



Greenhouse gas (GHG) accounting report

South Pole

Reporting period: 01/01/2017 – 31/12/2017

Zurich, 19 December 2018

South Pole

South Pole Carbon Asset Management Ltd. · Technoparkstrasse 1 · 8005 Zurich · Switzerland
+41 43 501 35 50 · info@southpole.com · southpole.com



Details

Prepared by:

South Pole Carbon Asset Management Ltd. (South Pole)

Technoparkstrasse 1 · 8005 Zurich · Switzerland

southpole.com

Project Manager:

Laura Guccione, Consultant

+61 2 8115 0021

l.guccione@southpole.com

Project Leader:

Sanna Setterwall, Consultant

+(46) 70 865 06 92

s.setterwall@southpole.com

Disclaimer:

This report is solely for the use of South Pole. No part of it may be circulated, quoted, or reproduced for distribution to third parties without prior written approval from **South Pole Carbon Asset Management Ltd**

Table of contents

Executive summary	5
1 Introduction	6
1.1 System boundaries	6
1.1.1 Organisational boundaries	6
1.1.2 Operational boundaries	6
1.2 Data inventory	7
2 Results	8
3 Accounting principles	17
4 Global warming potentials (GWP)	18
Annex I	19
Emission factors	19

List of tables

Table 1: Company information.	6
Table 2: Key figures according to the Global Reporting Initiative (GRI).	8
Table 3: GHG emissions by scope 2017.	8
Table 4: GHG emissions by scope and activity 2017.	10
Table 5: GHG emissions over time 2016-2017.	12
Table 6: GHG emissions by office 2017.	16
Table 7: Applied global warming potentials.	18

List of figures

Figure 1: Sources of GHG emissions in 2017.	5
Figure 2: GHG emissions by scope in 2017.	5
Figure 3: GHG emissions by source 2017.	9
Figure 4: Emissions per employee in 2015, 2016 and 2017.	9
Figure 5: Scope 1 and Scope 2 GHG emissions by source in tCO ₂ e (blue bars) vs energy intensity in GJ (blue line).	14
Figure 6: GHG emissions from business travel in tCO ₂ e (blue bars) and travelled passenger-kilometres (pkm, blue line).	14
Figure 7: GHG emissions from employee commuting (blue bars) in tonnes of CO ₂ e vs distance travelled per mode of transport (blue line) in millions of pkm.	15

Acronyms and abbreviations

AUD	Australian dollar
BEIS	Department for Business, Energy and Industrial Strategy, UK
CH ₄	Methane
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
GHG	Greenhouse gas
GJ	gigajoule
GRI	Global Reporting Initiative
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MWh	megawatt hour
N ₂ O	Nitrous oxide
pkm	passenger-kilometre
UNFCCC	United Nations Framework on Climate Change
US EPA	United States Environmental Protection Agency
t	tonne
T&D	transmission and distribution
WBCSD	World Business Council for Sustainable Development

South Pole GHG Accounting Report 2017

WRI World Resources Institute

WTT well-to-tank

Executive summary

The total greenhouse gas (GHG) emissions of South Pole's operations for the calendar year 2017 added up to 886.2 tonnes (t) of carbon dioxide equivalent (CO₂e).

The distribution of the 2017 GHG emissions by source and by scope is presented in Figure 1 and Figure 2, respectively.

The data inventory in 2017 was extended to include emissions from waste, water use, employee commuting and energy-related activities.

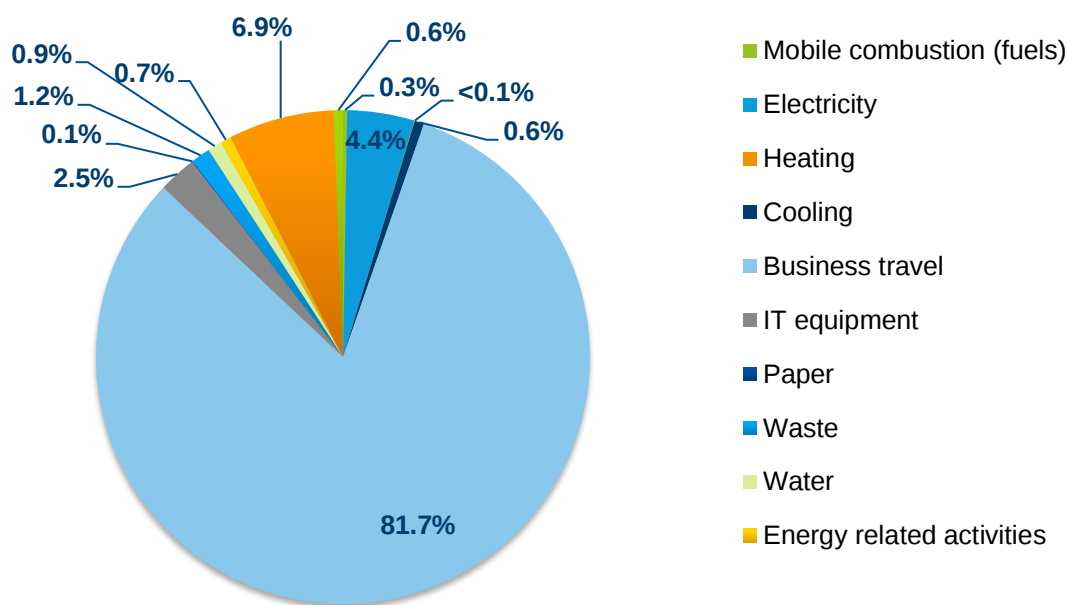


Figure 1: Sources of GHG emissions in 2017.

