

University of St Andrews Annual Sustainability Report 2020/2021



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 Green Gown
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Executive Summary

In January 2021 the University Court set a target of Net Zero by 2035 for the University of St Andrews and adopted our new Environmental Sustainability Strategy. The University's definition of net zero encompasses carbon and all greenhouse gas emissions, as well as stopping other forms of environmental degradation. It also addresses ways in which we can enhance the environment and generate a positive impact on the planet, including a just transition.

The Environmental Strategy was consulted on extensively within the University community ahead of its presentation to Court, and the response to our enhanced ambition was highly positive. Court's adoption of it signifies a pivotal point in the University's approach to sustainability that will enable us to initiate projects and processes to embed sustainability across the entire organisation.

Our target for net zero, set some ten years in advance of that of the Scottish Government, communicates our ambition to lead a wider transition in society, and to ensure that the up-coming generation has the skills and knowledge to deliver a sustainable future.

This report shares our key activities, actions and achievements from the Academic Year 2020/21 under our 'three missions for sustainability'. These are:

Sustainability Positive, establishing a net positive impact on the environment, and our wider influence through research and teaching.

Carbon Net Zero, emitting no more greenhouse gases than we sequester.

Climate Adaptive, planning our future estate and operations cognisant of a changing climate.

Net zero by 2035 means net zero impact on the planet, encompassing emissions as well as stopping other forms of environmental degradation.

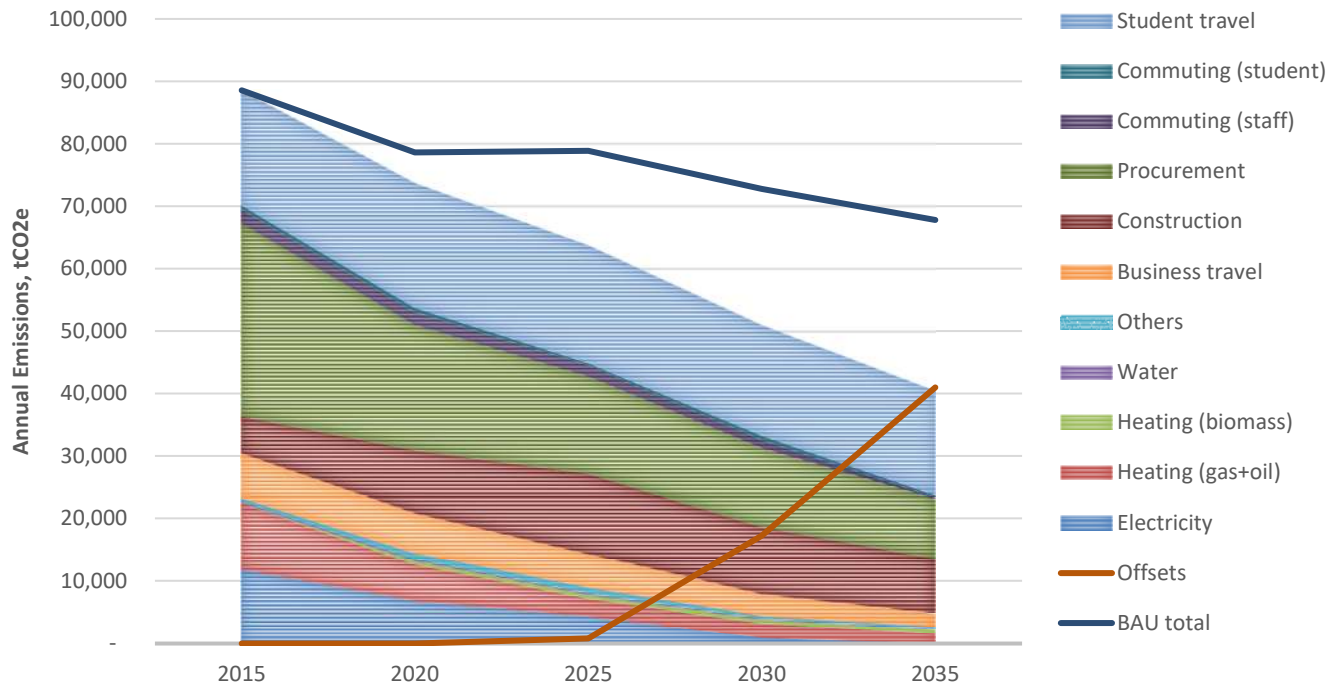
The pandemic has had a marked effect on activities during 2020/21, both reducing and changing our carbon footprint in an atypical manner. The disruption created also opens new avenues of possibility as we, like many around the world, aim to 'build back better'.

The University's Environmental Sustainability Board (ESB) continues to engage with the University community, including our students, to guide our institutional journey to net zero, setting direction principally through five groups that address: Research; Teaching and Learning; Students and Community; Estate, Energy and Environment; and Operational Adaptation.

Our approach has become even more outcome and data focussed, and this year we have included a suite of high level key performance indicators to enable the University to track progress across our three missions. Under Carbon Net Zero we have set trajectories and required reductions by each of our carbon emission streams, across our operations and behaviours, in order to track our progress to net zero by 2035. Indicators for Sustainability Positive and Climate Adaptation have been identified and will be monitored from 2021/22.

The challenge remains immense in terms of conceptualisation and action. A net zero future is a significantly different future. The highlights section illustrates the bold steps already taken at St Andrews on this journey.

Carbon Footprint and Trajectory 2015-2035



generation solutions such as wind, solar and biomass to meet what will be a markedly increased need for power from non-fossil fuel sources.

The University expects that natural gas will be eliminated as a fuel supply for heating the estate, and replaced through either biomass or alternate green fuels or the electrification of all buildings and transport. This transition will be planned in combination with a more efficient use of our space and enhanced building maintenance.

We will seek to reduce business and commuter travel, and will work with our community and

partners to improve public transport options for staff and students alike to reduce carbon emissions from commuting.

Additionally, the University will seek to avoid unnecessary procurement alongside identifying more sustainable purchasing options to reduce our carbon footprint further.

In terms of the University's supply chain, aside from local energy provision, the University expects that society will drive a reduction in the carbon footprint across all of the University's emission sources by an average of 25% by 2035.

The balance of our carbon footprint will be offset by a combination of nature-based carbon sequestration activities, such as the St Andrews Forest, and the development of carbon capture from the biomass boiler and other facilities, with that carbon reused to create new fuels to replace the need for fossil fuels.

Our Carbon Net Zero 2035 Pathway

Achieving carbon Net Zero at St Andrews will require a combination of behavioural change to drive down demand and waste, investment in more sustainable systems and products, and wider societal investments in major infrastructure. Even if we and our societal partners reach our goals, we will need to offset our remaining carbon.

The University plans to improve the efficiency and utilisation of its estate, reduce business travel, and will emphasise sustainability in the construction activities that must be undertaken to deliver our core services.

There is an expectation that there will be a significant bolstering of the local energy network, including power storage, and that by 2035 the grid will be substantially greener. Even then, the University may have to invest in local power

2020-2021 Highlights

Launch of the St Andrews Forest

In June the University launched the St Andrews Forest, an ambitious, long-term project inspired by our students to create a global tapestry of woodland and other nature-based projects.

The primary goal of the Forest is to sequester an amount of carbon equivalent to the emissions of student travel to and from St Andrews at the beginning and end of semesters. This is estimated to be equivalent to 20,000 tCO₂e/year.



ESB Students championing the St Andrews Forest in Clackmannanshire

The Forest is built around three pillars – Carbon, Nature, and People. While offsetting is a key driver, through its creation many other benefits can be achieved including enhanced biodiversity, ecosystem services, and health and well-being benefits. It will also provide a focus for research and hands-on teaching.

The Forest was launched by our alumni, Their Royal Highnesses the Duke and Duchess of Cambridge, who planted the first tree of the Forest in St Salvator's Quadrangle. The location of this tree at the heart of the University was deliberate – a living symbol of the importance of sustainability to the University's future.

