Sustainability Report 2021/22

Executive Summary

This report summarises the key environmental sustainability initiatives and outcomes from the University's activities in the academic year 2021/22. Sustainability continues to be in the foreground of our University Estates strategy, with the ongoing energy crisis dominating costs variations, supply availability and contract service provision costs. Tackling these challenges has led to the development of a strong strategic direction that will bring sustainability into the centre of our infrastructure, operations and procurement decisions; building campus resilience, whilst simultaneously enhancing teaching and learning, and the student and staff experience.

Sustainability has also been working closely with the Digital Directorate, as we begin to define and derive insights into space, place and what it means to be a University in a post digital landscape. Discussions around, and considerations of, Smart Building technologies, critical upgrades to our Building Management Systems and associated infrastructure are all tools that will support us in moving more rapidly toward decarbonisation through energy and cost reduction, and have dominated much of the later part of the reporting year.

Post Covid-19 we have seen an increase in campus footfall, and some encouraging continued reduction in carbon emissions. We were also delighted from April 2022 to include the newly refurbished Health and Wellbeing Building into our building portfolio. The University continues to perform well in several key areas implementing further energy efficiency projects, waste initiatives, procurement and design policy amendments and strong engagement with both our campus community, external partners and national bodies.

The headlines of the University's Sustainability Report 2021/22 include:

Energy

- As part of the University's commitment to achieve carbon neutrality for scope 1 and 2 emissions by 2030, **from April 2022, approximately 90% of our electricity is now procured from verified renewable energy suppliers**.
- Annual quantity of emissions in tonnes of Carbon Dioxide equivalent from the use of electricity was 397.2 tCO_{2e} **a decrease of -2.2%**.
- Total all campus emissions in tonnes of carbon dioxide was equivalent to 627.2 tCO_{2e} **a decrease of 1.9%**. A strong performance given the return to campus of staff and students and the addition of new building assets.
- The University has realised **a CO_{2e} emission reduction of 76%** against the baseline, exceeding the 55% reduction annual KPI target as we move towards decarbonisation.
- Combined systems across campus have generated some 41,293kWh of solar electricity during the reporting period, representing **a saving of 8,766 kg CO2e**.
- Energy and water costs have increased by over 40.3% on 2020/21 figures due to escalating cost per unit of utilities services.

- The Digitec Smart House has now reached the final stage of it's completion and is ready to be used as a research laboratory space.
- LED lighting installations continued to roll out across the Waterfront and Arts building.

Travel
- **A new green roof lockable bike store** was installed in the courtyard area between Arts and Long Street. This facility generated considerable media interest and not only provides a safe and secure storage area for staff and students and facilitates a healthy commute; but also increases our biodiversity and extends the wildlife habitat corridor.
- Sustainability, POD and Finance, have launched an **EV lease salary sacrifice car scheme** to enable staff to lease a new, fully insured and maintained car for a fixed monthly amount from their salary, providing an important staff benefit and improving our modal shift for travel.

Waste
- Total waste mass for AY21/22 *increased* from 128.335t 2020/21 to 149.718t. Following post covid return to campus this was anticipated. The University still maintain a good recycling rate of 90.18%.
- In 2022 we were delighted to be awarded a **top ten position for waste and recycling within the People and Planet University League**.
- In June 2022 Estates launched a furniture doctor program and begun the evaluation of sustainable furniture procurement to ensure ease of repair and extension of life cycle.
- As part of a raising awareness campaign for both waste and energy sustainability, with the support of the Digital Directorate, ran a nine week Think Before You Print Campaign. Over the duration of the campaign printing was reduced by over 75,069 printed pages, **saving 610.2kg of CO_2e and approximately 5.6 trees**.

Biodiversity
- **In celebration of the Queens Jubilee seven trees were planted near the entrance the Atrium**. These heritage species of St Edmunds Pipins, quince pears, plums and cherry were specially chosen for their ability to provide learning opportunities, whilst supporting the campus biodiversity plan through the creation of pollinator corridors.
- The **Physic Garden planting scheme** at the entrances to the H&W building was completed end of July, with species focus on improving air quality/cooling and yielding significantly higher biodiversity value and net gain then traditional urban landscaping offers.
- In addition to gaining the **Silver Hedgehog Campus Award**, student engagement in both the wildflower meadow and the wildlife garden was considerable this year with over 147 participants across 12 events.

New Reporting of Key Performance Indicators
As the University Sector enters a new stage of carbon reporting and moves towards net zero, the choice of data metrics has become less prescriptive in terms of KPI's. The key sector objective remains for overall carbon reporting in terms of absolute carbon for all scopes, however additional environmental and sustainability objectives are set at an institutional level in line with sector best practice.

This provides us with an opportunity to review our reporting mechanisms against institutional objectives and ensure the data that we are tracking for our KPI's is robust enough to accurately reflect performance, whilst simultaneously driving continuous improvements within a performance management framework.

In considering which metrics to select and report on moving forward, we used the following selection framework:

- the metrics are objective, understandable, trackable over time, support decision making and drive forward our strategy;
- they are consistent and comparable across the estate where possible, and address any limits in data;
- they are underpinned by the operational actions needed to be taken to achieve the target.

Key Objectives and Targets for 2022/23:
Over the next 8 years the university is committed to meeting the objectives highlighted below, please also note the targets for the academic year 2022/23 as part of our step change KPI's:

Carbon:

- Achieve carbon neutrality for scope 1 and 2 emissions by 2030

  Target 1 - 22/23: Carbon emissions scope 1 & 2 65% reduction against 2009/10 baseload.

  Target 2 – 22/23: Operational emission of GHG per m^3 of gross internal area no greater than 21 $kgCO^2$

  Target 3 – 22/23: Emissions per FTE Staff and Student no greater than 160 $kgCO^2$

Waste

- Achieve no greater than 5% of absolute waste sent to landfill by 2025. Interim target for 2022/23 of 10%
- Reduce absolute waste by 10% against 2022 baseline by 2025
- Ensure continuance of recycling rate of greater than 85%

Contents

1. Introduction

It has been another impactful year for sustainability; one with several significant challenges both in terms of energy supply and materials supply chain availability due to the war in Ukraine, covid related global shortages creating demand and cost implications. All of which has been set against an ever more salient backdrop of climate event acceleration and biodiversity crisis, driving a year of Net Zero community engagement around COP26 and operational review to drive forward decarbonisation.

The University of Suffolk continues to progress against the implementation of and commitment to the UN Sustainable Development Goals. Whilst this report focuses predominantly on those goals associated with environmental sustainability; broader actions and policy development has taken place across a range of SDG's, progressing the development of:

- SDG 3: Good health and wellbeing
- SDG 4: Quality Education
- SDG 7: Affordable and clean energy
- SDG 9: Industry, innovation, and infrastructure
- SDG 11: Sustainable cities and communities
- SDG 12: Responsible consumption and production
- SDG 13: Climate Action
- SDG 15: Life on Land
- SDG 17: Partnership for the goals

This year a new long term Estates Strategy has been developed to directly address decarbonisation and resource availability. Whilst also acknowledging supply chain pressures within building design, procurement, and maintenance during the life cycle of our infrastructure and assets and detailing the need to embed sustainability within them. Our emphasis has also sought to progress the reduction of asset wastage, it's associated costs, and focus on high performance lifecycle extension and the circular economy. Giving a greater weighting to the procurement of quality assets that lend themselves to repair and reuse and further exploring the installation of onsite energy generation and infrastructure with low carbon operating costs. This approach is a step towards ensuring future resilience, in meeting our increasing reliance on energy to deliver a high-quality IT and digital campus experience.

In order to achieve this, we have begun to address the entirety of our building stock, assessing BMS suitability, evaluating lighting, heating and cooling to gain a deeper understanding of building condition, space utilisation and user experience.

Moving forward and working with the Digital Directorate we will be reviewing the capacity and condition of the electrical infrastructure, both in terms of supporting the IT, heating and hot water provision and vehicle charging as a positive move is made towards electricity from on and off-site generation as the core energy source. The estate strategy will also operate on a building-by-building basis, identifying energy performance and electrical infrastructure, as well as identifying and finding solutions for building

fabric, system efficiency, energy and waste management, and occupant wellbeing and biodiversity.

