

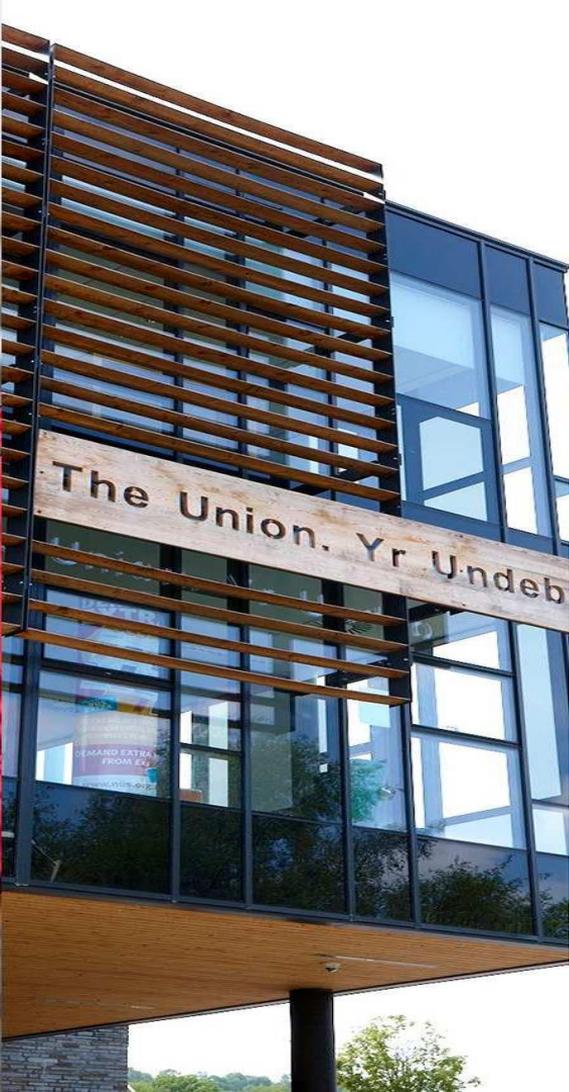
University of South Wales

Carbon Footprint Report 2018/19

September 2020



University of
South Wales
Prifysgol
De Cymru



Context

Growing acknowledgement of the latest science and recommendations from the Committee on Climate Change has resulted in unprecedented recognition of the global climate emergency, and the need to act urgently in order to reduce carbon emissions to limit further global warming and associated environmental impacts. Global initiatives are now focused on limiting warming to well below 2°C, aligning to the pledges outlined in the Paris Agreement. Despite this, warming continues, with the impacts being felt both nationally and internationally. Across the UK, continued warming is projected to make winters warmer and summers hotter and drier. Sea levels will also continue to rise and threaten many coastal communities across the country. Many industrial and farming processes will also be affected by a continuation of rising temperatures, exacerbating impacts that warming will have on communities across the UK.

The Welsh Government declared a climate emergency in 2019 and accepted the recommendations from the Committee on Climate Change (CCC) to target a 95% reduction in greenhouse gas emissions by 2050 relative to 1990. After the Welsh Government accepted the CCC's recommended target, it presented in parallel an ambitious plan to go further and reach "net zero" by 2050. Wales had already announced in 2017 their ambitions for the Welsh public sector to be carbon neutral by 2030.

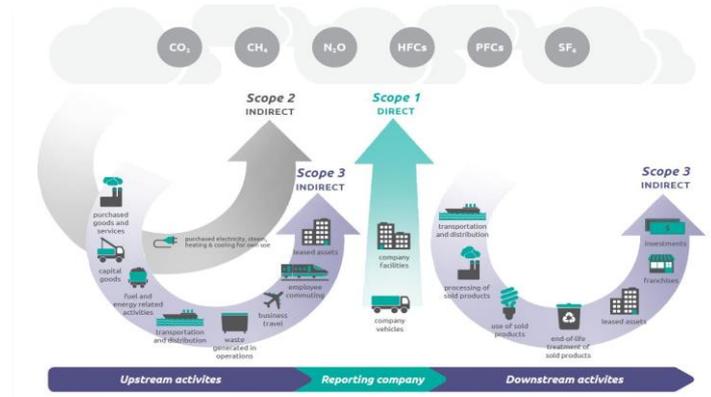
The University of South Wales recognises the significant role it can play in helping to accelerate the national transition towards developing a low carbon economy. This report was commissioned by the University to begin its pathway to carbon neutrality.

Contents

	Executive summary	3
	Section 1: Carbon Footprint Boundary	5
	Section 2: Carbon Footprint Methodology	9
	Section 3: Carbon Footprint Breakdown	11
	Section 4: Next Steps	20
	Reference Material	23
	Carbon Inventory	24

Executive Summary

- This Carbon Footprint report forms a key step in University of South Wales’ (USW) climate emergency response and sets out a number of strategic actions that USW should work towards in order to achieve their carbon reduction ambitions. Welsh Government have a desire for a carbon neutral public sector in Wales by 2030.
- In order to achieve this ambition, USW will need to ensure further follow-on activity is undertaken such as formal carbon strategies, project identification, pathway modelling and continued improved carbon footprinting.
- Initially there was a desire to include carbon emissions from investments, refrigerant leakage and commuting. The data collection process during this report revealed that the appropriate data for the sources was not obtainable at this time. Future carbon footprints will endeavour to include these areas.