Our alumni and friends have already contributed areas of woodland in Scotland and planted individual trees in their own gardens. Local planting projects will be undertaken during the 2021/2022 tree planting season in and around St Andrews.

New District Heating Network in the Old Town

This year the University energised our second district heating network in the University's historic core. This is a nodal network with the potential for future phased expansion. The initial phase is saving over 250 tCO₂e/year, as well as opening the opportunity to transform our strategy on how we heat our town centre buildings.

Commencement of works on a second district heating loop at Eden Campus has also begun, and pipes were laid to connect all planned future buildings to low-carbon heat from the University's biomass plant.

Enabling a Sustainability Positive Culture

The St Andrews Network for Climate, Energy, Environment and Sustainability (STACEES), a truly interdisciplinary research network, was launched by the University in April 2021 with the support of funding from the Scottish Funding Council. STACEES has a vision to place the University at the centre of international debates on environmental sustainability, as well as providing research insights to support the University to achieve its sector-leading vision of 'Net Zero by 2035', and putting St Andrews in a position to strongly target large-scale funding opportunities. Since its launch, STACEES has been leading a wide variety of initiatives designed to boost the impact and visibility of environmental sustainability research at St Andrews.

Starting from this year, all University of St Andrews students now complete sustainability training as part of their matriculation process. TESA – Training for Environmental Sustainability Action – starts the student sustainability journey by providing access to sustainability facts and guidance on practical actions for sustainability, to all students.

The University's refreshed [sustainability website](#) launched, which includes all information on University net zero targets and sustainability related information, helping to simplify the user experience and provide increased external visibility on our plans and targets.

Though the ESB has not yet been able to hold a face-to-face meeting, much has been achieved in our drive towards a sustainable future. This was acknowledged at the close of the year, when St Andrews was shortlisted as a finalist for 'Sustainability Institution of the Year' in the UK Green Gown Awards, which recognise leadership and innovation in our sector. Whilst out of sync with the reporting period, the University subsequently won this national accolade.



STACEES Sustainability Series photographic exhibition in St Salvator's Quad

Key Performance Indicators

Sustainability Positive

A holistic net zero target will require us to measure the wider impacts of our teaching, research and behaviours. Progress has already begun in these aspects, with the launch of STACEES and introduction of environmental sustainability teaching awards. It is important we develop the means to measure, track and record our work in these areas as we move forward.

Indicator	Current	Previous	Target	Comments
1.1	Percent of staff who feel empowered at work to make decisions that are more environmentally sustainable			TBC <i>Pending staff survey results</i>
1.2	Research award value for research in climate change, energy research and environmental sustainability across the University as a percent of total research award value			TBC <i>Not yet measured</i>
1.3	The proportion of new modules with Intended Learning Outcomes with environmental sustainability content			TBC <i>Not yet measured</i>
1.4	kg of waste to landfill per student FTE per annum	191	180	Zero Increase in year due to pandemic impact and increased use of disposable items

Carbon Net Zero

Indicator	Current	Previous	Target	Comments
2.1	Estate energy (Scope 1 & 2 emissions) per student FTE per annum	1.41	1.23	0.85 Increase since last year due to reopening and configuring COVID secure buildings, and provisioning Can Do capabilities
2.2	Scope 3 emissions per student FTE per annum	3.53	6.79	3.50 Significant reductions resulting from impact of global pandemic, put us on a par with 2035 target for Scope 3
2.3	To offset University carbon impacts to achieve net zero (forecast tCO ₂ e)	40,000	-	40,000 First year of reporting – forecast based on 2035 vision and carbon pathway

The University has seen a dramatic reduction in carbon emissions this year, a component of this has been from our continued sustainability performance, with large reductions resulting from pandemic impacts of reduced procurement, construction and close to zero travel. The University's total¹ carbon footprint is down 27% on the previous year, at 50,336 tCO₂e for 2020-21. This level of reductions is close to our 2030-35 emissions target, and demonstrates the level of change required to achieve Net Zero.

¹ Our total footprint is our entire institutional footprint including procurement, construction and commuting carbon

Climate Adaptive

We continue work to evaluate and mitigate the impact of climate change on the University, and utilise the Adaptation Capability Framework benchmarking tool to highlight governance and adaptation issues. The tool clearly outlines actions for improvement in the operation of the University to increase its resilience to climate change. Through this we have outlined our Climate Adaption Plan and processes we will use to commence detailed risk workshops in the coming year.

Indicator		Current	Previous	Target	Comments
3.1	Climate readiness within each of the relevant geographical areas of our estate	Amber	Amber	Green on aggregation	High level risk sat on University risk register. Will be subject to future refinement based on detailed risk assessment and actions completed in due course.

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Introduction

Following the recommendation of the Environmental Sustainability Board (ESB), Court approved a vision for the University to be Net Zero by 2035 in January of 2021. This vision, amongst the most ambitious in the sector and encompassing all environmental impacts of our operations, has given focus to the University's planning for sustainability and supported the acceleration of activities. Work is underway on how we integrate net zero into our everyday thinking and drive forward the transformative measures required to reach our 2035 target.

The University has seen a dramatic reduction in carbon emissions this year, a component of this has been from our continued sustainability performance, with large reductions resulting from pandemic impacts of reduced procurement, construction and close to zero travel. The University's total² carbon footprint is down 27% on the previous year, at 50,336 tCO₂e for 2020-21. This level of reductions is close to our 2030-35 emissions target and demonstrates the level of change required to achieve Net Zero.

The ESB celebrated its first-year anniversary, and this report includes contributions from all five working groups describing respective activities and achievements.

The pandemic has continued to impact much of our daily operations and lives, and whilst the ESB has not yet been able to hold a face-to-face meeting, much has been achieved in our drive towards a sustainable future. This was acknowledged at the close of the year, when St Andrews was shortlisted as a finalist for 'Sustainability Institution of the Year' in the UK Green Gown Awards.

2020-2021 highlights:

- Launch of the St Andrews Forest by our alumni THR the Duke and Duchess of Cambridge. The Forest is a long-term programme to create a global tapestry of woodlands and other nature-based projects, which will reduce the amount of carbon in the atmosphere, and forms a key component of our net zero ambition.
- Energisation of the University's second district heating network in the University's historic core, a nodal network with the potential for future phased expansion, with the initial phase saving over 250 tCO₂e/year.
- Launch of the St Andrews Network for Climate, Energy, Environment and Sustainability (STACEES), a truly interdisciplinary research network in April 2021. STACEES's vision is for the University to be at the centre of international conversations on environmental sustainability.
- Winning a £139,677 NatureScot grant to support the change from high-cost, low biodiversity grass mowing regimes to systems that are less intensive and support greater biodiversity. Called 'Meadows in the Making' the project is an important link between practical conservation work by our Estates' Grounds Team and ecologists in the Environment Team. So far, the project has created over 7 hectares of new Meadow.

² Our total footprint is our entire institutional footprint including procurement, construction and commuting carbon

Sustainability Report 2020/21

- Winning three prizes at the Green Gown Awards 2020. Our students Millie Sutton and Lottie Evans were named 'Sustainability Champion – student category' for creating TESA; the Residential and Business Services team won the 'Campus Health, Food and Drink' award for reducing the environmental impact of catering; and Tom Dawson, Principal Research Fellow in the School of History, was highly commended in the 'Benefiting Society' category for developing research projects which support communities to engage with coastal heritage sites endangered by climate change.
- The University hosted the first meeting of the St Andrews Local Net Zero Network to partner with organisations including the R&A, the Links Trust, representatives of local business and tourism, and Leuchars Army Base, as well as Fife Council, and the Community Councils in St Andrews and Guardbridge on a sustainable transition.
- The ESB students launched a student-led workshop series on Carbon Management and Nature Based Solutions, associated with the development of the St Andrews Forest, to over 100 of their peers.