This report presents both an insight into our overall operational performance and an overview of some of the more significant initiatives that have taken place over the academic year 2021/22, covering campus operations, learning and teaching support and research and external partnerships community engagements.

2.   Carbon and Utilities

Working within Carbon Trust PAS 2060 definitions and adhering where possible to science-based targets, the University of Suffolk is committed to achieve carbon neutrality for scope 1 and 2 emissions by 2030, with a net zero trajectory for remaining Scope 3 and all emissions by 2050.

Carbon neutrality means not adding new greenhouse gas (GHG) emissions to the atmosphere. Where our emissions do continue, for example in campus areas still served by gas hot water, or heating systems these must be offset by absorbing an equivalent amount from the atmosphere, through carbon capture and reforestation, supported by carbon credit schemes. If we can achieve decarbonisation without the need to offset we ill seek to do so. Net zero means cutting GHG emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, across the University value chain. Thereby included GHG from waste, water, travel, and embodied carbon within buildings.

Achieving carbon Net Zero at the University of Suffolk will require a combination of behavioural change to drive down resource usage and waste, investment in more sustainable systems and products, and deeper investments in major infrastructure. At the heart of the new Estates Strategy are step change plans to improve the efficiency and utilisation of the estate, which emphasise sustainability in the construction, retrofit and operational activities that must be undertaken to deliver our core services within the net zero framework.

Estates is focused on the elimination of natural gas as a fuel supply for heating the estate, to be replaced through either air source, or ground source heat networks, or through the electrification of all buildings and transport. This transition is being planned in combination with a more efficient use of our space and enhanced building maintenance

We will encourage sustainable business and commuter travel amongst our campus community where possible and will work with our wider community and partners to improve public transport options for staff and students alike to reduce carbon emissions. Additionally, we will seek to avoid unnecessary procurement alongside identifying more sustainable purchasing options to reduce our carbon footprint further.

2.1   Emissions and Decarbonisation

This reporting years emission performance builds on the success of the subsequent years' achievements. Although the overall decrease for all scopes of tCO2e is only a few percentages lower than 2020/21, the success is significant given the increase in campus

footfall post covid and the addition of the H&W building and its associated emissions into the campus portfolio from April.

- Annual quantity of emissions in tonnes of Carbon Dioxide equivalent from the combustion of gas was 206.1 tCO^2_e an increase of 3.5%
- Annual quantity of emissions in tonnes of Carbon Dioxide equivalent from the use of electricity was 397.2 tCO^2_e a decrease of -2.2%
- Total carbon for scope 1 and 2 emissions in tonnes of carbon dioxide equivalent was 603.3 tCO^2_e an increase of 0.88%
- **Total all campus emissions in tonnes of carbon dioxide was equivalent to 627.2 tCO^2_e a decrease of 1.9%**

Table 1: *Carbon Reduction Scope 1&2: University of Suffolk Sector Baseline KPI*

	2017/18		*2018/19*		*2019/20*		*2020/21*		*2021/22*
	Target	*Actual*	*Target*	*Actual*	*Target*	*Actual*	*Target*	*Actual*	***Target: 55%***
Carbon emissions Scope 1&2 (tCO^2_e)	1757	1,151	1,622	1,145	1,541	940.27	1541	598.08	**603.3**
Reduction from 2009/10 baseline: 2,704 tCO^2_e	35%	42%	40%	57%	43%	65.23%	43%	77%	**76%**

Our performance during the year can be further defined in terms of emissions per GIA/m^3 and per staff/student FTE, with comparisons against previous years' data presented in Table 2. Between 2018 and 2022 this shows a 32.6 kg CO_2e reduction per m^2 of GIA across the estate, and a decline of 281.56 kg/person for total staff/student FTE.

Table 2: *Emissions per GIA and FTE*

Emission Definition	2017/18	2018/19	2019/20	2020/21	*2021/22*
Emissions per m³ of GIA	56.30 kg CO^2_e	42.98 kg CO^2_e	34.73 kg CO^2_e	22.08 kg CO^2_e	***23.70 kgCO^2_e***
Emissions per FTE staff & Students	456.76 kg Co^2_e	329.24 kg CO^2_e	273.07 kgCO^2_e	154.76 kgCO^2_e	***175.2 KgCO^2_e***

All annual carbon emissions have been calculated by applying BEIS Government Conversion Factors for greenhouse gas (GHG). For the University of Suffolk, this produces total emissions of **627.2 tCO^2_e** a 1.9% decrease on last year's emissions performance.

2.2. Utilities Consumption and Costs

Overall combined contracted utilities consumption figures for gas and electricity for 2021/22 were 3,932,905 kWh, a decrease of 20% on the previous year.

The final stages of England's lockdown rules ended on the 19th July 2021, and with it partial campus closure at the beginning of the reporting year AY 2021/22. Virtual teaching and online events continued for the first half of the year, and many staff continued tobe supported by hybrid flexible working, with students accessing lectures via the Owl. This is particularly evident when looking at specific building usage. In James Hehir gas and electricity consumption remain almost identical to pandemic levels; with a similar picture presenting itself in the Waterfront building. Granulated sub meter data reveals that areas in buildings that have student workshop, or practical taught curriculum delivery occurring within them witnessed an uplift in consumption that was more reflective of pre-pandemic levels, suggesting these courses saw more on campus student footfall. This is most observable in the Arts building. Professional service buildings, such as Neptune Marina and STSC saw a consumption utilisation that was reflective of pre covid levels as staff in these areas returned to work on campus. Our ongoing new hybrid working pattern has helped us to reduce the University's overall consumption. However, it's continuation is not a given, and the challenge we face is to make sure our new ways of working do not lead to an significant increase in emissions, or simply transfer some of the University's emissions to our staff and students' homes and communities.

Energy efficiency infrastructure implemented during both this and the previous AY, such as LED lighting, increased on site solar generation, window replacement and behavioural campaigns; coupled with footfall reduction through agile working and both in person and online opportunities for lecture attendance continue to improve consumption figures.

Whilst data is not yet granulated sufficiently to accurately determine the impact of Agile working on electricity consumption, we can infer that with the average laptop using about 35w – 50w, and the average PC requiring 100w, a greater than 50% reduction in consumption is being realised per staff member. All staff members across campus are now transitioned to Agile; with only a few specialist desktops remaining. With a staff headcount of 604 and assuming 45% capacity interaction, this represents a conservative hourly saving of 13.5kwh during operations, equal to 3.14 $kgCO_2e$. A potential annual saving of 18,900 $kgCO_2e$.

Renewable Power Generation

This year as we transition to net zero, we were able to improve our energy mix source provision. On site renewable energy generation provided 41293 kWh of power, which was fully utilised by the buildings and areas they serve. Whilst in April 2022 we moved our main electricity energy contract across to EDF fully renewable power; generated by solar, wind and hydroelectric only. This contract is source certificated and meets GHG Protocol Scope 2 Guidance Quality Criteria verified by the Carbon Trust. During the last quarter of the AY, 874,954 kWh of offsite renewable energy was utilised. **This reporting year 23.3% of our total energy consumption was generated from renewable sources.**

Expenditure

The energy market this year has grown considerably in complexity and concerns over supply due to a multitude of factors. Prior to March 2022, COVID and subsequent lockdowns reduced the national overall demand for energy, but from end of March onwards commodity base load costs started to increase as things got back to normal. These costs were reflected in our own costs from April.

Due to decisions to reduce gas storage and transition, the UK depleted existing gas reserves in 2020-2021 and were then thrown into a need to secure additional gas as energy demand increased post lockdown. Additionally, the Russian invasion of Ukraine has greatly exacerbated an existing challenge as global events and responses continue to impact energy providers and stock markets due to the uncertainty and secure supply assurances. Russian threats to switch off gas supply, continues to cause more market volatility and higher prices. Increasing costs per kWh continue to be passed down to the UoS procurement consortium for both gas and electricity at price review and lock in points.