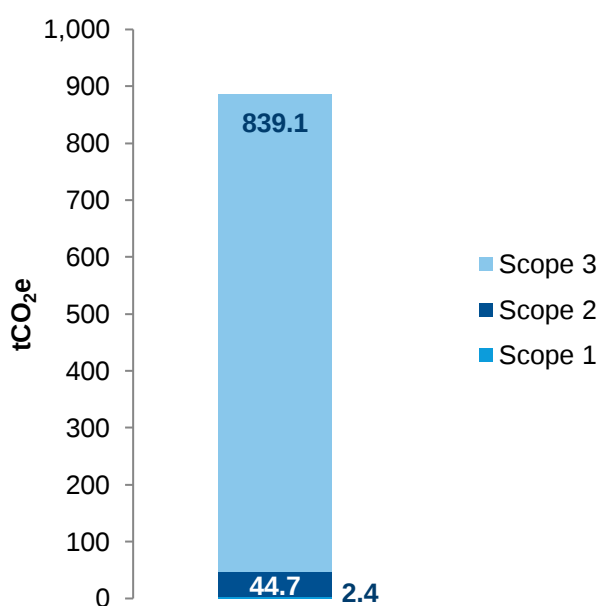


Figure 2: GHG emissions by scope in 2017.

1 Introduction

This report provides a summary of the GHG emissions from South Pole's operations from 1 January to 31 December 2017.

South Pole is a leading sustainability solution provider. Initially focused on the development of premium carbon emission reduction projects, the company now offers a wide spectrum of sustainability services, including climate policy and strategy advisory. Its expertise covers the areas of climate change, forests and land use, water, and sustainable cities and buildings, as well as renewable energy and energy efficiency. The company is determined to help its clients grow their business with ground-breaking solutions that positively impact the environment and the needs of society.

Table 1 presents general information on the company and the reporting period.

Table 1: Company information.

Company information	
Website:	www.southpole.com
Business area:	consultancy services
Reporting period:	2017
Number of employees:	170

1.1 System boundaries

1.1.1 Organisational boundaries

System boundaries were defined by the control approach, i.e. covering all entities where South Pole has operational control. The 2017 accounting included offices in Addis Ababa, Amsterdam, Australia,¹ Bangkok, Beijing, Colombia,² Jakarta, London, Mexico City, New Delhi, Stockholm and Zurich.³

1.1.2 Operational boundaries

The GHG accounting covers direct emissions from stationary and mobile combustion and leakage of refrigerants (Scope 1), indirect emissions from purchased electricity, heat and cooling (Scope 2) and other indirect emissions from business travel, IT equipment and paper (Scope 3). The 2017 GHG accounting was extended to include emissions from waste, water use, employee commuting, and energy-related activities. Emissions from other consumables, such as food and catering, telecommunications and courier services, have been estimated for the Australia office only.

The GHG accounting and reporting procedure is based on the 'Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard Revised edition (GHG Protocol)' – the most widely used international accounting tool for government and business leaders to understand, quantify, and manage GHG emissions. It was developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) in 2004.

¹ The Australia office includes operations in Melbourne and Sydney.

² The Colombia office includes operations in Bogota and Medellin.

³ The Zurich office also includes employees based in Berlin, Helsinki, Hong Kong, Madrid, Paris, Santiago de Chile, Sao Paulo, Singapore, Toronto and Valencia.

According to the GHG Protocol, emissions are divided into direct and indirect emissions. Direct emissions come from sources owned or controlled by the reporting entity. Indirect emissions are generated by the reporting entity's activities, yet they occur at sources owned or controlled by another entity. The direct and indirect emissions are:

- **Scope 1:** all direct GHG emissions, such as combustion of fuels in stationary and mobile sources (vehicles).
- **Scope 2:** indirect GHG emissions from the generation of purchased electricity, heat or cooling consumed by the company.
- **Scope 3:** other indirect emissions, such as business travels, IT equipment, paper usage, waste, water usage, energy related activities,⁴ and employee commuting.

1.2 Data inventory

South Pole has provided data on fuel usage for company vehicles, purchased electricity, heating, cooling, business travel, IT equipment, paper use, waste generation, water use and employee commuting.

The choice of assumptions and emission factors has followed a conservative approach. Unless otherwise specified, all emissions in this report are given in tonnes of CO₂ equivalents (tCO₂e). Details of the assumptions and emission factors used in the GHG accounting are included in [Annex I](#).

All the tables and graphs presented in [Section 2](#). Results have been elaborated based on the calculations conducted using the data provided by South Pole.

Please note that, due to the rounding of numbers, the values may not add up exactly to the total provided.