The sustainability work currently being carried out at St Andrews links closely to many of the UNs 17 Sustainable Development Goals (SDGs) – we have highlighted how our work relates to the appropriate SDGs in each section.

The Environmental Sustainability Board

The ESB is purposed to support the University in setting its strategic direction on environmental sustainability, and to engage across the institution to develop ideas that realise this. It continues to be chaired by Professor Sir Ian Boyd.

The ESB has addressed the 17th SDG (Partnership for the Goals) and in particular 17.14 (Enhance policy coherence for sustainable development) by establishing and approving sustainability policy at the highest levels of University governance. The ESB will continue this role within the University.

Following extensive consultation with the University community, the ESB proposed an environmental strategy to the University Court in January 2021 centred on a vision for the University to become 'Net Zero by 2035'. This includes net zero impact on the planet, encompassing emissions, as well as stopping other forms of environmental degradation, and recognises not only the need for a just transition but its potential to deliver a fairer, more prosperous society. Court approved the strategy and plans are advancing it deliver it under the missions of 'Sustainability Positive', 'Carbon Net Zero' and 'Climate Adaptive'.

Extended Scope 3 emissions – including return student travel to the academic year – are, at the recommendation of the ESB, now included in the University's carbon footprint and will be addressed in our planning for net zero. This planning has been advanced through the creation of a Pathway to Net Zero (see Carbon Targets) that sets out the key reductions in carbon required to be made by the University to reach net zero, as well as those we expect to see delivered externally. In our approach we recognise the need for offsetting difficult to eliminate carbon, and the University is now advancing work to develop nature-based offsetting opportunities.

After Court endorsed the strategy and vision, the ESB Working Groups have led the development of plans for realising it. These have taken the form of Working Group Strategy Modules that set out long-term goals and the near-term steps to action them across the five areas of: Research, Teaching & Learning; Estate, Energy and Environment; Operational Adaptation; and Student and Community. These modules have also been used to create a Transformation map (T-map) for Sustainability that sets out actions through to August 2024. A suite of Key Performance Indicators for this work have also been developed.

In addition, the ESB has supported the University's planning for COP26 and facilitated St Andrews winning Observer Status for the Glasgow event.

The University's Annual Sustainability Report has been revised to reflect our refreshed approach to sustainability, and to signify our shift in behaviours as we being to put the systems and actions required in place to deliver a sustainable St Andrews.

Sustainability Positive

Biodiversity

In autumn 2019 the University formed a Biodiversity Working Group and launched a Biodiversity Action Plan. The working group meets quarterly and is responsible for habitat infrastructure, planting, and management to improve the conditions for species living on our grounds.

Projects supporting the Biodiversity Action Plan include the NatureScot Biodiversity challenge programmes 'St Andrews Green Corridors' and the follow up programme 'Meadows in the Making' as well as 'St Andrews BioBlitz'. The Meadows in the Making initiative is a landscape-scale project that seeks to create a network of meadow habitat in open spaces in and around St Andrews and Guardbridge for the benefit of people and pollinators. Around 7 hectares of closely-mown grassland will be brought into meadow management, allowing wildflowers to flourish and attract a variety of wildlife. Around 1.3 hectares of woodland and 2,700 meters of hedgerows will also be planted. Meadows in the Making will offer lots of opportunity to get involved in practical conservation activities such as hay raking and seed gathering, wildlife surveys and monitoring, events, and training. The factor critical to the success of this work has been having an ecologist within Estates working alongside a designated practical conservation worker within the Grounds Team. This has enabled key decisions on the implementation and management of green spaces to be undertaken quickly and efficiently, whilst enabling students and staff to engage in the practical conservation work that is much valued by employers.

BioBlitz encourages people in St Andrews to engage with biodiversity. Students, locals, and scientists gather to survey biodiversity in designated areas. The data they collect help establish a baseline of invasive species and give an understanding of species shifting their ranges north due to climate change.



Rewilding embankment at the North Haugh

Our Biodiversity Action Plan is linked to target 15.5 (Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species), 15.8 (By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species)

Circular Economy

During the current pandemic certain existing methods of waste minimisation had to be reversed due to safety concerns. Even in these challenging circumstances the University has:

Increased the number of buildings where 'Bin the Bin' has been introduced. The objective of this project is to remove individual office desk bins and introduce centralised bin facilities, to which individuals are encouraged to take their waste items for sorting and recycling. The project has been expanded to Physics, Chemistry, the Byre Theatre, Butts Wynd, New Arts and parts of the Library and Students Union.

Upcycled desks and chairs that became surplus following moves of staff in the town centre. These were remanufactured locally by the Kinross Wooden Products Company, with some items returned to the University, helping to increase the circular economy, and others donated to community groups, schools and charities.

Introduced vegware composting collections in halls of residence to reduce compostable packaging going into landfill, as a result of students taking food items back to their rooms. Vegware needs to go to in-vessel composting over anaerobic digestion, hence the need for alternative composting collections.

Achieved an outstanding result in the end of term reuse campaign, with a further 4,300 bags donated to charity, this representing 35 tonnes of donated material at a value of £60,000 to the charity. This, along with our achievements in the previous years, has allowed us to reach a total of over £160,000 worth of donations to the charity, and over 85 tonnes of items being diverted from landfill.

Due to the pandemic, the University was forced to take decisions that have caused an increase in waste, such as reverting back to trays in catered halls and disposable packaging, as well as many single-use items. This has had a negative effect on waste figures in period and is likely to continue into 2022. Currently our recycling rate is at 31%. These figures are becoming more accurate than any previously reported figures, and when our approach to data gathering becomes even smarter, will likely decrease further.

The Sustainable Resources Plan has been developed this year, which focusses on the circular economy and waste hierarchy, in line with the Scottish Government's agenda and will be issued for wider consultation in the coming year.

The waste management strategy used by the University is addressing the 11th (Sustainable Cities and Communities) and 12th (Responsible Consumption and Production) SDGs. The University's dedication to the sustainable reduction, recycling, and reuse of materials reflects targets 11.6 (By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management) and 12.5 (By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse). The reduction in food waste in our residential catering is linked to target 12.3 (By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses).

Environmental management and compliance

The University has embraced the task of environmental management, and there have been no compliance issues during the year (i.e. no infringements of environmental legislation and no enforcement notices). The University fully complies with the terms of the Zero Waste (Scotland) Regulations which require us to segregate and manage recovery of our food waste.

Organisational Culture

With the Covid pandemic requiring staff to work from home, travel behaviour has changed significantly and normalised video conferencing and, to a lesser extent, walking and cycling. We have also seen large uptake in electric vehicles by staff with membership of the Universities EV Forum trebling, whilst pressure on chargers has increased too with more residents and local businesses using University chargers rather than the Fife council points that require payment. Our EV charging network has grown to 13 public chargers (26 points) and 12 University Only chargers. During this period the University also increased its own EV fleet from 7 to 11 vehicles, bringing us up to 15% of vehicles being electric and staying on target towards 100% by 2035.

The **Transition UStA** team supported sustainable transport at the University through a programme of over £100,000 of external funding from six different funds. There four travel related staff include a Campus Cycling Officer, two Sustainable Travel workers, and the team manager plus an external path consultant and bike mechanics.

