

Electricity North West Carbon Footprint Report 2013-2014

1. Introduction

This report details the carbon consumption arising from the undertakings of Electricity North West Limited for the financial year 2013-2014.

2. Summary

2.1. Operational Carbon Footprint for 2013/14

2013/14	tonne CO ₂ Eq	Percentage of BCF (incl. losses)	Percentage of BCF (excl. losses)
Buildings energy usage	8,985	1.4%	37.8%
Operational Transport	9,426	1.5%	39.7%
Business Transport	1,387	0.2%	5.8%
Fugitive Emissions	1,373	0.2%	5.8%
Fuel Combustion	2,590	0.4%	10.9%
BCF (excl. losses)	23,761		100.0%
Losses	627,681	96.3%	
BCF (incl. losses)	651,442	100.00%	

Note that losses are reported separately due to their relative magnitude in the overall total.

2.2. Comparison With Previous Year

	2012/13 tonne CO ₂ Eq	2013/14 tonne CO ₂ Eq	Percentage Change
Buildings energy usage	9,918	8,985	-9.4%
Operational Transport	9,894	9,426	-4.7%
Business Transport	1,303	1,387	+6.5%
Fugitive Emissions	1,199	1,373	+14.5%
Fuel Combustion	2,774	2,590	-6.6%
BCF (excl. losses)	25,088	23,761	-5.3%
Losses	652,308	627,681	-3.8%
BCF (incl. losses)	677,396	651,442	-3.8%

Note: The reported losses figure is a snapshot of received data as of the date of this report and will change as further settlement reconciliation runs are carried out (up to 28 months after each relevant settlement date).

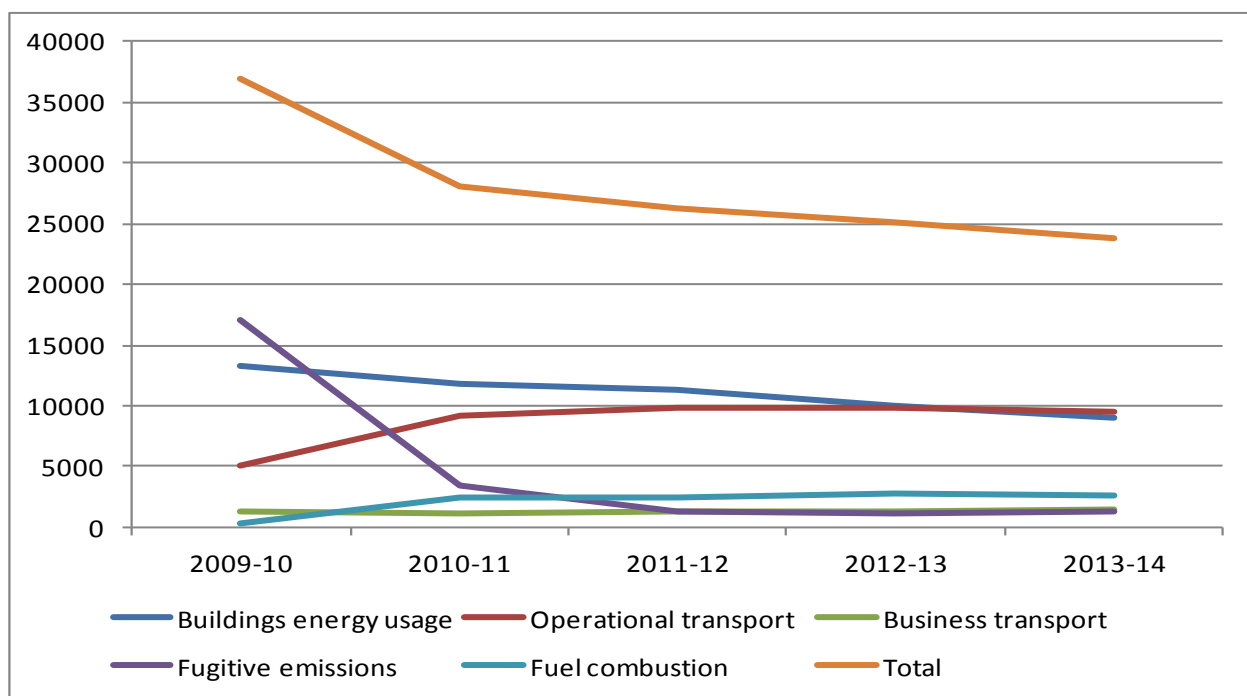
Our Business Carbon Footprint (BCF), excluding losses was 23,761, tCO₂e for 2013-14, a reduction of 1,327 tCO₂e (5%) from the previous year and a reduction of 13,150tCO₂e (36%) from the 2009-10 baseline year.

