Studio 6 Production Carbon Calculator Emission Calculation Methodology and References
for Carbon Calculator Version 3

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1.0 INTRODUCTION

The Studio 6 Carbon Calculator estimates CO2 emissions for the following sources:
- Electricity
- Natural Gas & Fuel Oil
- Vehicle & Equipment Fuel Use
- Commercial Flights
- Charter Flights
- Hotels & Housing

The calculator also collects information for procurement and waste practices, but emissions are not associated with these calculations. This document presents the methodology used by the calculator to quantify emissions for each source, documents the sources of the calculator input emission factors, and details where these factors can be referenced and updated in the Production Calculator.

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2.0 CO_2 EMISSIONS CALCULATION METHODOLOGY

2.1 Electricity

The production calculator calculates emissions from electricity using the following formula:

Electricity CO_2 (kg)= Electricity Used (kWh) x Electricity Emission Factor (kg CO_2/kWH)

The calculator converts user-entered information into electricity used by applying the following methodology based on the data entry option selected. The user-entered values are shown in bold, the embedded emission factors are shown in italics.

Table 1. Electricity used conversion methodology

Option	Methodology
Preferred (electricity use)	**kWh** is entered directly by the user
2nd Option (intensity estimate)	kWh = **Area** (sq ft) x **Days Used** (days) /*365* (days per year) x *average emission intensity by building type* (kWH/square foot)
3rd Option (cost estimate)	kWh= **Cost of Electricity** ($)/ *Cost per kWh* ($/kWh)

2.1.1 Average Emission Intensity by Building Type

The calculator utilizes US DOE benchmark from the Commercial Buildings Energy Consumption Survey (CBECS)[1] annual average intensity estimates based on principal building activity. The Location Types selected by the user and corresponding CBECs building activities are shown in the table below.

Table 2. Calculator location types and corresponding CBECs building activities

Production Calculator Location Type	CBECs Building Activity
On Location	Office
Office	Office
Warehouse	Warehouse and Storage
Stage(s)	Warehouse and Storage

2.1.2 Electricity Cost per kWh

Differences among contracts and regions results in highly variable electricity costs; the calculator applies a consistent average 2012 cost factor ($/kWh) provided by the U.S. Energy Information Administration EIA Short Term Energy Outlook price summary to all cost values entered in the calculator.

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[1] US Department of Energy Energy Information Administration, Commercial Building Energy Consumption Survey, http://www.eia.doe.gov/emeu/cbecs/contents.html

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2.1.3 CO_2 Electricity Emission Factors

Because CO_2 emissions for energy consumption depend on the mix of fuel used in generation, electricity emissions factors can vary significantly across regions. The calculator applies electricity CO_2 emission factors on a state or province basis for the United States, Canada and Australia and on a country-specific basis all other countries.

The reference for and calculator location of all of the electricity emission factors are detailed in Table 10.

2.2 Natural Gas & Heating Oil

The production calculator calculates emissions from natural gas and heating oil using the following formulas:

Natural Gas CO2 (kg)= Natural Gas Used (scf) x EF (kg CO2/cubic foot natural gas)

Fuel Oil CO2 (kg) = Fuel Oil Used (gal) x EF (kg CO2/gal fuel oil)

The calculator converts user-entered information into natural gas or fuel oil use by applying the following methodology based on the data entry option selected. The user-entered values are shown in bold, the embedded emission factors are shown in italics.

Table 3. Natural gas and fuel oil used conversion methodology

Option	Methodology
Preferred (electricity use)	**Fuel Use** is entered directly by the user
2nd Option (intensity estimate)	Fuel Use = **Area** (sq ft) x **Days Used** (days) /*365* (days per year) x *average emission intensity by building type* (cubic feet or gal/square foot)
3rd Option (cost estimate)	Fuel Use= **Cost of Natural Gas or Fuel Oil** ($)/ *Cost per cubic foot or gal*

The natural gas and fuel oil emission intensities by building type are determined by applying the CBECs factors as detailed in Section 2.1.1. The reference for and calculator location of the CBECs factors, the cost per unit values, and the CO_2 emissions factors are detailed in Table 10.

2.3 Fuel Use

The production calculator calculates emissions from fuel used from equipment and vehicles using the following formula:

Fuel Use CO_2 (kg) = Fuel Used (gal) x Fuel Type EF (kg CO_2/gal)

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The calculator converts user-entered information into fuel use by applying the following methodology based on the data entry option selected. The user-entered values are shown in bold, the embedded emission factors are shown in italics.