Overview of the World Resource Institutes GHG Protocol accounting methodology

Emissions included within the carbon footprint:

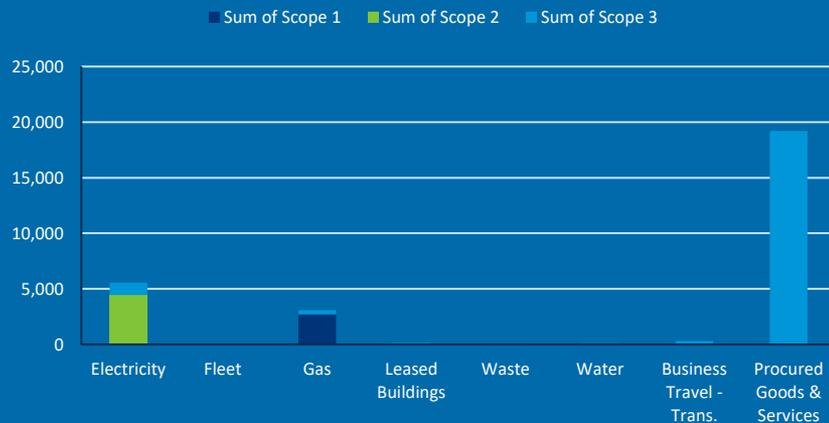


Scope 1	<ul style="list-style-type: none"> • Natural gas consumption • University fleet fuel consumption
Scope 2	<ul style="list-style-type: none"> • Electricity consumption in buildings
Scope 3	<ul style="list-style-type: none"> • Energy consumption from leased buildings • Business travel by air, train and non-university vehicles • Services and goods procurement from suppliers (contracts) • Upstream emissions from natural gas, vehicle fuel & electricity • Third-party disposal and treatment of waste generated in University-controlled operations • Supply and subsequent treatment of water consumed by the University’s operations

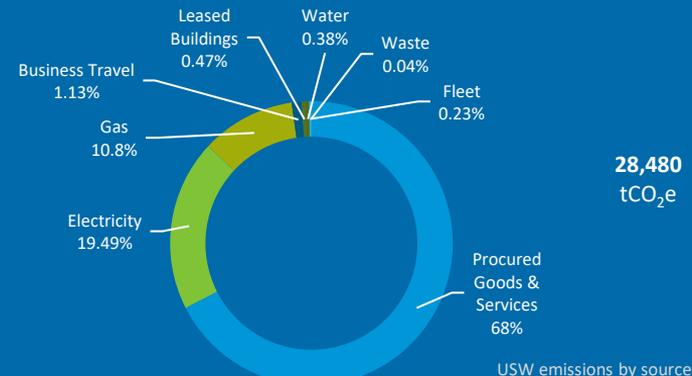
Carbon Footprint Overview

University of South Wales' footprint for the FY 2018/19 was calculated to be **28,480 tCO₂e**. Three key emission categories make up 97% of the total footprint:

1. **Procurement contracts** to university suppliers (19,217 tCO₂e)
2. **Electricity consumption** in buildings (5,550 tCO₂e)
3. **Gas consumption** in buildings (3,071 tCO₂e)



% of total emissions



- Scope 3 emissions make up 69.5% of the total footprint. The University will therefore have to integrate carbon management in its interactions with contractors and operators to achieve its decarbonisation targets, as well as focusing on the assets under their operational control.
- Procured Goods & Services account for 67.5% of all emissions, it should be noted that emissions generated from commuting and investments could make a large difference to the overall footprint when measured in the future.



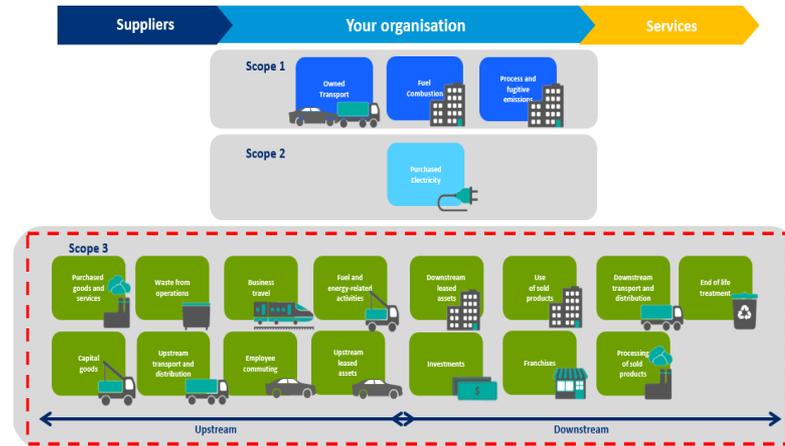
Section 1: Carbon Footprint Boundary

USW's footprint has been calculated according to the World Resources Institute (WRI) Greenhouse Gas (GHG) Protocol, and aligns to the following accounting definitions:

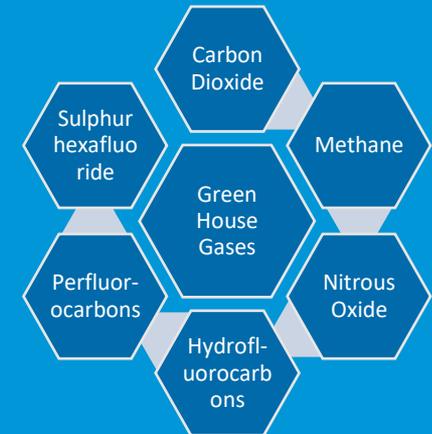
- Direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity
- Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity

The GHG Protocol further categorises these direct and indirect organisational emissions into three broad scopes (see figure below):

- **Scope 1:** All direct GHG emissions.
- **Scope 2:** Indirect GHG emissions from consumption of purchased electricity, heat or steam.
- **Scope 3:** Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. transmission and distribution (T&D) losses) not covered in Scope 2, outsourced activities, waste disposal, etc.



- Carbon dioxide is not the only green house gas. There are five other key green house gas types that contribute to global warming (shown below).
- Each gas has its own global warming potential (GWP). By comparing each gas's GWP to that of carbon dioxide (CO₂) we are able to derive a carbon dioxide equivalent value (CO₂e).



Section 1: Carbon Footprint Boundary

This section provides an inventory of USW's greenhouse gas emissions for the financial year 2018/19 – the 'baseline' against which future progress will be evaluated.