Overall energy and water costs, after initial adjustments for **2021/22 were £809,841 an increase of 40.3%**. Much of the cost uplift is associated with market unit price increases, Graph 1 visualises this aggregated disconnect between utility consumption when set alongside last year's performance.

Graph 1: *Consumption and Cost Comparison 2020/21 and 2021/22*
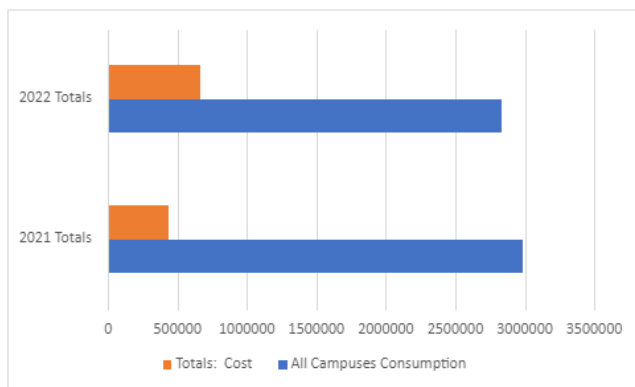
The University are part of a procurement consortium, currently managed by Vertas. This consortium is made up of SCC, local councils, schools, and academies, with bulk procurement for much of our electricity and gas provision accross the estate. Consortium tariffs exclude the majority of those buildings that we lease. Prices are locked in for electricity at two points during the year, with winter and summer supplies covering 6-month periods for the duration of the umbrella contract with the energy provider. EDF are under contract for our electricity provision until the 31st March 2025; with SEFE Energy contracted for our gas provision until September 2023.

Challenges arose in the third quarter of the reporting year with the University under contract with the UK arm of Gazprom a Russian state-owned gas and oil subsidiary. An ethical decision was taken at this time to work with our consortium partner to establish

how we could break contract. Fortunately in April, the German Government took over the British arm of Gazprom after Gazprom exited from its German subsidary and London-based subsidaries.

- Electricity:
    - From September 2021 to 31st March 2022, UoS consortium price lock at 0.15p per kWh
    - From 1 April to 31st September consortium price lock at 0.29p per kWh.
    - Moving into the new academic year prices are now locked from 1st October to March 2023 at 0.42p per kWh. However, it should be appreciated that these costs are being supported by the Energy Bill Relief Scheme which will cover this period, reducing the cost to 0.32p pkWh.

- Gas:
  Current contract is purchased to the end of our supply period at 29 p/therm until 30th Sept 2023.

Sustainability regularly monitors the energy market landscape with interim budget adjustments being presented to Finance as potential overspends look likely.

To ensure continued effective institutional growth and utility expenditure resilience, we will need to not only future proof, improve and accelerate energy efficiency measures in our infrastructure and campus assets; but also address our daily activities by adopting behaviours that demonstrate an energy conservation mind set. A Three Pillars' strategic approach is presented in table 3 below, which outlines targeted areas and the emerging activities we are taking to move us towards a more resilient and energy efficient campus, reducing costs, risks and cutting carbon as part of our decarbonisation plan.

Table 3: *Energy Resilience: Pillars for Success*
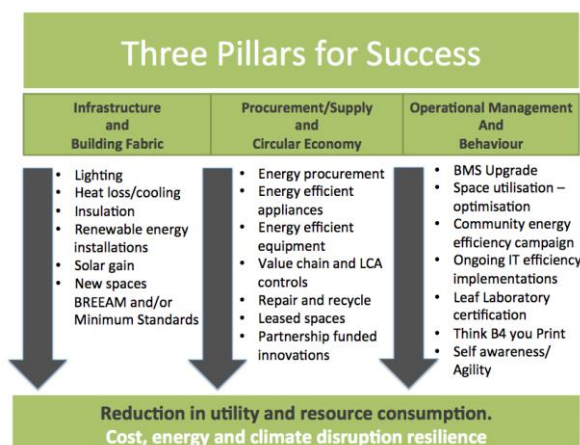
Within Estates and IT we will seek to further implement our infrastructure and building fabric strategies, securing where possible highly energy efficient, low carbon affordable solutions for our legacy buildings and all subsequent new builds and retrofits. This approach will specifically Building Management Systems targeting heating/ cooling and

lighting. However, as boundaries between energy, mobility, water, and digitalisation are increasingly intertwined, changes in one part of the system can have rippling and unexpected impacts for many areas of the University. The scope of the change required to achieve resilience and growth will be larger than anything the University has currently experienced and has been embedded into the new Estates Strategy.

3.   Display Energy Certificates

A Display Energy Certificate (DEC) is a legal requirement for all public buildings with a usable floor space over 250m2. The building's energy performance operational rating is based on its carbon dioxide (CO_2) emissions for the last year. It is given a score and an operational rating on a scale from A (lowest emissions) to G (highest emissions). The typical score for a public building is 100, giving it an operational rating of D. Although there is no specific target set for the proportion of rated University buildings, there is a sector expectation to obtain an average DEC rating of D or better.

DEC measurements are taken for a full calendar year and therefore reflect campus usage during 1 January 2021 to the end of the end of December 2021. The picture is varied with improvements across three of the key buildings. Some of these improvements are directly linked to reduced building occupancy, this is particularly evident in the Waterfront building. It is difficult to ascertain at this point the impact that the LED re-lamping programme will have had on this building.

Table 4: *Display Energy Certificates Performance and Comparison*

Building	DEC Rating 2019/20	DEC Rating 2020/21	DEC Rating 2021/22	Floor Area (m²)
Arts	B (44)	B (38)	C (74)	3727
Atrium	B (41)	B (36)	A (16)	11293
James Hehir	E (101)	E (104)	D (91)	3649
Waterfront	C (62)	C (60)	B (37)	10680

The James Hehir Building continues to under-perform, even with exceptionally low space occupancy. The future development of the first and second floors for dental curriculum and clinic activities presents an opportunity to address some of the challenges associated with this building. This refurbishment will also potentially extend to energy savings opportunities through the upgrade of the buildings Data Centre.

Performance changes in the Atrium and the Arts building were expected and are likely to fluctuate again within next year's DEC assessments. With the refurbishment of the Wellbeing Building and the obsolete boiler house, many of the electrical and gas networks shared on this part of the campus, have been blocked, or re-rooted. Metering is split through the library, which now takes most of the library and Long Street utility consumption through onto the Arts network. This was previous routed through to the Atrium. The result has been an improved performance for the Atrium and a lower performance for Arts. Long Street was used during the Wellbeing Building refurbishment by contractors which also added to the energy load for the Arts building.

Moving forward we will be working towards a detailed sub metering programme across the estate so that we can understand a more accurate performance of individual buildings.

4. Energy Efficiency Initiatives

4.1 Leaf

Laboratories are extremely energy and resource intensive (they typically will consume 3-10 times more energy than typical non-lab areas). LEAF was developed by UCL and contains actions which lab users can take to save plastics, water, energy, and other resources. This reporting year the Life Science laboratories and their technicians, with support and guidance from Sustainability Estates, launched a pilot programme to reduce carbon emissions and create an environment that operates tighter controls over resource usage and wastage. Now six months into the programme the Life Science Laboratories are well on their way to achieving the Bronze award. The LEAF Awards are supported by the National Technician Development Centre (NTDC).

Once the pilot has been successfully completed, the LEAF initiative will be promoted and rolled out to all other laboratory and workshop areas across campus. Improving sustainability knowledge amongst the technician teams and recognise the excellent work that they are already achieving in this area.

4.2 Solar panels

Our newest photovoltaic solar array is in the process of being installed on the roof of the Health and Wellbeing Building and work should be complete by November 2022. This has been a slower than anticipated build due to supply chain constraints. But at 35kWp, brings the total on site generation on campus up to 123kWp of zero-carbon electricity per year. Almost all this energy will be used within the building, reducing the amount of grid-supplied electricity we need to procure.