⁴ Fuel and energy-related activities comprise well-to-tank (WTT) emissions from fuels and emissions associated to electricity transmission and distribution (T&D) losses. WTT emissions account for the upstream emissions associated with extraction, refining and transportation of the raw fuel sources to an organisation's site (or asset), prior to combustion. T&D accounts for the emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it).

2 Results

Based on the information provided by South Pole, the total GHG emissions for 2017 are 717.7 tCO₂e.

Table 2 below shows key figures in terms of GHG emissions (in tonnes of CO₂ equivalents) and energy intensity (in gigajoules, GJ) relevant to corporate sustainability reporting, in accordance with the GHG Protocol.

Table 2: Key figures according to the Global Reporting Initiative (GRI).

GRI G4	GRI standards	Topic	Quantity	Unit
G4-EN3	302-1	Direct energy consumption by primary source:	37.4	GJ
		• petrol ⁵	37.4	GJ
G4-EN3	302-1	Indirect energy consumption by primary source:	432.5	GJ
		• renewable electricity	47.1	GJ
		• grid electricity	333.1	GJ
		• district heating	15.9	GJ
		• cooling	36.4	GJ
G4-EN15	305-1	Direct GHG emissions (Scope 1)	2.4	tCO ₂ e
G4-EN16	305-2	Energy indirect GHG emissions (Scope 2)	44.7	tCO ₂ e
G4-EN17	305-3	Other indirect GHG emissions (Scope 3)	839.1	tCO ₂ e
G4-EN18	305-4	GHG emission per employee	5.2	tCO ₂ e per employee

Table

3

and

⁵ Fuel for company car from the Bangkok office.

South Pole GHG Accounting Report 2017

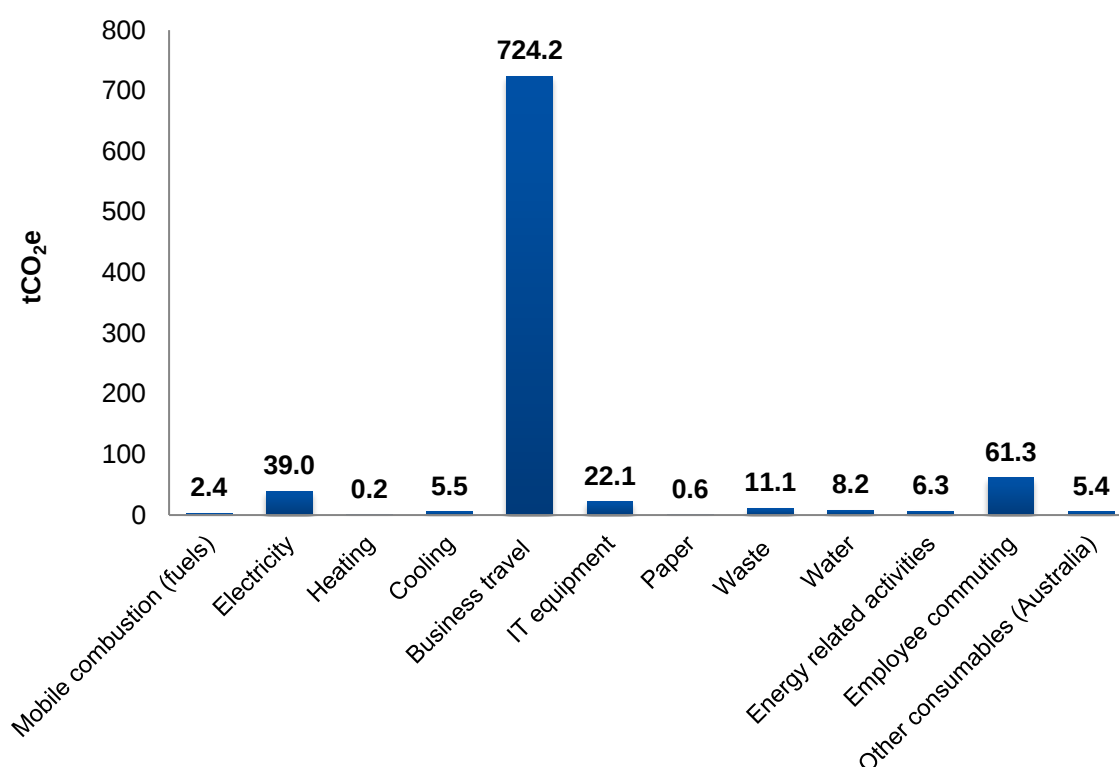


Figure 3 below show the breakdown of GHG emissions by scope and by source, respectively.

Table 3: GHG emissions by scope 2017.

Scope	Emissions (tCO ₂ e)	% of total
Scope 1: direct GHG emissions	2.4	0.3%
Scope 2: indirect GHG emissions from purchased electricity, heat and cooling	44.7	5.0%
Gross emissions without contractual instruments	52.3	
Avoided emissions from contractual instruments ⁶	-7.6	
Scope 3: other indirect GHG emissions	839.1	94.7%
Total GHG emissions	886.2	100.0%

⁶ South Pole has four offices that procure renewable energy: 1) Colombian offices in Medellín and Bogotá, which procure hydropower (100% of its annual consumption), 2) Stockholm office, which procures Green Power, and 3) Melbourne office, which procures a renewable power mix from Australian Green Power.