University of South Wales Emissions

Scope 1

Scope 2

Scope 3

Natural Gas

Fleet

Electricity

Water

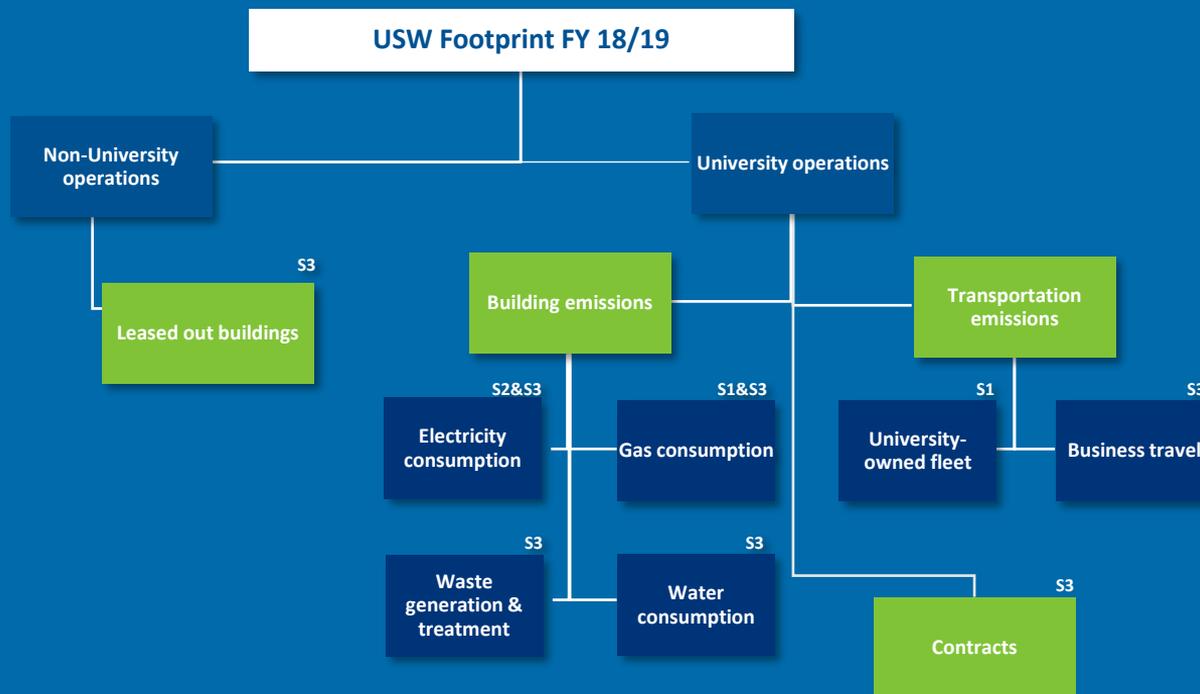
Contracts

Leased
Buildings

Business
Travel

Waste

Section 1: Carbon Footprint Boundary - Scope



An explanation of excluded emissions is included in next slide

Scope 1 emissions [S1]:

- Gas consumption, typically space and water heating in buildings
- University fleet fuel consumption

Scope 2 elements [S2]:

- Electricity consumption in buildings

Scope 3 elements [S3]:

- Business travel in non-University fleet vehicles
- Third-party disposal and treatment of waste generated in University-controlled operations
- Supply and subsequent treatment of water consumed by the University's operations
- Electricity and Gas consumption from buildings leased to a 3rd party operator (i.e. Baglan Campus)
- Associated emissions with procured goods & services (contracts)
- Upstream Well-to-Tank (WTT) emissions for Natural Gas & Electricity
- Upstream Transmission & Distribution (T&D) losses associated with electricity use

Section 1: Carbon Footprint Boundary - Excluded Emission Sources

Some emission categories are not relevant to USW's operations and have therefore been excluded from this footprint.

In future, USW should consider expanding its footprint to include further emissions categories. The emissions sources not included in this edition of the Carbon Footprint were excluded mainly due to the absence of appropriate data.

Scope	Emission Source	Reason for Exclusion	Data required
1	Refrigerants	Data not available at this time	Record of refrigerant recharges due to system leakages, detailing refrigerant type and amount in kg.
3	Employee commuting	Data not available at this time	Mileage and Transport type of students and staff. Survey questions provided by Carbon Trust.
3	Franchises	Out of scope: No franchises controlled by the University	-
3	Investments	Data not available at this time	The total value of each investment or fund. The sectoral % split of those funds (This usually follows GICS - Global Industry Classification Standard).
3	Processing of sold products	Out of scope: Not applicable to the University's operations	-
3	Use of sold products	Out of scope: Not applicable to the University's operations	-
3	End-of-life treatment of sold products	Out of scope: Not applicable to the University's operations	-

Section 2: Carbon Footprint Methodology



In footprinting the common unit of carbon dioxide equivalent (CO₂e) is used, which allows the impact of each of the seven main greenhouse gasses to be expressed in terms of the amount of CO₂ that would create the same amount of warming.

A carbon footprint is calculated by multiplying activity data (e.g. litres of vehicle fuel, kWh of electricity/gas) by an associated emissions factor:

- Where possible, real activity data should be collected throughout the reporting period for use in the footprint calculation.
- Emission factors are updated annually and published by the UK Government's department for Business, Energy and Industrial Strategy (BEIS).

If activity data is not available, various benchmarks and proxies can be used:

- Benchmarks can be used to approximate activity data. For example, typical electricity consumption per m² of a building.
- When input data is scarce, proxy factors can be used in place of the BEIS factors to approximate emissions from the available input data (e.g. contract value).