Combined systems across campus have generated some 41,293kWh of solar electricity during the reporting period, representing a saving of 8,766 kg CO_2e. In operational comparative terms that exceeds the annual electricity usage for STSC.

4.3 Long Street

With the second phase of the Long Street building retrofit currently under discussion and following the departure of the Wellbeing Building contractor team, this building has now been mothballed to save ongoing energy wastage.

4.4   Hot Water Plant Waterfront

The existing hot water plant in the Waterfront has been upgraded with a fully condensing, modulating 'A' rated gas fired water heater and solar pre-heat package retrofit. Unfortunately, we are not a stage yet financially where we are able to retrofit the entire gas hot water heating system within the building. The addition of the solar thermal PV array to the hot water system, will supplement and ameliorate a percentage of the carbon burden associated with the gas system. A BMS package has been added to the plant to monitor and record the solar performance of the system. With a pasteurisation pump included to enable maximum thermal transfer whilst still ensuring legionella control.

4.5   DigiTech: Smart House

The Digitec Smart House has now reached the final stage of it's completion and is ready to be used as a research laboratory space by for SSI Research fellows and academic staff with a digital and/or sustainable living research interest, along side innovator businesses and partners.

The aim of the Smart House is to develop and test infrastructure and technologies that will be used to evaluate performance to stimulate the adoption of, sustainable, smart, and healthy technological innovations and built environment materials. A Smart Lab approach will allow us to apply user-centered analytics, by pioneering new forms of in-context research, with a capacity to be both long-term and cross disciplinary.

The house construction and its materials seek to test the ability *to* achieve a Zero Carbon occupancy. With a dual design and build brief; to address climate change and the impact the construction industry has on this; and the UK housing crisis, which sees the chronic shortage of affordable housing. The house has achieved to date a reduction in embodied carbon of around 50% compared to a typical brick and block house. In the longer term, the completed build will utilise SMART systems to evaluate the performance of these sustainable materials, in addition to low carbon energy utilisation and water consumption, coupled with critical consideration of the wider landscape through ecological design.

Sustainable design in the house seek to replicate the most frequently deployed features of modern eco housing, with scope to flex in and out different technologies and materials as research funding enables. As a baseline the house currently operates the following build and utilities features:

- Elimination of cement and extensive use of timber with glulam beams and timber studs,
- Timber walls and wood fibre insulation, to provide breathability and thermal mass,
- Offsite manufacture,

- Lime render plaster,
- House is designed to Passivhaus: U values for walls ranging between 0.1W/m^2 K and 0.08W/m^2 K,
- Internal walls are non-structural and can be reconfigured to allow spaces to be re-organised by future occupants,
- Panellised sections in external walls can be removed to permit future extension of the laboratory,
- Timbers and coverings are screw fixed to enable the reuse of timber and insulation,
- Air source heat pumps,
- Small solar array.

In addition to the Smart House, the site also now hosts a smaller building test bed, the DiSH. Through a partnership between the University and NBC (Natural Building Systems) and funded with our CRF partners as a Community Renewal Fund case study, this building has been constructed using regenerative materials, such as hemp and timber and is carbon positive; having captured more carbon as the materials grew than created from the harvest, processing, and production. The space will be monitored to understand energy efficiency, comfort, and air quality.

5.   Travel Plan

Several positive initiatives against the annual Action Plan accompanying the extant University Travel Plan were implemented during 2021/22. However, the take up of the Cycle to Work Scheme was a little lower than in previous years, indicating the need for a communication refresh during academic year 22/23.

Project initiatives include:

- **Green Roof Bike Store**
  In February a new green roof lockable, 16 bay bike store was installed in the courtyard area between Arts and Long Street. This facility generated considerable interest and not only provides a safe and secure storage area for staff and students, encouraging a healthy commute; but also increases our biodiversity and extends the wildlife habitat corridor in that area also providing output against the Biodiversity Action Plan. In April the roof was planted with a rich seed mix of drought tolerant, nectar rich species for butterflies, bees and moths and other invertebrate wildlife, with side habitat panels fixed for over wintering insects.

  To further support cycling commutes, additional large bicycle equipment lockers were redistributed across campus and are now available in the Atrium, Health and Wellbeing, Arts and Waterfront. Appropriate lockers will be located in James Hehir as part of building refurbishment activities.

- **Electric Cargo Bike Trial**
  In collaboration with the SCC Active Travel Team, our Estates Post Room staff participated in a two-week electric cargo trike trial during April. Staff underwent an induction session and spent the two weeks assesses the suitability of the Raleigh Pro Cargo Trike to transport parcels and post item across campus. At the end of the trial, it was felt that given the compact nature of the site and the wide turning circle of the trike this method of conveyance was not fit for purpose.

- **EV Estates Van**
  Our current on-site diesel van is now within its replacement cycle and in 21/22 we completed the evaluation of our ongoing transportation needs. The Estates van is used to transport bulky items, furniture and materials destined for recycling around the campus grounds. In the final quarter of last AY, we began an assessment of suitable EV replacement vehicles, with CSA staff set to undertake test drives during September and October 2022. Our EV Van will support the Carbon and Transport Plan, further lowering the University's Scope 1 carbon emissions and provide a clear message on our position in promoting responsible vehicle use

  Our van achieves a conservative 1,500 miles a year usage, which when coupled with our existing onsite EV charging units generated via renewable electricity presents a positive solution.

- **Employee EV Car Salary Sacrifice**
  In close collaboration, Sustainability Estates, POD and Finance, have spent several months establishing a partnership with Tusker Cars to provide all eligible employees with access to an EV lease salary sacrifice car scheme from October 2022. This scheme will enable staff to lease a new, fully insured and maintained car for a fixed monthly amount from their salary. The main benefit of the salary sacrifice scheme includes a brand-new car built to specification, fully comprehensive insurance, annual servicing, and routine maintenance. Sustainability Estates has a full launch campaign and website support designed in readiness for the operational launch. Uptake will be closely monitored to determine additional onsite electric vehicle charging installation requirements.

- **EV Charging Usage 21/22**
  Four Electric vehicle-charging stations are now available on Long Street, one of which is available for disabled use. These form an important part of our Travel Plan and staff benefits as we move towards a national electric vehicle network.

  This AY 1,340,010 kWh have been used across all four chargers, creating a cost offsetting income of £394.93 to assist in the University energy costs associated with their use. The initial tariff of 0.23p kWh was increased to 0.50p kWh following the sharp rise in electricity utilities cost and advice from our service provider. Moving forward we will seek to identify a methodology to further granulate the data to identify numbers of vehicles using the facilities and therefore give a more precise understanding of demand.

Travel to Campus Survey 21/22

This year saw an increase in survey respondents by 8%. Of those who participated in the survey, single occupancy car usage was down on the previous year, with an increase in the percentage of those who walk or access alternate sustainable modes of travel. Other observations of note are:

- the average commute distances of staff and students, with over 43% of respondents travelling greater distance than 10 miles on their daily commute. Rendering the regional availability and low cost of train and bus infrastructure across Suffolk, Norfolk and Essex of increasing importance if we are to extend our reach and continue to support equality of campus accessibility.

- Improved public transport 37% and staff discounts 28% were considered the two most likely solutions to encouraging further uptake of alternate sustainable travel methods.

- 24% of respondents stating that none of the outline solutions would encourage a change in their current mode of travel.

These findings will form part of AY 22/23 Travel Action Plan activities. Headline findings are presented in the Tables 5 and 6 below, taken from the Travel Survey report.