The key reduction in the year was in the carbon footprint associated with our buildings energy usage which fell by 933 tCO₂e (9%) due to a combination of factors including the inclusion of energy efficiency measures in the refurbishment of our offices. Buildings energy usage comprises purchased electricity and is calculated using the kWh usage data provided by the business energy suppliers and/or landlords for whole buildings or parts of buildings occupied by Electricity North West.

Other decreases in carbon emissions were gained in operational transport where our fuel consumption decreased by 468 tCO₂e whilst delivering an increased capital programme, due entirely to the implementation of fleet fuel efficiency measures including the extension of rev limiters in our vehicles. An increase of 174 tCO₂e from SF₆ emissions was calculated in the year. This was due to a number of uncontrolled losses from apparatus which although very small in weight result in a noticeable increase in tCO₂e because of the high global warming potential of SF₆. The amount of uncontrolled losses remains very low in comparison to the total SF₆ bank and as older equipment is replaced in the RIIO period these losses are expected to fall.

There were some small increases in 2013-14 in business transport emissions which reflected an increased amount of management road, rail and air travel associated with the increased business planning and delivery activity in the year and in diesel consumption associated with the increased deployment of generators in the year to improve customer service in relation to planned outages.

The relative significance of the main elements of our operational carbon footprint is demonstrated in the graph below, showing performance over a five year period.



3. Detailed Tables

The classification of carbon sources in the tables follows the requirements of the industry regulator, Ofgem, for the purposes of reporting Business Carbon Footprint.

Unless otherwise stated in this document, all conversion rates are extracted from the Defra/DECC UK Government conversion factors for Company Reporting 2013 Version 1.0. The data for each respective calculation is set out in the tables below.

4. Buildings Energy Usage

The buildings-electricity energy usage figure is calculated using the kWh usage data provided by the business energy suppliers and/or landlords for whole buildings or parts of buildings that we occupy.

The substation-electricity usage data is calculated from kWh usage data provided by the business energy suppliers for metered supplies and the estimated consumption figure as submitted in the unmetered MPAN certificate.

To convert the usage into tCO₂e the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 2 Electricity Generated conversion factor of 0.44548 kgCO₂e per kWh is used. This factor is contained on the UK Electricity tab of the conversion factors.

The kWh total is multiplied by the conversion factor to give the kgCO₂e number and then divided by 1,000 to provide the tCO₂e number.

For 2013/14 the calculation is as follows:

- Direct purchased non-operational consumption = 4,813,932 kWh
- Purchased via landlord = 1,904,507 kWh
- Direct purchased metered operational consumption = 185,410 kWh
- Unmetered operational consumption = 13,266,135 kWh

20,169,984 kWh x 0.44548 / 1,000 = **8985.32 tCO₂e**.

5. Operational Transport

The operational transport figure is calculated from fuel litres purchased data provided by the business fuel card suppliers for the directly controlled fleet vehicles and from fuel litres used data provided by contractors in relation to their fleet usage on our behalf. All the operational vehicles that we own have diesel engines.

The fuel usage figure from contractors includes the usage by the larger framework contractors only and excludes any usage by smaller, low volume sub-contractors where the collation of data is impractical.

To convert the usage into tCO₂e the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 1 conversion factor for Diesel (average biofuel blend) of 2.6008 kgCO₂e per litre is used. This factor is contained in the Fuels tab of the conversion factors.

Note: the 'outside of scopes' conversion factor for the biogenic part of this fuel was not available via the Defra/DECC's "UK Government Conversion Factors for Company Reporting 2013 Version 1.0" at the time of calculation and was therefore not used.

