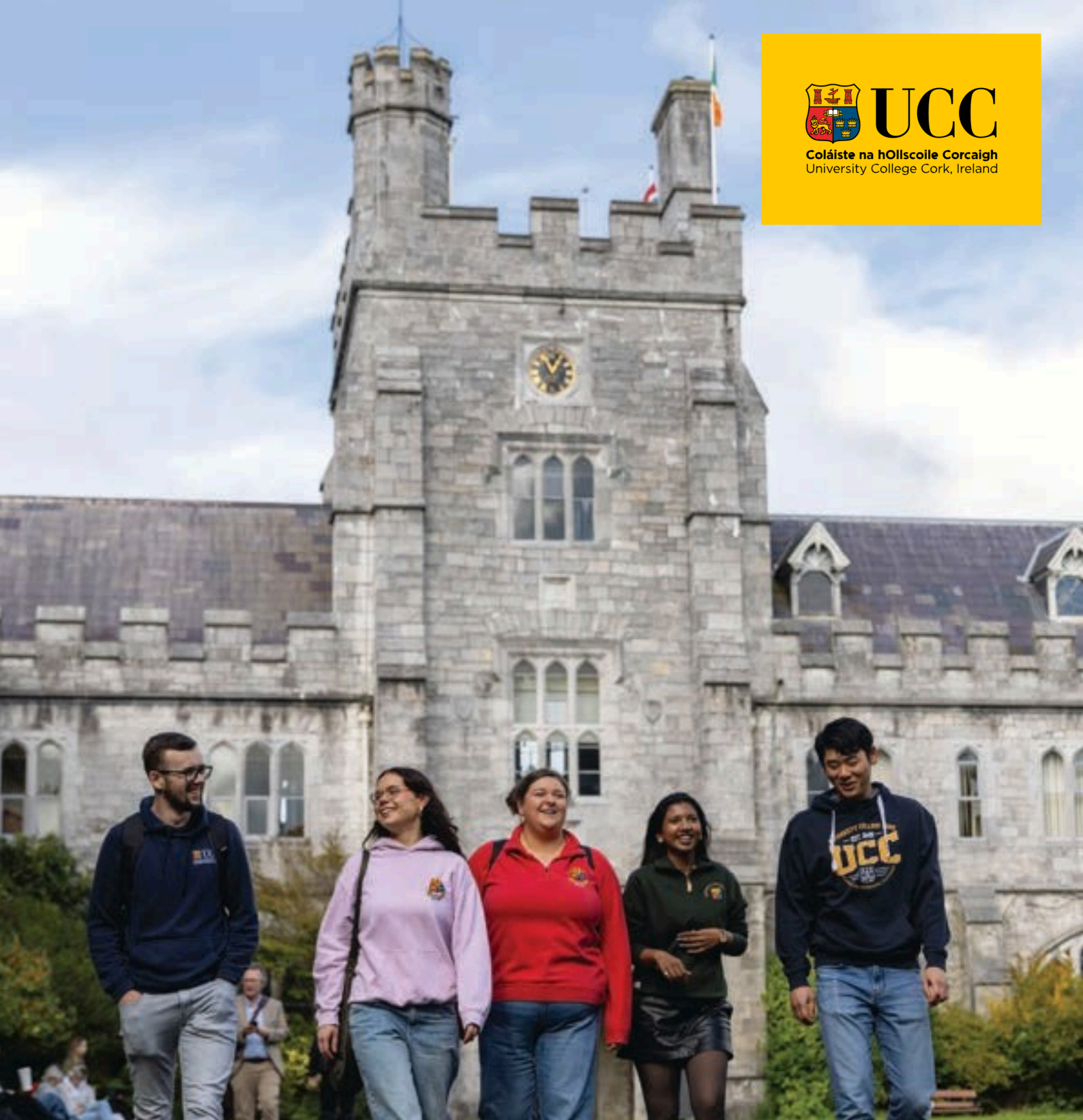




UCC

Coláiste na hOllscoile Corcaigh
University College Cork, Ireland



UCC Climate Action Roadmap

Update October
2025

President's Foreword

Sustainability is at the heart of everything we do at University College Cork, from educating future sustainability professionals and changemakers, engaging with communities and enterprise in Cork and beyond, enhancing campus environmental performance, and advancing world-leading research on sustainability. Sustainability is a core value and priority action in UCC's Strategic Plan 2023–2028: Securing Our Future, and sustainability principles are a cornerstone of organisational leadership and culture.