Table 5*: Headline Travel Survey Results*

	Which of these modes of transport are you currently using most often to travel to the location where you work?		Response Percent
	Answer Choices		
1	Bus		5.13%
2	Car driver - single occupant (whole journey)		45.73%
3	Car driver with a passenger/car share (any part of the journey)		8.12%
4	Car passenger		2.14%
5	Cycle		2.99%
6	Motor cycle/moped/motor scooter		0.43%
7	Park and ride		0.85%
8	Train		8.12%
9	Walk		18.80%
10	N/a - currently working at home		5.13%
11	Other (please specify):		2.56%

Table 6: *Travel Survey Insights*

	Answer Choices		Response Percent	Response Total
	25. If you don't normally use sustainable transport (walking, cycling, bus, train, Park and Ride, working from home or car passenger) which of these would encourage you to do so?			
1	Improved public transport (please provide more information in the 'Comments' box below)		37.31%	72
2	Better information about public transport		11.92%	23
3	Staff discounts (please specify which operator in the 'Comments' box below)		27.98%	54
4	Safer cycle paths or footpaths (please provide the locations of any cycle paths or footpaths you feel are unsafe in the 'Comments' box below)		18.13%	35
5	Better facilities at work for cyclists/walkers/active travel (such as showers, storage for clothing, somewhere to change)		9.84%	19
6	Availability of pool cars to reduce the use of your own car for work business (for example site visits or visiting clients)		5.70%	11
7	More flexible working to help with caring responsibilities (eg doing the school run or taking/collecting children to/from childcare provision, providing care for relatives)		11.92%	23
8	Development of mobile working/home working (eg provision of desk, broadband, IT, laptop)		11.40%	22
9	Help to find car sharing		9.84%	19
10	The needs of my job prevent me travelling sustainably (e.g I need to travel regularly around the county or need to transport a lot of equipment when I travel)		3.11%	6
11	Nothing		23.83%	46

6   Water

Improvements to the Automatic Meter Readers have been undertaken in Brickmakers Wood for the incoming pipe that services Arts, Long Street, LT4 and the Nursery. These final refinements bring us closer to greater accuracy with reading our water consumption and billing. For all of our Campus owned buildings and facilities we now have full visability of leak detection and consumption.

During 2021/22 we were able to detect several unusual water consumption readings across campus. Identifying and fixing leaks due to sanitary ware failings, improving campus service and minimising costs associated with water loss. Challenges associated with hard water destruction of fittings continues to present.

Working with the Estates Skills Team an assessment was undertaken of the extent and frequency of the ongoing damage caused to bathroom and kitchen area sanitary ware. The efficiency of our plumbing systems is greatly diminished because of hard water scaling inside pipes, cisterns and other appliances over a relatively short periods of time, in some instances halving the life of the fittings. The extent of the scaling worsens as time goes on in clogging and stressing pipes, including lessening the flow of water and

requiring greater amounts of maintenance. Solutions for preventing limescale build-up are costly and will need to be built into the refurbishment programme, as any wholesale retrofit would require the removal of complete systems to enable manufacturers compatibility.

Water management therefore not only presents itself as a maintenance output, but one designing for conservation. Estates policy for all new capital projects (and refurbishments that cover water requirements) will be required to use significantly less water and energy.

With front end design application of:

- Smart systems linked to the BMS;
- Water efficient sanitary fittings;
- Rainwater harvesting systems and greywater recycling systems;
- Ongoing leak detection;
- Water submetering;
- Presence detectors controlling the water supplies to washrooms;
- Water efficient irrigation practices.

University water consumption for 2021/22 was 31,155 m^3 an increase in 11.9% from AY 2020/21 with a sharp 33.5% increase of cost to £93,969. Indicative of the rising unit price per m^3. Using Defra Carbon Conversion Factors for 2021, data gathered from utilities bills and water meters reveal a scope 3 carbon emission equivilent of 11807 kg CO2e. The increase in consumption and costs was anticipated and to be expected as campus footfall returns to normal.

7.   Waste

AY 21/22 has been an important year for clarifying our strategic waste management direction. Sustainability Estates has led on collaborations with Digital Directorate colleagues, EAST and Innovation Lab technicians and contact partners; reviewing existing disposal processes and shaping discussions around the proposed content for the new draft Waste & Resource Use Policy which will cover the period from 2023 to 2028.

This draft policy is focused on both responsible resource procurement and asset use as the key to progressing sustainable waste management outputs; bringing together for the first time front-end procurement decision making, with waste reduction objectives. Its aim is to increase resource and asset efficiency, moving away from a linear model relationship to our campus capital, operational and consumable assets, adopting circular economy principles where practicable. Early initiatives are currently under development to ensure that we apply this basic framework prior to procurement and small project design, to prevent waste being generated in the first place, fulfil our legal obligations and align with the Waste Hierarchy:

- Suitable asset available elsewhere
- Ownership v's Lease

- Asset/product life cycle
- Asset maintenance
- Design for reuse/asset reuse
- Asset repair, product take back

As part of a wider communications and behavioural change approach, Sustainability will continue to work with colleagues across directorates and schools over the coming year. Providing advice and assisting in the management of specialist resources, whilst establishing strong messaging with the aim of achieving increased efficiency, cost savings, lower environmental impact and positive carbon reductions.

Through our initial performance under the draft waste strategy, we were delighted to awarded a top ten position for waste and recycling within the People and Planet University League.

Waste Performance

Total waste mass for AY21/22 *increased* from 128.335t 2020/21 to 149.718t. Considering partial campus closure during the last two reporting years an uplift associated with increased building occupancy and campus growth was to be expected.

A breakdown of waste fate analysis in the table below shows a recycling rate of 90.18%. This is within target tolerance and meets our recycling KPI. At 9.7% we have additionally met our target requirement of no greater than 10% of waste to landfill. Using Defra waste conversion factors for scope 3, our carbon emissions have decreased from 21.994 kg CO_2e to 9.545 kg CO_2e. This reduction directly correlates with less WEEE waste removal during the reporting year.

Table 7: *Waste Classification by Tonnes*

Waste Type	Weight (Tonnes)	Percentage of total
Hazardous	2.9728	1.99%
General	146.7450	98.01%
Recycled	135.0211	90.18%
Landfill	14.6062	9.76%
Incinerated	0.0000	0.00%

Trends

Whilst our recycling rates continue to be excellent, there is an observational trend of a steady increase in the annual gross amount of waste we produce. Much of this can be attributed to growth and development, specifically furniture items and IT assets. This reporting year new ways of working, such as Agile have necessitated the withdrawal and decommissioning of PC's and a traditional pedestal office furniture set up. However, it is anticipated that the Agile programme under its ongoing implementation will produce less waste over aggregated asset lifecycle, whilst additionally reducing energy consumption.

In order tackle the steady growing increase in production we will be setting a short-term rolling target of a 10% reduction in waste arising per capita (FTE staff and students), using this year's baseline of 42kg. This will ensure we can adjust for growth as new facilities and buildings become fully operational, whilst simultaneous tackling the procurement aspects of waste production through the launch of our Waste and Resource Policy in early 2023.

Furniture and Equipment Assets
This reporting year Estates has moved forward in finding solutions to address the high turnover 'fast furniture', model that has typified previous years small project and replacement furniture approach. Cheap to procure, with a seemingly high percentage of recyclability, (mostly through the recycling of metal elements and waste to energy for the remainder), fast furniture presents a misnomer; with our existing stock having a short life-cycles and being hard to repair.

Such designed obsolescence is a feature of the office furniture sector and sourcing a suitable furniture partner to collaborate with on a procurement and repair framework is proving a challenge. From September 2022 however, we will be holding a monthly furniture repair clinic to extend the life of our chairs, in addition to ensuring that all new furniture we procure can remove and repair parts as standard when possible. Data capture forms an important aspect of this work, ensuring we can move towards an understanding of which furniture assets provide the best performance over the lifecycle, the extent of that lifecycle and ease/cost of repair.

For unwanted specialist furniture and equipment assets Sustainability works closely with the school or directorate that owns the assets, to either repair/sell the item for re-use, or donate to an organisation, or charity that would benefit.

