

# WHAT IS CARBON FOOTPRINT AND HOW TO CALCULATE IT?

NAVEED SHAIKH

E3

Saturday 25<sup>th</sup> September 2021



Energy  
Emissions  
Environment

THE GREAT  
BIG GREEN  
WEEK 

READING  
CLIMATE  
FESTIVAL  
2021

# INTRODUCTION – NAVEED SHAIKH

- MSc. Energy Management from City University London
- Chartered Energy Manager with Energy Institute UK
- ESOS Lead Assessor
- Owner of blog E3 – [www.allaboute3.com](http://www.allaboute3.com)
- Working as a Senior Solution Manager to design and deliver Net-Zero works for blue-chip companies.



Energy  
Emissions  
Environment



READING  
CLIMATE  
FESTIVAL  
2021

# 1.0 WHAT IS CARBON FOOTPRINT?

- Green House Gases (GHG)

- Greenhouse gases are gases in Earth's atmosphere that trap heat. They let sunlight pass through the atmosphere, but they prevent the heat that the sunlight brings from leaving the atmosphere. The main greenhouse gases are:

- Water vapor
- Carbon dioxide (CO<sub>2</sub>)
- Methane
- Ozone
- Nitrous oxide
- Chlorofluorocarbons



Energy  
Emissions  
Environment

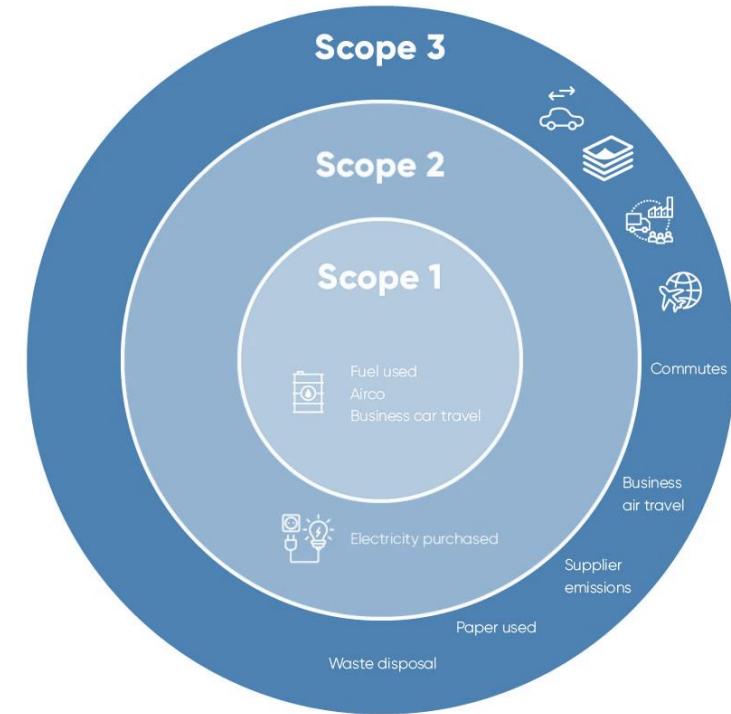
**THE GREAT  
BIG GREEN  
WEEK** 

**READING  
CLIMATE  
FESTIVAL  
2021**

# 1.0 WHAT IS CARBON FOOTPRINT?

Carbon footprint is a measure of the total greenhouse gases (GHGs) caused directly and indirectly by a person, product, activity or event expressed as equivalent to carbon dioxide (CO<sub>2</sub>e). Carbon dioxide equivalent (CO<sub>2</sub>e) number includes carbon dioxide and other greenhouse gases which are converted into CO<sub>2</sub> equivalent and therefore the value of CO<sub>2</sub>e will always be higher than CO<sub>2</sub> for any particular fuel, electricity or product, etcetera.

Direct emissions come from direct use of energy such as natural gas combustion for hot water or cooking at home. Indirect emissions can be of two types, one from direct consumption of electricity at home which is generated at power stations, resulting in CO<sub>2</sub>e and other by purchasing products and services such as bread for breakfast.



Source: ecochain.com



Energy  
Emissions  
Environment



# 2.0 HOW TO ESTIMATE CARBON FOOTPRINT?

- Carbon factor, often available from government portals is multiplied with the amount of energy consumption or use of service.
- **Example – Household Consumption:**
  - Annual grid electricity consumption – 2,430kWh
  - Annual electricity generation and consumption from solar – 450kWh
  - Annual gas consumption – 858m<sup>3</sup>
  - Diesel consumption for 2.0Ltr car – 200litres
  - Petrol consumption for 1.3Ltr car – 70litres
  - Water Use – 300m<sup>3</sup>