South Pole GHG Accounting Report 2017

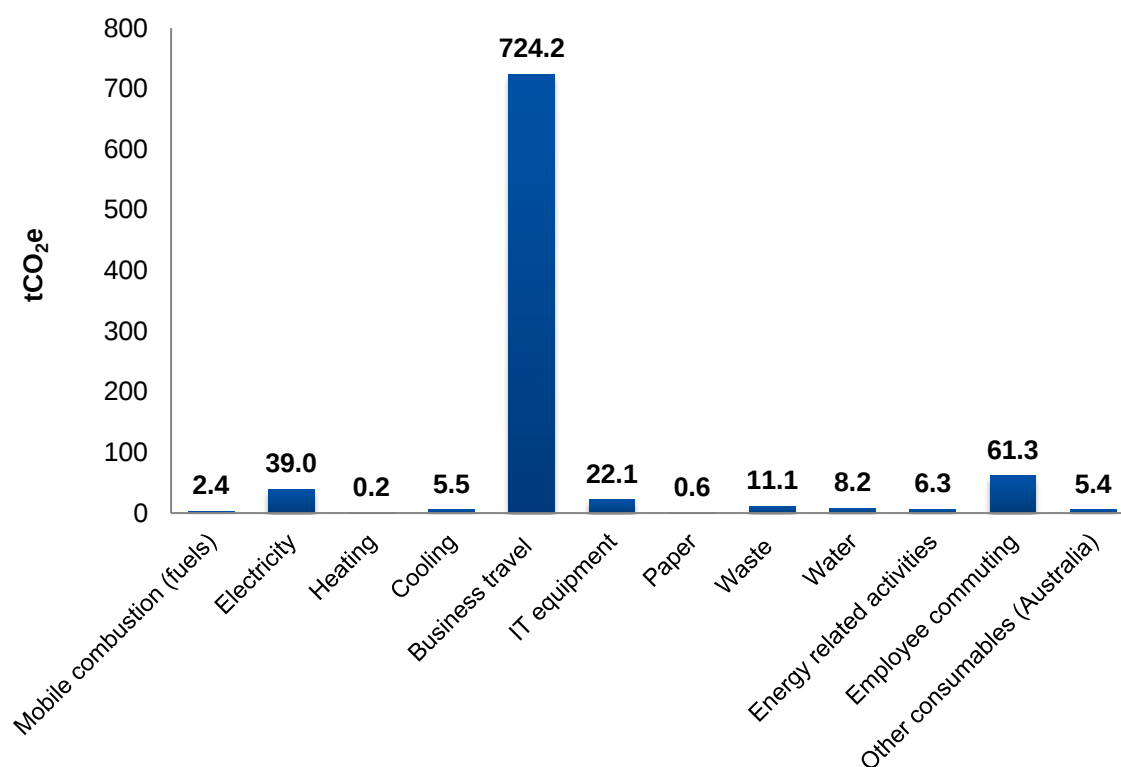


Figure 3: GHG emissions by source 2017.

Table 4 presents the GHG emissions by scope and activity, including details of the emission sources. Figure 4 below presents the emissions per employee in the years 2015, 2016 and 2017.

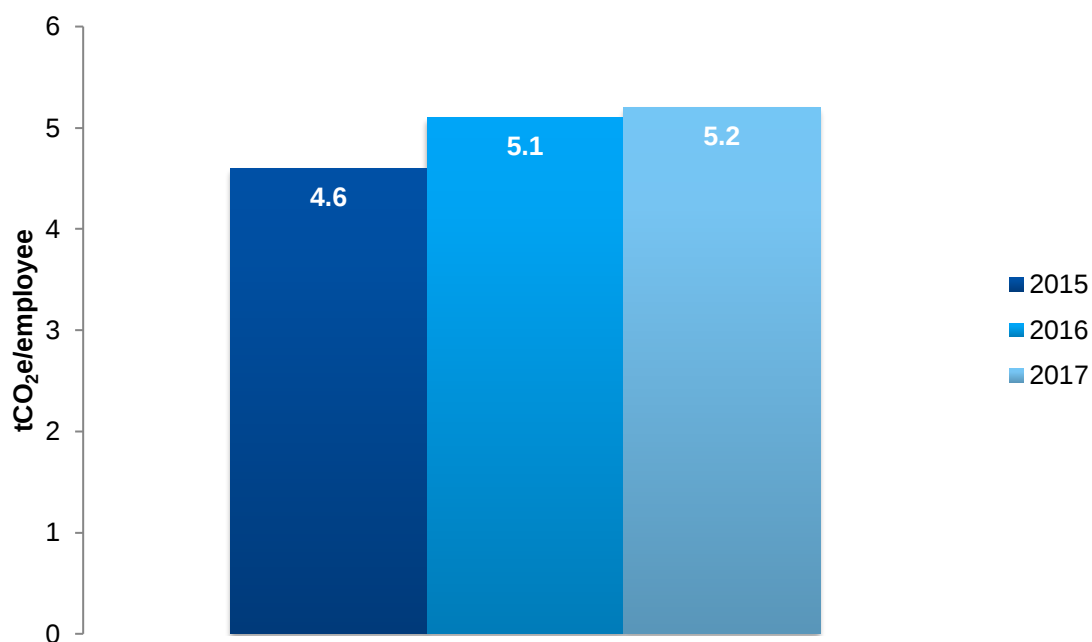


Figure 4: Emissions per employee in 2015, 2016 and 2017.

