

## Deloitte 2011 Corporate Responsibility Report Basis of Reporting



This document provides additional details about the calculation methods used to compile the environmental sustainability performance data published in the Deloitte 2011 Corporate Responsibility Report (the "Report"), available at [www.deloitte.com/2011crreport](http://www.deloitte.com/2011crreport). It should be read in conjunction with the Report and all definitions used therein also apply to this document.

### Emission factors

Deloitte Touche Tohmatsu Limited (DTTL) member firms are encouraged to select the most accurate, source-specific, localized, and recently published greenhouse gas (GHG) emission factor available for each emission source, such as specific emission factors for a local electric utility. Member firms are also provided with default emission factors from the following sources:

- The Greenhouse Gas Protocol published by the World Resources Institute and World Business Council for Sustainable Development
- The International Energy Agency (IEA)
- The UK's Department for Environment, Food and Rural Affairs (DEFRA)
- The U.S. Department of Energy (US DOE)
- Environmental Paper Network Paper Calculator ([www.papercalculator.org](http://www.papercalculator.org))
- The Carbon Neutral Company

A compilation of emission factors used in the Report is included at the end of this document.

## Global warming potential

The global warming potentials (GWP) of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR4) are used in calculating carbon dioxide equivalents.

## Building-related emission sources

Building-related emission sources included in the GHG emissions data of the Report were those associated with the use of electricity, natural gas, district heating, and district cooling and those arising from the fugitive emissions of refrigerants in the office buildings, apartments, and data centers that DTTL member firms either own or have operational control over. Upstream building-related emission sources, such as those associated with electric transmission and distribution line losses, were not included in the GHG emissions inventory.

Some of the activity data associated with building-related emission sources was available directly to the DTTL member firms. For example, some facilities have direct utility meters or submeters that DTTL member firms obtain readings from. Many of the spaces occupied by the DTTL member firms do not have meters; for these facilities, activity data is typically provided indirectly via the owner or operator of the building. For facilities that have no available meter data, activity data for the entire building was typically estimated by allocation on the basis of the percentage of total building floor space used (based on rentable square meters) by the DTTL member firm. Where building-specific data was unavailable, DTTL member firms estimated electricity and fuel usage using actual data from a similar building or an average from a recognized source.

GHG emission factors and system information (such as equipment type) associated with district heating and cooling are seldom available through the utility provider. In instances where emission factors and system information were unavailable, benchmark emission factors from the US DOE were used.

Fugitive emissions of refrigerants used in building cooling systems were included as a GHG emission source. To determine refrigerant leakage from a system, the refrigerant volume readings from the beginning and the end of the fiscal year are needed along with any volumes added or removed. For most systems and equipment at DTTL member firm facilities, this complete data set cannot be obtained and data is limited to refrigerant additions. In such instances, the assumption is made that all refrigerant added in a given year replaces refrigerant leaked during the same year. This method likely overestimates actual emissions in some years and underestimates them in others, but over time captures the fugitive emissions of the system. A similar simplifying assumption is used for calculating the volume of diesel fuel used for backup power generation; that is, it is assumed that diesel fuel purchased during the fiscal year is used that year.

## Business travel — Road

Reported GHG emissions from business travel by automobiles includes travel in DTTL member firm-owned vehicle fleets (employees driving in vehicles owned by DTTL and/or the member firm), reimbursed driving (employees driving in personal cars for which employees are reimbursed), rental cars (employees driving in rented/hired cars, for which the member firm pays); buses and taxis (reimbursed employee trips in buses, taxis, car-service vehicles, and limousines).

For road travel, activity data is gathered from expense reports, rental agency records, travel agency records, company accounting systems, fuel receipts, odometer logs, and receipts or other records indicating distance and location of trip segments. In instances when fuel information is available, GHG emissions are calculated on the basis of mobile combustion factors for the given fuel type. In instances when only distance information is available, GHG emissions are calculated on the basis of average emissions factors (emissions per kilometer traveled) for vehicles according to vehicle type (bus or car), fuel type (diesel, petrol, hybrid or unknown) and location.

