g of Gas /L aviation turbo fuel	Kg of Gas /L aviation turbo fuel	GWP	Kg of CO <sub>2</sub> eq /L aviation turbo fuel
CO <sub>2</sub>	2534	2.534	1	2.534
CH <sub>4</sub>	0.028	0.000028	25	0.001
N <sub>2</sub> O	0.071	0.000071	298	0.021
To convert L of Aviation Turbo Fuel into kg of CO <sub>2</sub> eq, multiply by :				2.555858

**Road (CTC Fleet)**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-11, page 196. Heavy Duty Diesel, Advanced Control

	g of Gas /L diesel	Kg of Gas /L diesel	GWP	Kg of CO <sub>2</sub> eq /L Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.11	0.00011	25	0.003
N <sub>2</sub> O	0.151	0.000151	298	0.045
To convert L of Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.710748

**Road (Third Party)**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-11, page 196. Heavy Duty Diesel, Moderate control

	g of Gas /L diesel	Kg of Gas /L diesel	GWP	Kg of CO <sub>2</sub> eq /L Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.14	0.00014	25	0.004
N <sub>2</sub> O	0.082	0.000082	298	0.024
To convert L of Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.690936

	g of Gas /L diesel	Kg of Gas /L diesel	GWP	Kg of CO <sub>2</sub> eq /L Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.11	0.00011	25	0.003
N <sub>2</sub> O	0.151	0.000151	298	0.045
To convert L of Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.710748

	g of Gas /L diesel	Kg of Gas /L diesel	GWP	Kg of CO <sub>2</sub> eq /L Diesel
CO <sub>2</sub>	2663	2.663	1	2.663
CH <sub>4</sub>	0.14	0.00014	25	0.004
N <sub>2</sub> O	0.082	0.000082	298	0.024
To convert L of Diesel into kg of CO <sub>2</sub> eq, multiply by :				2.690936

**Heating Oil/Furnace Oil**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, Table A8-4, page 193. Light Fuel Oil Industrial

	g of Gas /L industrial heating oil	Kg of Gas /L industrial heating oil	GWP	Kg of CO <sub>2</sub> eq /L industrial heating oil
CO <sub>2</sub>	2725	2.725	1	2.725
CH <sub>4</sub>	0.006	0.00006	25	0.000
N <sub>2</sub> O	0.031	0.000031	298	0.009
To convert L of Industrial Heating Oil into kg of CO <sub>2</sub> eq, multiply by :				2.734388

**Gasoline**  
Source: Environment Canada, National Inventory Report 1990-2009, Part 2, table A8-11, page 196  
LDGVs, Tier 1 control

	g of Gas /L Gasoline	Kg of Gas /L Gasoline	GWP	Kg of CO <sub>2</sub> eq /L Gasoline
CO <sub>2</sub>	2289	2.289	1	2.289
CH <sub>4</sub>	0.23	0.00023	25	0.006
N <sub>2</sub> O	0.47	0.00047	298	0.140
To convert L of Gasoline into kg of CO <sub>2</sub> eq, multiply by :				2.43481

## 2. Common Metrics Conversion Factors

Up to 7 decimal points

### Distance

1 ft=	0.3048	meter
1 meter=	3.2808	ft
1 km=	0.6213711	mile
1 mile=	1.6093442	km
1 mile=	0.8689762	nautical mile
1 nautical mile=	1.1507795	mile

### Weight

1 kg=	2.2046226	lb
1 lb=	0.4535924	kg
1 metric tonne=	1000	kg
1 kg=	0.001	metric tonne
1 short ton=	0.9071847	metric tonne
1 metric tonne=	1.1023114	short ton
1 short ton=	2000	lb
1 lb=	0.0005	short ton
1 short ton=	907.18474	kg
1 kg=	0.0011023	short ton

### Volume

1 US gal=	0.1336809	ft <sup>3</sup>
1 ft <sup>3</sup> =	7.4805002	US gal
1 US gal=	3.7854117	L
1 L=	0.2641721	US gal
1 ft <sup>3</sup> =	0.0283168	m <sup>3</sup>
1 m <sup>3</sup> =	35.3147248	ft <sup>3</sup>
1 m <sup>3</sup> =	1000	L
1 L=	0.001	m <sup>3</sup>
1 US gal=	0.8326741	UK gal (imp)
1 UK gal (imp)=	1.2009500	US gal
1 UK gal=	4.5460900	L
1 L=	0.2199692	UK gal (imp)

