One Carbon World

Report

Presented to:

Warwick District Council

October 2019

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Report by: M Potier	Date: 18/10/2019
Endorsed by: Dr Stephen Finnegan	Date: 21/10/2019
Amended by:	Date:

Introduction

Warwick District Council have been awarded a One Carbon World Carbon grant.

This report details the carbon footprint of Warwick District Council and provides recommendations to reduce and off-set its footprint.

The activities included in the carbon footprint measurement were agreed in consultation between One Carbon World and Warwick District Council The calculation of the footprint was undertaken by One Carbon World after a desk-top review of data provided by Warwick District Council

This report meets the reporting requirements of the Green House Gas (GHG) Protocol Corporate Standard and is compatible with international standards ISO 14064 and PAS 2060.

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Carbon Footprint Report

Name: Warwick District Council

Address: Riverside House, Milverton Hill, Leamington Spa CV32 5HZ, UK.

Description: Local Government Authority

Footprint boundary: All activities under operational control, covered under Scopes 1, 2 and 3 of the Green House Gas (GHG) Protocol Corporate Standard.

Footprint Period: 01/04/2018 to 31/03/2019

Activities/Emissions included in footprint:

- Fuel use: national grid gas, diesel, LPG and biomass
- Purchased national grid electricity
- Hire car or grey fleet mileage
- Mains water use

The GHG Protocol Corporate Standard requires reporting a minimum of scope 1 and scope 2 emissions.

Scope 1 - Direct Green House Gas (GHG) Emissions:

Scope 1 (direct) emissions are those from activities owned or controlled by an organisation. Direct emissions are principally the result of the following types of activities:

- Generation of electricity, heat, or steam. These emissions result from combustion of fuels in stationary sources, e.g., boilers, furnaces, turbines

- Transportation of materials, products, waste, and employees. These emissions result from the combustion of fuels in company owned/controlled mobile combustion sources (e.g., trucks, trains, ships, airplanes, buses, and cars)

- Fugitive emissions. These emissions result from intentional or unintentional releases, e.g., equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting; hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport.

- Physical or chemical processing. Most of these emissions result from manufacture or processing of chemicals and materials, e.g., cement, aluminium, and waste processing

Scope 1 Emissions data supplied and included in footprint:

- Total kWh of national grid gas used
- Total miles of council owned/leased diesel vehicles
- Total litres LPG consumed
- Total kWh of biomass (wood pellets) used

Scope 2 - Indirect GHG Emissions:

Scope 2 (indirect) emissions are those released into the atmosphere that are associated with the consumption of purchased electricity, heat, steam and cooling. These indirect emissions are a consequence of an organisation's energy use, but occur at sources not owned or controlled.

Scope 2 Emissions data supplied and included in footprint:

- Total kWh of national grid electricity used (including council owned/leased electric vehicles).

Scope 3 - Other Indirect GHG Emissions

Scope 3 (other indirect) emissions are a consequence of actions that occur at sources not owned or controlled and not classed as Scope 2 emissions. Examples of Scope 3 emissions are business travel by means not owned or controlled by an organisation, waste disposal, or materials or fuels an organisation purchases. Deciding if emissions from a vehicle, office or factory are Scope 1 or Scope 3 may depend on how operational boundaries are defined.

Scope 3 Emissions data supplied and included in footprint:

- Total miles of hire cars or grey fleet.
- Total cubic meters of mains water consumed

Footprint Calculation Method:

The most common approach for calculating GHG emissions is through the application of documented and approved GHG emissions conversion factors. These factors are calculated ratios that relate GHG emissions to a proxy measure of activity at an emissions source.

Further detail on emissions factors and the methodology behind them can be found at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726911/2018_methodology_paper_FINAL_v01-00.pdf

The activity data or amount of 'resources' used are multiplied by the relevant emissions factors to calculate total Greenhouse Gas equivalent (CO_2e) emissions.

GHG emissions = activity data x emission conversion factor

There are seven main GHGs that contribute to climate change, as covered by the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6) and nitrogen trifluoride (NF_3). Different activities emit different gases and an organisation should report on the Kyoto Protocol GHG gases produced by its activities.

CO_2e is the universal unit of measurement to indicate the global warming potential (GWP) of GHGs, expressed in terms of the GWP of one unit of CO_2. The GWPs used in the calculation of CO_2e are based on the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) over a 100-year period (this is a requirement for inventory/national reporting purposes).

All conversion factors used in this report are in units of kilograms of carbon dioxide equivalent (kg CO_2e).