The 2025 edition of UCC's Climate Action Roadmap highlights our continued progress towards our 2030 carbon reduction goals. In 2024, emissions from fossil fuels continued to reduce and are now 31.7% lower than the baseline period with a 3% reduction on 2023 emissions. Overall emissions from energy use have decreased by 31.6%, and the University has already met its 50% energy efficiency improvement target, six years ahead of schedule.

Our Procurement Office have shown exceptional leadership, ensuring that over 75% of tenders issued over the reporting period have incorporated Green Public Procurement requirements. The positive impacts of sustainable procurement practices are now visible across our supply chain from catering to cleaning and beyond.

Building on our strong foundation of sustainability knowledge and operational excellence, UCC launched the Sustainability Academy in 2025, the first university-based sustainability training and education unit of its kind in Ireland. Drawing on the expertise of over 100 sustainability-focused academics across 25 Schools, and supported by a core team of professional trainers and industry practitioners, the Academy has already delivered impactful programmes to a number of businesses and organisations, including the Department of Foreign Affairs.

This roadmap reflects our achievements to date and outlines our ambition for the year ahead to deepen our carbon reductions.

I would like to thank the entire UCC community for their continued commitment in driving our shared sustainability goals forward.



Professor John O'Halloran
President, University College Cork

1. Our Targets

1.1 Reduce energy related GHG emissions by 51% by 2030

Progress to Date

By the end of 2024, the University has achieved a 31.7% reduction in fossil fuel emissions, recording 4,679 tonnes of CO₂ from the consumption of 22.6 GWh of natural gas and 0.3 GWh of transport fuels.

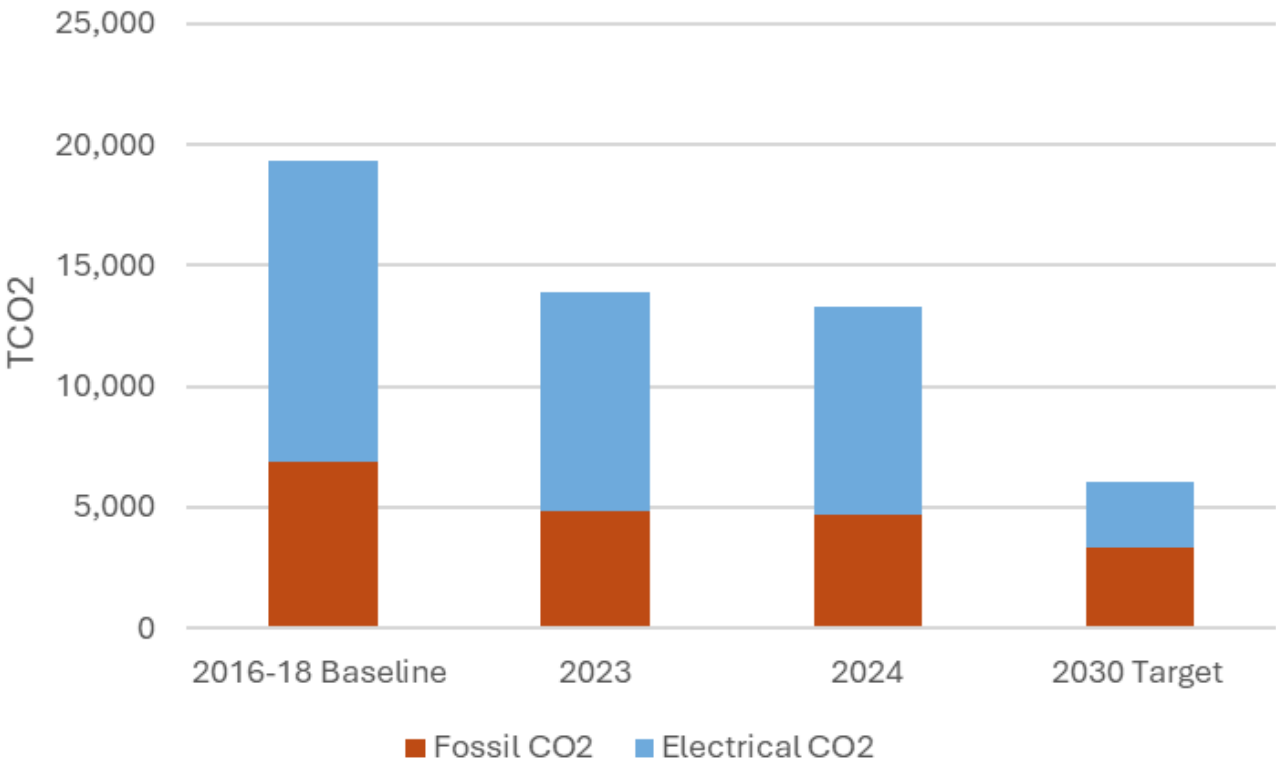
When combined with 32.6 GWh of electricity consumption, the University’s total energy-related emissions for 2024 amounted to 13,288 tonnes of CO₂, representing a 31.6% reduction compared to the baseline period.