Cycling: The University maintained its 'Excellent' rating as a Cycle Friendly Campus, based on its work and ambition outlined in the Cycling Strategy. This programme was supported again by Cycling Scotland funds paying for a Campus Cycling Officer together with funding from Fife Council's, Smarter Choices Smarter Places. Our campus cycling officer took on the theme of increasing diversity in cycling during the pandemic, through leading on a national conference on the issues and winning recognition amongst the UK's 'Top 100 women in Cycling'. This led on to a summer intern investigating the practical actions we can take here, alongside running an 8 week adapted cycle trail. A second summer cycling intern developed a plan to bring a shared bike scheme to St Andrews, which is now being worked on via the St Andrews MaaS project

Interest in cycling rose nationally during the covid pandemic, although we saw a decrease in the condition of bikes across campus from 5% unrideable in February 2020 to 36% by the summer of 2021. Bike pool maintenance sessions were constrained due to social distancing measures but still fixed 108 bikes at 22 sessions. The strategy to train up volunteers as bike mechanics and cycle trainers has led to much higher volunteering rates. This includes the 180 hours volunteers spent refurbishing 75 rental bikes following 7 people gaining their Gold (professional standard) velotech and 11 silver. We ran Cycle ride leader training and led rides whilst sending six locals on the Sustrans Making Cycling Mainstream course to learn about path development. The staff Go E-bike scheme continues to help staff move about quickly during work and on the commute. Plans to start offering Go E-Bikes from Eden Campus were delayed whilst better cycle shelter options are developed.

The Bike Pool loan scheme ran over 70 rentals which generated an income of over £3000 to support further cycling activities. The scheme also offered key workers free uses of a loan bike along with helmets, locks and lights with seven people taking this offer up.

Engagement and behaviour change

Training in Environmental Sustainability Action (TESA), the online student matriculation module, dedicated to helping guide students in how to take sustainability action when in St Andrews, has now been completed by all students. It includes practical tips on action relating to energy, water, food, biodiversity, waste minimisation (circular economy), travel and social justice.

A new [sustainability website](#) was launched, aimed at developing a 'one-stop-shop' for all sustainability related activities and information. The website helps users to easily find the information they are looking for, without having to search through a variety of websites. This simplifies the user experience.

In addition, 32 School Sustainability Representatives (SSR) were recruited from 17 of the University's academic schools in 2020/21. The SSR is a voluntary elected position for both undergraduates and postgraduates across the University. The key responsibilities of the SSRs are to:

- 1) increase environmental awareness by running sustainability-themed events at the academic schools
- 2) be an agent of change by organising audits and leading campaigns that make the school into a more environmentally-friendly place
- 3) liaise between the Environment Team, the Environmental Sustainability Board and the School to map and promote sustainability in the curriculum

We continue working with previous successful strategies. The Environment Team has had a presence at every student fayre to inform students and promote the sustainability efforts of the University. Through staff training programmes, other student representative roles, the publication of our Green Guide 2021/22 and the student interhall environment competition, we raise awareness of energy, waste minimisation, and sustainable travel.



Adaptive bikes demonstration in St Andrews

Our transport surveys show that the main barrier to cycling is fear of traffic, and the solution being traffic separation. Transition has continued its work on two path creation programmes, with funding from Sustrans, in order to develop new paths and support active travel within the town and beyond. The St Andrews Active Way is a partnership of community groups, administered by Transition, that is looking at large scale, long term path projects that aim to increase active travel across the town.

Infrastructure projects have included the upgrading of cycle shelters at the Jack Cole Building and the Observatory with funds secured from Cycling Scotland. Communication is also key and new signage has been introduced across the North Haugh supporting walking and wheeling. Transition also created Active Travel maps for Eden Campus and installed way marked trails to encourage staff to exercise and explore the surroundings, tied into the Step Count Challenge.

Every year within halls, students are nominated to become Hall Environment Representatives, taking part in the Interhall Environment Competition. The role includes helping to reduce energy bills and costs throughout the year whilst promoting environmentally sustainable behaviours to their student bodies. Student Representatives promote environmentally friendly choices in halls of residence through creating events, campaigns, and distributing information. In the first 6 months of last year, the interhall environment competition saved an estimate of 105 tCO₂e. This demonstrates the impact of our work to engage students and staff and motivate us to continue developing projects promoting behaviour change.

The large range of behaviour change activities with which members of the University engage and promote address various aspects of SDGs 2 (Zero Hunger) and 12 (Responsible Consumption and Production). Edible Campus and The Tree contribute to target 2.3 (By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment) by increasing the knowledge and practice of growing in the local community and providing opportunities for local farmers to reach a wider market for their products. The StAndRe-Use project addresses target 12.5 (By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse) as thousands of kg of goods are diverted from landfill. The Kernel, and in particular the Toolshare, provides resources that also address target 12.5 as it allows tools to be re-used by a whole community. The other various behaviour change activities undertaken at the University work towards target 12.8 (By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature) as students, staff, and the wider community are educated about sustainability and the environment.

The University's strives to provide various forms of safe and environmentally-friendly transportation contribute to achieving SDG 11 (Sustainable Cities and Communities) and in particular target 11.2 (By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons).

Sustainable food

As a result of Covid-19, waste reduction initiatives brought in during 2019/20 have had to be changed to maintain social distancing. In the future we intend to bring these measures back in, including tray free dining, reusable cups, water filters and reusable Tupperware.

During the pandemic, vegware recycling bins have been introduced to encourage composting vegware through in-vessel composting. This has seen 8.9 tonnes of vegware being composted. More plant-based meals were introduced this year, as we engaged with more vegan and vegetarian suppliers.

We are accredited as a Fair Trade University and supported the **Fairtrade Fortnight** in March. Four events were hosted during this event, with four different student societies. You can find all these successful events on the [Fairtrade Facebook](#) page.

We have also engaged the local Food Cooperative 'The Tree' to spread information about Fair Trade relating to female empowerment, fast fashion, social justice, and socio-cultural aspects of the banana industry. The Tree also helped spread information on actions taken by the University and actions that individuals could take. Our Residential Business Services helped spread this information too through their meal boxes.

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The University has continued to serve Fair Trade tea, coffee, and juices at our cafes and distribute locally made face masks of Fair Trade cotton. We meet quarterly with the Students' Association President and the Fair Trade Steering Committee to keep up to date with Fair Trade action in the University. Our academic Sustainable Development Society hosted a competition 'Bananas about Fairtrade' where people were to dress up/make art/carve Fairtrade bananas and interact on our social media pages.

The reduction in food waste in our residential catering is linked to target 12.3 (By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses) and 12.5 (By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse). The success with Fair Trade through collaboration is linked to target 17.6 (Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries)

Transition University St Andrews

The Transition University of St Andrews (Transition UStA) team has bounced back after furlough and funding changes in 2020 with a number of successful grant applications and new appointments of staff and consultants. As a student led Community Interest Company linked to the Estates Environment Team it raised £242,000 of external funding in this period to deliver its programme of work that covers University and community outcomes. Its team of six staff was complemented by two externally funded summer internships and the support of two external consultants as well as paying partners at the St Andrews botanic Garden and Fife Coast and Countryside Trust for roles within partnership projects.

Transition UStA has also been active this year in supporting the Fife-wide Climate Action Fife programme which is delivered by a partnership including Fife Council, Greener Kirkcaldy and the Fife Communities Climate Action Network. Its role has included the development of the Fife Community Woodland project to identify community planting sites that may potentially assist with the St Andrews Forest. Transition UStA is also part of the Transition Town movement which has recently received the largest 'climate action fund' lottery grant to date, and we have plans to engage with the network to ensure resources and support come to St Andrews.

StAndReuse: This Transition UStA household waste re-use programme has had a challenging but busy year and gained a large number of local residents as volunteers which has been vital over the busy summer months. With the base for re-use being demolished as part of the Albany Park redevelopment the project has moved to University Hall from where students and locals can get access to materials once collected from halls. During this period over 600 students, 40 staff and nearly 100 residents have accessed the scheme and taken goods worth in excess of £30,000

Edible Campus: The 14 growing sites continue to operate across campus, but the programme of activities has reduced as capacity in the transition team was lost after external funding closed. The transition team promote the project, coordinate safe garden sessions and manage resources. Harvest was much reduced this year due to activity across sites being hampered by Covid but activities are picking up with the new Semester and return to face to face work.

A new garden at the Students Union has been developed with the BAME society and LGBTQ+ sub committee.

The Tree Food COOP: This service links local producers with mainly student customers via an online shop front. Deliveries of food continued through Covid but have been re-established from September. It provides real life business experience for students with a number going on to set up or work with similar projects when they leave St Andrews.

