Aberystwyth University Annual Carbon Management Performance 2022/23

1. **Summary of Latest CO2 Emissions 2022/23 against the base year emissions from 2019/20**

In 2019 the Executive Team and University Council agreed to a pledge to try to achieve carbon neutrality by 2030. Emissions have been quantified in line with the latest version of Welsh Governments reporting guidance. The figures below summarise our latest years emissions data against our base year of 2019/20.

We have significantly improved our data capture methodologies in the last FY, since engaging with our Net Zero strategy support. The scope of their work included provision for reviewing our operations to identify all applicable emission sources and develop suitable methodologies for each emission source. Recent changes to methodology have increased the accuracy and breadth of the data collected. These changes include F-gas emissions and widening the scopes for agricultural and waste emissions.

Table 1. Summary of emissions (tCO2e) by category

Emissions Source	***2019/20 Base Year***	***2022/23 Current year***	***% Change from base year***
Buildings – Electricity	6,261	4,290	-31%
Buildings – Gas	5,195	4,991	-4%
Buildings – Other	1,099	887	-19%
Business Travel	1,812	742	-59%
Staff Commuting	2,505	1,385	-45%
Agricultural Emissions	4,301	3622	-16%
Total Gross Emissions	**21,174**	**15,917**	**-25%**
Sequestration by AU land	-2718	-2797	3%
Total Net Emissions	**18,456**	**13,120**	**-29%**

Our recently published 'Towards net zero 2030 strategy' has identified a range of decarbonisation priorities and actions that we will work on to get as close to net zero by 2030 as possible. Funding availability (especially for heat decarbonisation) and grid constraints are the main barriers that we are working to overcome. We have made significant progress over the last 12 months. The latest total net emissions were 15,917 tCO2e, down 29% since our base year of 2019/2020. The largest emission sources this year were Gas/Heating (31%), Electricity (27%), Livestock and fertilizer emissions (23%), Staff Commuting (9%) and Business Travel (5%). Sequestration currently offsets 16% of our total emissions (assuming no change to sequestration), so we will therefore require an additional 84% reduction in gross emissions by 2030/31 to achieve our target of a net zero estate.

Table 2. Supply chain emissions

Emissions source	***2019/20 Base year***	***2022/23 Current year***	***% Change from base year***
Supply chain	*29,082*	*11,868*	*59%*

Emissions associated with purchased goods and services (based purely on spend data) have reduced by 59% since our base year. This reduction is largely down to a change in methodology for measuring supply chain emissions. Previous years used the HESCET tool whereas we now use the Welsh Government SIC code-based accounting. It is widely recognised that using spend based data to quantify emissions from supply chain is a very inaccurate and crude approach. However, due to a lack of viable alternatives this approach is useful to better understand priority areas to decarbonise in supply chain emissions.

2. Recently Completed Carbon Reduction Projects

Publication of our Net Zero strategy

In 2023, we published our 'Towards Net Zero 2030 strategy'. The strategy discusses a range of risks to sustainable practice as well as potential mitigations and decarbonisation projects to help achieve the goal of net zero by 2030. It sets out our priority actions that support decarbonising our operations and working towards becoming a net zero organisation. Achieving net zero means reaching a balance between Greenhouse Gas (GHG) emissions emitted into the atmosphere and the emissions taken out through land sequestration. The strategy has identified a range of measures that will reduce our emissions by approx. 70% and identifies a range of measures that we can build on to make further reductions. Performance against the targets and actions will be reviewed annually and the strategy updated every 2 years, so that further reduction measures can be incorporated where and when identified.

REFIT Phase 2 - Solar PV Array in Fferm Penglais Fields

We have completed works on a 2.5MW solar PV array at Fields above Fferm Penglais that will provide 25% of Penglais Campus annual electricity requirements. The site has been fully generating since February 2023 and has already reduced emissions by 298 tCO2e. The project is expected to reduce our energy related CO2 emissions by >500 tCO2e per annum.

Bespoke Lighting Projects

We have recently invested £110,000 in replacing inefficient lighting in some of our plant growth facilities with LED lighting. This is expected to reduce our emissions by 94 tCO2e per annum. We have also invested £35,000 in replacing inefficient lighting in the Equine centre with LED lighting.

Transport Projects

Helping our transition to electric vehicles was the purchase of 6 EV cars and 9 EV vans, which in conjunction with other electric fleet vehicles is helping to reduce the volume of direct emissions produced by business travel and commuting. We have also increased the purchase cost limit on our 'Cycle to Work' Scheme to £3500, increasing the incentive for our staff to purchase electric bikes.

Heating optimisation

To reduce gas emissions and costs, a range of heating optimisation projects were undertaken, including standardising building temperatures across campus. These developments have reduced emissions by over 300 tCO2e per annum, in addition to decreasing university energy costs during these unprecedented times.

Woodland creation/ Tree planting Project – Phase 1

Phase 1 of our tree-planting project has been completed, with over 16,000 native broadleaf trees planted on unproductive agricultural land under the Glastir Woodland creation scheme across 3 sites. Once mature, the woodland is expected to increase the university's carbon sequestration

capacity by approx. 16 tCO2e per annum. Native broadleaf trees were identified and planted to enhance the area's local biodiversity, providing habitats to wildlife and reducing potential soil erosion in the area.

3. Planned Carbon Reduction Projects

Tree planting Project – Phase 2

Subject to approval under the Glastir woodland creation scheme, we are hoping to plant an additional 60,000 trees on unproductive agricultural land across Rhydyronnen over the next winter. The proposal would increase carbon sequestration by approx. 60 tCO2e per annum along with being a key component of our biodiversity enhancement activity. As with Phase 1, these trees will be predominantly native broadleaf that will also help to enhance biodiversity.

REFIT Phase 3

Working with our REFIT contracted partner 'Vital Energi', we are developing a business case for a 3rd phase of large-scale energy efficiency activity. If approved, the project will include large-scale LED lighting upgrades across the university estate, in conjunction with a rooftop solar PV system and improvements to pipework and heating insulation. Subject to various approvals, these improvements would significantly reduce the university emissions, with works planned to commence at the start of 2024.

Large scale heat decarbonisation of Penglais Campus

Recognising the difficulty of decarbonising building heating (gas) related emissions which account for 30% of our total emissions, we have just completed a high-level feasibility study looking at heat electrification through a district heat network. We have been liaising with nearby public sector organisations (Hywel Dda and Ceredigion County Council), who have all shown support for a collaborative project like this. We are now exploring possible funding sources and most cost-effective options for heat decarbonisation before looking to take the agreed approach through more detailed feasibility studies and business case approval processes.

Renewable Energy Projects

With the success of our solar array, we are now looking into the feasibility of developing further large-scale renewable energy projects within the upcoming years. Our latest Net Zero strategy outlines an ambition for 25% of our energy being generated by renewable sources. Since the installation of our solar array, we are now at just over 13%.

Transport Projects

Many aspects of decarbonisation and sustainable development can only be achieved through behavioural change, as outlined in our Net Zero strategy. Therefore, to help with the transition to electric vehicles, we are about to introduce an EV salary sacrifice scheme to incentivise staff to purchase electric vehicles rather than a car powered by fossil fuels. As we have noticed much of our scope 3 emissions are due to business and commuting milage in private cars, we hope the introduction of this scheme will reduce emissions from both forms of transport.