Emissions factors used in footprint calculation:

Activity Data	CO_2e Emissions factor	Source
Gas	Fuels - Gaseous Fuels, Natural Gas, (cubic meters)	DEFRA Conversion Factors Full Set for Advanced Users 2018
Diesel	Fuels - Liquid Fuels: Diesel, average biofuel blend (litres)	DEFRA Conversion Factors Full Set for Advanced Users 2018
LPG	Fuels - Gaseous Fuels: LPG (litres)	DEFRA Conversion Factors Full Set for Advanced Users 2018
Biomass	Biomass – Wood pellets (kWh)	DEFRA Conversion Factors Full Set for Advanced Users 2018
Electricity	UK Electricity (kWh)	DEFRA Conversion Factors Full Set for Advanced Users 2018
Water	Water supply and Water treatment (cubic meters)	DEFRA Conversion Factors Full Set for Advanced Users 2018
Grey fleet/Hire cars	Business travel - land – average car, unknown fuel (miles)	DEFRA Conversion Factors Full Set for Advanced Users 2018

Assumptions and/or Omissions:

Following the GHG Protocol guidance, 2018 emissions factors have been used as most the footprint period is within 2018.

Scope 3 emissions data, including Well to Tank Scope 3 emissions associated with extraction, refining and transportation of raw fuels, and Transmission and distribution (T&D) Scope 3 emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it), are not included in this footprint calculation.

There is a 7.80% variance in the emissions from electricity use as readings were not available at the time of calculation for 26 out of 332 meters.

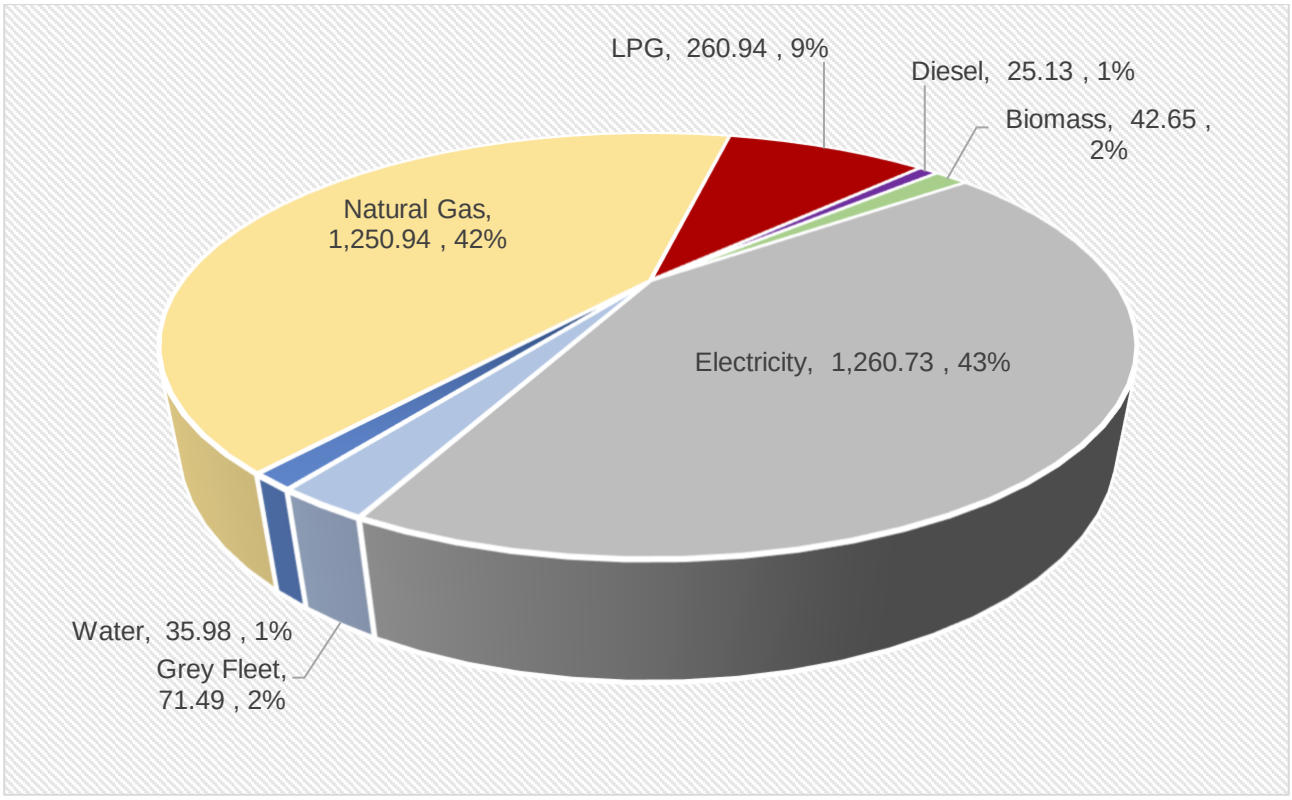
Total national grid electricity use (minus usage for electric vehicles) has been calculated from average use over a 10 month period.

Water readings are based on legacy information available at time of calculation.