Toolshare: With the kernel facility closed during lockdown the Tool Library was moved to Woodburn to allow tools to be accessed and serviced. A successful bid to the Climate Challenge Fund for new tools, a bike and trailer, as well as lockers meant that tools could be loaned out via a pick-up station at the Students Union rather than face to face. Loan days have increased by 300% to 7452 days and membership numbers have gone up too.

Town Cleans: Linked to the Toolshare has been the loan of litter picking kits. With funding from Keep Scotland Beautiful, Transition purchased three new litter pick kits that are made available via the Toolshare to groups to run events, along with guidance and expertise. Over 15 events were supported this period. Transition also runs litter picks during Orientation, and special events in response to community concerns.

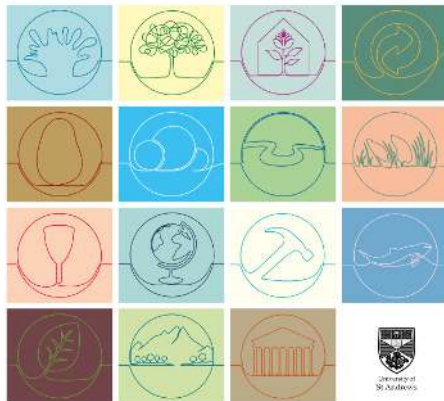
The St Andrews Green Film Festival: This moved online during Covid and showed a regular programme of films during term, alongside discussions. The subgroup of Transition is made up from local residents and students who are interested in showing films that link to action on sustainability. As part of the annual festival, in February short film competition was run with judges from Film Studies and Sustainable Development departments

Skillshare: With a focus on repair and sustainable food, this programme continues to deliver around two peer-led sessions per week (102 sessions this period) whilst enabling students and local residents to work together. The programme builds the capacity of participants, whilst engaging them in discussion on Climate Action.

Research at St Andrews

The Research working group of the ESB was established in February 2020 to advise on how to position the University as a global leader on environmental sustainability research, in line with the University Strategy 2018-23. Drawing on the expertise of a wide and interdisciplinary group of researchers through its Steering Group, the working group has built an ambitious strategy to bring the University to the forefront of cutting-edge environmental sustainability research, focused on two strategic modules.

The Sustainability Series



STACEES
St Andrews Network for Climate, Energy,
Environment and Sustainability

The first module aims to boost the volume, visibility and impact of the University's research on climate change and environmental sustainability. The second module aims to minimise the environmental impacts of University research activities.

The implementation of these modules is being facilitated by the 'St Andrews Network for Climate, Energy, Environment and Sustainability' (STACEES), a new research network established by the Research working group.

STACEES is a truly interdisciplinary initiative co-led by academics

across three Schools, with seed funding secured through SFC funds to the internal SARIRF call, which enabled a launch in April 2021, and further University funding secured to support the network through to July 2023. STACEES's vision is for the University to be at the centre of international conversations on environmental sustainability, thus putting St Andrews in a position to strongly target large-scale funding opportunities as they arise as well as providing research insight to support the University to achieve its sector-leading vision of

'Net Zero by 2035'. Since its launch, STACEES has been leading a wide variety of initiatives designed to boost the impact and visibility of environmental sustainability research at St Andrews. A selection of these activities is highlighted below:

Seminar series featuring internal and external speakers

Networking events for researchers aimed at establishing new collaborations and spurring new funding applications

STACEES exhibition (St Salvator's Quad): A series of ten photographs illustrating the breadth of the University's environmental sustainability research

The Sustainability Series: A collection of 15 outward-facing articles showcasing the research of STACEES members

Building on the activities of STACEES, the Research working group are developing a proposal for a new institute of advance studies for climate, energy, environment and sustainability (The Sustainability Institute). Early consultation across the University has been met with enthusiasm and interest. As a first step towards turning this vision into a concrete proposal, the STACEES Research Fellow is investigating the structures and funding models of successful institutes around the world which could serve as exemplars for The Sustainability Institute. This research will inform the development of a formal proposal for The Sustainability Institute early in 2022.

Our research supports SDGs 4 (Quality Education) and 17 (Partnership for the Goals) by increasing and sharing knowledge of climate change and mitigation efforts, as well as collaborating with other research partners across the globe.

Sustainability in the Curriculum

The Sustainability in the Curriculum Committee has led the formulation of the Education strategy module as a component of the University's new Environmental Sustainability Strategy. This includes an expansion of its remit and membership to include the promotion of environmentally sustainable careers. The Committee has introduced two prizes and a mark of recognition for environmental sustainability teaching. The first of the prize is for the best designed new module proposal submitted to the Curriculum Approvals Group (CAG), and the second is for an existing module addressing sustainability and modules are nominated to this prize. To recognise excellence in sustainability teaching more widely and help students find courses, a Golden Dandelion 'stamp' was launched for modules at St Andrews which excel in teaching environmental sustainability. The stamp is awarded to the modules nominated to the Sustainability in the Curriculum Prize and which fulfil the criteria of [QAA's guide on Education for Sustainable Development](#). The committee also developed a Green Careers Guide for students leaving University and starting their careers which provides tips on how to help embed sustainability into their place of work.

The University's first online sustainability summer short course, run by the Associate Dean Education (Science) in conjunction with the Global Office, engaged participants in interdisciplinary lectures and group discussions over seven weeks. Topics included food security, education for climate justice, global temperature changes, energy ethics, and a lecture on sustainability in practice, delivered by St Andrews Prize for the Environment winners, Litre of Light.

The actions taken support SDGs 4 (Quality Education) and 13 (Climate Action). The University's dedication to incorporating sustainability into all aspects of education will address targets 13.3 (Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning) and 4.7 (By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development).

Students and the Community

It has been a busy year for those involved with student and community sustainability in St Andrews, despite the pandemic. Achievements of the Students' Association Environment Subcommittee and ESB Student and Community working group (S&C) are set out below.

Students' Association Environment Subcommittee

For the second year in a row, the University year began with a Line in the Sand climate protest. This year the Environment Subcommittee and Transition organised a symbolic protest. Due to Covid restrictions a line of shoes donated from StAndReuse were formed on West Sands beach to represent a call for action.

The Subcommittee continued to expand their Unearth magazine, which was launched in 2019. The team created regular issues of the magazine, with over 20 writers, editors and artists involved with its production. Themes explored in the magazine included social and climate justice, intersectional environmentalism and anti-capitalism.

Intersectional Environmentalism became a key theme of work within the Environment Subcommittee throughout the last year. The subcommittee started to incorporate social justice into its vision. Several speaker events were organized to show how environmental activism is interconnected with land rights, decolonization and anti-racism. For instance, events were held on decolonizing conservation, neo-colonialism through green energy infrastructure, crofting rights and writing climate justice into law. The Subcommittee also increased their collaboration and outreach with organizations such as the Third Generation Project. They ran several social media campaigns to highlight various other intersections of climate justice with LGBT+ rights, disability justice etc.

Green Week 2020 was held virtually, with a range of successful events that resulted in high attendance rates. The week was centred around daily themes, including focussing on social justice, system change and rising against capitalism.

ESB Student and Community Working Group

Over the last year, the ESB Student and Community Group (S&C) have finalised their strategy modules, creating three that are titled Sustainable Saints, Green St Andrews and Beyond the Bubble. They have also engaged in a range of activities, as described below:

The most significant outcome of the ESB S&C's work over the last year has been the development of the St Andrews Forest proposal, which has now begun to be implemented. This project is enabling the University to create its own regulated offsetting project for Scope 3 student travel emissions, whilst providing educational and research opportunities. Whilst the S&C, specifically Deanna Coleman, created this idea, the project is now being run by a project manager in the University. Members of the ESB S&C were involved with the official launch of the St Andrews Forest and the planting of the first trees, with the Principal and TRH Duke and Duchess of Cambridge.