Using the SEAI Gap to Target tool, UCC has projected that without taking action its energy-related carbon emissions for 2030 will reach 8,414 TCO₂, which exceeds the 2030 target of 6,034 TCO₂.

To meet its 2030 carbon emissions targets, UCC has developed a decarbonisation pathway structured around four core technical pillars: [energy optimisation](#), [electrification of heat](#), [building fabric retrofits](#), and [on-site renewable energy generation](#).

The overall cost of the gap to target project plan is estimated at €33.7 million of which €8.6 million has been spent with €4.1 million coming from grant funding programs such as the HEA pathfinder and SEAI support scheme for renewable heat (SSRH)

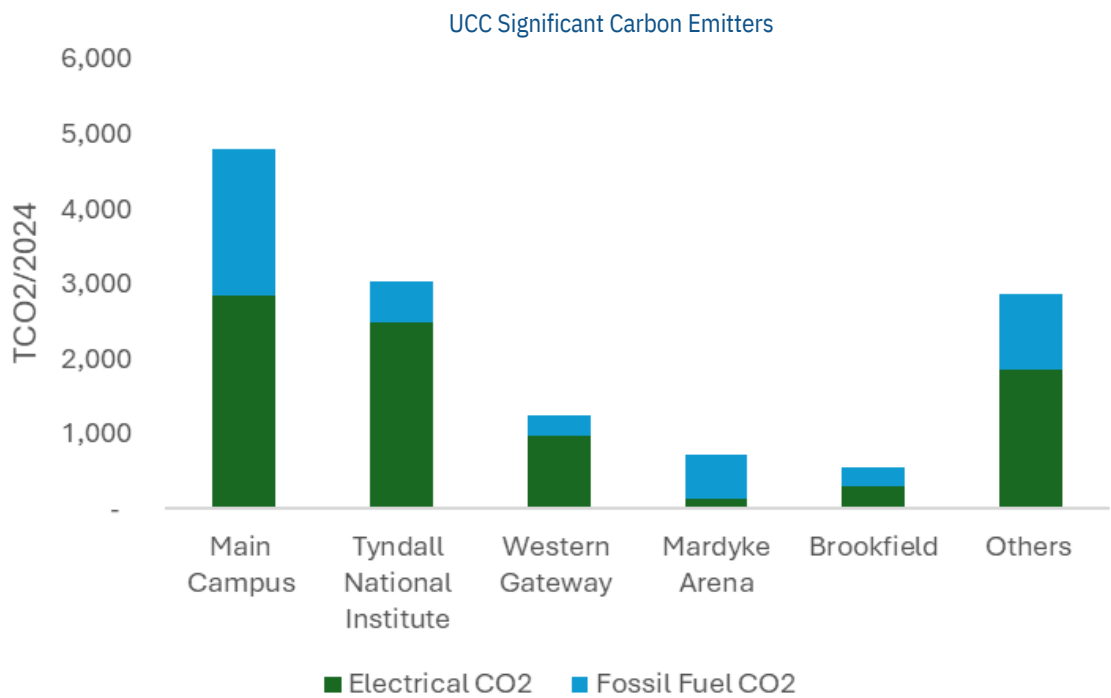
UCC TCO₂ emissions from energy use



Significant Carbon Emitters

Five locations account for 78% of UCC’s energy related emissions with the Main Campus accounting for 36%. Tyndall (23%) Western Gateway (9%), Mardyke Arena (5%) and Brookfield campus (4%) make up the remaining significant emitters. The 22% attributed to Others would include satellite sites such as the North Mall campus, student accommodation buildings and other smaller properties.

The energy management team continue to place a heavy emphasis on identifying and implementing energy projects at these five significant carbon emitters, forming a key plank of UCC achieving the 2030 targets and our own 2040 carbon neutral goals.

