CarbonGuru

Greenhouse Gas Protocol Report for The University of Edinburgh

Assessment Period: August 2014 - July 2015

Produced on Jan. 18, 2016 by *Our Impacts* on behalf of Carbon Masters

Assessment Details

Consolidation Approach

Operational Control

Organisational Boundaries

Operations of The University of Edinburgh

Included

- Academic estate
- Accommodation

Operational Boundary

- Air travel
- Bus and coach
- Cars
- Composted waste
- Electricity
- Hazardous waste
- Incinerated waste
- Landfilled waste
- Motorcycle
- Natural gas
- Other fuel(s)
- Rail
- Rail (train, tram, light rail, underground)
- Recycled plastic
- Recycled waste
- Residential waste mass anaerobic digestion (ERWMADI)
- Residential waste mass used to create energy (ERWMENE)
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Introduction

A greenhouse gas (GHG) emissions assessment quantifies the total greenhouse gases produced directly and indirectly from a business or organisation's activities. Also known as a carbon footprint, it is an essential tool, providing your business with a basis for understanding and managing its climate change impacts.

A GHG assessment quantifies all seven Kyoto greenhouse gases where applicable and is measured in units of carbon dioxide equivalence, or CO_2e[1]. The seven Kyoto gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), nitrogen trifluoride (NF_3), sulphur hexafluoride (SF_6) and perfluorocarbons (PFCs). The global warming potential (GWP) of each gas is illustrated in the Table 1.

Table 1. GWP of Kyoto Gases (IPCC 2007)

Greenhouse Gas	GWP
Carbon dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	298
Hydrofluorocarbons (HFCs)	124 - 14,800
Perfluorocarbons (PFCs)	7,390 - 12,200
Nitrogen trifluoride (NF_3)	17,200
Sulphur hexafluoride (SF_6)	22,800

This assessment has been carried out in accordance with the World Business Council for Sustainable Development and World Resources Institute's (WBCSD/WRI) Greenhouse Gas Protocol; a Corporate Accounting and Reporting Standard. This protocol is considered current best practice for corporate or organisational greenhouse gas emissions reporting. GHG emissions have been reported by the three WBCSD/WRI Scopes.

Scope 1 includes direct GHG emissions from sources that are owned or controlled by the company such as natural gas combustion and company owned vehicles. Scope 2 accounts for GHG emissions from the generation of purchased electricity, heat and steam generated off-site. Scope 3 includes all other indirect emissions such as waste disposal, business travel and staff commuting. Reporting of these activities is optional under the WBCSD/WRI GHG Protocol, but as they can contribute a significant portion of overall emissions Ecometrica recommends they are reported where applicable.

A GHG assessment is an essential tool in the process of monitoring and reducing an organisation's climate change impact as it allows reduction targets to be set and action plans formulated. GHG assessment results can also allow organisations to be transparent about their climate change impacts through reporting of GHG emissions to customers, shareholders, employees and other stakeholders. Regular assessments allow clients to track their progress in achieving reductions over time and provide evidence to support green claims in external marketing initiatives such as product labelling or CSR reporting. Ecometrica GHG assessments are designed to be transparent, consistent and repeatable over time.

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[1] Carbon dioxide equivalent or CO_2e is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact.

Data Quality and Availability

In order to provide the most accurate estimate of an organisation's GHG emissions, primary (actual) data should be used where it is available, up to date and geographically relevant. Secondary data in the form of estimates, extrapolations and industry averages may be used when primary data is not available. Table 2 details the quality of data submitted for this assessment with the key assumptions used stated below.

