



Greenhouse Gas Report

CSA Standards Annual Conference Travel 2006-2009

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1. Summary

The content of this report has been formulated by the CSA Climate Change office located in Ottawa, Ontario. For any questions or concerns, please contact any member of the team.

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This Greenhouse Gas (GHG) report has been conducted primarily for voluntary self-evaluation purposes, but will also be available to the public through the GHG CleanStart Registry website. The purpose of this report is to summarize the procedure and results of the GHG inventory performed by CSA for the travel emissions associated with the four annual conference and committee meetings held in June of each year from 2006 to 2009 (inclusive).

CSA Standards has introduced this voluntary initiative to maintain a carbon neutral status for the travel to and from their annual conferences. This involves quantifying, and offsetting, the emissions resulting from travel for the attendees across Canada, North America and the world. The reporting period covers four events over four years from 2006-2009.

The first annual conference travel greenhouse gas inventory was compiled for the year of 2006, and accounted for all attendee travel to and from the conference by road vehicle or plane travel. The second inventory was for the 2007 year and also accounted for all attendee travel to and from the conference by road vehicle or plane travel. The third conference travel inventory for 2008 accounted for all attendee travel to and from the conference by road vehicle, train or plane travel. The fourth conference travel inventory for 2009 accounts for all attendee travel to and from the conference by road vehicle, train or plane travel. The target for all four years was

for CSA to maintain a carbon neutral status for all additional travel emissions created when hosting the annual conference.

This report has been created in compliance with Section 7.3.1 of the CSA/ISO 14064-1 standard, titled as the *Specification with Guidance at the Organization level for Quantification and Reporting of Greenhouse Gas Emissions and removals*.

This inventory has been compiled to the best of our knowledge, using emission factors from highly reputable organizations obtained at the time of quantification.

Due to the small size of this carbon footprint, and the voluntary nature of this initiative, CSA has decided to take the self-declaration route under the GHG CleanStart Registry. The ability to self-declare accuracy of calculations, in lieu of third party verification, is a common method taken with small voluntary initiatives. This option is available under GHG CleanStart and results in the issuance of a Letter of Participation as opposed to a full Certificate of Carbon Neutrality.

Scope:

The greenhouse gases quantified in this report include: carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Other GHGs such as Hydrofluorocarbons (HFCs), Hydrofluoroethers (HFEs) and Perfluorocarbons (PFCs) have been omitted from this report as they are outside the scope of tier three *'other indirect'* emissions resulting from business travel to the CSA Annual Conference.

2. Organization & Event Profile

CSA Group is an independent, non-for-profit membership organization, dedicated to serving business, industry, government and consumers. It is comprised of three major divisions: CSA Standards, which develops standards and provides guidance on how to apply them; CSA International, which provides testing and certification services; and OnSpeX, which provides consumer product evaluation and consulting services for retailers and manufacturers.

The annual conference, and subsequent committee meetings, is held in June each year. This event is used to bring together all the CSA Standards committee members, employees and associates who assist and contribute to the operation of CSA Standards. The conference results in hundreds of people traveling from across North America (and the world) to the conference. Due to the large nature of travel emissions associated with this event, CSA has decided to offset the emissions from travel to ensure we are respecting the environment and doing our part to reduce emissions.

3. GHG Inventory Design and Development

Organizational Boundaries

A **control share** approach was selected to account for the emissions resulting from the annual conference travel. Control share is used to illustrate that CSA's control over operating parameters involved with the conferences. Therefore CSA has the control to choose where the conference is located and how our staff travel to the event. CSA has used the operational control to influence travel options and shift to train travel over that of plane travel.