GHG emissions from employee commuting were not included in the GHG emissions inventory published in the Report. Some DTTL member firms do estimate these emissions and include them in their respective corporate responsibility or sustainability reports. However, too few DTTL member firms collect commuting data for to provide meaningful estimates of GHG emissions from commuting across the DTTL member firm network. DTTL and member firm professionals' commuting will continue to be evaluated for future inclusion.

### **Business travel — Rail**

Rail travel accounts for GHG emissions from employee trips on subways, railways, and trams, with different GHG emission factors used for each type of rail system. Activity data sources included travel agency reports, employee expense reports, company accounting systems, receipts, and other records indicating the distance and location of trip segments. In cases where actual distance figures were unavailable, travel distances were estimated from travel expense data according to average travel costs per unit of distance traveled.

### **Business travel — Air**

Reported GHG emissions are those resulting from air travel by professionals flying for business reasons in accordance with DTTL and member firm policies. GHG emissions from flights taken by non-employees are also reported in instances where flight activity data is captured in DTTL or member firm travel systems and reimbursed or paid for by DTTL or a member firm (such as travel by family members in accordance with policies or travel by prospective DTTL and member firm professionals). The majority of business air travel data was obtained from DTTL and member firm travel systems. Much of the rest was obtained from travel expense records.

The default GHG emission factors used to calculate emissions from air travel were based on information published by DEFRA. Flight segments were identified by distance, and emission factors were applied according to whether the flight segment was categorized as long haul (more than 1108km), medium haul (463 to 108 km) or short haul (less than 463km), regardless of the seat class. An uplift factor of 1.09 was applied to airline distance data to account for non-direct routes, delays, and circling. The emission factors used did not include radiative forcing or indirect emissions.

### **Accommodations**

The GHG emissions inventory in the Report includes emissions from accommodations at hotels, guest houses, and apartments for business reasons and in accordance with member firm policies. Data was collected from corporate travel agency records, employee travel expense reports, and internal records. The emission factors were applied according to the region where the accommodation is located.

## Paper

Paper used in business in DTTL and member firm offices, mainly printer paper, was included in the inventory. Paper used in documents produced by outside vendors was not included in the inventory. Paper data was obtained from procurement records and grouped by sheet size, percentage of recycled content, and paper type and weight. Default emission factors were selected using the Environmental Paper Network Paper Calculator based on the percentage of recycled content and applied to the purchased weight. Where a specific percentage of recycled content could not be identified, the most conservative possible assumption was made (for example, 30% recycled content was assumed if the paper source was identified as having 30% or more recycled content.)

## Estimations

In calculating emissions, various estimations and extrapolations were made to account for known data gaps.

For many travel activities, activity information and cost data were available both from travel providers (reservation systems, travel agencies, or travel vendors) and from DTTL or member firm expense systems. Travel expenses recorded in DTTL or member firm expense systems often exceeded the corresponding expenses recorded by travel providers because of travel arrangements made outside of reservation systems or without travel agencies. In cases where such differences were identified, the travel activity data associated with the incremental cost was estimated based on the same proportion of cost to activity that was reflected in the original travel system reservation.

Not every DTTL member firm has the capacity to report activity data for GHG emissions, and some member firms report on some, but not all, of the activities that the Report's boundaries includes. In such cases the missing data is estimated. Ratios of emissions per FTE (average full time equivalent for FY2011) by emission source were calculated for the member firms that reported and averages of these ratios were calculated based on clusters of geographic location and size. Using the appropriate cluster ratio, missing data was extrapolated based on the known FTE data.

Consistent with other Global Reporting Initiative indicators, emissions intensity per FTE was calculated using the FTE total at the reporting year end (31 May 2011).

While the above description is intended to be as accurate as possible, invariably the inventory will contain some exceptions to this reporting basis. None of the known exceptions are considered to materially change the total emissions reported.

## Emission factors

The table below shows emission factors that were used in the inventory.

**Note** — Some values below may differ slightly from the published reference source due to the use of the IPCC AR4 GWPs rather than the GWPs of the Second Assessment Report of the Intergovernmental Panel on Climate Change. Where factors are used in specific countries only, these are listed after the emission source.