For 2013/14 the calculation is as follows:

- Electricity North West fuel card purchased: 1,583,140.26 litres (diesel)
- Contractor reported use: 2,041,053.00 litres (diesel)

3,624,193.26 litres x 2.6008 / 1,000 = **9425.80 tCO₂e**

6. Business Transport

6.1. Road Travel

The business transport figure for road travel is calculated from the mileages claimed back through the electronic business corporate expenses system (ESS). Excluded from the figures is any incidental-contractor business mileage as the collation of this data is impractical.

To convert the usage into tCO₂e the following conversion factors from the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 1 Passenger Vehicle tab were used:

- Small petrol cars 0.260585 kgCO₂e per mile
- Medium petrol cars 0.329755 kgCO₂e per mile
- Large petrol cars 0.477621 kgCO₂e per mile
- Small diesel cars 0.226081 kgCO₂e per mile
- Medium diesel cars 0.281233 kgCO₂e per mile
- Large diesel cars 0.3692 kgCO₂e per mile
- Average small car (unknown fuel) 0.250366 kgCO₂e per mile
- Average medium car (unknown fuel) 0.307111 kgCO₂e per mile
- Average large car (unknown fuel) 0.306146 kgCO₂e per mile
- Average car (unknown fuel) 0.306146 kgCO₂e per mile
- Average petrol motorbike (unknown engine size) 0.191367 kgCO₂e per mile

For 2013/14 the calculation is as follows:

- Small petrol car: 56,097.00 miles x 0.260585 / 1,000 = 14.62 tCO₂e
- Medium petrol car: 302,849.30 miles x 0.329755 / 1,000 = 99.87 tCO₂e
- Large petrol car: 39,016.00 miles x 0.477621 / 1,000 = 18.63 tCO₂e
- Small diesel car: 178,558.00 miles x 0.226081 / 1,000 = 40.37 tCO₂e
- Medium diesel car: 2,101,116.00 miles x 0.281233 / 1,000 = 590.90 tCO₂e
- Large diesel car: 684,190.40 miles x 0.3692 / 1,000 = 252.6 tCO₂e
- Small unknown car: 353,806.50 miles x 0.250366 / 1,000 = 88.58 tCO₂e
- Medium unknown car: 404,908.88 miles x 0.307111 / 1,000 = 124.35 tCO₂e
- Large unknown car: 37,095.00 miles x 0.402706 / 1,000 = 14.94 tCO₂e
- Average unknown car: 218,317.00 miles x 0.306146 / 1,000 = 66.84 tCO₂e
- Average petrol motorcycle: 81.00 miles x 0.191367 / 1,000 = 0.02 tCO₂e

Total business transport road = **1311.72 tCO₂e**

6.2. Rail Travel

The business transport figure for rail is calculated using details provided by our travel supplier of rail journeys undertaken by our employees. The journey details are split into those travelled on national rail, London Underground and international rail and then the mileages for each journey calculated using the distances between stations published on the Network Rail website. The mileages are then converted into kilometres for calculating the tCO₂e.

For London Underground journeys, nominal mileages were used for unspecified Zone 1, 2 and 3+ journeys based on typical locations visited by our staff for example Ofgem offices and Energy Networks Association offices. Zone 1 journeys were taken to be a 3 miles one-way, Zone 2, 6 miles one-way and Zone 3, 9 miles one-way.

Excluded from the rail journey calculations are any journeys booked by employees directly and claimed back through the corporate expenses system as these are minimal and the details not specific enough to make a valid calculation.

To convert the usage into tCO₂e the following conversion factors from the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 3 Business Travel – Land tab were used:

- National rail 0.04904 kgCO₂e per kilometre
- International rail 0.01235 kgCO₂e per kilometre
- London Underground 0.06361 kgCO₂e per kilometre

For 2013/14 the calculation is as follows:

- National Rail: 488,898.99 km x 0.04904 / 1,000 = 23.98 tCO₂e
- International Rail: 747.00 km x 0.01235 / 1,000 = 0.01 tCO₂e
- London Underground: 2,551.39 km x 0.06361 / 1,000 = 0.16 tCO₂e

Total business transport rail = **24.15 tCO₂e**

6.3. Air Travel

The business transport figure for air travel is calculated using details provided by our travel supplier of air journeys undertaken by our employees. The journey details are split into domestic, short haul international and long haul international and the kilometres travelled for each journey calculated using the air journey distance calculator on the www.webflyer.com website.