Operational Boundaries

The operational boundaries for this event cover emissions from all attendee travel to and from each annual event:

- **2006:** Conference June 18th to 23rd, 2006 at the Deerhurst Resort in Huntsville, Ontario, Canada.
- **2007:** Conference June 10th to 12th, 2007 at the Westin Nova Scotian, in Halifax, Nova Scotia, Canada.
- **2008:** Conference June 15th to 20th, 2008 at the Westin Calgary in Calgary, Alberta, Canada.
- **2009:** Conference June 14th to 16th, 2009 at the Lac Leamy Hilton Hotel in Gatineau, Quebec, Canada

Emissions have been further broken down by travel type. They were classified as either ground or air travel for the first two events in 2006 and 2007, and either road, rail or air travel for the second two events in 2008 and 2009.

The annual conference/ committee meetings travel are **all** classified as scope 3 or 'other indirect' emissions (emissions due to travel) under the ISO 14064-1 method of classification.

Quantification of GHG Emissions and Removals

Identification of GHG Sources and Sinks

The sources of GHG emissions for this report are:

- Emissions from fuel combustion for motor vehicle travel
- Emissions from fuel combustion for plane travel

- Emissions from fuel combustion for train travel
- 2006 had 401 attendees whose travel was classified either by plane or car.
- 2007 had 481 attendees whose travel was classified either by plane or car.
- 2008 had 531 attendees whose travel was classified either by plane, train or car.
- 2009 had 542 attendees whose travel was classified either by plane, train or car.

Selection of Quantification Methodologies

The quantification methodology selected was to calculate GHG emissions by multiplying GHG activity data by reputable emission factors. Emission factors were used to calculate emissions in terms of CO₂ equivalents (CO₂ e), where the GHG is reported in tonnes times its global warming potential, which can be found in Annex C of the ISO 14064-1 standard. Emissions are also reported in tonnes (1000 kg) of specific GHG.

This methodology of calculation was chosen as a direct measurement of GHG emissions from conference attendee transport was not possible.

Selection and Collection of GHG Activity Data

GHG activity data was collected as distances traveled in kilometres and modes of transportation used for such travel. Data was collected at the conference registration so that each attendee would identify their means of transport and home location or area. Attendee data entered included:

- Name
- Organization
- Home Address
- City & Province or State
- Home Postal or Zip code
- What mode of transportation was used to get to the conference

Distances travelled were calculated using online maps based on each attendee home or organization address information provided.

From 2007 onwards flights were broken down into a type based on distance, in accordance with the DEFRA emission factors available¹. A short haul length is defined as a flight of less than 500 km. A medium length haul is defined as a flight between 500 and 1600 km. A long haul length is defined as a flight over 1600 km.

¹ Table 4, Page 10, <http://www.DEFRA.gov.uk/environment/business/reporting/pdf/passengertransport.pdf>

Assumption: When attendees did not specify travel type, mode was assumed to be by air if distance traveled to conference location was over approximately 150 km. Travel mode was assumed to be by car if distance traveled was less than approximately 150 km. When no home departure/return address was specified, the attendee's work location was used as the travel starting and returning point.

Selection of GHG Emission or Removal Factors

The emission factors selected and used to calculate emissions are as follows:

2006:

- Air = Air Transport Association of Canada (ATAC) emission factors for air
- Car = Environment Canada (EC) National Inventory Report 1990-2005

2007:

- Air = DEFRA / DECC's GHG Conversion Factors for Company Reporting
- Car = DEFRA / DECC's GHG Conversion Factors for Company Reporting

2008:

- Air = DEFRA / DECC's GHG Conversion Factors for Company Reporting
- Car = Environment Canada National Inventory Report 1990-2007
- Train = Environment Canada National Inventory Report 1990-2007

2009:

- Air = DEFRA / DECC's GHG Conversion Factors for Company Reporting
- Car = Environment Canada National Inventory Report 1990-2007
- Train = Environment Canada National Inventory Report 1990-2007

Note that from 2007 onwards separate air emission factors were used from DEFRA for each flight type (short, medium or long haul) to be more accurate.

The emission factors selected were decided to be the most accurate, reputable and reliable factors at the time of calculation for the different modes of transportation used. The emission factors used were all updated, accurate and relevant. Note that when using DEFRA emission factors for air travel a total 109% of traveled km's were used in calculations; as required by DEFRA to account for non-linear air travel.