South Pole GHG Accounting Report 2017

Table 4: GHG emissions by scope and activity 2017.

Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Scope 1: direct GHG emissions			2.4	0.3%
Mobile Combustion			2.4	0.3%
Petrol	1,085.0	litres	2.4	0.3%
Scope 2: indirect GHG emissions from purchased electricity and heat			44.7	5.0%
Electricity	73.1	MWh	39.0	4.4%
Grid	60.0	MWh	39.0	4.4%
Renewable	13.1	MWh	0.0	0.0%
Heat	4.4	MWh	0.2	0.0%
District heating	3.4	MWh	0.2	0.0%
Electricity, grid	1.0	MWh	0.0	0.0%
Cooling	10.1	MWh	5.5	0.6%
Electricity, grid	10.1	MWh	5.5	0.6%
Scope 3: other indirect GHG emissions			839.1	94.7%
Business travel			724.2	81.7%
Flights	3,357,878	pkm	651.9	73.6%
<463 km	51,844	pkm	15.4	1.7%
463-3,700 km	769,027	pkm	135.2	15.3%
>3,700 km	2,537,006	pkm	425.6	48.0%
Flights, directly reported			75.7	8.5%
Car, directly reported			0.1	<0.1%
Car	69,134	km	16.3	1.8%
Local travel, directly reported			21.7	2.4%
Taxi	63,377	pkm	17.1	1.9%
Train	146,256	pkm	3.0	0.3%
Subway	16,691	pkm	0.9	0.1%
Tram	1,114	pkm	0.1	<0.1%
Bus	46,230	pkm	7.0	0.8%
Ferry	393	pkm	0.0	0.0%
Public transport (unspecified)	32,503	pkm	4.9	0.6%
Accommodation (Australia only)	20	nights	1.2	0.1%
IT equipment	275.0	No. devices	22.1	2.5%
Desktops	3	No. devices	0.1	<0.1%
Laptops	141	No. devices	17.0	1.9%
Servers	3	No. devices	0.3	<0.1%

South Pole GHG Accounting Report 2017

Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Printers	11	No. devices	0.7	0.1%
Projectors	4	No. devices	<0.1	<0.1%
Monitors	89	No. devices	1.5	0.2%
Mobile Phones	24	No. devices	0.6	0.1%
External hard drives	20	No. devices	1.6	0.2%
TVs	5	No. devices	0.1	<0.1%
Paper	134,110.4	No. sheets	0.6	0.1%
Paper unspecified	76,460.4	No. sheets	0.4	<0.1%
Paper recycled	57,650.0	No. sheets	0.2	<0.1%
Waste	37.9	tonnes	11.1	1.2%
General	35.4	tonnes	8.5	1.0%
Paper	2.4	tonnes	2.5	0.3%
Food	0.0	tonnes	<0.1	<0.1%
Garden	0.0	tonnes	<0.1	<0.1%
Water	15,540.7	m3	8.2	0.9%
Water supply	7,770.3	m3	2.7	0.3%
Water treatment	7,770.3	m3	5.5	0.6%
Energy-related activities			6.3	0.7%
WTT fuels	1,085.0	litres	0.6	0.1%
T&D electricity	71.9	MWh	5.6	0.6%
Employee commuting	620,828.0	pkm	61.3	6.9%
Bicycle	79,872.0	pkm	0.0	0.0%
Walking	11,232.0	pkm	0.0	0.0%
Tram	5,668.0	pkm	0.3	<0.1%
Train	246,480.0	pkm	13.8	1.6%
Bus	86,788.0	pkm	13.2	1.5%
Ferry	0.0	pkm	0.0	0.0%
Car	79,456.0	pkm	18.8	2.1%
Motorcycle	82,212.0	pkm	12.1	1.4%
Metro/subway	22,048.0	pkm	1.2	0.1%
Taxi	7,072.0	pkm	1.9	0.2%
Other consumables (Australia only)			5.4	0.6%
Catering/food	995.5	AUD	5.3	0.6%
Telecommunications	234.2	AUD	0.1	<0.1%
Courier/postage	42.0	AUD	<0.1	<0.1%
Total GHG emissions			886.2	100.0%

South Pole GHG Accounting Report 2017

Table 5: GHG emissions over time 2016-2017.