Data Quality Overview

Accuracy Overview	tCO_2e/year	%
Actual	107,226	100
Estimated	7.68	0.00716
Total	107,233	100

Table 2. Data Quality and Availability

Source of emissions	Data quality
Premises	
Electricity	Complete
Fuel oil	N/A
Natural gas	Complete
Other fuel(s)	Complete
Water supply	Complete
Water treament	Complete
Company owned vehicles	
Other fuel(s)	Complete
Business Travel	
Air travel	Complete
Bus and coach	Complete
Cars	Complete
Rail (train, tram, light rail, underground)	Complete
Taxi	Complete
Waste	
Composted waste	Mixed
Hazardous waste	Complete
Incinerated waste	Complete
Landfilled waste	Mixed
Recycled glass	N/A
Recycled metal	N/A
Recycled paper & board	N/A
Recycled plastic	Complete
Recycled waste	Complete

Residential waste mass anaerobic digestion (ERWMADI)	Complete
Residential waste mass used to create energy (ERWMENE)	Complete
Staff Commuting	
Bicycle	N/A
Bus and coach	Complete
Cars	Complete
Estimated emissions	N/A
Motorcycle	Complete
On foot	N/A
Rail	Complete
Taxi	Complete
Student Commuting	
Bus and coach	Complete
Cars	Complete
Motorcycle	Complete
On foot	N/A
Rail	Complete
Rail (train, tram, light rail, underground)	Unknown
Taxi	Complete

Assessment Summary for The University of Edinburgh
Gross Overall Emissions: 107,233 tCO_2e

Key Performance Indicators

Absolute GHG emissions will vary over time and often correspond to the expansion or contraction of an organisation. It is useful therefore to use reporting metrics that take these effects into account and monitor relative GHG emissions intensity. A common emissions intensity metric is tonnes of CO_2e per full time equivalent. This has been calculated, along with other relevant metrics, in the table below:

Data	KPI
35,258 Number of students	3.04 tCO_2e per Student
827,007 Floor area (square metres)	0.13 tCO_2e per Floor area (square metres)
841,000 Thousand GBP Revenue (£)	0.128 tCO_2e per Thousand GBP Revenue (£)
9,195 Full Time Equivalent Employees	11.7 tCO_2e per Full Time Equivalent Employee

Summary by Activity (tCO_2e)

By Activity	tCO_2e/year	%
Premises	84,597	78.9
Company owned vehicles	433	0.403
Business Travel	12,556	11.7
Waste	200	0.186
Staff Commuting	5,156	4.81
Student Commuting	4,292	4
Total	107,233	100

Summary by WBCSD/WRI Scope (tCO_2e)

Scope	tCO_2e/year	%
Scope 1	41,140	38.4
Scope 2	40,002	37.3
Scope 3	26,091	24.3
Total	107,233	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year	tCO_2e/year
CO_2	1	96,099	96,099
CH_4	25	3.86	96.5
N_2O	298	1.56	464
CO_2e	1	10,573	10,573
Total			107,233

Detailed Results

Detailed Summary by WBCSD/WRI Scope

Source of Emissions	tCO_2/yr	tCH_4/yr	tN_2O/yr	Total Emissions (tCO_2e/yr)	%
Scope 1 Total	**41,044**	**2.48**	**0.114**	**41,140**	**38.4%**
Company owned vehicles Total	420	0.0106	0.0396	433	0.403%
Other fuel(s)	420	0.0106	0.0396	433	0.403%
Premises Total	40,624	2.47	0.0741	40,708	38%
Natural gas	40,589	2.47	0.074	40,672	37.9%
Other fuel(s)	35.4	0.0016	1.4e-4	35.5	0.0331%
Scope 2 Total	**39,682**	**1.21**	**0.97**	**40,002**	**37.3%**
Premises Total	39,682	1.21	0.97	40,002	37.3%
Electricity	39,682	1.21	0.97	40,002	37.3%
Scope 3 Total	**15,372**	**0.168**	**0.474**	**26,091**	**24.3%**
Business Travel Total	12,096	0.064	0.393	12,556	11.7%
Air travel	11,727	0.0539	0.387	11,844	11%
Bus and coach	0	0	0	95.1	0.0887%
Cars	0	0	0	247	0.23%
Rail (train, tram, light rail, underground)	252	0.00896	0.00424	253	0.236%
Taxi	116	0.00114	0.002	117	0.109%
Premises Total	3,277	0.104	0.0813	3,887	3.62%
Electricity: Electricity - transmission & distribution losses	3,277	0.104	0.0813	3,304	3.08%
Water supply	0	0	0	197	0.184%
Water treament	0	0	0	386	0.36%
Staff Commuting Total	0	0	0	5,156	4.81%
Bus and coach	0	0	0	841	0.784%
Cars	0	0	0	3,771	3.52%
Motorcycle	0	0	0	37	0.0345%
Rail	0	0	0	496	0.463%
Taxi	0	0	0	11	0.0103%
Student Commuting Total	0	0	0	4,292	4%
Bus and coach	0	0	0	2,301	2.15%
Cars	0	0	0	1,282	1.2%
Motorcycle	0	0	0	34	0.0317%
Rail	0	0	0	660	0.615%
Taxi	0	0	0	15	0.014%
Waste Total	0	0	0	200	0.186%
Composted waste	0	0	0	4.94	0.0046%
Hazardous waste	0	0	0	4.12	0.00384%
Incinerated waste	0	0	0	21.3	0.0198%