Calculation of GHG Emissions and Removals

For 2006 emissions were calculated as follows:

Passenger flight kms (2 way)	= 535,114 km
ATAC emission factor for average flight	= 0.1359 kgCO ₂ e / pass-km
Tonnes CO ₂ e	= 535,114 * 0.1359 / 1000
Total flight emissions 2006	= 72.72 t CO₂ e

Passenger vehicle driving kms (2 way)	= 205,524 km
Emission factor for average large car	= 0.2834 kg CO ₂ / km
Tonnes CO ₂ e	= 205,524 * 0.2834 / 1000
Total car emissions 2006	= 58.25 t CO₂ e

Total 2006 emissions from event travel= 131 t CO₂ e

For 2007 emissions were calculated as follows:

Short Flights:

Passenger flight kms for short flights (2 way)	= 4,077 km
DEFRA emission factor for short flights	= 0.1580 kg CO ₂ e/ pass-km
Tonnes CO ₂ e	= 4,077 * 0.1580 / 1000
Short flight emissions	= 0.644 t CO ₂ e

Medium Flights:

Passenger flight kms for medium flights (2 way)	= 819,013 km
DEFRA emission factor for medium flights	= 0.1304 kg CO ₂ e/ pass-km
Tonnes CO ₂ e	= 819,013 * 0.1304 / 1000
Medium flight emissions	= 106.79 t CO ₂ e

Long Flights:

Passenger flight kms for long flights (2 way)	= 1,076,216 km
DEFRA emission factor for long flights	= 0.1056 kg CO ₂ e/ pass-km
Tonnes CO ₂ e	= 1,076,216 * 0.1056 / 1000
Long flight emissions	= 113.65 t CO ₂ e
Total flight emissions 2007	= 221.09 t CO₂ e

Passenger vehicle driving kms (2 way)	= 66,402 km
DEFRA Emission Factor for a medium sized vehicle	= 0.2162 kg CO ₂ / km
Tonnes CO ₂ e	= 66,402 * 0.2162 / 1000
Total car emissions 2007	= 14.36 t CO₂ e

Total 2007 emissions from event travel = 235.45 t CO₂ e

For 2008 emissions were calculated as follows:

Short Flights:

Passenger flight kms for short flights (2 way)	= 10,800 km
DEFRA emission factor for short flights	= 0.1728 kg CO ₂ e/ pass-km
Tonnes CO ₂ e	= 10,800 * 0.1728 / 1000
Short flight emissions	= 1.87 t CO ₂ e

Medium Flights:

Passenger flight kms for medium flights (2 way) = 135, 085 km
DEFRA emission factor for medium flights = 0.0992 kg CO₂ e/ pass-km
Tonnes CO₂ e = 135,085 * 0.0992 / 1000
Medium flight emissions = 13.40 t CO₂ e

Long Flights:

Passenger flight kms for long flights (2 way) = 1,849,882 km
DEFRA emission factor for long flights = 0.1059 kg CO₂ e/ pass-km
Tonnes CO₂ e = 1,849,882 * 0.1059 / 1000
Long flight emissions = 195.90 t CO₂ e
Total flight emissions 2008 = 211.17 t CO₂ e

Passenger vehicle driving kms (2 way) = 101,040 km
Assumed conservative fuel efficiency = 8.6 (L/100km)
Total fuel consumed = 8,689.47 L
EC emission factor for a Light Duty Gasoline Vehicle = 2,289 (g CO₂/L fuel)
EC emission factor for a Light Duty Gasoline Vehicle = 0.12 (g CH₄/L fuel)
EC emission factor for a Light Duty Gasoline Vehicle = 0.16 (g N₂O/L fuel)
Total car emissions 2008 = 20.34 t CO₂ e

Passenger train travel kms (2 way) = 105, 830 km
EC emission factor for Diesel Train Engine = 0.1378 kg CO₂ / km
Tonnes CO₂ e = 105,830 * 0.1378 / 1000
Total train emissions 2008 = 14.58 t CO₂ e

