1. **Summary of Latest CO2 Emissions 2023/24 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.

Following the development of our Net Zero by 2030 strategy in 2023, we have continued to develop this and have widened the scope of our emissions. Emissions from gas have reduced more than expected due to the milder winter we have had this past year, however we have continued to make significant efforts to reduce both our gas and electricity demand; our top 2 emissions sources.

*Table 1. Summary of emissions (tCO2e) by category*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Emissions Source*** | ***2019/20***  ***Base Year*** | ***2023/24 Current year*** | ***% Change from base year*** |
| *Buildings – Electricity* | 5,327 | 4,069 | -24% |
| *Buildings – Gas* | 5,113 | 3,840 | -25% |
| *Buildings – Other* | 635 | 643 | +1% |
| *Business Travel* | 3,531 | 832 | -76% |
| *Staff Commuting* | 2,505 | 971 | -61% |
| *Agricultural Emissions* | 2,076 | 1,556 | -37% |
| *Waste* | 9 | 15 | +54% |
| ***Total Gross Emissions*** | 19,227 | 11,871 | -38% |
| *Sequestration by* *AU land* | -2,797 | -2,528 | -10% |
| ***Total Net Emissions*** | 16,429 | 9,347 | -43% |

With our ‘Towards net zero 2030 strategy’ revised in 2024, with new targets added, the strategy identifies a range of decarbonisation priorities and actions that we will continue to 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 9,347 tCO2e, down 43% since our base year of 2019/2020. The largest emission sources this year were Electricity (34%), Gas/Heating (32%), Livestock and fertilizer emissions (11%), Staff Commuting (8%) and Business Travel (7%). Sequestration currently offsets 20% of our total emissions. To be on track for Net Zero emissions by 2030, we needed to achieve a 36% reduction in our emissions since our base year. We have exceeded this figure with a 43% emissions reduction since 2019.

*Fig 1. Table of our estimated emissions against forecasted emissions and our net zero target line.*

*Table 2. Supply chain emissions*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Emissions source*** | ***2019/20***  ***Base year*** | ***2022/23***  ***Current year*** | ***% Change from base year*** |
| *Supply chain* | *29,082* | *6549* | *-77%* |

Emissions associated with purchased goods and services (based purely on spend data) have reduced by 77% since our base year. Although these emissions are not part of our net zero 2030/31 ambition, we have added additional targets to our Net Zero strategy this year, specifically an aim to reduce supply chain emissions by 30% by 2030. Whilst we have met this goal, this is now our second year utilising the Welsh Government’s SIC code-based accounting method to measure supply chain emissions, whereas we used to use the HESCET tool. It is widely recognised that using spend data to quantify emissions from the supply chain in an inaccurate and crude approach. However, due to a lack of alternatives, this approach is useful to better understand priority areas to decarbonise in supply chain emissions.

1. **Performance Against Net Zero KPIs**

We have monitored our progress against each of our targets specified within the Net Zero strategy and summarised the results below, as well the likelihood of achieving these goals by 2030, with red meaning we are off target, yellow possible to achieve and green very likely/already achieved.

|  |  |  |  |
| --- | --- | --- | --- |
| **Target** | **2030 Target** | **Progress** | **Likelihood** |
| **Renewables** | 25% of our electricity to come from on-site renewable generation | Currently 12% from renewable sources |  |
| **Decarbonise Heat** | 85% annual gas demand from renewable sources | Limited - external funding support & high capital costs |  |
| **Energy Efficiency** | 15% reduction in total energy demand | 24% reduction |  |
| **Construction/Refurbishment** | Stringent standards for all new builds and refurbishments | Checklist developed for major projects |  |
| **Travel** | 54% reduction in travel emissions | 70% reduction |  |
| **Waste** | 35% reduction in DR waste | 54% increase |  |
| **Water** | 25% reduction in water consumption | 77% reduction |  |
| **Procurement** | 30% reduction in supply chain emissions | 68% reduction |  |
| **Agriculture** | Develop detailed decarbonisation targets by 2025 | Plans in development |  |
| **Community Involvement** | Hold at least 3 events per year | Held over 10 events |  |

Overall, we are on track with our KPIs and making good progress with emission reductions, in particular our energy reduction . However, there are areas we can continue making improvements in. Our heat decarbonisation project is significant in our aim to reach net zero, however this is limited by external funding opportunities, so unless funding becomes available, we must continue to focus on further gas demand reduction. Our emissions from waste have increased, however we have recently changed our methodology for waste data is more accurate, and we are hoping that the implementation of the recent workplace recycling law will help data collection in the future. While our water and sewerage emissions are down 50%, this is due to a reduction in emission factors since our base year rather than a reduction in water consumption, therefore we need to continue working on water reduction strategies. Travel data was estimated based on this year’s staff travel survey results, and while improving on our methodology from 2019, this was a relatively small sample (17% response rate), so methodology may still benefit from improvement.