	Landfilled waste	0	0	0	124	0.115%
	Recycled plastic	0	0	0	0.0937	8.73e-5%
	Recycled waste	0	0	0	39.7	0.037%
	Residential waste mass anaerobic digestion (ERWMADI)	0	0	0	1.16	0.00108%
	Residential waste mass used to create energy (ERWMENE)	0	0	0	4.95	0.00461%
Total		**96,099**	**3.86**	**1.56**	**107,233**	**100%**

Summary by Company Unit

Assessment	August 2013 - July 2014		August 2014 - July 2015	
Company Unit	**Total Emissions (tCO_2e)**	**Emissions per FTE (tCO_2e/FTE)**	**Total Emissions (tCO_2e)**	**Emissions per FTE (tCO_2e/FTE)**
The University of Edinburgh	108,412	12.4	107,233	11.7
Academic estate	92,863	-	87,336	9.5
Accommodation	10,393	-	10,450	-

Annual Activity Data

Source of Emissions	Value	Unit
Business Travel		
Air travel		
Long-haul, average class (RFI 1.9)	9,634,487	pass.km
Long-haul, business (RFI 1.9)	2,266,139	pass.km
Long-haul, economy (RFI 1.9)	21,519,263	pass.km
Long-haul, first class (RFI 1.9)	92,843	pass.km
Long-haul, premium economy (RFI 1.9)	2,001,592	pass.km
Medium-haul, average class (RFI 1.9)	3,903,527	pass.km
Medium-haul, business (RFI 1.9)	349,622	pass.km
Medium-haul, economy (RFI 1.9)	9,136,156	pass.km
Short-haul (RFI 1.9)	9,413,812	pass.km
Bus and coach		
Total CO2e emissions	95.1	tonne
Cars		
Total CO2e emissions	247	tonne
Rail (train, tram, light rail, underground)		
Eurostar	689,465	pass.km
Train, national	5,388,080	pass.km
Tram	15,420	pass.km
Underground/Subway	25,381	pass.km
Taxi		
Black cab taxi	356,900	km
Company owned vehicles		
Other fuel(s)		
Diesel, retail station biofuel blend	96,242	l
Gas Oil	52,881	l
Petrol, retail station biofuel blend	13,677	l
Premises		
Electricity		
Electricity consumption	86,548,521	kWh
Natural gas		
Natural gas consumption (gross CV)	220,506,426	kWh
Other fuel(s)		
LPG	153,987	kWh
Water supply		
Water supply	573,922	m3
Water treament		
Water treatment	545,226	m3
Staff Commuting		