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Air Travel - Short Haul (<400km)	0.11	km	Ministry of Land, Infrastructure, Transport and Tourism (MLTI) for Japanese domestic flights (2009)
Air Travel - Short Haul (<400km)	0.165	Passenger km	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6) - Excludes uplift

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Air Travel - Long Haul (>1108 km)	0.111	Passenger km	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6) - Excludes uplift
Air Travel - Medium Haul (463-1108 km)	0.097	Passenger km	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6) - Excludes uplift
Air Travel - Various lengths (Belgium)	0.22-0.66	Passenger km	Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)
Air Travel - Various lengths (Finland, Germany)	0.133-0.208	Passenger km	Travel agency records
Bus - Europe	0.135-0.149	Passenger km	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Bus – Japan	0.048	Passenger km	Ministry of Land, Infrastructure, Transport and Tourism (MLTI) for Japanese domestic flights (2009)
Bus – United States	0.107	Passenger miles	WRI - GHG protocol emission factors from cross sector tool set v 1.1 (June 2011)
District Cooling	0.960	Metric tonne - hour	U.S. DOE EIA-1605 (2007) Appendix N
District Cooling (Japan)	57	GJ	Ministry of the Environment, Government of Japan, Law Concerning the Promotion of the Measures to Cope with Global Warming
District Cooling	0.797	Short Ton-Hours (District Cooling)	The Climate Registry, General Reporting Protocol, v 1.1 (May 2008), Energy Star for energy conversion of ton-hrs to MMBtu
District Heat/Steam	72.74	Thousand - lb.	U.S. DOE EIA-1605 (2007) Appendix N
District Heat/Steam (Denmark)	0.158	kWh	Denmark - Power plant average
District Heat/Steam (Germany)	0.257	kWh	Deloitte Germany emission factor based on DEFRA
District Heat/Steam (Japan)	57	GJ	Ministry of the Environment, Government of Japan, Law Concerning the Promotion of the Measures to Cope with Global Warming
Electricity (Various Countries)	89.23-840	MWh	IEA Statistics, "CO <sub>2</sub> Emissions from Fuel Combustion Highlights." 2009
Electricity (Australia)	0.32-1.23	kWh	Australian Government Department of Climate Change National Greenhouse Energy Reporting System (NGERs) Technical Guidelines (June 2010). Table 7.2 Indirect (scope 2) emission factors for consumption of purchased electricity from a grid.
Electricity (Belgium)	0	MWh	Electrabel Alp Energy - Hydro energy
Electricity (Belgium)	227	MWh	Electrabel
Electricity (Canada)	6-930	MWh	Environment Canada (2009)