Emissions are calculated by multiplying activity data by an emissions factor:

Input/ activity data x **Carbon factor** = **Carbon emissions (kgCO₂e)**

- | | | | | |
|--|---|---|---|---|
| <ul style="list-style-type: none"> • kWh (utilities) • Litres or km (fuel) | x | <ul style="list-style-type: none"> • BEIS factor (kgCO₂e/unit) | = | Carbon emissions (kgCO₂e) |
| <ul style="list-style-type: none"> • £ (contract value) • m² (floor area) | | <ul style="list-style-type: none"> • Proxy factor e.g. (kgCO₂e/£ spent) | | |

General calculation methodology to calculate carbon emissions

Section 2: Carbon Footprint Methodology

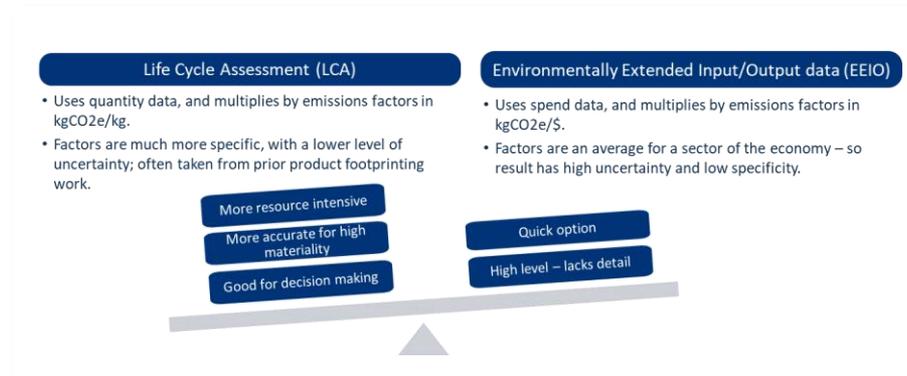


Overall the data provided for the USW's carbon footprint was sourced from direct activity data. Contracts were the only category where proxy factors were used to calculate emissions. This is common practice when undertaking a first carbon footprint.

The carbon footprint is calculated by multiplying the spend data on each contract (e.g. staff recruitment, stationary) by an associated Environmentally Extended Input / Output data (EEIO) emissions factor. EEIO uses the OPEN IO database originally developed by the University of Arkansas and further developed by the Carbon Trust.

Utilising EEIO proxy factors allows the USW to gain an initial understanding of the highest impact contracts on scope 3 emissions. The University can then target these contracts for enhanced scope 3 footprinting (more detail in next steps) in the future, working with suppliers to understand 'true' emissions from a contract or service and instilling good practice to decrease the carbon footprint.

If there is good volumetric data and LCA emission factors, these will be used in preference to spend data and EEIO factors. However for areas of lower materiality, it will be acceptable to use spend based data.



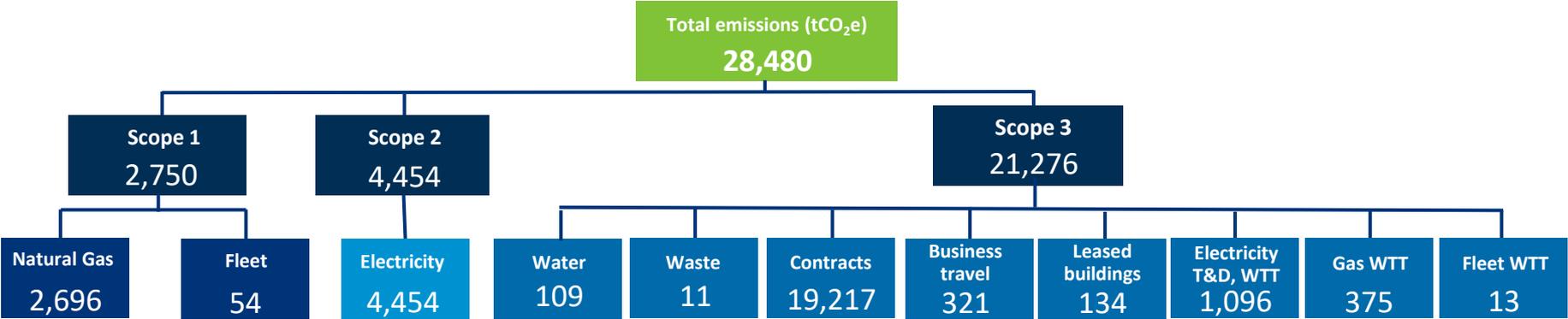


Section 3: University of South Wales Footprint FY 18/19

In the 12 month period Aug' 2018 – Jul' 2019, **28,480 tCO₂e** were emitted from the University's own operations and associated activities.

- **Scope 1:** gas (primarily for heating buildings) and transport fuel consumption in the University's own fleet;
- **Scope 2:** electricity consumption within USW buildings used by USW staff;
- **Scope 3:** waste generation, water supply and treatment, business travel (arising from USW operated buildings, journeys completed by USW staff, post vehicles), leased assets and procured services and products (i.e. contracts).

There is a breakdown analysis for each category in the following slides.

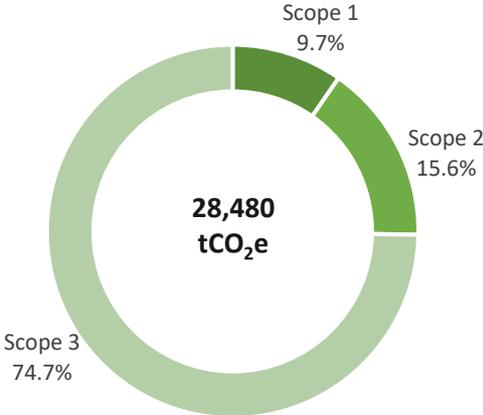


Section 3: University of South Wales Footprint FY 18/19

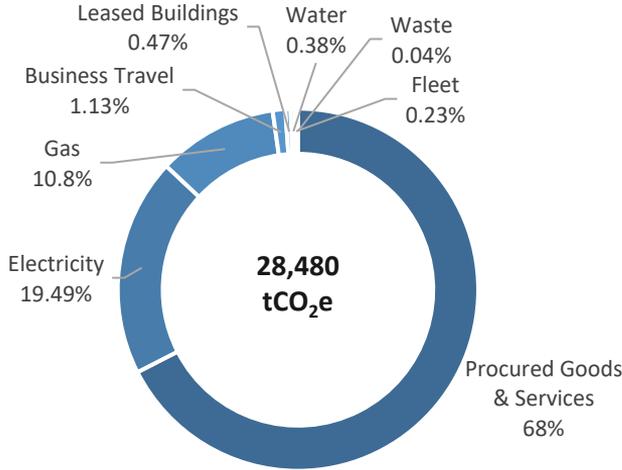
USW's footprint is primarily made up from three emission categories, so-called emission hotspots:

-  **67.5%** of emissions are associated with Procured Goods and Services for University operations
-  **19.5%** of emissions from electricity consumption in the University-controlled buildings
-  **11%** of emissions come from gas consumption used mainly for heating the University-controlled buildings

These emission hotspots could be the priority for the University to consider reduction activities.