Table 4. Fuel use conversion methodology

Option	Methodology
Preferred (fuel use)	**Fuel use** is entered directly by the user
2rd Option (cost estimate)	Fuel use= **Cost of fuel** ($)/ *Cost per unit** **($/gal)**
3rd Option (distance-vehicles only)	Fuel use = **Distance traveled** (miles)/*Vehicle efficiency* (mpg)

*If the user does not enter fuel cost per gallon information and leaves the cell blank, the calculator applies a default cost of fuel that represents an average cost estimation value. More accurate fuel costs specific to the time range and location of the purchase can be obtained by using the references (e.g., Energy Information Agencies' weekly regional gasoline or diesel cost) listed in Table 10.

Vehicle efficiency (miles per gallon) is based on the general class of vehicle as categorized by the US Department of Transportation (US DOT). The vehicle type user options and corresponding US DOT categories are shown in the table below.

Table 5. Calculator vehicle types and corresponding US DOT classifications

Production Calculator Vehicle Types	DOT Vehicle Classifications
Cars	Passenger Cars
Motorcycles	Motorcycles
Buses	Buses
Vans, Pickups, SUVs	Other 2-Axel 4 Tire vehicles
Trucks (<18 wheel)	Single-Unit 2-axles 6-tire or more trucks
18 Wheelers	Combination Trucks
All Vehicles	All Motor Vehicles

The reference for and calculator location of the fuel type CO2 emission factors, the cost metrics and vehicle efficiency factors are detailed in Table 10.

2.4 Hotels and Housing

The production calculator calculates emissions from hotels and housing using the following formula:

$$Electricity\ CO_2 = Electricity\ Used\ (kWh)\ x\ EF\ (CO_2/kWh)$$

Unlike the previous data entry screens, the Hotels and Housing data entry tab does not include multiple data options for determining the electricity used. Instead, the electricity used is calculated based on embedded factors based on the type of location selected by the user. If the user selects a type of hotel (i.e., economy, midscale, upscale, or luxury) the electricity used is calculated based on the average room type-specific square footage and electricity emission intensity. The

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Production Calculator categorizes hotel types based on the EPA Energy Star Hotel Database Classifications and the Residential Energy Consumption Survey classifications detailed in the table below.

Table 6. Calculator hotel types and corresponding Energy Star classifications

Production Calculator Housing Types	Example	Average Size in Square Feet
Economy Hotel	Motel 6, Red Roof, Days Inn	535
Midscale Hotel	Holiday Inn, Ramada, Best Western	656
Upscale Hotel	Marriot, Hilton	842
Luxury Hotel	Four Seasons, Ritz Carlton	905
Apartment/Condo		<1000 square feet
Average House		1000 - 4000 square feet
Large House		>4000 Square feet

The Production Calculator based House and condominium electricity use on the average electricity use of a household. The calculator determines the regional-based CO_2 emission factor based on the selected county and/or state/province, as described in Section 2.1.3.

The reference for and calculator location of the hotel square footage and electricity intensity factors, the housing kWh usage and the electricity CO_2 emission factors are detailed in Table 10.

2.5   Commercial Air Travel

The production calculator calculates emissions from commercial air travel using the following formula:

Commercial Flight CO_2 (kg) = Passenger distance traveled (mi) x Trip length EF (kg CO_2/passenger mile)

The calculator converts user-entered information into passenger distance traveled by applying the following methodology based on the data entry option selected. The user-entered values are shown in bold, the embedded emission factors are shown in italics.

Option	Methodology
Preferred (route-specific)	**Number of One Way Trips** x **One Way Distance** (mi) x *Trip length-specific EF* (kg CO_2/passenger mile)
2nd Option (total mileage	Commercial Flight CO_2 (kg) = **Total Distance** (mi) x *Average trip length EF* (kg CO_2/passenger mile)

Because different amount of emissions are associated with take-off, cruising and landing flight phases, passenger air travel emission factors depend on the length of the trip. The table below shows the calculator trip classifications, associated mileage and the associated classification from the UK's Department for Environment, Food, and Rural Affairs (Defra) emission factor reference. For the second option calculations, average factor is applied to the total distance.

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Table 7. Calculator and Defra flight distance classifications and associated lengths

Calculator Flight Distance Categories	DEFRA Flight Distance Categories	Mileage
Short	Domestic	< 288 mi
Medium	Short-Haul International	288 – 688 mi
Long	Long-Haul International	≥ 689 mi

The reference for and calculator location of the passenger air travel emission factors are detailed in Table 10.