Total 2008 emissions from event travel = 246.10 t CO₂ e

For 2009 emissions were calculated as follows:

Short Flights:

Passenger flight kms for short flights (2 way) = 81,467 km
DEFRA emission factor for short flights = 0.1728 kg CO₂ e/ pass-km
Tonnes CO₂ e = 81,467 * 0.1728 / 1000
Short flight emissions = 14.07 t CO₂ e

Medium Flights:

Passenger flight kms for medium flights (2 way) = 59,368 km
DEFRA emission factor for medium flights = 0.0992 kg CO₂ e/ pass-km
Tonnes CO₂ e = 59,368 * 0.0992 / 1000
Medium flight emissions = 5.89 t CO₂ e

Long Flights:

Passenger flight kms for long flights (2 way)	= 618,335 km
DEFRA emission factor for long flights	= 0.1059 kg CO ₂ e/ pass-km
Tonnes CO ₂ e	= 618,335 * 0.1059 / 1000
Long flight emissions	= 65.48 t CO ₂ e
Total flight emissions 2009	= 85.45 t CO₂ e

Passenger vehicle driving kms (2 way)	= 153,216 km
Assumed conservative fuel efficiency	= 8.6 (L/100km)
Total fuel consumed	= 13,1776.59 L
EC emission factor for a Light Duty Gasoline Vehicle	= 2,289 (g CO ₂ /L fuel)
EC emission factor for a Light Duty Gasoline Vehicle	= 0.12 (g CH ₄ /L fuel)
EC emission factor for a Light Duty Gasoline Vehicle	= 0.16 (g N ₂ O/L fuel)
Total car emissions 2009	= 30.85 t CO₂ e

Passenger train travel kms (2 way)	= 31,726 km
EC emission factor for Diesel Train Engine	= 0.1378 kg CO ₂ / km
Tonnes CO ₂ e	= 31,726 * 0.1378 / 1000
Total train emissions 2009	= 4.37 t CO₂ e

Total 2009 emissions from event travel = 120.67 t CO₂ e

All calculations were performed using Microsoft Excel spreadsheets developed by the CSA Climate Change Division. Global warming potentials for methane and nitrous oxide were determined to be 21 and 310 respectively; as published by IPCC and shown within Annex C of the ISO 14064-1 Standard.

Summary of Emissions

Emission reporting must be completed on a per gas basis; reported as tCO₂e; as stated within ISO 14064-1 (section 7.3.2.g). Please refer to Tables 1-5 for finalized emissions resulting from the CSA Annual conference attendee transport, for the years 2006-2009. Emissions for each year have also been broken down by source. As stated with the operational boundaries section; all emissions are scope 3 'other indirect' emissions resulting from transportation. No 'direct' scope 1 and 2 emissions are quantified as part of this inventory, as per the previously identified boundaries.

Table 1: Emissions breakdown for 2006 event in tonnes of GHGs.

Source	Emissions (Reported in tonnes CO ₂ e)			
	CO ₂	CH ₄	N ₂ O	Total
Air Travel	69.24	1.37	2.12	72.73
Road Travel	56.26	0.06	1.92	58.24
Total	125.50	1.43	4.04	130.97

Table 2: Emissions breakdown for 2007 event in tonnes of GHGs.

Source	Emissions (Reported in tonnes CO ₂ e)			
	CO ₂	CH ₄	N ₂ O	Total
Air Travel	210.48	4.17	6.44	221.09
Road Travel	14.05	0.0100	0.3000	14.36
Total	224.53	4.18	6.74	235.45

Table 3: Emissions breakdown for 2008 event in tonnes of GHGs.

Source	Emissions (Reported in tonnes CO ₂ e)			
	CO ₂	CH ₄	N ₂ O	Total
Air Travel	205.26	0.1361	5.7754	211.17
Road Travel	19.89	0.0219	0.4310	20.34
Train Travel	12.91	0.0153	1.6537	14.58
Total	238.06	0.1733	7.8601	246.10

Table 4: Emissions breakdown for 2009 event in tonnes of GHGs.