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Electricity (Denmark)	432	MWh	Energinet (Government of Denmark, 2010, 125% method)
Electricity (Finland)	260	MWh	Finnish Electricity Company
Electricity (France)	37	MWh	Electricity provider EDF - Average of monthly emission factors for 2011-2010
Electricity (Germany)	563	MWh	Umweltbundesamt, Strommix Deutschland, UBA 2010
Electricity (India)	7660-841	MWh	India Environmental Portal CO <sub>2</sub> Baseline Database for the Indian Power Sector - User Guide - v 5.0
Electricity (Ireland)	541	MWh	The Commission for Energy Regulation, "Fuel Mix and CO <sub>2</sub> Emission Factors Disclosure 2007." Table C, November 7, 2008
Electricity (Japan)	294-931	MWh	Various Japanese Power Companies
Electricity (New Zealand)	110-140	MWh	New Zealand - Ministry of Economic Development - Quarterly Energy Updates
Electricity (Switzerland)	25.83	MWh	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 10)
Electricity (UK)	545	MWh	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 3)
Electricity (US)	310-868	MWh	USEPA eGRID2010 v 1.1 Subregion Data
Hotel stays	31.93-33.45	Nights	Carbon Neutral Company
Hotel stays (China, Australia, US)	40.91	Nights	Private study based on IEA 2005, DEFRA 2005, DTI 2004 and DOE 1997.
Hotel stays (Denmark)	16.06	Nights	Based on a representative sample of Danish hotels, who have reported their emissions.
Hotel stays (Japan)	7	Nights	Carbon Offset Japan
Mobile Combustion - Car or Van (Diesel)	2.676	Liter	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6) <i>et al.</i>
Hotel stays (New Zealand)	2.56-7.97	Nights	Landcare - CarboNZero emissions factor database
Mobile Combustion - Car or Van (Diesel) (Belgium)	2.947	Liter	Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)
Mobile Combustion - Car or Van (Diesel) (Denmark)	0.128	km	Denmark traffic authority (trafikstyrelsen)
Mobile Combustion - Car or Van (Diesel) (Europe)	0.143-0.215	km	Specific fleet and rental car information
Mobile Combustion - Car or Van (Diesel) (Europe)	0.194	km	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Mobile Combustion - Car or Van (Diesel) (UK)	0.2549-0.271	km	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Mobile Combustion - Car or Van (LPG) (Europe)	1.529	Liter	WRI (2008) GHG Protocol Tool for Mobile Combustion v 2.2
Mobile Combustion - Car or Van (Petrol) (Outside Europe)	0.237	km	WRI (2008) GHG Protocol Tool for Mobile Combustion v 2.2
Mobile Combustion - Car or Van (Petrol) (Australia)	2.692	Liter	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Mobile Combustion - Car or Van (Petrol) (Belgium)	2.834	Liter	Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)
Mobile Combustion - Car or Van (Petrol) (Denmark)	0.132	km	Denmark traffic authority (trafikstyrelsen)
Mobile Combustion - Car or Van (Petrol) (Europe)	0.208	km	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Mobile Combustion - Car or Van (Petrol) (Europe)	2.327	Liter	WRI (2008) GHG Protocol Tool for Mobile Combustion v 2.2
Mobile Combustion - Car or Van (Petrol) (Japan)	2.322	Liter	Ministry of the Environment, Government of Japan, Law Concerning the Promotion of the Measures to Cope with Global Warming
Mobile Combustion - Car or Van (Petrol) (New Zealand)	2.319-2.370	Liter	Landcare - CarboNZero emissions factor database
Mobile Combustion - Car or Van (Petrol) (UK)	0.349	km	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Mobile Combustion - Car or Van (Unknown fuel)	0.248	km	DTTL estimated using data from WRI (2008) GHG Protocol Tool for Mobile Combustion v 2.2
Mobile Combustion - Car or Van (Unknown fuel) (Australia)	2.289	Liter	Australian Government Department of Climate Change (Jun 2009) National Greenhouse Accounts (NGA) Factors. Table 4
Mobile Combustion - Car or Van (Unknown fuel) (France)	0.19-0.33	km	ADEME Bilan Carbone
Mobile Combustion - Car or Van (Unknown fuel) (France)	2.4-2.7	Liter	Petroleum company Information
Mobile Combustion - Car or Van (Unknown fuel) (Japan)	2.322	Liter	Ministry of the Environment, Government of Japan, Law Concerning the Promotion of the Measures to Cope with Global Warming
Mobile Combustion - Car or Van (Unknown fuel) (New Zealand)	0.150-0.310	km	Landcare - CarboNZero emissions factor database