Activity	2016 (tCO ₂ e)	2017 (tCO ₂ e)	Difference 2016-17 (%)
Scope 1: Direct GHG emissions	1.1	2.4	+111%
Mobile combustion			
Diesel	0.8	0.0	-100%
Petrol	0.4	2.4	+535%
Scope 2: Indirect GHG emissions from purchased electricity, heat and cooling	45.4	44.7	-2%
Electricity	44.5	39.0	-12%
Grid	44.5	39.0	-12%
Renewable	0.0	0.0	0%
Heat	0.9	0.2	-76%
District heating	0.9	0.2	-76%
Electricity, grid	-	-	-
Natural gas	-	-	-
Cooling	-	5.5	-
Electricity, grid	-	5.5	-
Scope 3: Other indirect GHG emissions	748.5	839.1	+12%
Business travel	726.6	724.2	-0.1%
Flights ⁷	655.4	651.9	-1%
Short haul	26.1	15.4	-41%
Medium haul	210.6	135.2	-36%
Long haul	375.6	425.6	+13%
Directly reported	43.1	75.7	+76%
Car, directly reported	0.1	0.1	+13%
Car	39.8	16.3	-59%
Local travel, directly reported	11.8	21.7	+83%
Taxi	14.6	17.1	+17%
Train	0.7	3.0	+332%
Subway	1.0	0.9	-11%
Tram	0.0	0.1	+22%
Bus	3.0	7.0	+136%
Ferry	0.1	0.0	-94%
Public transport (unspecified)	-	4.9	-
Accommodation (Australia only)		1.2	-

⁷ In 2016 the flight distance intervals for short, medium and long haul flights were changed from <500 km, 500-1200km and >1,200 km to <463 km, 463-3,700 km and >3,700 km, respectively.

South Pole GHG Accounting Report 2017

Activity	2016 (tCO ₂ e)	2017 (tCO ₂ e)	Difference 2016-17 (%)
IT equipment	21.3	22.1	+3%
Desktops	0.1	0.1	+50%
Laptops	18.6	17.0	-8%
Servers	1.1	0.3	-68%
Printers	0.2	0.7	+267%
Projectors	-	0.0	-
Monitors	1.4	1.5	+8%
Mobile Phones	1.1	0.6	-46%
External hard drives	-	1.6	-
TVs	-	0.1	-
Paper	0.5	0.6	+14%
Paper consumption, unspecified	0.5	0.4	-26%
Paper consumption, recycled	0.0	0.2	+1,255%
Waste	-	11.1	-
General	-	8.5	-
Paper	-	2.5	-
Food	-	0.0	-
Garden	-	0.0	-
Water	-	8.2	-
Water supply	-	2.7	-
Water treatment	-	5.5	-
Energy-related activities	-	6.3	-
WTT fuels	-	0.6	-
T&D electricity	-	5.6	-
Employee commuting	-	61.3	-
Bicycle	-	0.0	-
Walking	-	0.0	-
Tram	-	0.3	-
Train	-	13.8	-
Bus	-	13.2	-
Ferry	-	0.0	-
Car	-	18.8	-
Motorcycle	-	12.1	-
Metro / subway	-	1.2	-
Taxi	-	1.9	-
Other consumables (Australia only)	-	5.4	-
Total GHG emissions	795.0	886.2	+11%

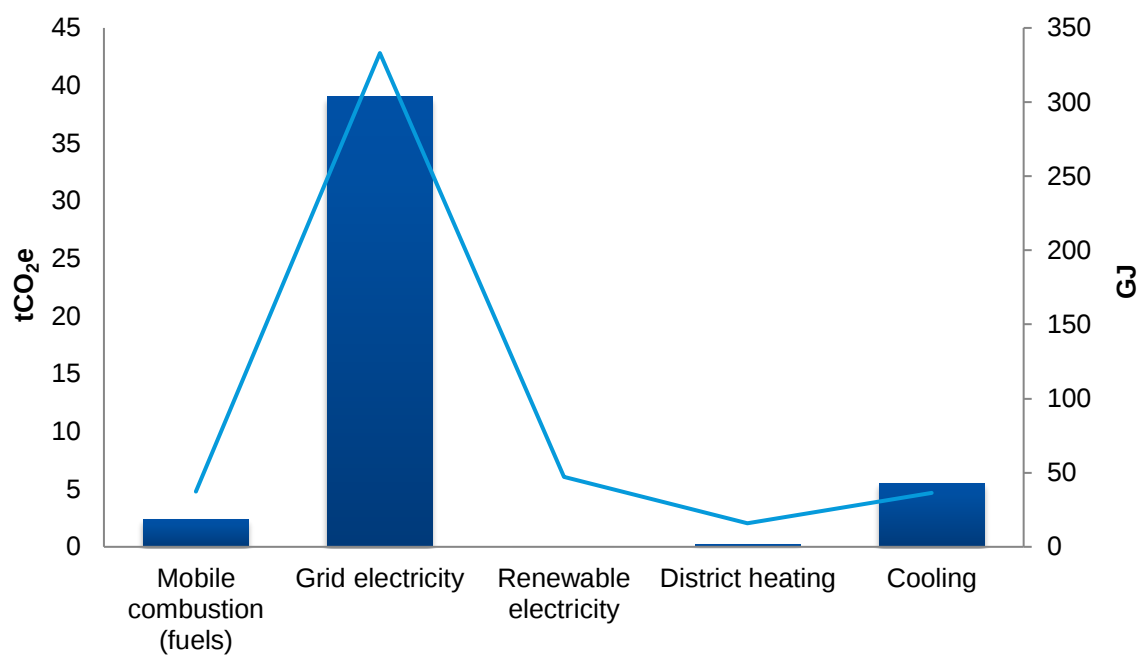


Figure 5: Scope 1 and Scope 2 GHG emissions by source in tCO₂e (blue bars) vs energy intensity in GJ (blue line).