To convert the usage into tCO₂e the following conversion factors from the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 3 Business Travel – Air tab were used:

- Domestic, Average Passenger Without RF 0.1727568 kgCO₂e per kilometre
- Short Haul, Economy Class Without RF 0.096984 kgCO₂e per kilometre

- Long Haul, Business Class Without RF 0.253584 kgCO₂e per kilometre

In line with Defra guidelines, the Without RF conversion factors were used to provide comparable reporting with previous years when an uplift figure of 9% was used.

The kilometre travelled totals are then multiplied by the conversion factors to give the kgCO₂e number and then divided by 1,000 to provide the tCO₂e number.

For 2013/14 the calculation is as follows:

- Domestic Average Passenger : 27,777.00 km x 0.1727568 / 1,000 = 4.80 tCO₂e
- Short Haul International Economy Class : 51,235.00 km x 0.096984 / 1,000 = 4.97 tCO₂e
- Long Haul International Business Class: 163,034.00 km x 0.253584 / 1,000 = 41.34 tCO₂e

Total business transport air = **51.11 tCO₂e**.

Total business transport = **1,386,98 tCO₂e**.

7. Fugitive Emissions

This category includes gases identified as having a high global warming potential (GWP) value (as published by the IPCC in its Second Assessment Report (Climate Change 1995). The relevant gases for Electricity North West are Sulphur Hexafluoride (SF₆) and Hydrofluorocarbons (HFCs).

7.1. Sulphur Hexafluoride (SF₆)

The amount of sulphur hexafluoride (SF₆) emitted is calculated using the actual mass of SF₆ used when topping up or replacing distribution network apparatus with low gas or gas loss. The top-up amounts are the actual amounts recorded by the engineers on-site when topping up. The loss amounts for apparatus that has been replaced as a result of gas loss are the amounts of gas held by those units.

To convert the usage into tCO₂e the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 1 conversion factor for SF₆ of 23,900 tCO₂e per tonne was used. This factor is contained in the Refrigerant and Other tab of the conversion factors.

The amount of gas emitted is then multiplied by the conversion factor to give the tCO₂e number.

For 2013/14 the calculation is as follows:

0.0571 tonnes x 23,900 = **1364.69 tCO₂e**.

7.2. Hydrofluorocarbons (HFCs)

The "gases other" figure is calculated using data held on the capacity and type of HFC gases contained in air conditioning units in use within our occupied offices.

An estimated leakage rate is taken from Table 8B in Annex 8 of the *2012 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting*. To determine which leakage rate applies the units were compared with the sizing guide in the December 2011 ICF document *Development of the GHG Refrigeration and Air Conditioning Model Final Report*. All units were judged to be "Small Stationary Air Conditioning" units.

The time used by each unit was calculated as 24% of time available in the year based on an assumed usage of 8 hours per day, 5 days per week = 40 hours per week/168 hours in week= 24%.

To convert the usage into tCO₂e the following conversion factors from Defra/DECC's "UK Government Conversion Factors for Company Reporting 2013 Version 1.0" Scope 1 Refrigerant and Others tab were used:

- HCFC-22/R22 Chlorodifluoromethane 1,810 tCO₂e per tonne.
- R407C 1,526 tCO₂e per tonne.
- R410A 1,725 tCO₂e per tonne.

The capacity for each HFC type is multiplied by the time used percentage, the annual leak rate and the global warming potential conversion factor to provide the tCO₂e number.

For 2013/14 the calculation is as follows:

- R22: 0.505 tonnes charging capacity x 24% usage x 3% leakage rate x 1,810 = 6.58 tCO₂e.
- R407C: 0.005 tonnes charging capacity x 24% usage x 3% leakage x 1,526 = 0.05tCO₂e.
- R410A: 0.177 tonnes charging capacity x 24% usage x 3% leakage x 1,725 = 1.95tCO₂e.