Bus and coach			
	Total CO2e emissions	841	tonne
Cars			
	Total CO2e emissions	3,771	tonne
Motorcycle			
	Total CO2e emissions	37	tonne
Rail			
	Total CO2e emissions	496	tonne
Taxi			
	Total CO2e emissions	11	tonne
Student Commuting			
Bus and coach			
	Total CO2e emissions	2,301	tonne
Cars			
	Total CO2e emissions	1,282	tonne
Motorcycle			
	Total CO2e emissions	34	tonne
Rail			
	Total CO2e emissions	660	tonne
Taxi			
	Total CO2e emissions	15	tonne
Waste			
Composted waste			
	Composted waste, food & drink	334	tonne
	Composted waste, garden waste	489	tonne
Hazardous waste			
	Combusted waste, energy recovery, mixed commercial and industrial	196	tonne
Incinerated waste			
	Incinerated waste, mixed commercial & industrial, with heat recovery	1,012	tonne
Landfilled waste			
	Mixed commercial and industrial waste, landfilled	1,280	tonne
	Scrap metal, landfilled	7	tonne
	Wood, landfilled	7	tonne
Recycled plastic			
	Average plastics, open loop recycled	4.46	tonne
Recycled waste			
	Recycled waste, WEEE, open loop	107	tonne
	Recycled waste, books, closed loop	6.51	tonne
	Recycled waste, glass, closed loop	146	tonne
	Recycled waste, mixed commercial & industrial, closed loop	1,418	tonne
	Recycled waste, paper & board, closed loop	211	tonne
Residential waste mass anaerobic digestion (ERWMADI)			

Municipal waste, average, anaerobic digestion	55.1	tonne
Residential waste mass used to create energy (ERWMENE)		
Combusted waste, energy recovery, municipal waste, average	236	tonne

References

Defra/DECC (2012). Guidelines to Defra/DECC's GHG conversion factors for company reporting. Department of Environment Food and Rural Affairs/Department for Energy and Climate Change, London.

Defra/DECC (2015). UK Government conversion factors for greenhouse gas reporting. Department of Environment Food and Rural Affairs/Department for Energy and Climate Change, London.

Assessment Summary for Academic estate

Gross Overall Emissions: 87,336 tCO_2e

Key Performance Indicators

Absolute GHG emissions will vary over time and often correspond to the expansion or contraction of an organisation. It is useful therefore to use reporting metrics that take these effects into account and monitor relative GHG emissions intensity. A common emissions intensity metric is tonnes of CO_2e per full time equivalent. This has been calculated, along with other relevant metrics, in the table below:

Data	KPI
827,007 Floor area (square metres)	0.106 tCO_2e per Floor area (square metres)
9,195 Full Time Equivalent Employees	9.5 tCO_2e per Full Time Equivalent Employee

Summary by Activity (tCO_2e)

By Activity	tCO_2e/year	%
Premises	74,302	85.1
Company owned vehicles	399	0.457
Business Travel	12,556	14.4
Waste	79	0.0904
Total	87,336	100

Summary by WBCSD/WRI Scope (tCO_2e)

Scope	tCO_2e/year	%
Scope 1	37,361	42.8
Scope 2	34,083	39
Scope 3	15,891	18.2
Total	87,336	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year	tCO_2e/year
CO_2	1	85,972	85,972
CH_4	25	3.44	86
N_2O	298	1.4	416
CO_2e	1	862	862
Total			87,336

Assessment Summary for Accommodation

Gross Overall Emissions: 10,450 tCO_2e

Summary by Activity (tCO_2e)

By Activity	tCO_2e/year	%
Premises	10,295	98.5
Company owned vehicles	33.7	0.323
Waste	121	1.16
Total	10,450	100

Summary by WBCSD/WRI Scope (tCO_2e)

Scope	tCO_2e/year	%
Scope 1	3,779	36.2
Scope 2	5,919	56.6
Scope 3	752	7.2
Total	10,450	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year	tCO_2e/year
CO_2	1	10,127	10,127
CH_4	25	0.423	10.6
N_2O	298	0.163	48.6
CO_2e	1	263	263
Total			10,450