WEEE e- Waste
Waste electrical and electronic equipment, referred to as WEEE or e-waste is generated in considerable quantities every year by the University. Globally it is now one of the fastest and most valuable growing waste streams, containing trace elements of precious metals as well as potential environmental contaminants. Recycling E-waste is critical to preventing the escape of pollutant components like PCBs and CRTs, this paper puts emphasis on the processes of dismantling and recovering resources from PCBs and CRTs and reducing exposure levels of heavy metals. All our WEEE waste is recycled through specialist licenced waste carriers and processes, with end-of-life details available for every consignment. A full internal and external audit was undertaken on our WEEE waste during 2021/22 to ensure that all regulations were being adhered to, to fully discharge our Duty of Care and to fully understand the extant of our WEEE waste challenge.

Digital & IT Collaborations
Estates Sustainability will continue to work with IT colleagues over the coming academic year to identify alternate solutions for the disposal of our unwanted IT and e-waste assets. Waste items include, computers, speakers, printers and copiers, cables and associated items such as monitors, keyboards and mice. Working with the Infrastructure analysts we are collectively seeking to develop long-term, sustainable solutions and

approaches on all policy-related and operational areas related in e-waste. Assets currently fall out of usage for several reasons:

- Department, or ITS upgrade programme identifies areas for upgrade and laptops/computers are withdraw
- User computer/laptop failure, or need of upgrade
- Digital infrastructure larger asset support equipment no longer fit for purpose

ITS collect the units and take them to be repaired and/or usable parts identified and separated. A small percentage of usable complete assets are made available to staff/students for bespoke project work or stand alone platforms. The remaining bulk of assets are wiped and transferred to Estates to recycle.

To check each unit for donation viability and wipe it, is a time consuming and resource intensive process, there is currently a backlog of assets that require evaluation. This explains the reduction in WEEE waste disposal data for 21/22 down to 1.97T, from the more averaged previous reporting years 5.25T. Donating viable computers to community groups would be a preferred disposal route for our unwanted equipment. However, finding suitable programmes able to deal with the volumes involved will require further investigation, as too will sourcing the human resource required to assess and wipe the backlog. A working group is to be established to look develop practices and solutions to our ongoing WEEE waste challenge.

Think Before You Print Campaign
As part of a raising awareness campaign for both waste and energy use, with support from the Digital Directorate and Marketing and Communications, Sustainability ran a nine week Think Before You Print Campaign during the third quarter of the year.

Printing is an important service provision for staff and students, but the effects of wasted resources associated with it presents us with an excellent opportunity to reduce our environmental impacts. During the reporting AY the total impacts of campus wide printing resulted in:

- Total Printed Pages: 1,209,938
- Total Jobs: 110,348
- Trees consumed: 88.41
- CO2 produced: 9,356kg CO2e

The Campaign was supported through the work of a third year Micro Placement Student, who created a well-researched environmental impacts infographic for use on all targeted comms platforms. Additional promotional activities underpinned the campaign, which focused at its core on the simple messaging of:

- Do you really need to print
- Only print the pages you need
- Print in black and white
- Set printers to double-sided

Ongoing support from the Digital Directorate ensure that all printers automatically default to B&W and double sided unless the user specifically alters the default settings to help support behavioural change.

A definite decrease in printing usage was observed at the end of the campaign when compared against a baseline of average annual datasets for March 2021/22. Over the duration of the campaign printing was reduced by over 75,069 printed pages and 5319 fewer printing jobs were sent to the printers; translating to 5.67 less trees consumed through paper usage and a saving 610.2kg of CO_2e via reduction in energy use.

Table 8: Comparison Average Total Printed Pages and Print Jobs Per Week
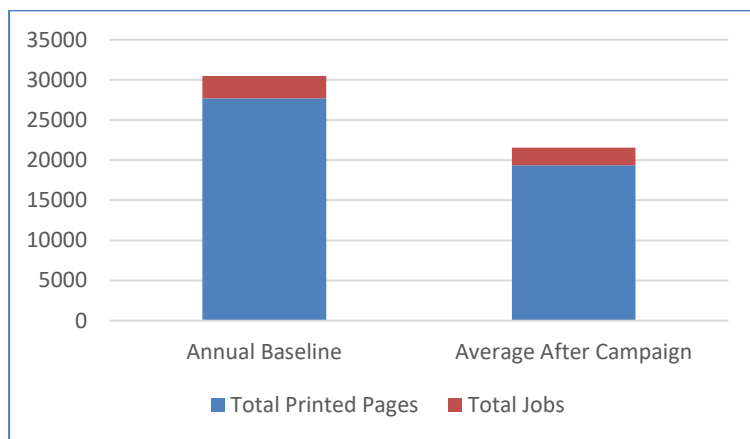
Data continues to be collected to monitor printing upswing as behavioural drift occurs, a refresh campaign will be run again in March of the new academic year.

3D Printer Lab
Following an internal laboratory audit request from the recently into post 3D Printing Technician, several legislative non-compliances were identified associated with 3D chemical waste storage and disposal practises. The resulting amelioration of the challenges surrounding the operational and management practices for this aspect of the facility represented a highly successful collaboration between technician staff across schools and estates team members. This area now exemplifies best practice for chemical waste management.

8.   Campus Biodiversity

The University Biodiversity Plan 2019 – 2024 has continued to drive biodiversity project implementation across Campus throughout 2020/21, with milestones achieved against the Biodiversity Action Plan. Urban biodiversity support connections and contact with nature, in addition to living lab curriculum and research opportunities. This year has also been pivotal for reviewing the role that landscape design plays in supporting the student and staff experience, with a focus within the emerging Estates strategy to create outdoor destination spaces that allow for reflection, well-being engagement and interaction with nature.

The following projects have been instigated this year to great success:

- **Silver Award Hedgehog Friendly Campus:**
  In March 2022, in collaboration with Estates, the Wildlife Society were successfully awarded the Silver Hedgehog Friendly Campus Award.

- **Student Wildlife Garden**:
  Work on the student Wildlife Garden continued though out the year, with four half day organised engagement events. This included the construction of:

  - a wattle hazel fence around the pond,
  - a Phase One Habitat Survey,
  - Ground preparation and sowing of seed mix
  - Oxygenation pond plant planting

- **Wildflower Meadow:**
  The wildflower meadow suffered during late summer following the extensive dry period, which provided a good learning opportunity for Students on the effects of climate change and planting scheme adjustments. But had a good spring and early summer impact. We were delighted to record large numbers of both Dark Bush and Roesel Bush Crickets, in addition to Large and Small Skippers, with our hand sown horseshoe vetch and common birds foot trefoil providing much need foraging for them.

  Scything meadow maintenance was conducted with a group of 10 student volunteers during the autumn led by Suffolk Naturalists David Basham and Julian Dowding, followed by a Q and A session on habitat management.

- **Jubilee Trees**
  The Queen's Green Canopy (QGC) was a unique tree planting initiative created to mark Her Majesty's Platinum Jubilee in 2022. As part of this celebration the University marked the occasion through the planting of seven orchard fruit tree's to represents a decade of her Majesty's historic reign. Species were chosen for their heritage value and symbolism, taking into account the robust nature of each tree and its ability to thrive in an urban environment. The species selected were:

  - Two St Edmunds Pipins, believed to have originated in Suffolk in 1875.
  - Two quince pears, believed to be of great antiquity
  - Two Plum Jubilee's, a hardy Edwardian variety.
  - A Cherry May Duke Standard, originating from the late 18C

  It is also hoped that the mini jubilee orchard also introduces staff and student to species and varieties that they may not have seen before and when established, will create a visual impact through all the seasons promoting healthy eating and overall wellbeing. The trees were celebrated during a plaque unveiling ceremony with Chancellor   Helen Pankhurst CBE and Vice Chancellor Helen Langton.

- **Wellbeing Building and Clinic Rooms**
  Basic landscaping to both the lift and clinic room entrance to the Wellbeing Building was completed during the reporting year.

  The approach to the Clinic Rooms now has a row of Rowen trees and Dogswood, underplanted with geraniums to create all year-round wildlife foraging and further develop the visual aesthetic on this part of campus. Herb planters are an additional feature situated near the disabled ramp, with species selected for their medicinal properties; such as hyssop, rosemary, thyme, echinacea, mints, damask rose and viola's.