Source	Emissions (Reported as Tonnes CO ₂ e)			
	CO ₂	CH ₄	N ₂ O	Total
Air Travel	83.06	0.0551	2.3370	85.45
Road Travel	30.16	0.0332	0.6536	30.85
Train Travel	3.87	0.0046	0.4958	4.37
Total	117.09	0.0928	3.4863	120.67

Table 5: Total emissions from the four events from 2006-2009 in tones of GHGs.

<i>Source</i>	<i>Emissions</i> <i>(Reported as Tonnes CO₂e)</i>			
	<i>CO₂</i>	<i>CH₄</i>	<i>N₂O</i>	<i>Total</i>
Air Travel	568.04	5.7312	16.6724	590.44
Road Travel	120.36	0.1251	3.3046	123.79
Train Travel	16.78	0.0199	2.15	18.95
Total	705.18	5.88	22.13	733.19

In total 734 tonnes of CO₂ equivalents were emitted over the previous four years of CSA annual conferences (held from 2006-2009). An equivalent volume of verified emission reductions will be purchased (and retired to the environment) to offset the emissions from this travel. Details of the offsets purchased may be seen within the Carbon Neutral Reports posted on GHG CleanStart Registry. One report has been prepared for each year. http://www.ghgregistries.ca/cleanstart/listings_e.cfm

4. GHG Inventory Components

GHG Emissions, Removals and Base-Year

Becoming carbon neutral through the purchase of carbon offsets is a voluntary aspect of CSA's Corporate Environmental initiative. There is no base-year to quantify as the conference location changes each year resulting in different requirements for travel distances. Furthermore no emission removals can be quantified year to year as this is a dynamic event.

Insufficient data existed for the 2006 and 2007 events to differentiate between car and train travel so all ground transportation was assumed to be by car as a conservative approach. Emission factors for the 2006 conference flight emissions did not incorporate the breakdown into short, medium and long haul flight types.

Note that (only) air travel from CSA group employees was excluded from the GHG emission calculations for 2008 and 2009; as all employee business air travel is accounted for and offset through the CSA Group Corporate Greenhouse Gas Inventory for North American Operations. This exclusion included air distances for CSA group employees from 2008 onwards.

Assessing and Reducing Uncertainty

In order to safely claim carbon neutrality for these events' travel, a conservative approach was taken to calculating the emissions created. Where insufficient data was available on attendees travel modes or routes specified, the longest route of possible options was chosen as a conservative estimation of the resulting emissions.

The resulting uncertainty is estimated to be low, as all attendee's participating within the conference were recorded and each entry was looked at, and calculated, individually. This labour intensive process ensures quality of quantification and reduces uncertainty.

5. GHG Inventory Quality Management

All data files and email correspondence concerning the completion of this GHG Inventory have been electronically saved and filed in a secure location at the CSA Ottawa office. An information management system document has also been prepared providing specific and detailed information about data collection, manipulation, storage and reporting for the GHG inventory. This can be used as a reference tool for existing employees and a training tool for new employees on data quality management.

Further directives to increase data collection and data availability have also been discussed. In future inventories, CSA Group will try to streamline the data collection approach by drawing on those within the organization who do similar work for other purposes. The goal will be to integrate the data collection for the annual conferences into already established reporting procedures for the organization to ensure that all of the information is available and accessible when required.

6. GHG Assertion

Verification Statement regarding the GHG Report or GHG assertion

CSA Group's, annual conference GHG Inventory for 2006-2009 report was prepared in conformance with the CSA/ISO 14064-1 standard entitled Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.

Emissions from CSA Group's annual conference and committee meetings travel inventory covers all attendee transport to the four events from 2006-2009. The emissions from these four event's travel were calculated to be 734 tonnes CO₂ e.

These assertions have been self declared and internally verified. Please refer to *Self Declaration Report* of further information on GHG Assertions and internal verification procedures.