Total emissions gases other = **8.83 tCO₂e**.

Total fugitive emission = **1,373.52 tCO₂e**.

8. Fuel Combustion

8.1. Diesel

The fuel combustion - diesel figure is calculated from fuel litres purchased data provided by the business plant card supplier.

To convert the usage into tCO₂e Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 1 conversion factor for Diesel (average biofuel blend) of 2.6008 was used. This factor is contained in the Fuels tab of the conversion factors.

Note: the 'outside of scopes' conversion factor for the biogenic part of this fuel was not available via the Defra/DECC's "UK Government Conversion Factors for Company Reporting 2013 Version 1.0" at the time of calculation and was therefore not used

The litreage total is multiplied by the conversion factor to give the kgCO₂e number and then divided by 1,000 to provide the tCO₂e number.

For 2013/14 the calculation is as follows:

Electricity North West fuel card purchased: 56,459.54 litres (average biofuel diesel) x 2.6008 / 1,000 = **146.84 tCO₂e**

8.2. Other

The fuels other figure is calculated from fuel litres purchased data provided by the business fuel card supplier for the directly controlled generators and plant and from fuel litres used data provided by sub-contractors in relation to their generator and plant usage on our behalf.

To convert the usage into tCO₂e the following conversion factors from the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 1 Fuels tab were used:

- Petrol (average biofuel blend) of 2.2144 kgCO₂e per litre.
- Gas Oil 2.9343 kgCO₂e per litre.

Note: the 'outside of scopes' conversion factor for the biogenic part of this fuel was not available via the Defra/DECC's "UK Government Conversion Factors for Company Reporting 2013 Version 1.0" at the time of calculation and was therefore not used

The litreage total is multiplied by the conversion factor to give the kgCO₂e number and then divided by 1,000 to provide the tCO₂e number.

For 2013/14 the calculation is as follows:

- Electricity North West fuel card purchased: 26,918.81 litres (average biofuel petrol) x 2.2144 / 1,000 = 59.61 tCO₂e
- Contractor reported use: 18,145.00 litres (average biofuel petrol) x 2.2144 / 1,000 = 40.18 tCO₂e
- Electricity North West purchased: 312,698.00 litres (Gas oil) x 2.9343 / 1,000 = 917.55 tCO₂e
- Contractor reported use: 485,885.00 litres (Gas oil) x 2.9343 / 1,000 = 1425.73 tCO₂e

Total fuel combustion other = **2,443.07 tCO₂e**

Total fuel combustion = **2589.91 tCO₂e**.

9. System Losses

Losses occur in all electricity networks, and for GB distribution companies typically represent 5-10% of energy distributed to end customers. Losses are usually divided into two categories: technical and non-technical. Technical losses can be further divided into fixed losses (e.g. transformer iron losses) and variable losses which are dependent on power flows in circuits, both of which have a direct carbon impact. Non-technical losses include unregistered or illegal connections, theft, meter inaccuracies, meter settlement errors and other settlement data issues.

Losses are measured as the difference between energy entering (generation) and energy exiting the network (demand), as recorded under the Balancing and Settlement Code (BSC) arrangements. Reported losses therefore do not distinguish between technical and non-technical losses.

The reported figure is a snapshot of received data as of the date of this report and will change as further settlement reconciliation runs are carried out (up to 28 months after each relevant settlement date).

To convert the usage into tCO₂e the Defra/DECC's *UK Government Conversion Factors for Company Reporting 2013 Version 1.0* Scope 2 Electricity Generated conversion factor of 0.44548 kgCO₂e per kWh is used. This factor is contained on the UK Electricity tab of the conversion factors.

The kWh total is multiplied by the conversion factor to give the kgCO₂e number and then divided by 1,000 to provide the tCO₂e number

For 2013/14 the calculation is as follows:

- Reported losses: 1,409 GWh = 1,409,000,000 kWh
- Conversion factor = 0.44548

Total losses 1,409,000,000 kWh x 0.44548 / 1000 = **627,681.32 tCO₂e**