  The Physic Garden planting scheme, wraps around to the lift entrance, with a species focus on improving air quality/cooling and yielding significantly higher biodiversity value and net gain then traditional urban landscaping offers.

- **Campus University Allotment:**
  The Paramedics Courtyard is an essential space provision for teaching and learning, with planning underway to create a simulation scenario with the addition of an ambulance and car wreck in support of situational learning.

  The space will also host a community wellbeing garden which will provide the benefits of gardening and fresh produce, without impact on curriculum. This will be a particularly beneficial asset to campus community members who may not have access to an outdoors space for growing and for all to benefit from the wide spectrum of mental health benefits associated with allotment activities. Initial discussions with Estates Sustainability, Suffolk Mind and the Director of Practice and Health Partnerships are in the process of defining collaboration opportunities for eco therapy led sessions, with research potential around the impacts of outdoor gardening on mental health as part of green and social prescribing.

- **Additional Planting**
  A lavender planting scheme has been implemented to the pavement area in front of the Atrium and to the left of the building entrance. The species selected should cope well in the poor soil quality and dry conditions, echoing the Physic Garden theme from New Street to Long Street and provide foraging for wildlife and visual pleasure for all.

9.   Engagement and Events

Engagement with our external business and public sector partners on environmental and sustainability issues is key to ensuring that the University can not only make continual improvements in its sustainability performance, but also unlock opportunities and shape thought leadership.

Whilst internal engagement is crucial to raising awareness, effective behavioural change and enhancing student and staff experience. Many of our student experiences are

designed to help create, sustain and support a sense of community and belonging, providing enablers for social and learning opportunities on campus.

9.1   Raising Awareness

Competitions can be an effective tool for raising awareness amongst the student population and create an output that inspires further engagement beyond the competition activity itself. This reporting year, the following competitions were created to help make sustainability more visible within our student community, whilst simultaneous enabling a creative outlet for thoughts and opinions.

- **Sustainability Student Hub Platform**

Collaborating with the Learning Design Team, broad based introductory content to sustainability at the University was designed and published for our new and existing student cohorts. This work forms an important foundation to students who would like to understand how the University approaches sustainability, with signposting to areas of interest that further support the student experience.

- **Climate and Me Competition**

In November, the UK hosted the UN Climate Change Conference (COP26) in Glasgow. To build momentum for this event, we invited Students to take part in a creative Climate and Me competition. The competition was an opportunity to vocalise views and raise awareness to a wider audience. Entrants were encouraged to interpret and explore this theme in broad and figurative ways, as well as more literal considerations. A wide range of students from all degree disciplines submitted painting, craft items, sculptures, poetry, short stories and academic essays describing their relationship and thoughts on climate change. The competition was judged by Tony Juniper CBE, Chair of Natural England, Councillor Richard Rout, Deputy Leader of Suffolk County Council, with responsibility for Finance and Environment, and Vice Chancellor Professor Helen Langton.

The winning entry was submitted by a first-year social work student, whose essay established the importance of ensuring that social work training includes content on climate change, due the professions focus on social justice, helping society deal with inequalities and families cope with trauma.

- **Intranet banner design competition**

An additional competition was run in the Spring with design students to develop a header banner for our new look intranet pages due to be launched in the new academic year.

- **4 press releases and 3 radio events**

Of the course of the reporting year Sustainability Estates wrote several external press releases and participated in 3 local radio events. Sharing knowledge on sustainability best practice for businesses and raising awareness around University activities.

9.2   Events

Sustainability Estates ran, or partnered on the following events during the reporting year, bringing subject leadership and sharing knowledge with approximately 575 participants in total over a range of sustainability themes:

Staff and Students

- Meadow scything: 11 students
- 3 Wildlife Garden project events: 17 students
- East Seminar Series Stars: 26 staff members
- Festival of Suffolk: Meadow Citizen Science: 119 year 10 students from across the County
- Student Wellbeing and Sustainability event: 75 student engagements
- Pop up climate cinema event: 19 student engagement

Total student and staff engagements: 267

Business Sustainability Leadership

- **UK Governments Zero Carbon Bus Tour:** Working in partnership with Suffolk County Council and Planet Mark. The University was the third leg of the nationwide Zero Carbon Tour which travelled across Britain bringing together powerful examples of sustainability actions and innovation in the build up to COP26 in Glasgow: 63 attendees.

- **Babergh and Mid Suffolk Local Energy Showcase: 116 delegates at the University Q and A, 18 delegates at the Workshop**
  As part of our further commitment to COP26, the University provided sponsorship to the two-day Local Energy Showcase event at Wherstead Park, with Sustainability Estates running a highly successful workshop in community climate planning and hosting a main event Q&A session with student participants. The Showcase provided opportunities for businesses and communities to learn more about localised energy production and to promote our own best practices and those of successful local businesses and community groups already operating in this sector.

- **Greenest County Awards Event:**
  This year the University was honoured to be invited to participate on the judging panel of the Greenest Community Award. The Greenest County Awards are a fantastic event celebrating the wider achievements of our Suffolk community.

- **Decarbonisation Innovation Symposium: 46 delegates**
  Please see the section on the SSI for more detail

Total external engagements: 308

Curriculum Support

Curriculum degree support during the academic year was provided for:

- Wildlife Conservation and Ecology Science Degree: Sustainability and Applied Conservation Module: Design and delivery
- IPL The Professional in the Team: 4 lecture sessions, Sustainability in the NHS: Design and delivery

Working Groups and Committees

The University both through Estates and the Suffolk Sustainability Institute continues to contribute and lead on thought leadership and is a key contributor working within the regional Sustainable Development arena on the following working groups and committees.

- Greener Ipswich/Ipswich Oasis
- Suffolk Climate Change Partnership
- Carbon Charter Panel Member
- Anglian Eastern RFCC Environment Subgroup: Regional Partners
- Low Carbon Homes: Regional Group
- Carbon Charter
- Net Zero CRF
- Suffolk Climate Change, Environment and Energy Board (SCCEEB):
- National Energy Skills Council Steering Committee
- SCEP: Industrial and Commercial Emissions Sub-Group
- SCEP: Collaborative Group
- UK Space Agency Space Cluster – Norfolk and Suffolk Space Energy Initiative (SEI)

10.   Suffolk Sustainability Institute

In its first year of operation under the directorship of Professor Darryl Newport, the Institute has been building a solid stable core around its key research themes. We have attracted several key researchers and continue to build a strong team from within to lead on our future growth. The team are working collaboratively on a number of key regional and national projects. The Institute continues to provide additional research, and consultancy; supporting innovation and enabling knowledge transfer and skills development for business, community and policymakers, within Suffolk and through its UK wide established networks, building a knowledge base that has clear benefit to all its current and future partners.

10.1   Areas of Specific Research Interest

The SSI is currently supported by two part time Research Fellows, who have been in post from April 2022 onwards. Research is focused interest on specific themes:

- **Sustainable Healthy Communities**: The focus of the SHC theme is the health of the community, how individuals and organisations including infrastructure and the built environment contribute to this. This aligns with pre-existing work with the Dunhill Medical Trust, the Centre for Alternative Technology and Anglian Ruskin University.

- **Green Infrastructure:** Interactions between the built environment and the natural environment. This includes the proposal (in development) with Suffolk County Council on impact of highways management on biodiversity, a wider developing research theme with Dr Mark Bowler on the impact of street light management on bats, and synergies with impact on water and air quality.

- **Natural Systems**: air, water, land and life in our region (initial work is Suffolk focused). Collaboration with local authorities, community and other stakeholders. Development of research on understanding and management of air quality in Suffolk. Developing existing work on surface water quality picked up from Prof Nic Bury in August 2022, currently with citizen and community scientists across Suffolk and North Essex.

- **Smart House at Adastral Park**: Developing facilities at the Smart House to enable pilot research projects in 2022-2023. Initial discussions in the May – July 2022 include anticipated use, available technology, development of pilot projects in collaboration with internal and external organisations, plans for addition of internal and external connectivity to the Smart House.