2.6   Charter and Helicopter Flights

The production calculator calculates emissions from charter and helicopter flights using the following formula:

Charter & Helicopter Fuel Use CO_2 (kg) = Fuel Used (gal) x Fuel Type EF (kg CO_2/gal)

The calculator converts user-entered information into fuel use by applying the following methodology based on the data entry option selected. The user-entered values are shown in bold, the embedded emission factors are shown in italics.

Table 8. Charter and Helicopter Flights fuel use conversion methodology

Option	Methodology
Preferred (fuel use)	**Fuel use** is entered directly by the user
2rd Option (hours flown)	Fuel use= **Hours Flown** x *gallons per hour*
3rd Option (distance)	Fuel use = **Distance traveled** (miles)/*Plane efficiency* (mpg)

Fuel use and miles traveled per gallon can vary greatly depending on the specific equipment used, flight length and operating conditions. The calculator uses general values for gallons per hour and miles per gallon based on the plane-type classifications. The Fuel Type CO_2 EF is based on the fuel type used by each plane type. The plane type classifications and associated fuel types are shown in the table below.

Table 9. Plane types and associated fuels

Plane Type	Fuel Type	Number of Passengers
Chartered Commercial Jet	jet fuel	>20
Large Private Jet	jet fuel	14-20
Small Private Jet	jet fuel	5-13
Helicopter	aviation gasoline	N/A

The reference for and calculator location of the gallons per hour, miles per gallon and fuel CO_2 EFs are detailed in Table 10.

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3.0   EMISSION FACTOR REFERENCES & CALCULATOR LOCATION

The following table provides details the specific references, access and calculator location of the emission factors used in the production carbon calculator by emission source type.

Table 10. Calculator emission factors and worksheet reference

Factor	Reference	Calculator Reference
Electricity		
kWh per Square foot by Building Activity	U.S. Energy Information Administration Independent Statistics and Analysis, Commercial Buildings Energy Consumption Survey, Table E6. Electricity Consumption (kWh) Intensities by End Use for Non-Mall Buildings, 2003, Released September 2008, Total Energy Intensity (kWH/square foot) by Principal Building Activity, accessed from http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html	"CBECs" worksheet Column B
Average US electricity cost per kWh	U.S. Energy Information Administration (EIA)Short Term Energy Outlook , August 6, 2013 Release, Price Summary: 2012 Electricity value, http://www.eia.gov/forecasts/steo/	"Costs" worksheet cell B2 (divide by 100 to convert to $/kWh)
US CO_2 emissions per kWh	United States Environmental Protection Agency "Emissions & Generation Resource Integrated Database (eGRID)". eGRID 2012 version 1.0 (2009 data) http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html (data files created 4/27/12), eGRID2012V1_0_year09_DATA.xls, "ST09" worksheet, Column T: State annual CO2 output emission rate (lb/MWh)	"ElectricityEFs" Column D Rows 145-195 (Calculator converts from lb/MWh to kg/kWh)
Puerto Rico CO_2 emissions per kWh	The Climate Registry's 2013 Default Emission Factors. Table 14.1 US Emission Factors by eGRIDSubregion. "US Territories (not an eGRID Region)" from Department of Energy Guidance on Voluntary Reporting of Greenhouse Gases, Form EIA-1605 (2007), Appendix F. Accessed September 4, 2013 from http://www.theclimateregistry.org/downloads/2013/04/2013-Climate-Registry-Default-Emissions-Factors.pdf.	"ElectricityEFs" Column D Row 196 (Calculator converts from lb/MWh to kg/kWh)