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Mobile Combustion - Car average (Unknown fuel) (US)	0.394	Mile	WRI - GHG protocol emission factors from cross sector tool set v 1.1 (June 2011). US Environmental Protection Agency default fuel economy for generic car transport
Mobile Combustion - Car or Van (Various fuels) (Europe)	0.124-0.153	km	Specific fleet and rental car information
Mobile Combustion – Motorcycle	0.12	km	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6) <i>et al.</i>
Mobile Combustion - Taxi	0.147	Vehicle km	WRI - GHG protocol emission factors from cross sector tool set v 1.1 (June 2011)
Mobile Combustion - Taxi (Australia)	0.116-0.149	Vehicle km	Australian Government Department of Climate Change (June 2009) National Greenhouse Accounts (NGA) Factors. Table 4
Mobile Combustion - Taxi (Denmark)	0.3	Vehicle km	Klimakompasset (2007)
Mobile Combustion - Taxi (France)	0.31-0.33	Vehicle km	ADEME Bilan Carbone
Mobile Combustion - Taxi (Japan)	0.388	Vehicle km	Ministry of Land, Infrastructure, Transport and Tourism (MLTI) 2008
Mobile Combustion - Taxi (New Zealand)	0.3-0.31	Vehicle km	Landcare - CarboNZero emissions factor database
Mobile Combustion - Taxi (UK)	0.183-0.247	Vehicle km	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Mobile Combustion - Taxi / Car service (US)	0.324 - 0.411	Passenger miles	Specific information from service providers
Paper resources	0.625-2.94	kg	Specific vendor information
Paper resources	1.688-3.011	kg	Environmental Paper Network Paper Calculator v 3.1 ( <a href="http://www.papercalculator.org">www.papercalculator.org</a> )
Paper resources	1.52	kg	Japan Paper Association LCA Inventory (published in FY2011)
Paper resources (Belgium)	1.32	kg	Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)
Paper resources (Denmark)	2.634	kg	From Klimakompasset (FEFCO)
Paper resources (Germany)	1.06	kg	German initiative for paper production. Source: <a href="http://www.initiative-papier.de">www.initiative-papier.de</a>
Rail - Average (Light Rail or Tram)	0.102	Passenger km	WRI - GHG protocol emission factors from cross sector tool set v 1.1 (June 2011)
Rail (Subway) (USA)	0.164	Passenger mile	Derived from the U.S. EPA
Rail (Denmark)	0.039	Passenger km	Calculations made by Danske Statsbaner in 2010

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Rail (Europe)	0.010-0.025	Passenger km	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6) <i>et al.</i>
Rail (Germany)	0.043-0.086	Passenger km	Direct information from Deutsche Bahn
Rail (Japan)	0.018	Passenger km	Ministry of Land, Infrastructure, Transport and Tourism (MLTI) 2008
Rail (UK)	0.056	Passenger km	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 6)
Rail (USA)	0.185	Passenger mile	Derived from the U.S. EPA
Refrigerant - HFC-134a	1430	GWP	Fourth Assessment Report (2007) of the Intergovernmental Panel on Climate Change (IPCC)
Refrigerant - HFC-143a	4470	GWP	Fourth Assessment Report (2007) of the Intergovernmental Panel on Climate Change (IPCC)
Refrigerant - R-403a (Various Countries)	1400	GWP	American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 34 (WRI)
Refrigerant - R-407c (UK)	1774	GWP	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 8) <i>et al.</i>
Refrigerant - R-410a	2088	GWP	DEFRA/DECC's 2010 Guidelines to GHG Conversion Factors for Company Reporting (Annex 8) <i>et al.</i>
Refrigerant - R-600a (China)	3	GWP	Realzero Carbon Calculator
Stationary Combustion - Heating Oil (Denmark)	2.663	Liter	Klimakompasset
Stationary Combustion - Heating Oil (France)	0.301	kWh	ADEME Bilan Carbone
Stationary Combustion - Heating Oil (Japan)	2.710	Liter	Ministry of the Environment, Government of Japan, Law Concerning the Promotion of the Measures to Cope with Global Warming
Stationary Combustion (Diesel)	2.692	Liter	WRI (2008) GHG Protocol Tool for Stationary Combustion v 4.0
Stationary Combustion - Natural Gas	0.203	kWh	WRI (2008) GHG Protocol Tool for Stationary Combustion v 4.0
Stationary Combustion - Natural Gas (Denmark)	2.41	Cubic meters	Klimakompasset
Stationary Combustion - Natural Gas (France/Belgium)	0.238	kWh	Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)
Stationary Combustion - Natural Gas (Japan)	2.149-3.132	Cubic meters	HV-gas company

Emission source	Emission factor	Unit kg CO <sub>2</sub> e/unit	Reference
Stationary Combustion - Natural Gas (New Zealand)	0.194	kWh	Landcare - CarboNZero emissions factor database (ending 30th June 2011)
Stationary Combustion - Natural Gas (Switzerland)	0.198	kWh	Swiss department of Environment, Transport, Energy and Communication
Stationary Combustion - Natural Gas (UK)	0.185	kWh	DEFRA/DECC's 2011 Guidelines to GHG Conversion Factors for Company Reporting

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