As part of the St Andrews Forest Initiative, the ESB S&C created an online carbon literacy course, which was facilitated and accredited by the Centre for Educational Enhancement and Development (CEED). Experts from across the world led various modules. To receive the final certificate, students were split into groups by their discipline and year group - consisting of over 80 students, 12 groups were created - and were required to design a module outline for a topic inspired by the expert-led workshops. These ideas will all be pooled together by academic staff at the University to create a multi-disciplinary research agenda, including a new Vertically Integrated Project, which will be led by Prof Bill Austin.

Communicating to students, and the local community, has been a key part of the S&C's agenda over the last year. A Sustainable Saints radio show and podcast were created to discuss relevant issues and engage students. ESB students took over the University of St Andrews Instagram each month to spread environmental news to a wider audience. They also developed proposals for the creation of a 'sustainable introduction' to the University, through the creation of starter packs and a token scheme for hall catering, and for the first time a 'Sustainability Welcome' mail was sent to all returning students to the academic year 2021/22. They also began to develop a plan to make it easier for students to digest environment related information, by bringing communications on sustainability together in one place. This is a project they will further in the year ahead.

Whilst the importance of embedding awareness and garnering interest from the University's internal audience was a key activity for the group, engagement with external stakeholders who are fundamental to the conversation on sustainability locally was an area of work that developed over the year. As part of the Environmental Strategy consultation process, the groups engaged with stakeholders including and not limited to St Andrews Environmental Network, Sustainable St Andrews and the Royal Burgh of St Andrews Community Council.

In May 2021 the inaugural meeting of the Local Net Zero Network took place. This stakeholder network allows the University to actively engage key local counterparts in conversations surrounding sustainability, enabling explorative discussions on environmental initiatives, shared goals, and shared ambitions in terms of sustainability and becoming Net Zero. Attendees included representatives of local government, the Scottish and UK Parliaments, as well as the business and tourism sector and local agricultural establishments. A range of shared interests and topics for discussion were established including waste, carbon sequestration, transport and parking, strategies for behavioural change and training and local amenities and infrastructure.

Carbon Net Zero

The University's total carbon footprint for 2020/21 is 50,336 tCO₂e. Compared with the footprint for the previous year (73,880 tCO₂e) this represents a 35% reduction. Whilst this reduction is in part due to our planned downward trajectory, the pandemic had a significant impact on travel and procurement.

Carbon Footprint:

Greenhouse Gas (GHG) Emissions (CO ₂ e tonnes)		2018/19	2019/20	2020/21
Scope 1	Fossil fuels: Non-residential (tCO ₂ e)	3,224	2,967	6,964
	Residential (tCO ₂ e)	4,451	1,842	1,437
	Fleet Vehicles (tCO ₂ e)	125	123	32
	Refrigerant losses (tCO ₂ e)		187	262
Scope 2	Non Residential Electricity Purchased (tCO ₂ e)	5,090	4,373	4,066
	Residential Electricity Purchased (tCO ₂ e)	1,631	1,324	1,125
	Non Residential Heat Purchased (tCO ₂ e)	130	346	312

Greenhouse Gas (GHG) Emissions (CO ₂ e tonnes)		2018/19	2019/20	2020/21
	Residential Heat Purchased (tCO ₂ e)	306	359	369
Scope 3	Water & Sewerage (tCO ₂ e)	288	227	91
	Waste sent to landfill (tCO ₂ e)	381	728	863
	Waste recycled (tCO ₂ e)	37	16	15
	Non Residential Electricity Transmission	432	376	360
	Residential Electricity Transmission	138	114	100
	Business Travel (tCO ₂ e)	5,877	4,418	123
Sub-total Scope 1 to 3 Emissions (minimum requirement for external reporting)		22,113	17,268	16,119
Scope 3 (extended)	Construction (tCO ₂ e) *	13,023	10,000	7,500
	Procurement (tCO ₂ e) *	20,725	25,000	17,500
	Staff daily commuting (tCO ₂ e)	2,103	1,240	500
	Student daily commuting (tCO ₂ e)	720	450	250
	Student semester commuting (tCO ₂ e)	19,531	19,851	7,940
	Homeworking estimate (tCO ₂ e)**	-	-	526
Total institutional Scope 1 to 3 Emissions		78,198	73,809	50,336

*Based on DEFRA 2013 emission factors for associated construction & procurement spend

**Based on SSN methodologies provided under PBCCD and assumed 65% FTE

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Sub-total emissions reflect our previous reporting standard (as minimum external reporting requirement) and has been included for reference, total institutional Scope 1 to 3 includes our full operational footprint which will be taken forward as our emissions scope as part our science-based net zero carbon target.

Carbon Targets

Following the University formally approving its vision to be net zero by 2035, a carbon trajectory has been created, which outlines the scale and scope of carbon reductions required and a potential pathway to net zero 2035.

The Estate, Energy and Environment (E3) working group will continue to monitor targets and performance reported internally and externally, which now also includes our forecast offset requirement at 2035. A summary of estimated required reductions and our 2035 targets is provided in this section (with a 2019/20 baseline).

Future targets leverage carbon reductions in society but University reductions will also need to account for the impact of our increased space requirement and consumption from University growth.

To best manage and monitor, a specification has been created and endorsement from the ESB has been achieved, for a carbon accounting tool to improve our data and insights as we transition to net zero. Next year we will launch phase 1 of this tool to measure performance against these targets, improve data sharing, and challenge our supply chains in our continually review and low-carbon thinking (see the Operational Adaptation for further details).

Externally, and in the shorter-term our targets in the Scottish Funding Council (SFC) Outcome Agreement are as below:

The projected increases in 2021/22 result from an expected increase in travel, as a result of a relaxation of international restrictions and increased numbers of students able to attend St Andrews, an increase in construction activities, and an increase in heat requirement for buildings owing to increased ventilation requirements to manage CO₂ levels in response to providing a Covid-safe environment.

Category	2019/ 2020	Demand reduction		Supply reduction		2035 Residual	
	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e
Heating - Gas and oil	4,810	50%	2,405	20%	481	40%	1,924
Heating - Biomass	639		-	25%	160	75%	479
Electricity	6,186	20%	1,237	50%	2,474	40%	2,474
Water	227	40%	91	25%	34	45%	102
Waste	988	50%	494	60%	296	20%	198
Business Travel	4,418	30%	1,325	25%	773	53%	2,319
Construction	15,000	20%	3,000	25%	3,000	60%	9,000
Procurement	20,000	25%	5,000	40%	6,000	45%	9,000
Commuting (Staff)	1,025	40%	410	60%	369	24%	246
Commuting (Student)	355	10%	36	60%	192	36%	128
Student Commuting (start and end of term)	19,851	5%	993	25%	4,715	71%	14,144
Total emissions	73,499	20%	14,990	25%	18,494	54%	40,014

Natural offsets - lifetime carbon sequestration	20,000
carbon capture and reuse to avoid fossil fuels	20,000
	40,000

3 year period ending	Performance			Targets		
	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Gross carbon footprint - tonnes CO ₂ e	78,198	73,809	50,336	70,250	68,850	65,500

Reductions relative to 2018/19 (pre-pandemic) result from the UCRF funded Smart Campus Programme, which was completed in November 2020 and forecast savings remain on target. A detailed report is expected next period, following the conclusion of the M&V period in November 2021. Continued improvement has been achieved through our rolling Campus to Climate fund, plus plans to implement larger-scale projects in coordination with the Estates Capital Projects team. We also expect to maintain a reduction in levels of Procurement and Business Travel as part of a behavioural shift and new ways of thinking adopted in the pandemic.

We continue to work through EAUC Scotland with the FE/HE sector in Scotland to have agreed scopes and standard calculation methodologies for all expanded methods. The carbon performance by scope tables will be re-benchmarked once the full breadth of carbon reporting is agreed.