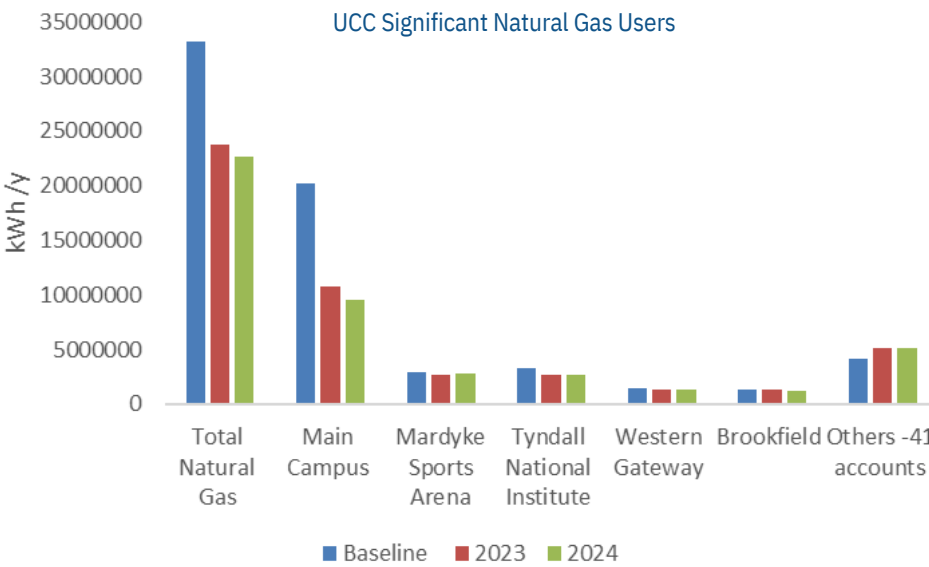


Fossil Fuel Emissions

96% of UCCs fossil fuel emissions stem from the burning of natural gas to heat buildings, and to generate domestic hot water. By the end of 2024, UCC’s natural gas consumption was 22.6 GWh, a 31% reduction when compared with the 2016–2018 baseline. A major contributor to this reduction was the retirement of the Combined Heat & Power (CHP) plant on the Main Campus in September 2017, which reduced gas consumption by 10 GWh. Further reductions of 2.5 GWh were achieved through heating optimisation projects, including the installation of an Air Source Heat Pump (ASHP) in the O’Rahilly Building in 2021.

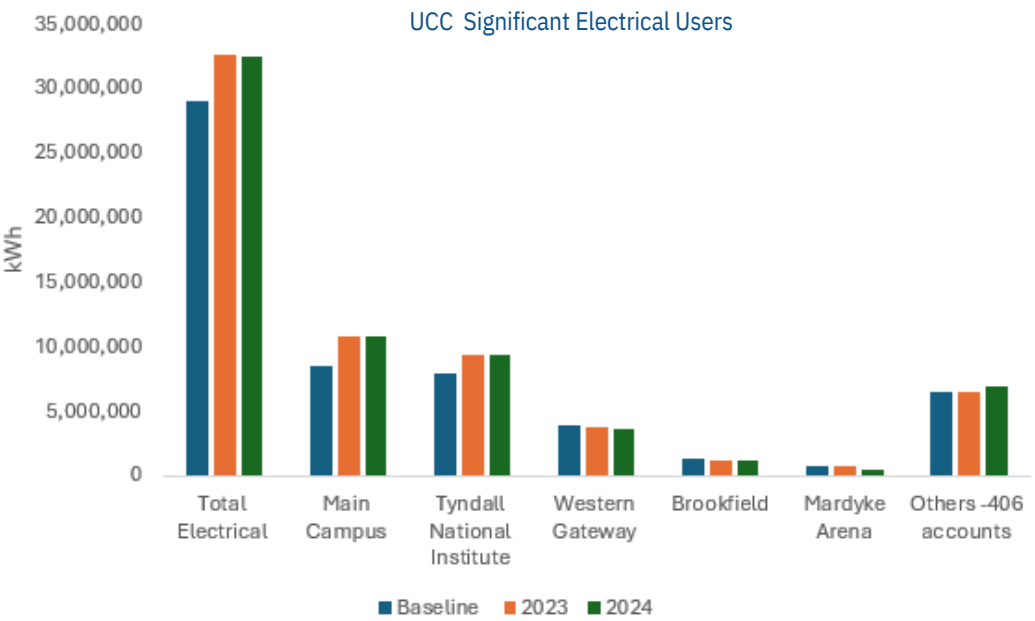
However, these savings were partly offset by the University’s growth since the baseline period. The addition of the IMI campus, the Lapps Quay building, the Cork Centre for Architectural Education, and the opening of the Crows Nest student accommodation collectively added over 2 GWh of gas consumption to the University.