Emissions by Scope (tCO2e)



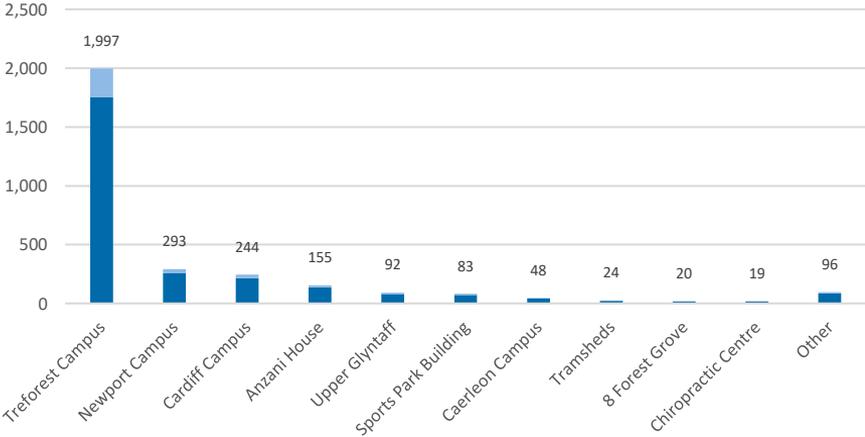
Emission by Source (tCO2e)



Section 3: Emissions Breakdown – Natural Gas & Fleet (Scope 1)

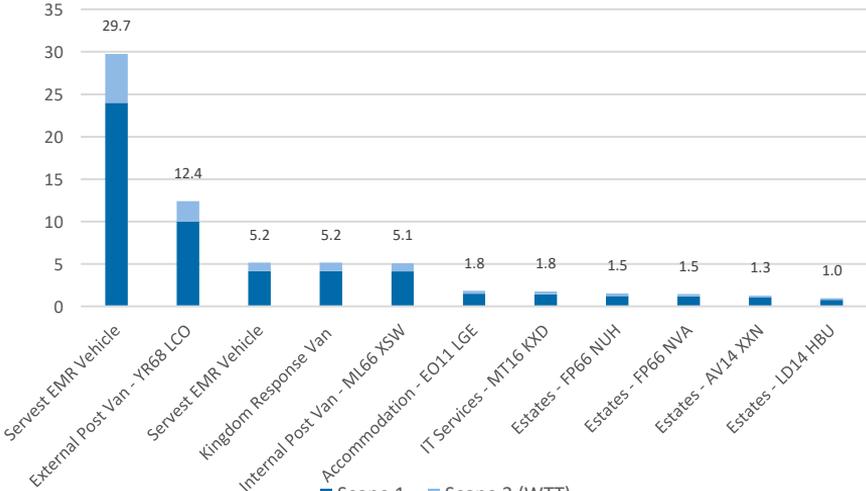
- Scope 1 emissions are a result of the direct burning of fossil fuels by the university.
- This arises from the university owned transport fleet which burns petrol and diesel. The heating to the university operated buildings also contributes to this.
- Total scope 1 emissions contribute 2,750 tCO₂e.
- Associated scope 3 well-to-tank (WTT) emissions are also included in tables below.
- Electrification of heating or switching to low / zero carbon fuels for the university owned transport fleet will be the main option to move towards carbon neutrality in this area.
- It should be noted that Caerleon Campus will not be included in future footprints as it is no longer under university control.

Gas Emissions (tCO₂e)



■ Scope 1 ■ Scope 3 (WTT)

Fleet Emissions (tCO₂e)



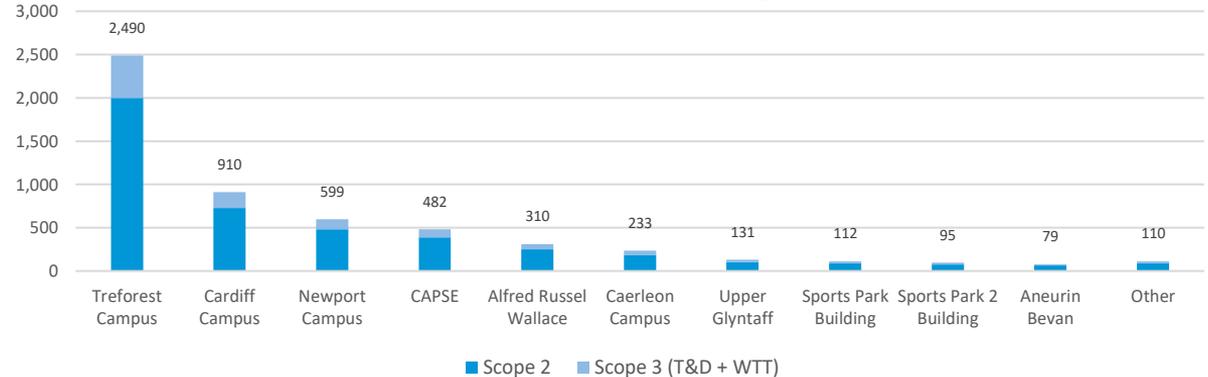
■ Scope 1 ■ Scope 3 (WTT)



Section 3: Emissions Breakdown – Electricity (Scope 2)