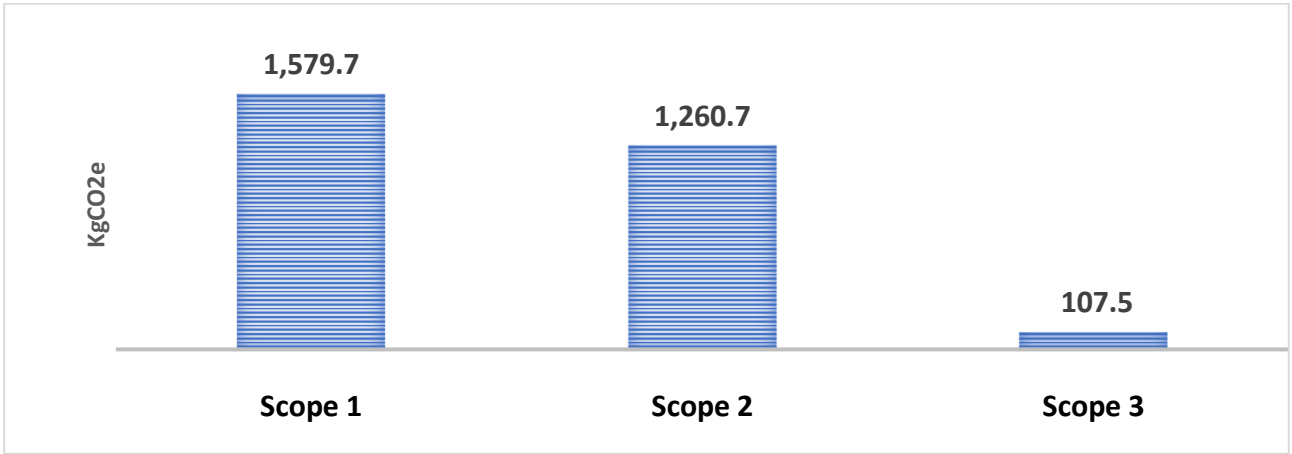
Carbon Footprint:

The Total Carbon Footprint of the activities measured = **2,947.86 tons CO_2e.**

Sources of CO_2e by emission activity (figures in tons)



Sources of CO_2e by GHG Protocol Scope



Carbon Footprint Reduction Recommendations

The most significant source of CO_2e emissions identified are:

- Electricity use
- Natural Gas use

To reduce these emissions, it is recommended that:

- The amount of electricity used is reviewed and if possible reduced. With an audit and identification of electricity use over time, there could be better/more efficient uses of electricity through use of better/more efficient technology e.g. LED lighting, timer switches etc.

- Also, electricity can be sourced from renewable sources e.g. wind, bio-mass, solar etc. Many energy suppliers are part of the Renewable Energy Guarantee of Origin (REGO) scheme that provides transparency to consumers about the proportion of electricity that suppliers source from renewable generation. Through purchasing electricity from guaranteed renewable sources, Warwick D.C. could potentially greatly reduce the emissions associated with its electricity use.

- The amount of natural gas used is reviewed and if possible reduced. As natural gas is primarily used for heating purposes, there could be some very quick wins with a thorough audit of the system. On the back of the audit and identification of energy use over time, there could be better/more efficient methods to insulate buildings, improve heating systems, or supply alternative/renewable energy sources for heating e.g. infrared panel heaters, air source heat pumps (ASHPs) ground source heat pumps (GSHPs), solar thermal, solar PV plus others.

To effectively monitor the Carbon Footprint of Warwick District Council over time, it is also recommended that a relevant performance indicator is chosen.

Indicators can be based on number of employees e.g. 1,544.30 tons / X no. employees = X tons CO_2e per employee

Other performance indicators can also be used, such as those based on financial data e.g. $KgCO_2e$ £, with the cost indicator linked to financial turnover and/or profit

These recommendations are non-exhaustive and are designed to provide guidance only.

Further Reduction Recommendations

In addition to reducing its own emissions through action targeted reduction strategies, Warwick District Council can off-set its CO_2e emissions **now**. This can be achieved through investing in verified projects that support reduction of CO_2e emissions even further and will provide Warwick District Council time to develop an effective emissions reduction plan.

Warwick District Council has been awarded a One Carbon World Carbon grant which includes the retirement of up to 300 tons equivalent of carbon credits.

With the retirement of these credits the total 2018-2019 Carbon Footprint of Warwick District Council will be off-set to a total of **2,647.86 tons**.

The 300 carbon credits that will be retired in the name of Warwick District Council come from both verified international afforestation projects and from United Nations clean development mechanism projects.

With the retirement of these credits Warwick District Council has achieved the criteria required for the One Carbon World Launchpad to Carbon Neutral Standard.

Further to off-setting 300 tons of its Carbon Footprint, with the award of the One Carbon World grant, Warwick District Council has the opportunity of achieving the One Carbon World Carbon Neutral Gold Standard through off-setting the balance of its 2018-2019 Carbon Footprint of 2,647.86 tons.

With the support of the grant award, the cost of Warwick District Council off-setting its 2018-2019 Carbon Footprint and achieving the One Carbon World Carbon Neutral Gold Standard is **£1,588.72**.

By off-setting the balance of its 2018-2019 Carbon Footprint of 2,647.86 tons, Warwick District Council can become 'carbon neutral' or 'net zero' for its energy, fuel, water and car travel emissions.