The main campus estate accounts for 42% of our annual gas consumption with the Mardyke Arena the next largest consumer at 13%, closely followed by Tyndall at 12%. Through our gap to target plans, the Energy Management team continue to focus on optimising the heating loads in our significant users and moving these buildings to low carbon heating technology.



Emissions from Electrical Consumption

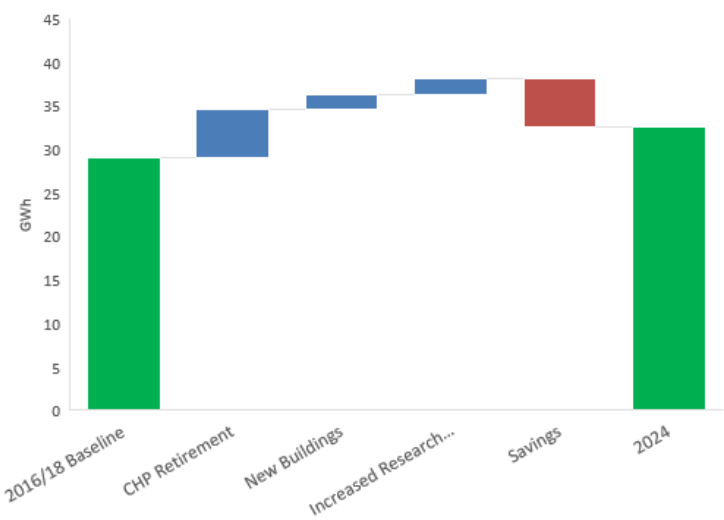
In 2024, 65% of UCC’s energy-related carbon emissions originated from the electricity consumed across the University. Although overall electricity consumption has increased since the baseline period, emissions from electricity use have decreased by 31%, reflecting the ongoing decarbonisation of Ireland’s national electricity grid.



The Main Campus represents 29% of UCC’s total annual electricity consumption, with the Kane, Boole Library, Food Science, Biosciences, and Pharmacy buildings being the largest users. The Tyndall National Institute, as a research-intensive facility, accounts for 27%, followed by the Western Gateway Building at 14%, Brookfield at 5%, and the Mardyke Arena at 3%. The remaining 23% of electricity use is distributed across campus accommodation and other ancillary buildings.

UCC’s electrical consumption has risen by 12% compared with the 2016-18 baseline period. The CHP plant had previously supplied around 50% of the main campus electricity demand and its retirement in 2017 required an additional 5.5 GWh of electricity to be sourced from the national grid. New facilities, including the Crows Nest accomodation building contributed a further 2 GWh to the annual load while increased research activity, particulary in Tyndall, added a further 2 GWh of electrical consumption. However, continuous energy optimisation initiatives and projects have delivered 6 GWh in savings. Energy projects completed include BMS upgrades, pump replacement programmes, LED lighting retrofits and HVAC renewal programs.

UCC changes in electrical consumption since 2016/18 baseline



Recent Projects Completed

Since late 2024 UCC completed a number of significant decarbonisation projects that will reduce natural gas consumption and fossil fuel emissions.

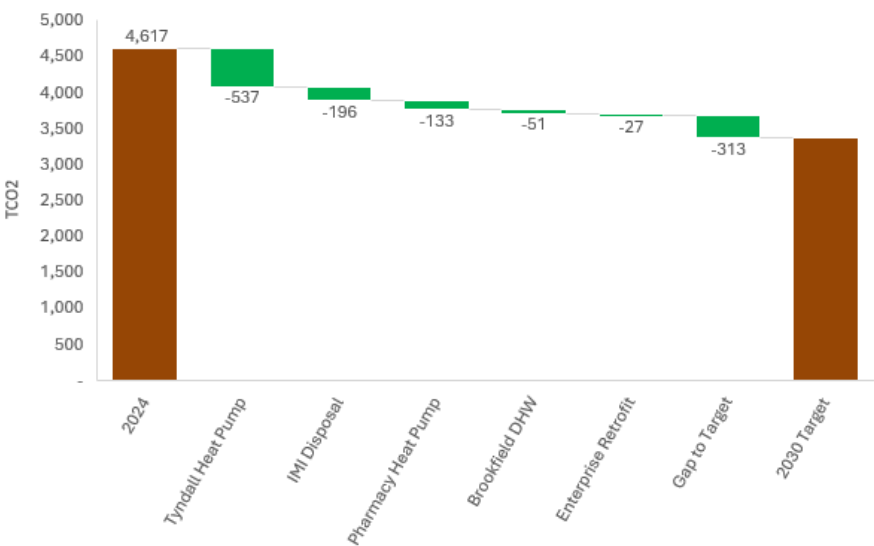
At [Tyndall](#), a new four-pipe heat pump system was installed to replace the end-of-life central chilled water plant. This system recovers waste heat from the chillers to provide space heating, eliminating the need for natural gas. The project marked the conclusion of a three-year building optimisation programme, delivered with support from SEAI’s EXEED scheme and will avoid 2.8 GWh / yr of natural gas use.