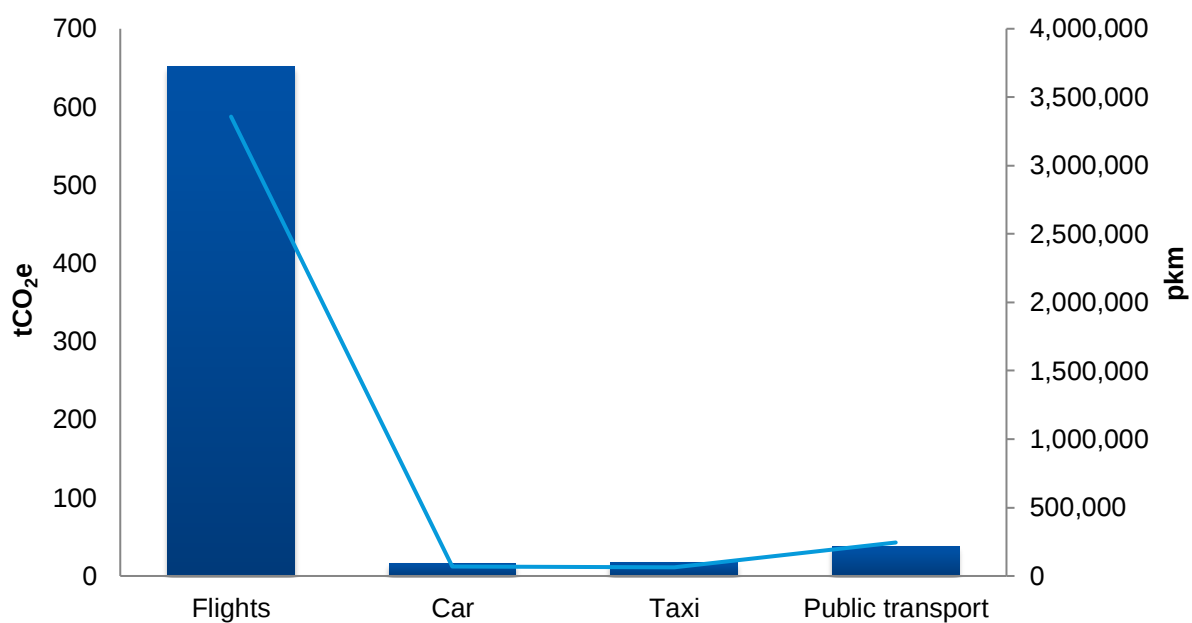


Figure 6: GHG emissions from business travel in tCO₂e (blue bars) and travelled passenger-kilometres (pkm, blue line).

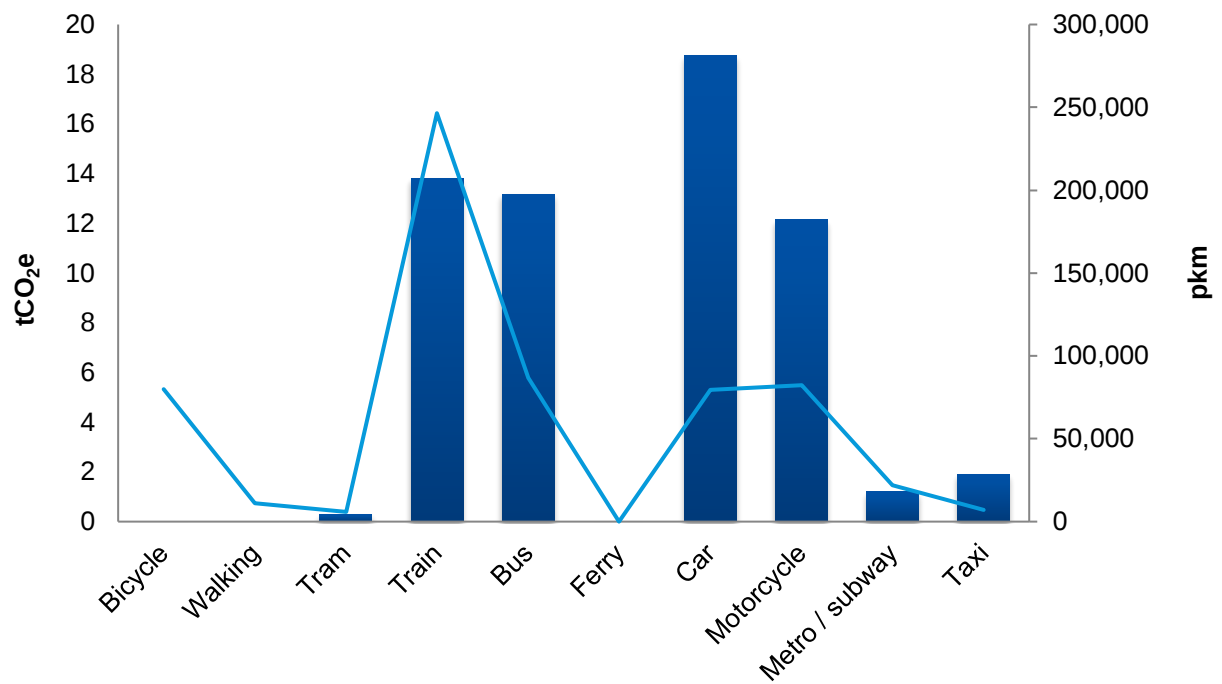


Figure 7: GHG emissions from employee commuting (blue bars) in tonnes of CO₂e vs distance travelled per mode of transport (blue line) in millions of pkm.