### Area

1 ft <sup>2</sup> =	0.0929030	m <sup>2</sup>
1 m <sup>2</sup> =	10.7639151	ft <sup>2</sup>

### Density

1 Short Ton Mile	1.4599723	Tonne Km
1 Tonne Km=	0.6849444	Short Ton Mile

## 3. Energy Conversion Factors

Source: National Energy Board, <http://www.neb.gc.ca/clf-nsi/nrnyfntn/ststc/nrgycvrsntbl/nrgycvrsntbl-eng.html#s1ss2>

Source: Propane Gas Association of Canada, <http://www.propanegas.ca/FileArea/PGAC/Propane%20properties.pdf> Page 3

Use 7 decimal points

### General

1 TJ =	1,000	GJ
1 GJ =	0.001	TJ
1 MJ =	0.001	GJ
1 GJ =	1,000	MJ
1 KJ =	0.000001	GJ
1 GJ =	1,000,000	KJ

### Electricity

1 MW.h=	1,000	kW.h
1 GW.h=	1,000,000	kW.h
1 kW.h=	0.0036	GJ
1 GJ=	278	kW.h

### Petroleum Products

1 m <sup>3</sup> of diesel=	38.68	GJ
1 m <sup>3</sup> of gasoline	34.66	GJ
1 m <sup>3</sup> of heavy fuel oil=	41.73	GJ
1 m <sup>3</sup> of light fuel oil=	38.68	GJ
1 m <sup>3</sup> of other products=	39.82	GJ
1 m <sup>3</sup> of Kerosene=	37.68	GJ

### Natural Gas (@ 14.73 psia and 60F)

1 m <sup>3</sup> =	35.301	ft <sup>3</sup>
1 ft <sup>3</sup> =	0.0283278	m <sup>3</sup>
1 ft <sup>3</sup> =	0.00105	GJ
1 GJ =	952.3809524	ft <sup>3</sup>
1 m <sup>3</sup> =	0.0370661	GJ
1 GJ =	26.9788297	m <sup>3</sup>
1 m <sup>3</sup> =	37.0661	MJ
1 m <sup>3</sup> =	10.2961389	KW.H
1 therm (US)=	0.1054804	GJ
1 GJ =	9.4804343	therm (US)
1 therm (US)=	2.8457377	m <sup>3</sup>
1 m <sup>3</sup> =	0.3514027	therm (US)

### Propane (@ 14.73 psia and 60F)

1 m <sup>3</sup> =	35.3144754	ft <sup>3</sup>
1 ft <sup>3</sup> =	0.0283170	m <sup>3</sup>
1 m <sup>3</sup> =	25.53	GJ
1 GJ =	0.0391696	m <sup>3</sup>

## 4. Equivalent Conversion Factors

### AVERAGE CANADIAN HOUSEHOLD EQUIVALENTS

**ENERGY - includes electricity, Natural Gas, Heating oil, Propane and Wood use**

Source: Natural Resources Canada, "Survey of Household Energy Use", 2007

From	To	Divide by
Amount in GJ	Equivalent number of Canadian homes powered for a year	105.9

### Waste

Source of Waste per capita: Statistics Canada, Waste Management Industry Survey: Business and Government Sectors 2008 (Statistics Canada, 2010). Page 10.

From	To	Divide by
Amount in tonnes of waste	Equivalent number of average Canadian household waste for a year	0.640

### AVERAGE CANADIAN HOUSEHOLD EQUIVALENTS CONT'D

**Energy - includes ELECTRICITY ONLY**

Source: Natural Resources Canada, Table 11.4 - Electricity Intensity from 2007

From	To	Divide by
Amount in GJ	Equivalent number of CANADIAN homes powered for a year	40.2
	Equivalent number of ONTARIO homes powered for a year	32.2
	Equivalent number of QUEBEC homes powered for a year	58.2

## 5. Footprint Factors

### CTC Consolidated Revenue

Source : Corporate Accounting/Annual MD&A Reports

2007 CGAAP	8,606,100,000
2010 CGAAP	8,980,800,000

### The SBU's Net POS Sales

Source : Corporate Accounting/Annual MD&A Reports

CTR & PS	
2007	7,338,000,000
2010	7,510,000,000