On the [Main Campus](#), a new bivalent heating system comprising two Air Source Heat Pumps (ASHPs) and a modular boiler arrangement to provide resilience during peak demand was installed in the Pharmacy building. The project was grant aided under SEAI’s SSRH program and will reduce UCC’s gas consumption by 0.6 GWh/yr. At [Brookfield](#), a dedicated heat pump system for domestic hot water was brought online. This allowed the building to decouple hot water production from the central boiler plant, enabling the buildings heating network to run at lower temperatures and reduced operating hours, avoiding 0.3 GWh/yr of gas consumption.

The HEA pathfinder supported deep retrofit and heat pump installation at the Enterprise building was completed in the summer of 2024 and has resulted in the 2800 m² building coming off the natural gas network.

As a result of these projects, UCC’s natural gas consumption is projected to decrease by 4.6 GWh by mid-2026, representing a 20% reduction compared to 2024 levels and a 45% reduction relative to the 2016–2018 baseline period. Collectively, these improvements are expected to deliver a 46% reduction in fossil fuel-related emissions across the University.

Forecasted change in fossil fuel emissions by 2026.





Spotlight on the Pharmacy Heat Pump Project

The Building

The Pharmacy building, opened in 2006, measures 5,600 m² and comprises of lecture halls, laboratories equipped with fume cupboards, and administrative offices.

Low Temperature Hot Water (LTHW) was provided by 2 no. 865 kW gas-fired condensing boilers manufactured in 2005. These supplied heat to Fan Coil Units (FCUs), Air Handling Unit (AHU), underfloor heating, radiators and a 500L Domestic Hot Water (DHW) calorifier. The FCUs are located in the labs and are used to preheat makeup air drawn in through the façade when a fume cupboard is on in a lab. The lecture theatre has an AHU with thermal wheel for heat recovery.

The Process

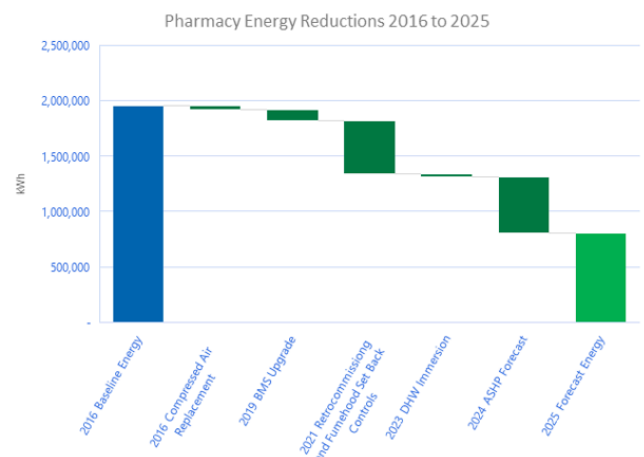
Over a five-year period, the Estates team, in close collaboration with building users, implemented a series of energy-saving projects aimed at optimising the building's services. These efforts enabled the heating systems to operate efficiently at a reduced temperature of 50°C. Through ongoing system optimisation and sustained engagement with occupants, the Estates team developed a strong understanding of user needs. This insight informed the successful delivery of a project to replace the aging boilers with a bivalent heating system.

The System

The system installed included 2no. 148kW low GWP refrigerant heat pumps, fitted with VSD controls and BACnet comms to BMS.