South Pole GHG Accounting Report 2017

Table 6: GHG emissions by office 2017

South Pole: GHG emissions by office (tCO ₂ e)												
	Bangkok	Beijing	Jakarta	Colombia	Mexico	New Delhi	Zurich ⁸	Amsterdam	Stockholm	London	Australia	Addis Ababa
Scope 1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mobile combustion	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scope 2	10.2	2.6	6.8	0.0	1.3	3.3	2.0	0.5	0.2	0.0	17.9	0.0
Electricity - grid	4.7	2.6	6.8	0.0	1.3	3.3	2.0	0.5	0.0	0.0	17.9	0.0
Electricity –	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
District heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Cooling	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scope 3	121.1	32.1	70.9	137.4	41.9	10.6	290.1	7.1	4.0	57.5	51.0	15.4
Business travel	108.5	29.6	54.3	111.3	35.9	6.8	270.0	5.8	2.5	51.0	33.5	15.0
Paper	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
IT equipment	1.7	1.1	3.2	1.8	1.7	0.6	7.1	0.2	0.8	2.5	1.2	0.1
Waste	0.1	0.5	0.4	0.8	0.0	0.1	2.8	0.0	0.0	0.0	6.4	0.0
Water	0.0	0.4	3.4	0.2	1.7	0.0	0.7	0.1	0.3	1.2	0.3	0.1
Energy related	0.9	0.2	0.8	0.0	0.2	0.9	0.2	0.0	0.0	0.1	3.0	0.0
Commuting	9.7	0.4	8.8	23.2	2.5	2.1	9.2	0.9	0.4	2.7	1.2	0.1
Other	-	-	-	-	-	-	-	-	-	-	5.4	-
Total GHG emissions	133.6	34.7	77.7	137.4	43.2	13.8	292.1	7.6	4.2	57.5	68.9	15.4
No of employees	15	6	16	36	10	4	48	2	4	18	10	1
Emissions per employee (tCO₂e/employee)	8.9	5.8	4.9	3.8	4.3	3.5	6.1	3.8	1.1	3.2	6.9	15.4

⁸ The Zurich office also includes employees based in Sao Paulo, Hong Kong, Singapore, Madrid, Berlin, Helsinki, Paris, Santiago de Chile, Toronto and Valencia.

3 Accounting principles

The GHG accounting was based on the GHG Protocol's principles of:

- **relevance:** an appropriate inventory boundary that reflects the GHG emissions of the company and serves the decision-making needs of users.
- **completeness:** accounting all emission sources within the chosen inventory boundary. Any specific exclusion is disclosed and specified.
- **consistency:** meaningful comparison of information over time and transparently documented changes to the data.
- **transparency:** data inventory sufficiency and clarity, where relevant issues are addressed in a coherent manner.
- **accuracy:** minimised uncertainty and avoided systematic over or under quantification of greenhouse gas emissions.

4 Global warming potentials (GWP)

Global warming potential (GWP) measures the climate impact of a GHG compared to carbon dioxide over a time horizon. GHGs have different GWP values depending on their efficiency in absorbing long-wave radiation and the atmospheric lifetime of the gas.

The applied GWP-values in the GHG accounting are taken from the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC). The use of GWP-values from AR4 is required by the international GHG accounting standards from the United Nations Framework Convention on Climate Change (UNFCCC). They are also commonly used by GHG accounting authorities (e.g. Department for Business, Energy & Industrial Strategy (BEIS) of the United Kingdom and the United States Environmental Protection Agency (US EPA)).

Although the GHG protocol recommends GWP-values from Fifth Assessment Report (AR5), it is currently difficult to find corresponding emission factors from third-party suppliers.

Table 7: Applied global warming potentials.

GHG	GWP (100 years)
CO ₂	1
CH ₄	25
N ₂ O	298

(Source: IPCC Fourth Assessment Report (AR4) 2007)

Annex I

Emission factors

Activity	Emission factor reference ⁹
Fuels	BEIS, 2017
Electricity	International Energy Agency, 2017
Heat	Fortum, 2017; Treeze ferwärmerechner, 2017
Cooling	International Energy Agency, 2017
Business travel	BEIS, 2017
IT equipment	IBM, 2016; Dell, 2010, 2011, 2013, 2014, 2016; LCA LED, 2016; Apple, 2012, 2013, 2016; Projector LCA, 2006; Lenovo, 2016
Paper	BEIS, 2017
Waster	BEIS, 2017
Water use	BEIS, 2017
Energy-related activities	BEIS, 2017
Employee commuting	BEIS, 2017

⁹ South Pole derives its emission factors from reliable and credible sources. South Pole is not responsible for inaccuracies in emission factors provided by third parties.