## Carbon Factors – 2020 UK DEFRA:

- Electricity – 0.23314kgCO<sub>2</sub>e/kWh
- Gas – 0.18387kgCO<sub>2</sub>e/kWh
- Diesel – 0.240572kgCO<sub>2</sub>e/kWh
- Petrol – 0.2292kgCO<sub>2</sub>e/kWh
- Coal – 0.31666kgCO<sub>2</sub>e/kWh
- Water Supply – 0.344kgCO<sub>2</sub>e/m<sup>3</sup>



Energy  
Emissions  
Environment

THE GREAT  
BIG GREEN  
WEEK

READING  
CLIMATE  
FESTIVAL  
2021

# 2.0 HOW TO ESTIMATE CARBON FOOTPRINT?

Energy Source	Formula	Carbon Footprint (kgCO <sub>2</sub> e/year)
Grid Electricity	$2,430 \times 0.2331$	566.43
Solar Electricity	$450 \times 0$	0 (Carbon intensity for electricity generated from renewables including solar is zero)
Natural gas Converting from m <sup>3</sup> into kWh: $858 \times 1 \times 39,200 \div 3600 = 9,343\text{kWh}$	$9,343 \times 0.18387$	1,717.89
Diesel Converting Diesel litres into kWh: $200 \text{ (litres)} \times 10.60 \text{ (kWh/litre)} = 2,120\text{kWh}$	$2,120 \times 0.240572$	510.01
Petrol Converting Diesel litres into kWh: $70 \text{ (litres)} \times 9.44 \text{ (kWh/litre)} = 660.8\text{kWh}$	$660.8 \times 0.2292$	151.45
Water Use	$300 \times 0.344$	103.2



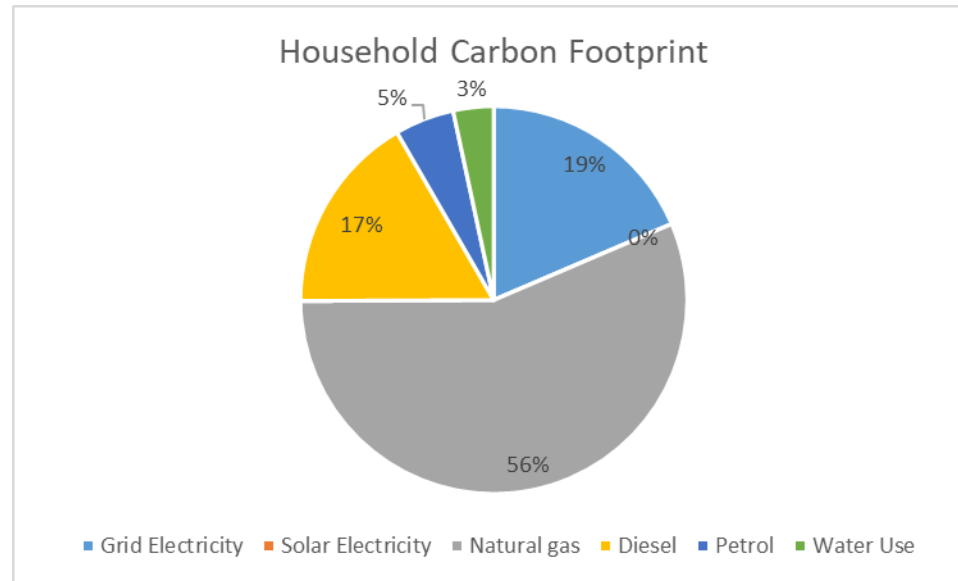
Energy  
Emissions  
Environment



READING  
CLIMATE  
FESTIVAL  
2021

# 2.0 HOW TO ESTIMATE CARBON FOOTPRINT?

The household carbon footprint is approximately 3,049kgCO<sub>2</sub>e or 3.05teCO<sub>2</sub>e. The above results are shown in graphical form below.



Energy  
Emissions  
Environment



# 3.0 CARBON FOOTPRINT CALCULATOR

There are a number of online tools available to calculate carbon footprint for household and commercial sectors.

<https://allaboute3.com/carbon-foot-print/>

Coupon Code: READINGCAN21



Energy  
Emissions  
Environment



READING  
CLIMATE  
FESTIVAL  
2021



THANK YOU FOR LISTENING

PLEASE POST ANY QUESTIONS TO

[contact@allabout3.com](mailto:contact@allabout3.com)

[www.allabout3.com](http://www.allabout3.com)



Energy  
Emissions  
Environment

**THE GREAT  
BIG GREEN  
WEEK** 

**READING  
CLIMATE  
FESTIVAL  
2021**

# Help Reading reach net zero by 2030

Join us now to take action!  
Visit [www.readingcan.org.uk](http://www.readingcan.org.uk)

We support individuals, communities and organisations working together to tackle climate change in Reading with the goal of a net zero, climate resilient town by 2030