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Factor	Reference	Calculator Reference
Canada CO_2 emission per kWH	National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada Part 3, 2013, http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/can-2013-nir-15apr.zip Annex 13: Electricity Intensity Tables, A13-2 through A13-13, 2011 values for Greenhouse Gas Intensity gCO_2/kWh	"ElectricityEFs" Column E Rows 197-210 (divide by 1000 to convert to kg/kWh)
Australian CO_2 emissions per kWh	National Greenhouse Accounts (NGA) Factors, Australian Government Department of Climate Change, July 2012, http://www.climatechange.gov.au/sites/climatechange/files/documents/03_2013/nga-factors.pdf , Table 5: Indirect (scope 2) emission factors for consumption of purchased electricity from the grid, (kgCO2e/kWh)	"ElectricityEFs" Column E Rows 211-218
International CO_2 emissions per kWh	International Energy Agency Data Service, "CO2 Emissions from Fuel Combustion (2011 Edition)" obtained from Greenhouse Gas Protocol Initiative, Compilation of Emission Factors from Cross-sector Tools, Versions 1.3, August 2012. "Electricity Other Countries" worksheet, Table 9, Total kg CO_2 per kWh for 2009, Available: http://www.ghgprotocol.org/calculation-tools/all-tools	"ElectricityEFs" Column E Rows 1-143
Taiwan CO2e emissions per kWh	Bureau of Energy, Ministry of Economic Affairs in Taiwan. (available in Chinese only) http://www.moeaboe.gov.tw/promote/greenhouse/PrGHMain.aspx?PageId=pr_gh_list obtained from Greenhouse Gas Protocol Initiative, Compilation of Emission Factors from Cross-sector Tools, Versions 1.3, August 2012. "Electricity China and Taiwan" worksheet, Table 7, Total kg CO_2e per kWh for 2010, Available: http://www.ghgprotocol.org/calculation-tools/all-tools	"ElectricityEFs" Column E Row 144
Natural Gas & Fuel Oil		
Natural gas per Square foot by Building Activity	U.S. Energy Information Administration Independent Statistics and Analysis, Commercial Buildings Energy Consumption Survey, Table E8. Natural Gas Consumption (cubic feet) and Energy Intensities by End Use for Non-Mall Buildings, 2003, Released September 2008, Total Natural Gas Intensity (cubic feet/square foot) by Principal Building Activity, accessed from http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html	"CBECs" worksheet Column C

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Factor	Reference	Calculator Reference
Fuel Oil per square foot by Building Activity	U.S. Energy Information Administration Independent Statistics and Analysis, Commercial Buildings Energy Consumption Survey, Table E10. Fuel Oil Consumption (gallons) and Energy Intensities by End Use for Non-Mall Buildings, 2003, Released September 2008, Total Fuel Oil Intensity (gallons/square foot) by Principal Building Activity, accessed from http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html	"CBECs" worksheet Column D
Average US Cost of Natural Gas per square foot	U.S. Energy Information Administration (EIA)Short Term Energy Outlook , August 6, 2013 Release, Price Summary: 2012 Natural gas value, http://www.eia.gov/forecasts/steo/	"Costs" worksheet cell B2 (divide by 1000 to convert to cubic feet per square foot)
Average US Cost of Fuel Oil per gallon	U.S. Energy Information Administration (EIA)Short Term Energy Outlook , August 6, 2013 Release, Price Summary: 2012 Heating oil value, http://www.eia.gov/forecasts/steo/	"Costs" worksheet cell B4
CO_2 emissions of Natural Gas per cubic foot	The Climate Registry (TCR) General Reporting Protocol v.2.0, March 2013 Table 12.1 U.S. Default Factors for Calculating CO_2 Emissions from Fossil Fuel and Biomass Combustion, accessed September 4, 2013 from 2013 Climate Registry Default Emission Factors- Released April 2, 2013, "12.1 U.S. Default Factors for Calculating CO_2 Emissions from Fossil Fuel and Biomass Combustion" table CO_2 emission factor for natural gas available: http://www.theclimateregistry.org/downloads/2013/04/2013-Climate-Registry-Default-Emissions-Factors.pdf	"FuelEFs" column B
CO_2 emissions of Fuel Oil per gallon	The Climate Registry (TCR) General Reporting Protocol v.2.0, March 2013 Table 12.1 U.S. Default Factors for Calculating CO_2 Emissions from Fossil Fuel and Biomass Combustion, accessed September 4, 2013 from 2013 Climate Registry Default Emission Factors- Released April 2, 2013, "12.1 U.S. Default Factors for Calculating CO_2 Emissions from Fossil Fuel and Biomass Combustion" table CO_2 emission factor for distillate fuel oil no. 2 available: http://www.theclimateregistry.org/downloads/2013/04/2013-Climate-Registry-Default-Emissions-Factors.pdf	"FuelEFs" column B
Fuel Use		