By taking extensive measures to reduce the University's carbon footprint, we are working towards addressing various targets of the 7th SDG (Affordable and Clean Energy). The Eden Campus biomass plant contributes to target 7.2 (By 2030, increase substantially the share of renewable energy in the global energy mix) by diversifying the University's energy mix. The energy efficiency projects that have been undertaken using the SALIX fund has allowed for the University to contribute to target 7.3 (By 2030, double the global rate of improvement in energy efficiency).

Carbon Performance

The top five carbon savings projects completed in this period include:

- Energisation of the Old Town district heating network and removal of all temporary boilers from St Salvador's
- Addition of a new plate heat exchanger in Physics to ensure 100% utilisation of generated heat from the CHP unit
- Rolling programme of LED installations in University buildings with the Trades team

- Science equipment reviews and replacement, including purpose of automatic sample loader to support consolidation of high consuming x-ray sources and cooling equipment to save energy across neighbouring labs
- Installation of window and insulation upgrades across a number of schools and residences to reduce heat demand and improve thermal comfort

The biomass plant had a continued period of good operation with no unplanned outages, representing a saving equivalent to over 5,000 tCO_{2e} of natural gas consumption.

The most significant reductions were achieved as a result of the global restrictions on travel, meaning overall last year the University achieved close to our 2030 reductions target. This was clearly not a normal year and demonstrates the scale and scope of transformational changes we will require as part of our 2035 target. Moving forwards it is important we maintain a reduced level of travel and procurement as part of a green recovery. This could be achieved by control of budgets and encouraging continued use of remote working technologies.

Externally the University is reporting on our 'whole institution' scope of emissions, which includes the embodied carbon of construction and the goods and services we procure, in addition to staff and student commuting (inclusive of student travel at the beginning and end of each semester).

Utilities management

To enhance utilities reductions and clean energy production, the Estate, Energy and Environment (E3) group of the ESB have produce four strategy modules to act as sustainability advice and inform our development workflows, building on our Carbon Management Vision.

Works have concluded on the UCRF Smart Campus project, energy savings from which are being monitored and externally validated, we are on track to deliver the 1,000 tCO₂e per annum forecasted. Works have been challenging in period owing to the availability of specialist contractors in material, and accordingly rolling Salix investment has been focused on a programme of LED replacements with our internal Trades teams, science equipment audits and replacements, and building fabric improvement trials.

The Old Town district heating project is nearing its first full year of operation, and planning permission has been achieved for phase 1 expansion (pending business case approval).

The team has also been successful in the award of LCITP grant funding for the development of an innovative enhanced ground source heat pump (EGSHP), which captures and stores heat rejected from the University data centre. This has potential to fully heat and eliminate gas consumption in our Arts and Library buildings. The project signifies a step change in how we can heat our larger buildings, and the resulting Investment Grade Business Case Proposal is pending final LCTIP decision on capital funding support.

The Eden Campus Energy Centre remains a significant component of our ambitions for carbon neutrality, saving approximately 5,000 tCO₂e in period. Works on a second district heating loop to serve all planned Eden Campus buildings commenced, with completion due by calendar year end. The network is currently at design capacity and next year it is important we review options to grow the network future, noting the five key objectives for the project that reflect its vision and continues to be a theme for our development:

- Achieve a 'step change' in carbon emissions
- Control energy costs and protect against volatility in energy prices
- Establish a green supply chain with local economic benefit
- Offer a low carbon exemplar and demonstrate the learning journey
- Implement the 'Guardbridge Guarantee'

Since 2007 the University has spent circa £5.2M through our energy investment fund (SALIX), which is delivering lifetime carbon savings of over 85,000 tonnes CO₂ across over 250 individual projects. This continued of investment has equated to an overall reduction of 6,500 tCO₂e from our 'business as usual' annual energy carbon footprint, through these incremental improvement projects. The University continues to demonstrate its commitment by extending this scheme internally with our Campus to Climate initiative, which also includes water savings and to invest over and above Salix applicable projects. This ensures that £400,000 of funding is available each year for energy reduction investments; energy savings are reinvested back internally and externally to the SALIX 'pot' to enable continued improvement.

Finally, in February 2020, the University resubmitted its planning application for Kenly windfarm. This project still has many challenges to overcome, however this resubmission clearly signals the University's intent and ambition to achieve our energy carbon reduction targets.

Operational Adaptation

The ESB Operational Adaptation (OA) working group, co-chaired by Dr Louise Reid and Dr Lindsay Wilson, works across four key areas to influence and reduce the University's Scope 3 emissions; Procurement, Travel, Development & Engagement and Digital. Scope 3 emissions are indirect emissions that occur in relation to our business as usual, for instance, the impact of our travel and consumption.

Procurement

Procurement is the largest contributor to the University's carbon footprint (17,500 tCO₂e in year). OA has begun the journey of addressing this, securing a new post to review and develop the University procurement processes and financial systems, for example, revising standards of environmental sustainability criteria for procurement systems and cascading these into key contracts and supplier approval processes.

We have also begun the task of developing a 'carbon challenge' tool to enable better information provision, for all, about the carbon impact of our activities. Of course, such a tool will only be successful if we develop the surrounding cultural and organisational infrastructure, hence we have reviewed our HR 'cradle-to-grave' policies, identifying opportunities to embed sustainability values at staff recruitment (improving our digital offer), entry (further particulars, induction training), and continuing professional development (annual reviews, promotion). Core to this is improvement in our training offer. We have begun a training needs assessment, and propose a new 'Sustainability Know-How' programme. This will be embedded as part of a wider engagement strategy, work on which is beginning, and which has been aided by the inclusion of sustainability in the AVP Dean of Science portfolio.

Travel

Travel is the second largest contributor to the University's carbon footprint with student flights making up over 60% of total travel emissions. Business Travel and Commuting are the areas identified for the highest levels of direct action, with reduction targets of 47% and 76% by 2035 respectively.

To improve the uptake of shared vehicle transport we have attracted additional funding (£395,480) to implement a new University MaaS-ter plan. The Mobility as a Service (MaaS) approach will ensure we make efficient use of assets and fleet, encourage a shift to lower carbon modes, and improve route planning for staff, students and local residents.

The Global Office has developed a new Travel Tool with guidance and resources for all students and staff undertaking Business Travel; we have ensured that sustainability guidance will be added to this.

We are also improving our digital offer to reduce travel where possible, and ITS is rolling out Enterprise Architecture in early 2022 to document our digital ecosystem. This builds on investments in video conference and virtual event platforms, and a new digital undergraduate prospectus (with a postgraduate taught version launching in 2022), this complementing a recently completed review of ITS equipment.

In addition to the 25 EV charging points installed, the University has entered a Vehicle to Grid collaboration project with Nissan and E.ON to trial this new smart technology, and further understand its role as part of our net zero estate. The first two charge points, plus an additional unit at the Grounds Department, will be installed in 2021.

Eden Campus – Energy Innovation Hub

By 2027 Eden Campus will be a net zero carbon zone, supporting the University's wider carbon reduction targets. As the campus buildings are renovated, Eden will become a key location for industry to work alongside the University's academic community.

Eden Campus is a central component in the University of St Andrews' strategy to become the UK's first energy carbon neutral university. The campus will contribute to national and international ambitions for carbon reduction, while simultaneously supporting jobs growth in low-carbon technologies, and supporting University spin-outs to establish and grow.



Biomass Energy Centre: Now in its fourth year of operation, the Centre delivers heat and hot water to over 45 university buildings in St Andrews, and provides low-carbon heat to meet 40% of the University's heat demand. During 2021, the district heating network will be extended to include buildings at Eden Campus. There is scope to look beyond heat generation to create high value by products from the energy centre such as the conversion of CO₂ from the flue into synthetic fuels and other useful products.

Solar PV: The University has commenced construction of a 1 MW ground-mounted solar PV facility at Eden Campus. The electricity generated will support a private network that will in turn be utilised by all the buildings on the Campus. As with the energy centre, there is scope with the solar PV to look beyond the primary purpose and to utilise any surplus renewable electricity converted into higher-value products such as hydrogen.