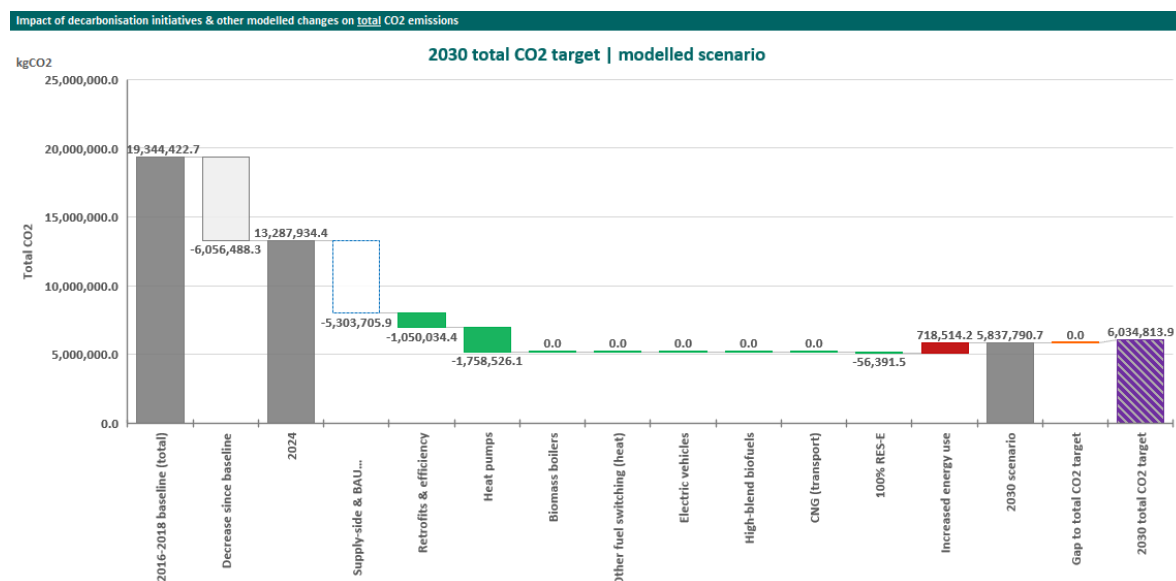
3 no. 140kW wall hung boilers required for peaking and backup were fitted as well as a buffer vessel, and new secondary circulation pumps with BACnet comms to the BMS. A new 4kW DHW exhaust air heat pump using tempered air in the plantroom as its source has a 450L volume with integrated 2no. 2kW electric immersions and a backup 6kW immersion. The project is expected to deliver a 3% reduction in UCC's fossil fuel emissions.

Energy reduction program Pharmacy building.



UCC Gap to Target

UCC Gap to Target Programme



To meet its 2030 carbon emissions targets, UCC has developed a decarbonisation pathway structured around four core technical pillars: energy optimisation, electrification of heat, building fabric retrofits, and on-site renewable energy generation.

Energy optimisation remains a cost-effective and impactful approach for reducing both energy consumption and carbon emissions. Through continuous improvement of building systems, UCC is targeting a annual 1% reduction in total energy use. Planned optimisation measures include upgrading older lighting systems to LED technology, improving the efficiency of pumping systems, retrofitting ventilation systems with high-efficiency fans, and modernising BMS platforms across high-energy-use buildings. These improvements will be supported by recommissioning building services and driving behavioural change through staff and student engagement initiatives.

Electrification of heating is central to UCC's strategy to transition away from natural gas. The Estates team has adopted a structured approach to this challenge, first by optimising current gas-fed systems and decoupling hot water generation to better establish heating baseloads. Following this, low-cost building fabric interventions will be made to reduce heating demand, and suitably sized heat pump systems will be installed. This phased and evidence-based method builds on experience gained through previous electrification projects.

In parallel, UCC recognises the importance of improving its existing building stock. As part of its long-term sustainability goals, the University aims to complete two **deep fabric retrofit** projects by 2030. These projects will improve energy performance, reduce emissions, enhance occupant comfort and extend the lifetime of the building.

With the transition to electric heating and the expected expansion of campus infrastructure and research activity, electricity demand is projected to rise. To offset this increase and ensure progress toward the total carbon reduction targets, UCC plans to install 500 MWh of **on-site renewable energy generation** by 2030.

The University continues to explore opportunities for grant aid and funding programs and mechanisms such as EPC's to secure the funding required to support the program.

At the time of publishing this climate roadmap, 6 gap to target projects have been completed, 9 are in progress, 7 are at design stage while the remaining 11 are at concept stage.