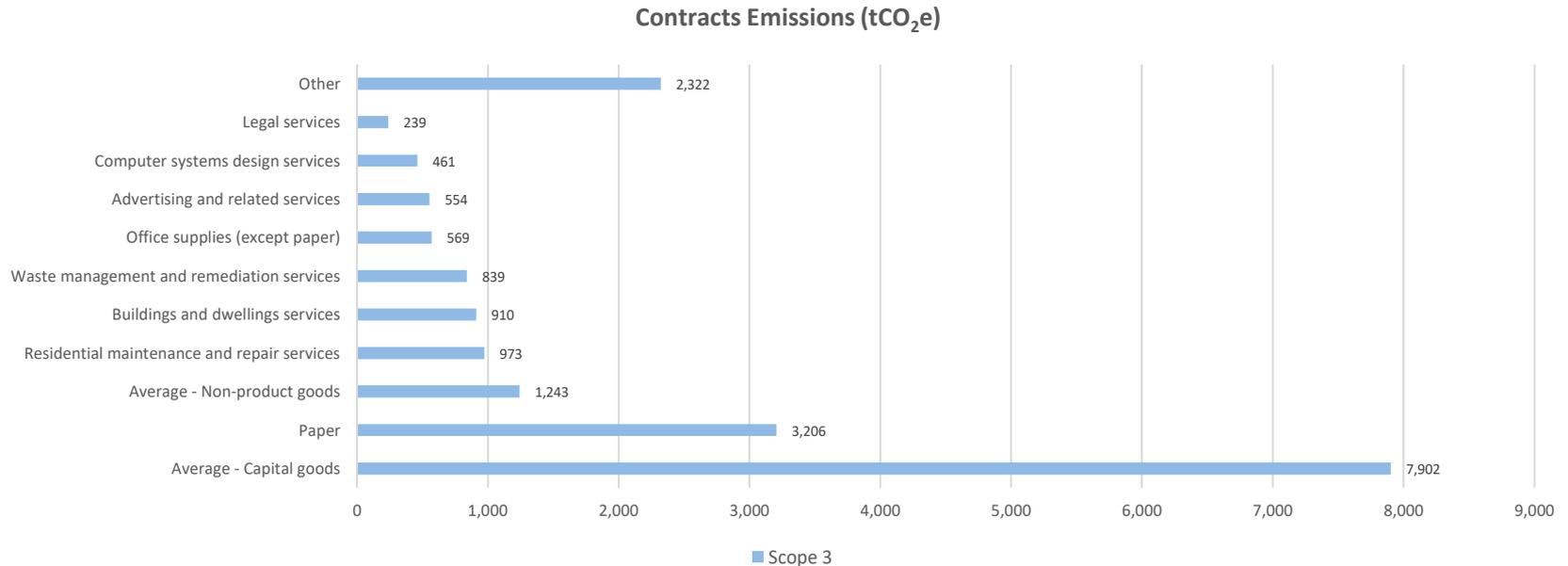
- Scope 2 emissions are a result of the electricity consumption by the university.
- These emissions calculated for electricity generation are associated with the generation, and transmission and distribution of electricity.
- Associated scope 3 emissions from T&D losses and WTT footprint are also included in the graph below.
- First and foremost, emissions should be reduced through energy efficiency measures. Scope 2 emissions will naturally decrease over time as a result of the decarbonisation of the National Grid. However, further efforts to reduce scope 2 emissions from on site renewables and energy efficiency measures are important to reduce stress on the national grid, speed up decarbonisation and help to mitigate any increases in electricity prices.
- **Across all scopes, electricity consumption from assets operated by the university accounts for 19.5% (4,454 tCO₂e) of the overall footprint.**

Electricity Emissions (tCO₂e)



Section 3: Emissions Breakdown – Contracts (Scope 3)

- Scope 3 emissions arising from contracts held by the university sum to 19,217 tCO₂e or 68% of the total carbon footprint.
- The high proportion of this scope 3 category in relation to the whole carbon footprint is not uncommon. Most organisations undertaking scope 3 measurements will see that procured goods and services (contracts) emissions are the highest contributor.
- Despite being an indirect source, the university is still able to influence contractual emissions. This can be achieved through requiring minimum sustainability/environmental standards when procuring contracts; it is advised that sustainability be a core metric to consider when renewing all contracts.





Section 3: Emissions Breakdown – Water (Scope 3)

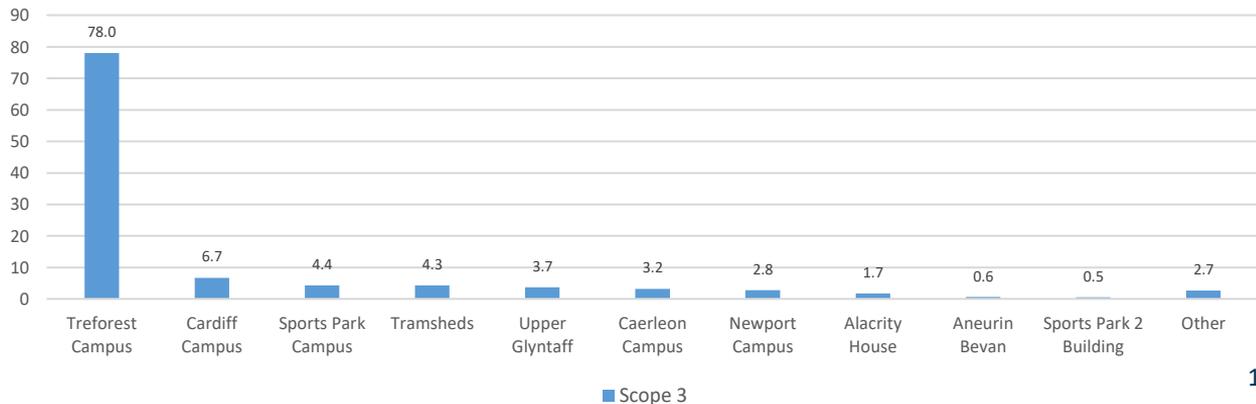
Scope 3 emissions from water is one of the smallest contributors to the universities overall carbon footprint at 0.38%.

Water emissions are induced by the direct supply of water to university buildings and the treatment of water after being used on site.

Simple water efficiency measures can be put in place to reduce water demand:

- low-flow toilets,
- push button/sensor taps,
- tap and showerhead aerators,
- more complex systems can also be utilised such as large rainwater harvesting.

