CarbonGuru

Greenhouse Gas Protocol Report for The University of Edinburgh

Assessment Period: August 2011 - July 2012

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Assessment Details

Consolidation Approach

Operational Control

Organisational Boundaries

Operations of The University of Edinburgh

Included

- Academic estate
- Accommodation

Operational Boundary

- Bus and coach
- Cars
- Electricity
- Motorcycle
- Natural gas
- Other fuel(s)
- Composted waste (Defra factors)
- Electricity
- Incinerated waste (Defra factors)
- Landfilled waste
- Rail
- Recycled waste (Defra factors)
- Taxi
- Water supply
- Water treament

Quality Assurance Assessor

- Aphra Morrison - aphra@carbonmasters.co.uk

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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	86,653	87.9
Estimated	11,945	12.1
Total	98,599	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)	Estimated
Waste	
Composted waste (Defra factors)	Mixed
Incinerated waste (Defra factors)	Estimated
Landfilled waste	Complete
Recycled waste (Defra factors)	Mixed
Staff Commuting	
Bicycle	N/A
Bus and coach	Mixed
Cars	Mixed
Motorcycle	Estimated
On foot	N/A
Rail	Estimated
Rail (train, tram, light rail, underground)	Unknown
Taxi	Mixed
Student Commuting	
Bicycle	N/A

Bus and coach	Estimated
Cars	Estimated
Estimated emissions	N/A
Motorcycle	Estimated
On foot	N/A
Rail	Estimated
Taxi	Estimated

Key Assumptions

It is assumed that the Staff and Student Travel Survey (2010) is representative of staff and student commuting behaviours in 2011-12.

Assessment Summary for The University of Edinburgh
Gross Overall Emissions: 98,599 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
31,335 Number of students	3.15 tCO_2e per Student
765,372 Floor area (square metres)	0.129 tCO_2e per Floor area (square metres)
700,887 Thousand GBP Revenue (£)	0.141 tCO_2e per Thousand GBP Revenue (£)
8,022 Full Time Equivalent Employees	12.3 tCO_2e per Full Time Equivalent Employee

Summary by Activity (tCO_2e)

By Activity	tCO_2e/year	%
Premises	86,500	87.7
Company owned vehicles	453	0.46
Waste	157	0.159
Staff Commuting	6,596	6.69
Student Commuting	4,893	4.96
Total	98,599	100

Summary by WBCSD/WRI Scope (tCO_2e)

Scope	tCO_2e/year	%
Scope 1	39,208	39.8
Scope 2	43,763	44.4
Scope 3	15,628	15.9
Total	98,599	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year	tCO_2e/year
CO_2	1	86,017	86,017
CH_4	25	3.81	95.4
N_2O	298	1.03	308
CO_2e	1	12,178	12,178
Total			98,599

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	**39,109**	**2.69**	**0.106**	**39,208**	**39.8%**
Company owned vehicles Total	443	0.0107	0.0315	453	0.46%
Other fuel(s)	443	0.0107	0.0315	453	0.46%
Premises Total	38,665	2.68	0.0746	38,755	39.3%
Natural gas	38,469	2.68	0.0739	38,558	39.1%
Other fuel(s)	196	0.00427	7.44e-4	196	0.199%
Scope 2 Total	**43,481**	**1.04**	**0.861**	**43,763**	**44.4%**
Premises Total	43,481	1.04	0.861	43,763	44.4%
Electricity	43,481	1.04	0.861	43,763	44.4%
Scope 3 Total	**3,427**	**0.0864**	**0.0673**	**15,628**	**15.9%**
Premises Total	3,427	0.0864	0.0673	3,982	4.04%
Electricity: Electricity - transmission & distribution losses	2,980	0.0751	0.0585	2,999	3.04%
Electricity: Electricity - transmission & distribution losses (carbon masters standard)	447	0.0113	0.00879	450	0.457%
Water supply	0	0	0	180	0.183%
Water treament	0	0	0	353	0.358%
Staff Commuting Total	0	0	0	6,596	6.69%
Bus and coach	0	0	0	1,299	1.32%
Cars	0	0	0	4,321	4.38%
Motorcycle	0	0	0	76.6	0.0777%
Rail	0	0	0	897	0.91%
Taxi	0	0	0	3.4	0.00345%
Student Commuting Total	0	0	0	4,893	4.96%
Bus and coach	0	0	0	1,862	1.89%
Cars	0	0	0	1,912	1.94%
Motorcycle	0	0	0	17.6	0.0178%
Rail	0	0	0	1,078	1.09%
Taxi	0	0	0	23.8	0.0242%
Waste Total	0	0	0	157	0.159%
Composted waste (Defra factors)	0	0	0	1.74	0.00176%
Incinerated waste (Defra factors)	0	0	0	1.3	0.00132%
Landfilled waste	0	0	0	110	0.111%
Recycled waste (Defra factors)	0	0	0	43.9	0.0445%
Total	**86,017**	**3.81**	**1.03**	**98,599**	**100%**