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Factor	Reference	Calculator Reference
CO_2 emissions of Kerosene and Propane per gallon	The Climate Registry (TCR) General Reporting Protocol v.2.0, March 2013 Table 12.1 U.S. Default Factors for Calculating CO_2 Emissions from Fossil Fuel and Biomass Combustion, accessed September 4, 2013 from 2013 Climate Registry Default Emission Factors- Released April 2, 2013, "12.1 U.S. Default Factors for Calculating CO_2 Emissions from Fossil Fuel and Biomass Combustion" table CO_2 emission factor for kerosene or propane available: http://www.theclimateregistry.org/downloads/2013/04/2013-Climate-Registry-Default-Emissions-Factors.pdf	"FuelEFs" column B
CO_2 emissions of gasoline, diesel, RFO, Biodiesel, Ethanol, LNG, & LPG per gallon	The Climate Registry (TCR) General Reporting Protocol v.2.0, March 2013, Table 13.1 US Default CO2 Emission Factors for Transport Fuels, accessed September 4, 2013 from 2013 Climate Registry Default Emission Factors- Released April 2, 2013, "13.1 U.S. Default Factors for Transport Fuels" table CO_2 emission factor for mobile fuels available: http://www.theclimateregistry.org/downloads/2013/04/2013-Climate-Registry-Default-Emissions-Factors.pdf	"FuelEFs" column B
CO_2 emissions of blended biodiesel and ethanol	Emissions factors based on a weighted average of the percent biodiesel/diesel (biodiesel blends) or ethanol/gasoline (E85). For example, the EF for B5 is (5% x biodiesel EF) + (95% x diesel EF) referenced above	"FuelEFs" column B
Gasoline Average US cost per gallon	U.S. Energy Information Administration (EIA)Short Term Energy Outlook , August 6, 2013 Release, Price Summary: 2012 Gasoline value, http://www.eia.gov/forecasts/steo/	"Costs" worksheet column B
Diesel average US cost per gallon	U.S. Energy Information Administration (EIA)Short Term Energy Outlook , August 6, 2013 Release, Price Summary: 2012 Diesel value, http://www.eia.gov/forecasts/steo/	"Costs" worksheet column B
Propane average US cost per gallon	U.S. Energy Information Administration (EIA)Heating and Oil Update , March 20, 2013 Release, Residential Propane Prices excluding sales tax, , accessed September 4, 2013 from http://www.eia.gov/petroleum/heatingoilpropane/. Note: Short Term Energy Outlook (STEO) no longer collects propane data, accessed September 4, 2013 from	"Costs" worksheet column B

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Factor	Reference	Calculator Reference
Residual Fuel Oil average US cost per gallon	U.S. Energy Information Administration (EIA) Refiner Petroleum Product Prices by Sales Type (dollars per Gallon Excluding Taxes), End Users-Residual F.O., 2010, US Average, accessed September 4, 2013 from http://www.eia.gov/dnav/pet/pet_pri_resid_dcu_nus_a.htm	"Costs" worksheet column B (divide by 100 to convert to $/gal)
Average Biodiesel cost per gallon	USDA Livestock, Poultry & Grain Market News. National Weekly Ag Energy Round-up. Biodiesel B100 (SME) ($/gal). Based on average of minimum and maximum cost. Released August 20, 2013. Accessed September 4 2013 from http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&navID=MarketNewsAndTransportationData&leftNav=MarketNewsAndTransportationData&page=Bioenergy.	"Costs" worksheet column B (averages values)
Average Ethanol cost per gallon	USDA Livestock, Poultry & Grain Market News. National Weekly Ag Energy Round-up. Ethanol ($/gal). Based on average of minimum and maximum cost. Released August 20, 2013. Accessed September 4 2013 from http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&navID=MarketNewsAndTransportationData&leftNav=MarketNewsAndTransportationData&page=Bioenergy	"Costs" worksheet column B (averages values)
Alternative fuel (CNG, E85, LNG, LPG cost per gallon)	Based on average of minimum and maximum cost of alternate fuel for Los Angeles California September 2013, from http://www.altfuelprices.com/	"Costs" worksheet column B (averages values)
Timely Location-specific Fuel costs	Alternative fuels: (Biodiesel, CNG, E85, LNG, LPG): http://www.altfuelprices.com/ Gasoline: weekly averages by region, state and major cities: http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html Diesel: weekly retail on-highway diesel prices by region & California: http://tonto.eia.doe.gov/oog/info/wohdp/diesel.asp	Add "actual" value to column I in "Fuel" data entry spreadsheet
Fuel efficiency of non-motorcycles and buses	Davis, Stacy C., Susan W. Diegel, and Robert G. Boundy. Transportation energy data book: Edition 32. No. ORNL 6968. United States. Department of Energy, 2013. Accessed September 4, 2013 from cta.ornl.gov/data.	"MPG" worksheet column B