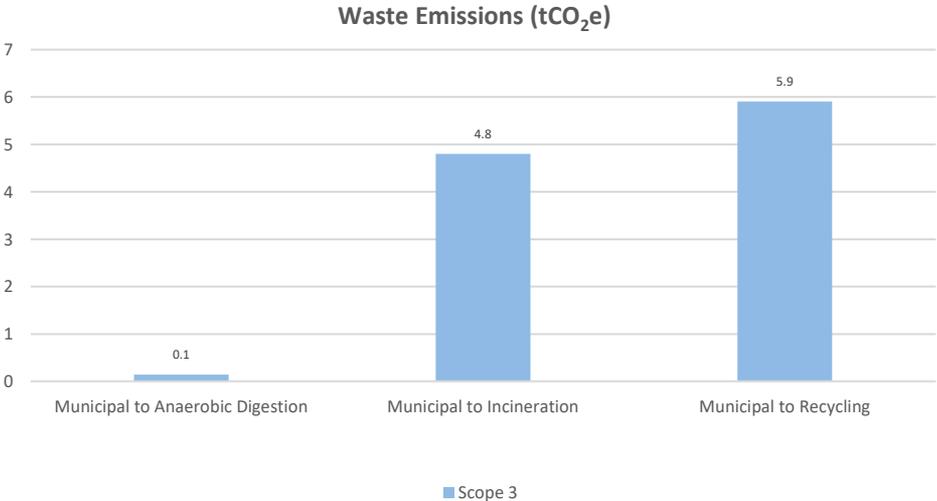
Water Emissions (tCO₂e)





Section 3: Emissions Breakdown – Waste (Scope 3)

- Scope 3 emissions from waste is the smallest contributor to the universities overall carbon footprint at 0.04%.
- Waste emissions are caused by the type and amount of a waste stream and its waste terminal (AD, incineration, recycling, landfill etc.). Sending waste to landfill has the highest associated emission factor. Not sending any waste to landfill has helped keep the waste footprint low for the university.
- To reduce emissions from waste disposal, an effective waste management protocol needs to be put in place. This should follow the simple waste hierarchy of ‘Reduce, Reuse, Recycle’ across all forms of waste.
- Future footprints will endeavour to ensure all waste streams have been recorded across the estate.



Sum of Mass (kg)	
Anaerobic Digestion	14,340
Incineration	224,330
Recycling	276,180

USW 18/19 waste streams.

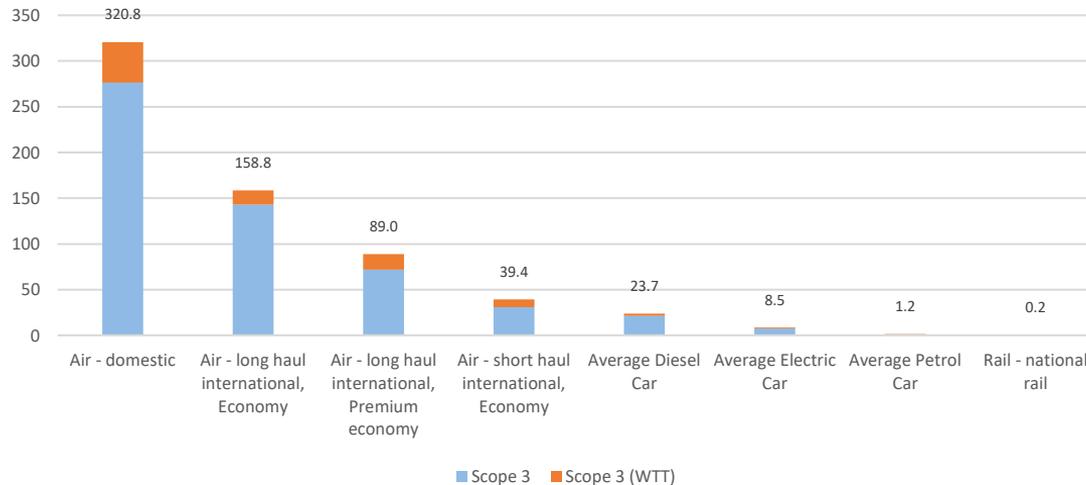
Section 3: Emissions Breakdown – Business Travel

The emissions associated with business travel on behalf of USW currently total 328 tCO₂e. Whilst proportionally, and in terms of prioritisation, there are more carbon intensive hotspots the university should target, the following opportunities should be considered to encourage a reduction in business travel associated emissions. These opportunities largely revolve around reducing the total journeys and mileage being completed by university employees.

- The use of Skype and MS Teams (and other video conferencing tools) are a great way to cut down on face to face meetings.
- Car sharing and encouragement on the use of public transport where possible should also be investigated.

Ultimately, USW will need to engage with its employees to better understand the practical implications of reducing its business travel footprint.

Business Travel Emissions (tCO₂e)



Remote working



Video conferencing



Encourage use of public transport



Employee engagement



Car sharing incentives



Section 3: Emissions Breakdown – Leased Buildings (Scope 3)

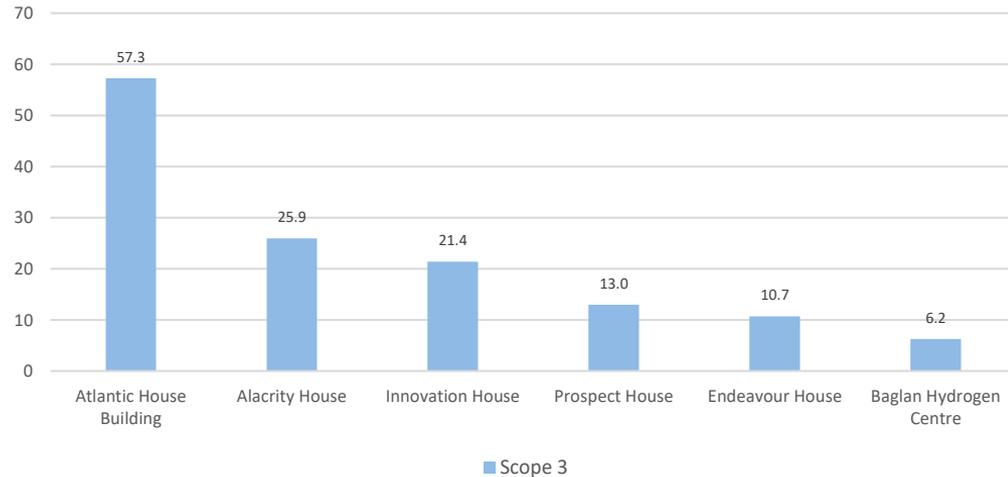
These scope 3 emissions are a result of the direct electricity and gas consumption on leased sites. Annual consumption (kWh) data was provided for each site.