Low Carbon Innovation: In 2022-23, the GENESIS Centre will become a new facility for R&D activity in the storage and conversion of energy. It will provide a space where companies can access University and industrial expertise, engage with other companies, build business-to-business collaborations, and develop and experimentally test new approaches to the development of low-carbon energy systems. These low-carbon systems would include energy based on 3 key areas of research expertise:

- a) New battery technologies, and their application in static power (e.g. Sodium-ion, a new Electrochemistry with a huge potential for Battery Energy Storage Systems), and the use of new batteries in hybrid fuel cell-battery systems for transport and mobility;
- b) The development of Hydrogen-based energy systems, and its use in storage and propulsion systems including land and marine. This will include new generations of fuel cells for static power and transport, and Ammonia production and its use in energy storage;
- c) The conversion of CO₂ into useful synthetic fuels and higher-value chemicals, building on our research expertise in Electrolysis, and demonstrating a 'power to X' concept whereby surplus renewable electricity can be converted into high-value products.

The proposed Centre is therefore unique in a UK and Scottish context: there is no other centre which focuses specifically upon energy storage and conversion, and which uses some of the UK's top research in this area to create economic opportunities for companies in energy storage and its applications (including sustainable mobility).

Hydrogen: Eden Campus is home to the Hydrogen Accelerator Team who are facilitating Scotland's hydrogen future by stimulating innovation in SME's. The Team provides access to product test and development space, expert academic advice and signposting to funding opportunities.

The project will also support companies who wish to transition or diversify into the hydrogen related sector, including companies from the oil and gas sector.

Advanced Manufacturing: This initiative enables the University to engage with companies working in energy storage and conversion. The University will provide scale-up facilities for translation of research and development into early prototyping and through proving technology before moving to large scale manufacture.

It will do this by developing a range of processing capabilities of relevance to battery, fuel cell and catalyst manufacture. This will be supported by test and development space where companies operating in the energy storage and conversion sectors can have access to high quality equipment and facilities and university know-how and expertise.

The Advanced Manufacturing Challenge Fund provided a significant step change opportunity to target SME's. The manufacture, test and development space at Eden campus will be open to all companies, large and small, with a recognition of the nurturing and networking obligations among the wider network of larger companies in our support of SME's. Examples of work that drive our sustainability goals include:

- Conversion of renewable electricity to hydrogen and ammonia through manufacture of catalysts;
- Manufacture and Development of new generation batteries;
- Fuel cell development & construction.

Carbon Offsets

Carbon offsetting programmes will be required to achieve net zero. As recognised, some emissions will not be decarbonised by 2035, and other carbon emissions are unavoidable and will continue.

The level of offsets required in 2035 is dependent upon the University meeting its carbon reduction targets (as detailed in the previous section), and we are currently forecasting a 40,000 tCO₂e requirement for 2035. This will be best achieved by a blend of market purchased carbon credits and University owned sequestration projects, to offset those emissions not yet offset and our unavoidable carbon emissions respectively.

The carbon offset market is relatively immature, and the forecast cost per carbon credit is £100/t. It is likely to increase beyond this as we approach 2035, as many others purchase to meet their net-zero targets. It is forecast we will require to purchase 20,000 tCO₂e of credits from the market in 2035, with the aim of reducing this requirement in the years thereafter.

The following section outlines University owned projects we are progressing now to ensure we meet the required in-house credits, and minimise a need for additional purchases.

The St Andrews Forest

In June the University Launched the St Andrews Forest, an ambitious project to create a global tapestry of woodland and other nature-based projects.

The goal of the Forest is to sequester an amount of carbon equivalent to the emissions of student travel to and from St Andrews at the beginning and end of semesters. This is approximately 20,000 tCO₂e/year.

The Forest is built around three pillars – Carbon, Nature, and People.

While carbon offsetting is the primary driver, creation of additional woodlands also benefits the natural environment. This includes increased habitat leading to enhanced biodiversity, additional ecosystem services (clean air and water), and improved flood mitigation.

Beyond immediate health and well-being benefits, the 'people' pillar will be key for the long-term future of the Forest. By developing projects that will continue to provide benefit to generations to come, the people who come after us will have a reason to manage and preserve the trees, keeping the carbon locked-up for longer.

Across all three of its pillars, we see opportunities to integrate the development of the Forest with research and teaching at the University.

The Forest was launched by The Duke and Duchess of Cambridge planting the first tree in St Salvator's Quadrangle. The central location of the tree within the University was deliberate - a living symbol of the importance of sustainability to the University's future.

Donors have already contributed areas of woodland in Scotland and planted individual trees in their own gardens. Local planting projects will be undertaken in the 2021/2022 tree planting season.

Climate Adaptive

We continue work to evaluate and mitigate the impact of climate change on the University and have Adaptation Capability Framework benchmarking tool to highlight governance and adaptation issues. The tool clearly outlines actions for improvement in the operation of the University to increase its resilience to climate change. These include:

- Organisational Culture and Resources – identifying opportunities to include climate adaptation in future plans
- Understanding the challenge – undertaking strategic climate risk assessments
- Planning and Implementation – Identifying potential adaptation measures
- Working together – develop communication and engagement with partners such as Fife Council / Fife Environment Forum

An internship project was carried out this year to discuss and capture historical events and communicate future climate projections to Estates staff, and highlight the case for action across our core functions.

Findings were recorded as part of our draft Climate Adaption Plan, with a view of holding detailed risk workshops as part of a North Haugh masterplanning exercise. This will ensure future development is carried out taking into account future climate risks and it is intended this exercise will be replicated in other estate areas, masterplans and functions following on.

By preparing for the effects of climate change on our organisation we are addressing the 13th SDG (Climate Action) and in particular targets 13.1 (Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries) and 13.2 (Integrate climate change measures into national policies, strategies and planning) although on an institutional scale rather than national.

Conclusion

The year 2020/21 was dominated by the disruption of the pandemic, as our working and private lives changed dramatically. This shared experience has acted as an inflection point for sustainability, illustrating that change is possible, needed, and can sometimes be better than anticipated.

We've adapted to flexible working and have a true sense for the potential of digital platforms for enabling communications – as well as their limitations. We've reconsidered the role of travel and have questioned how much 'stuff' we need, as well as opening up reflections on what really matters to us and our communities. We've come to understand the pressures that globalisation places on this planet, and the fragility of the systems we are all dependent on. We have shifted, and very few people want to go back to the way the world was.

Amid the year's difficulties, the University has advanced its strategy towards sustainability markedly, setting a clear and stretching goal of becoming Net Zero by 2035. We have characterised the scale of the challenge across our different areas of activity, and have begun to set out the pathways to delivering reductions in our carbon footprint, as we build up the contributions we make to enhancing biodiversity, teaching, and research in sustainability. We've also furthered work to adapt our surroundings, indeed ourselves, to the real threat of climate change. Bold, new actions have been started, such as the St Andrews Forest, that will have an impact well beyond many of our professional lives.

There is still so much to do. All of us struggle to grasp the magnitude of the task and risks ahead. Even with few flights taken and little procurement this year, the University's carbon footprint remained above 50,000 tCO₂e/year, and the University has plans to grow to find place for more research as well as students. Our strategic engagement and ideas need to become even bolder if we are to successfully manage a sustainable transition.

The three missions of Sustainability Positive, Carbon Net Zero, and Climate Adaptive provide direction for what is rapidly becoming a whole institution effort, and it is excellent that the next iteration of the University Strategy will include Sustainable St Andrews as a pillar. As we aim to drive forward change, we must ensure that everyone senses the contribution they can make, and that embedding change across the University is an investment worth the time it takes.

This report captures an array of vital inflection points that the St Andrews community, and society more widely, in 2035 will be the beneficiaries of. Their success will depend on the radical, unstinting engagement of both the University's community and leadership in the present.