Summary by Company Unit

Assessment	August 2010 - July 2011		August 2011 - July 2012	
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	101,234	12.9	98,599	12.3
Academic estate	83,849	-	81,688	-
Accommodation	10,788	-	10,314	-

Annual Activity Data

Source of Emissions	Value	Unit
Company owned vehicles		
Other fuel(s)		
Diesel, retail station biofuel blend	138,863	l
Gas Oil	27,443	l
Petrol	5,096	l
Premises		
Electricity		
Electricity consumption	90,743,261	kWh
Natural gas		
Natural gas consumption (gross CV)	208,134,492	kWh
Other fuel(s)		
LPG	128,069	l
Water supply		
Water supply	523,811	m3
Water treament		
Water treatment (Europe)	497,621	m3
Staff Commuting		
Bus and coach		
Total CO2e emissions (metric tonnes)	1,299	tonne
Cars		
Total CO2e emissions (metric tonnes)	4,321	tonne
Motorcycle		
Total CO2e emissions (metric tonnes)	76.6	tonne
Rail		
Total CO2e emissions (metric tonnes)	897	tonne
Taxi		
Total CO2e emissions (metric tonnes)	3.4	tonne
Student Commuting		
Bus and coach		
Total CO2e emissions (metric tonnes)	1,862	tonne
Cars		
Total CO2e emissions (metric tonnes)	1,912	tonne
Motorcycle		
Total CO2e emissions (metric tonnes)	17.6	tonne
Rail		
Total CO2e emissions (metric tonnes)	1,078	tonne
Taxi		
Total CO2e emissions (metric tonnes)	23.8	tonne
Waste		

Composted waste (Defra factors)		
Composted waste, food and drink waste	13.4	tonne
Composted waste, garden waste	276	tonne
Incinerated waste (Defra factors)		
Combusted waste, energy recovery, mixed commercial and industrial	62	tonne
Landfilled waste		
Mixed commercial and industrial waste, landfilled	551	tonne
Recycled waste (Defra factors)		
Recycled waste, WEEE, mixed, open loop	75.2	tonne
Recycled waste, batteries, open loop	0.6	tonne
Recycled waste, books, closed loop	4.1	tonne
Recycled waste, glass, closed loop	4.9	tonne
Recycled waste, mineral oil, closed loop	17.1	tonne
Recycled waste, mixed commercial and industrial, closed loop	1,987	tonne

Key Observations

It should be noted that there has been a significant change in 2011/12 in the methodology for measuring emissions from waste, compared with previous years. In previous years, emissions factors from IPCC were used for landfilled and incinerated waste. In the 2011/12 calculations emissions factors from Defra/Decc have been used as these offer a more detailed breakdown into different waste streams. It should be noted that the IPCC emissions factors provide a significantly higher estimate for emissions per tonne waste sent to landfill. It is therefore not advisable to directly compare 2011/12 waste emissions with those reported in earlier years. It is recommended instead that comparisons should be made on the basis of tonnage of waste.

It should also be noted that the category for emissions from 'Staff Commuting' has not been allocated to either the academic division or the accommodation division. Instead these emissions fall under the parent level for University of Edinburgh. The reason for this is that there is no straightforward way of identifying which emissions are from staff commuting to accommodation premises and which emissions are from staff commuting to academic premises.

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.

Assessment Summary for Academic estate

Gross Overall Emissions: 81,688 tCO_2e

Summary by Activity (tCO_2e)

By Activity	tCO_2e/year	%
Premises	76,247	93.3
Company owned vehicles	415	0.508
Waste	134	0.163
Student Commuting	4,893	5.99
Total	81,688	100

Summary by WBCSD/WRI Scope (tCO_2e)

Scope	tCO_2e/year	%
Scope 1	35,162	43
Scope 2	38,050	46.6
Scope 3	8,476	10.4
Total	81,688	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year	tCO_2e/year
CO_2	1	75,857	75,857
CH_4	25	3.39	84.7
N_2O	298	0.904	269
CO_2e	1	5,477	5,477
Total			81,688

Assessment Summary for Accommodation

Gross Overall Emissions: 10,314 tCO_2e

Summary by Activity (tCO_2e)

By Activity	tCO_2e/year	%
Premises	10,253	99.4
Company owned vehicles	37.8	0.367
Waste	22.9	0.222
Total	10,314	100

Summary by WBCSD/WRI Scope (tCO_2e)

Scope	tCO_2e/year	%
Scope 1	4,046	39.2
Scope 2	5,713	55.4
Scope 3	556	5.39
Total	10,314	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year	tCO_2e/year
CO_2	1	10,160	10,160
CH_4	25	0.426	10.6
N_2O	298	0.13	38.6
CO_2e	1	105	105
Total			10,314