Leased buildings are sites that are leased by the university from a third-party; this means the university may not have direct control over how energy is used on those sites.

The university can aim to reduce emissions from leased buildings by retrofitting them with energy efficient measures, as well as encouraging energy efficient behaviour.

It should be noted that Atlantic House and Alacrity are no longer under the Universities control, future footprints will not include these sites.

Leased Buildings Emissions (tCO₂e)





Section 4: Next Steps - Governance and Engagement

Stakeholder engagement

Robust engagement with stakeholders from across the university will be crucial for successful climate action implementation. The university should explore innovative ways through which the whole organisation can contribute towards achieving carbon neutrality by 2030.

This should ensure that an effective engagement strategy that actively involves all university departments, employees and students is drawn up. Achieving the greatest possible input and buy-in will allow the USW to work closely with all stakeholders to identify the areas of the university to prioritise in order to reduce emissions. It will be important for the university to remain transparent throughout all engagement activities, to provide stakeholders with the opportunity to contribute towards the planned reduction activities that the university intends to implement across its own estate.



Developing a robust stakeholder engagement plan should build on previous engagement to:



- Develop an initial list of stakeholders from across the university to continually engage.
- Complete internal in-depth stakeholder mapping exercise to identify, map and prioritise key stakeholders from across the university. This will ensure that key stakeholder needs are identified and understood with the relevant resources being targeted effectively.
- Develop and agree a communications / engagement strategy that clearly details the university's approach towards stakeholder engagement, ensuring complete transparency.
- Develop the appropriate tools to accurately plan and track all stakeholder interaction and store stakeholder information.



Section 4: Next Steps - Monitoring and Reporting

Once a carbon footprint has been measured, progress is an important part of implementation. Monitoring and reporting are essential activities that should be undertaken at least annually between the baseline year and target year, and beyond.

Monitoring

Collecting the data should be completed internally on a regular basis. This process should become streamlined as the necessary data sources and associated contacts / owners become familiar with the process and adopt best practice data management.

Not only does the footprint need to be monitored but progress with implementing carbon reduction opportunities should be actively monitored too, including implementation year, energy reduction and cost savings. In this way, successful projects can be reported on in a quantitative as well as a qualitative way. This can help to drive momentum and support securing budget towards future measures.

In addition to monitoring the footprint itself, the project team should continually monitor how local plans and policies will affect the university's footprint and affect the ability of the university to reach respective carbon reduction targets. This will help the project team to identify other potential carbon reduction opportunities and ensure that any carbon reduction co-benefits of specific policies can be delivered.





Section 4: Next Steps – Enhanced Scope 3 Footprinting

As mentioned previously, USW can aim to enhance their scope 3 footprint by moving away from proxy values (EEIO) to real, more precise data.

Emission factors can be developed by doing a detailed scope 1 and 2 footprint of individual contractors and suppliers. This creates an inventory of supply chain emissions which can be updated at regular intervals.

Furthermore, USW could look to develop appropriate metrics for measuring the performance of key suppliers. By analysing the model and the results, it is likely that different metrics will be relevant for different economic sectors and/or key suppliers.

For example, the performance metric for the waste collection and treatment sector should be kgCO₂e/tonne of waste collected and treated, whereas the metric for passenger transport could be kgCO₂e/km of service delivered, or passengers served. For construction, it could be kgCO₂e/km of road laid or m² of building completed. For all suppliers however, there will always be the fall-back option of measuring kgCO₂e/£ spent.

Develop a process to actively reduce contract emissions:

Actively engage with contractors and supply chain to:

- start documenting their carbon footprints and
- ask contractors to set emissions reduction targets
- assess the necessity of certain suppliers/contractors

Furthermore, not only should USW engage with current contractors, criteria should be set when determining future contractors and suppliers. Examples may include:

- Mandatory reporting of scope 1 & 2 emissions
- Suppliers must have emission reduction targets
- Suppliers must hold environmental/sustainability standards e.g. ISO 50001 (Energy Management, ISO 20121 (Sustainable Events), PAS 2050 and/or 2060
- Use of the Better Buying Index



Reference Material

- Energy, vehicle mileage, utilities data, contract values – University of South Wales
- Emission Factors – BEIS <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>
- EEIO proxy emission factors https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf
- UK consumption and emission factors projections – National Grid Future Energy Scenarios <https://www.nationalgrideso.com/future-energy/future-energy-scenarios>
- Policies – Climate Change Committee <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>
- Policies - Welsh Government <https://gov.wales/welsh-public-sector-be-carbon-neutral-2030>



Whilst reasonable steps have been taken to ensure that the information contained within this publication is correct, the authors, the Carbon Trust, its agents, contractors and sub-contractors give no warranty and make no representation as to its accuracy and accept no liability for any errors or omissions. All trademarks, service marks and logos in this publication, and copyright in it, are the property of the Carbon Trust (or its licensors). Nothing in this publication shall be construed as granting any licence or right to use or reproduce any of the trademarks, services marks, logos, copyright or any proprietary information in any way without the Carbon Trust's prior written permission. The Carbon Trust enforces infringements of its intellectual property rights to the full extent permitted by law.

The Carbon Trust is a company limited by guarantee and registered in England and Wales under company number 4190230 with its registered office at 4th Floor Dorset House, Stamford Street, London SE1 9NT.

Published in the UK: 2020.

© The Carbon Trust 2020. All rights reserved.