10.2   Contributions to peer-reviewed papers, book chapters, conference proceedings, other publications

- Osei, G., F. Pascale, N. Delle-Odeleye and A. Pooley (2022). *Green Infrastructure. The Palgrave Encyclopedia of Urban and Regional Futures*. Cham, Springer International Publishing**:** 1-10 [online] https://doi.org/10.1007/978-3-030-51812-7_260-1
- *Smarter Suffolk Live Labs: Device to Decision in Public Sector Highways* Invited presentation at Canadian embassy for Smart City technology event (focused on Smarter Suffolk) at Canada House, 9/06/22
- *University of Suffolk Smart House: Developing a facility for interdisciplinary collaborative sustainability research in an innovative domestic environment* Presentation at UoS RKE conference (focused on Smart House) at University of Suffolk 30/06/22
- Ayati, B., Newport, D., Wong, H. and Cheeseman, C. (2022). Acid activated smectite clay as pozzolanic supplementary cementitious material. Cement and Concrete Research Volume 162 https://doi.org/10.1016/j.cemconres.2022.106969
- Ayati, B., Newport, D., Wong, H. and Cheeseman, C. 2022. Low-carbon cements: Potential for low-grade calcined clays to form supplementary cementitious materials. Cleaner Materials Volume 5. https://doi.org/10.1016/j.clema.2022.100099
- Devereux, R., Westhead, E., Jayaratne, R., and Newport, D. 2022. Microplastic abundance in the Thames River during the New Year period. Marine Pollution Bulletin. Volume 177. https://doi.org/10.1016/j.marpolbul.2022.113534
- Shishkin, A., Aquedal, H., Goel, G., Peculevica, J., Newport, D. and Ozolins, J. 2021. Influence of waste glass in the foaming process of open cell porous

ceramic as filtration media for industrial wastewater. Journal of Cleaner Production. P 282 (Art.124546). https://doi.org/10.1016/j.jclepro.2020.124546

10.3   Grant Funding Applications
- Funding application to NERC, redirected to ESRC and currently for an open call (£1m/4 yrs). Partners onboard/agreed, including UCL.
- Further applications to be submitted this AY for a small grant (£40k) with community partner to AHRC.
- Further grants through Leverhulme/Wellcome being explored.
- Application for CRF challenge fund project with Natural Building Systems- £5k.
- Drafting application for R & D facilities funding (HEIF) for 3D printing project with Connect Energy – expected £5k- to print a model of CE battery storage solution.
- Smarter Suffolk Adaptive Lighting Project: application by request of SCC. £70,000. With Prof Nicholas Caldwell, School of EAST. Awaiting installation of technology by SCC prior to confirmation.
- Highways management impact on biodiversity to SCC: application by approach and request of SCC. Dr Hannah Steventon currently in informal discussions with SCC, potential value £240,000, with Dr Andres Arce and Dr Mark Bowler, School of EAST. In progress.
- MRC Application In collaboration with UEL, Kingston University and UoS for Indoor Air Quality Monitoring on newly retro fitted residences(150K)
- Current additional bids being developed with partners include UKRI Strategic Partnerships programme(£120K), Pioneering Places Fund (£75K), The National Lottery has a Climate Action Fund(£300K)

10.4   Internal engagement projects/initiatives
- Collaborating with IHW re potential future bids where interests overlap, including taking part in the H&W challenge lab to take place in 19/10/22.
- Working with colleagues within EAST (architecture) developing student projects for DiSH.
- Research presented at R&KE UoS conference in June 2022
- Air Quality Challenge lab planning for November 9 with colleagues in Institute of health and wellbeing and psychology
- Water Quality with School of EAST: Prof Nic Bury, Dr Svetlana Gretton
- Biodiversity with School of EAST: Dr Andres Arce, Dr Mark Bowler
- Data and computing with School of EAST: Prof Nicholas Caldwell, Dr Kakia Chatsiou, Mark Power
- KTP engagement: Dr Kenny Lang

10.5   External Businesses and Partners
- Sustainable Homes strand of the Suffolk Climate Emergency Plan.
- Chaired and presenting at Suffolk Climate Emergency Plan stakeholder engagement event.
- Speaker at UoS hosted AGM/meeting of Ipswich Building Preservation Trust, with a focus on Retrofit

- Represented UoS/SSI at a Building with Hemp event at Margent Farm (Huntingdon), which will lead to a building with natural materials challenge lab in near future.
- Working with commercial developer and community leader on development project in Framlingham, includes stakeholder engagement and regenerative development frameworks – funding being sought from UKRI for research for this longitudinal research project
- Developing ESRC project (see above) with Prof Peter Hobson (Professor Biodiversity Conservation & Sustainability and School Research Leader Co-Director Centre for Econics & Ecosystem Management School of Sustainable Environments & Design)
- Wide ranging engagement with local authorities on air quality
- Support for Ipswich Borough Council's DEFRA-funded Domestic Burning project, including use of Smart House as an experimental venue
- SME engagement: discussions with Roland Group, Liveable Cities, Vivacity Labs, Genie Connect, Informetis

BT Applied Research: includes collaboration on Data Hackathon (see below), Smart House projects (see below, includes workshopping project plan.

10.6   Community Renewal Fund
Working with our wider County, local authority and NALEP CRF partners we completed delivery on The Road to Net Zero Work Package 1 in collaboration with the UEA. The following outputs were realised:

- Decarbonisation survey and report exploring the barriers to decarbonisation across all sectors within Norfolk and Suffolk.
- Innovation Symposium on 22 April, World Earth Day with a diverse range of innovators and SME's
- The development of testbeds for technology and behavioural change. Prof Newport has been in conversation with 25+ businesses about accessing the testbeds and developing collaborations to support development of innovative solutions in net zero housing and energy solutions. UoS currently has 2 businesses testing products within the space and have firm plans to develop this further in the next few months. UoS worked to promote the Road to net Zero grants and challenge funds, having held 15+ conversations with businesses referring them to the Growth Hub.

10.7   Engagement Activities Curriculum - HEI/FE
- Work is underway with colleagues in EAST to develop undergraduate and postgraduate curriculum for engineering/architecture/built environment
- Writing paper based on short project (undertaken through CAT) on transformative learning and developing climate awareness within community learning settings
- Data and challenges for Information Engineering Module
- Guest speaker on Internet of Things for BTEC IT at Suffolk One

- Development and organisation of annual Data Hackathon for computing and data students (Oct 22, next planned for Nov 22)
- Organised and ran collaborative workshop with BT and computing lecturers to develop multiple computing projects for MSc, BSc and DTS.
- Developed socio-digital projects with ICSJ for offer to psychology and criminology students
- Support for dissertation project for SCC / UoS Civil Engineering Apprentice

10.8   SMART house initial and emerging case studies and research projects

Work in Smart House continues to include development as research and educational facility. Projects are being broadly developed by:
- Workshop with BT Applied Research and computing lecturers
- Liaison with BT and other partners
- Discussions with criminology, social justice and psychology researchers and lecturers
- Liaison with multiple technology providers
- Collaboration with local authorities

10.9   Natural Building Systems (NBS Ltd) Project. (£25K)

The project was funded was to work in collaboration with NBS Ltd to take there To observe the fabrication, build and installation of an innovative zero-carbon test building, utilising biobased insulation materials and modern methods of construction at the BT Adastral Park in Ipswich as part of the University of Suffolk Sustainability Institute. Funded by New Anglia LEP through the UK Government's Community Renewal Fund, the project aims to demonstrate the feasibility of this manufactured construction and assembly solution together with the potential for buildings to act as net carbon sinks.

Objective
   -Trial a new approach to ADEPT delivery using a component-based method of assembly (appropriate for awkward access sites)
   - Demonstrating the ease and efficiency of the construction process and potential future adaption
   - Document the production and assembly process to capture lessons learnt and feed
   into design & process improvements
   - Instrument the building for future analysis to enable us to evidence the actual thermal performance in comparison to estimated values.

   The Institute's role is to monitor the performance of the building over an extended period, in parallel with the new Digitec Smart House for temperature, IAQ, liveability and Humidity.