1. **Recently Completed Carbon Reduction Projects and Improvements**

***Heating optimisation***

To reduce gas demand, we have implemented multiple changes to our heating strategy. These include reducing temperature set-points in offices and residential areas, reducing core heating hours by an hour in the morning and evening, and closely monitoring temperatures across different buildings to detect any issues and check performance. This year, our summer switch-off was earlier than usual. We also implemented changes across individual campuses/buildings; the majority of our Llanbadarn campus is now at heated just to a background level in accordance to new space rationalisation methods, and we have also have optimised heating in the Hugh Owen library as well as Fferm Penglais. While last Winter was much milder than the year before, after normalising for weather differences, we have saved an estimated £530,000 on gas costs, and reduced emissions by around 1000 tCO2e.

***REFIT Phase 2 - Solar PV Array in Fferm Penglais Fields***

Having completed works on a 2.5MW solar PV array at Fields above Fferm Penglais, the site has been fully generating since February 2023. The site has since reduced emissions by 610 tCO2e, and constitutes 20% of Penglais Campus’ electricity demand. Emissions reductions are in line with estimated savings of 500 tCO2e.

***Transport Projects***

AU has also been involved with the cycle path development running from Bow Street to Aberystwyth through the release of land for project development. Phases 1 & 2 have been completed, with phase 3, Gogerddan Campus to Waunfawr, having started in late 2023. We now also have 20 EV vehicles in our fleet in addition to continuing our EV salary sacrifice scheme.

***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.

***Bespoke Lighting Projects***

This year, we have invested a further £45k into further upgrades to our plant growth facility’s lighting, with 132 lights replaced and estimated 18tCO2e. This leads on from our work last year where we invested £110,000 in replacing inefficient lighting in some of our plant growth facilities with LED lighting to reduce emissions by around 94tCO2e.

***Sustainable Travel Policy***

This year we updated our travel policy to include sustainability measures, including the travel hierarchy, not permitting flights between mainland Britain unless there are extenuating circumstances, and that all travel funded by the university will be booked through AU’s travel management company so that we can monitor carbon emissions and make efficiencies when possible.

1. **Planned Carbon Reduction Projects and Improvements**

***Tree planting Project – Phase 2***

Subject to approval under the Glastir woodland creation scheme, we are hoping to plant an additional 80,000 trees predominantly on unproductive agricultural land across Rhydyronnen and Frongog over the next winter. The proposal would increase carbon sequestration by approx. 80 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 planning to carry out a 3rd phase of large-scale energy efficiency activity. The project includes large-scale LED lighting upgrades across the university estate, in conjunction with a rooftop solar PV system and improvements to pipework and heating insulation. The works also include further upgrades to our plant growth facility’s lighting, with 132 lights replaced and estimated 18tCO2e. This leads on from our work last year where we invested £110,000 in replacing inefficient lighting in some of our plant growth facilities with LED lighting to reduce emissions by around 94tCO2e. These improvements will significantly reduce the university emissions, with works due to be complete by September 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 have undertaken feasibility surveys for the development of a wind turbine at our Gogerddan campus. This aligns with our aim highlighted in our Net Zero Strategy of 25% of our electricity coming from renewable sources by 2030. After a year of activity from our solar array, we are currently at 12%.

***Ethical Investments Policy***

We also adopted a new ethical investments policy, including commitments to publish our investment portfolio annually and to socially responsible investment. We have screened and will no longer invest in many industries, including the fossil fuel industry, those involved with coal & tar sands, thermal coal mining/power generation and unconventional coal and gas.

***Ethical Careers Policy***

We have developed a new ethical careers policy, tackling the promotion of jobs within sectors that negatively affect the climate. This includes not directly promoting fossil fuel and mining companies. We hope this will encourage students to consider emissions and sustainability when choosing their career, while not removing choices or opportunities from our students.