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Factor	Reference	Calculator Reference
Fuel efficiency of motorcycles	US Department of Transportation, Federal Highway Administration Office of Highway Policy Information, Highway Statistics 2007, December 2008, Table VM-1, Annual Vehicle Distance Traveled in Miles and Related Data-2007, Average miles traveled per gallon of fuel consumed accessed from http://www.fhwa.dot.gov/policyinformation/statistics/2007/	"MPG" worksheet column B
Fuel efficiency of buses	John Dunham & Associates (2010). Motorcoach Census 2011. A Benchmarking Study of the Size and Activity of the Motorcoach Industry in the United States and Canada in 2010. American Bus Association Foundation. Retrieved September 5, 2013 from http://www.buses.org/files/Foundation/Final_Motorcoach_Census_2011_7-3-2012.pdf.	"MPG" worksheet column B
Fuel Efficiency of All Vehicles	US Environmental Protection Agency. Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2012. March 2013. Average Fuel Economy. Accessed September 4, 2013 from http://www.epa.gov/otaq/fetrends.htm.	"MPG" worksheet column B
Commercial Air Travel		
CO_2 per passenger mile	Department for Environment, Food and Rural Affairs (2012). 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. Version 1.0 (updated May 28). Annex 6 Passenger Transport, Table 6l: Air Passenger Transport Conversion Factors Total kg CO_2 per passenger km	"AirTravel" column D (Calculator converts to CO_2 per passenger mile)
Chartered Flights		
CO_2 emissions of jet fuel and aviation gasoline	The Climate Registry (TCR) General Reporting Protocol v.2.0, March 2013, Table 13.1 US Default CO2 Emission Factors for Transport Fuels, accessed September 4, 2013 from 2013 Climate Registry Default Emission Factors- Released April 2, 2013, "13.1 U.S. Default Factors for Transport Fuels" table CO_2 emission factor for jet fuel or aviation gasoline available: http://www.theclimateregistry.org/downloads/2013/04/2013-Climate-Registry-Default-Emissions-Factors.pdf	"FuelEFs" column B
Plane type Gallons per hour	Values obtained from sample set of equipment types in each plane type category	"AirTravel" Column N and O (calculator averages gallons per hour by plane type)

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Factor	Reference	Calculator Reference
Miles per gallon-Commercial Jet	US EPA Climate Leaders Greenhouse Gas Inventory Protocol Core Module Guidance, Direct Emissions from Mobile Combusion Sources, Table 4: Fuel Economy Values by Vehicle Type, Air Travel Domestic Carriers	"AirTravel" Column J, (Divide 1 by value to convert to miles/gal)
Miles per gallon-Large Private Jet	http://www.ehow.com/about_5665316_private-suv-jet-fuel-cost.html	"AirTravel" Column J
Miles per gallon-Small Private Jet	http://www.ehow.com/about_5665316_private-suv-jet-fuel-cost.html	"AirTravel" Column J
Miles per gallon - Helicopter	http://en.wikipedia.org/wiki/Fuel_efficiency_in_transportation	"AirTravel" Column J
Hotels & Housing		
Square footage by hotel type	US EPA, Combined Heat and Power Partnership, CHP in the Hotel and Casino Market Sectors, December, 2005, Table 16: Average Hotel Size per Room in Square Feet, Accessed from: http://www.epa.gov/chp/documents/hotel_casino_analysis.pdf	"Hotel Factors" Column B
Electricity Intensity by Hotel Type	US EPA, Combined Heat and Power Partnership, CHP in the Hotel and Casino Market Sectors, December, 2005, Table 17: Gas and Electric Energy Usage Intensities by Climate and Chain Scale, Ave. Elec kWh/sf/yr, Accessed from: http://www.epa.gov/chp/documents/hotel_casino_analysis.pdf	"Hotel Factors" Column C
Apartment, condo and house electricity use	US Energy Information Administration, Residential Energy Consumption Survey (RECS) Table CE2.1 Household Site Fuel Consumption in the U.S., Totals and Averages, 2009 (Released January 2013), accessed from: http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption	"Hotel Factors" Column D
CO_2 emissions per kWh	*See Electricity References for US, Canada, Australian and International factors*	

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