Growth Forecast

Two major building projects, the Tyndall North Campus and the Cork Business School, are expected to add 5.5 GWh to UCC's electrical load, when operational. Additionally, the anticipated growth in research activities will contribute a further 1.5 GWh of energy demand by 2030.

The impact of the planned growth have been factored into the the Gap to Target plan.

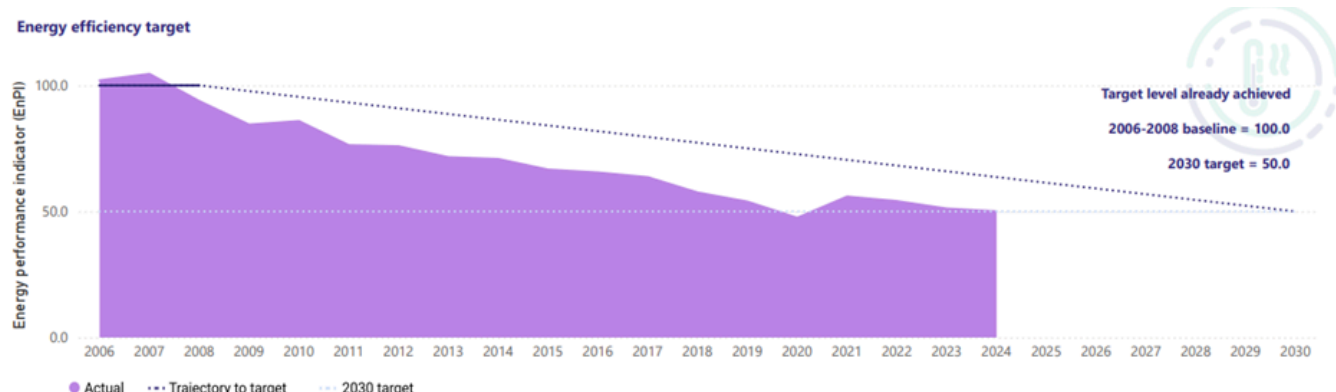
Current Projects

Over the next 12 months, UCC will undertake a series of targeted energy projects aimed at further reducing natural gas consumption. One of the key initiatives will take place at the Mardyke Arena, where a new pool air handling unit will be installed. This unit will be equipped with a heat recovery system and its own heat pump, allowing the facility to avoid an estimated 0.7 GWh of gas use annually. This upgrade forms part of a broader energy improvement programme at the Arena, which also includes the installation of a 74 kWp solar photovoltaic array, enhancements to roof insulation, and an upgrade to the BMS to improve control and efficiency.

At the Boole Library, the installation of a new BMS platform is expected to deliver additional savings of 0.1 GWh per year through improved operational controls while ongoing energy optimisation programs including pump replacements and LED lighting programs should deliver over 0.6 GWh/y in electrical savings.

1.2 Improve Energy Efficiency by 50% by 2030

Energy Efficiency Progress



At the end of 2024 UCC achieved a 50% improvement in energy efficiency, 6 years ahead of the 2030 target. With the energy projects planned over the next five years it is forecasted that UCC will achieve a 71% improvement in energy efficiency by 2030.

Summary Table: Our Targets

Requirement	Response	12 month lookahead
Reduce fossil fuel GHG emissions by 51% in 2030.	Ongoing implementation of gap to target plan. 31.7% reduction achieved by the end of 2024.	Realise a further 12% reduction in emissions from fossil fuels from projects completed in late 2024. Continue to explore funding streams to support the gap to target plan.
Reduce total energy related GHG emissions by 51% in 2030.	Ongoing implementation of gap to target plan. 31.6% reduction achieved by the end of 2024.	Continue to explore funding streams to support the gap to target plan.
Improve energy efficiency by 50% by 2030.	50% target achieved.	Energy optimisation projects will further improve UCC's energy efficiency.
Update Climate Action Roadmaps annually within 6 months of the publication of the Climate Action Plan.	Roadmap updated.	Implement actions identified in the roadmap.
Ensuring consistency with section 15(1) of the Climate Action and Low Carbon Act 2021.	Screening exercise to be completed.	Screening exercise to be completed.

2. Our People

2.1 Leadership and Governance for Climate Action

Since 2022, University College Cork (UCC) has operated a dedicated governance structure to lead its sustainability and climate action efforts. A University Leadership Team (ULT) Subgroup on Sustainability and Climate Action, chaired by the President, provides high-level oversight of the University's Climate Action Plan and its implementation roadmap.

Mark Poland, Director of Buildings & Estates and a member of the ULT, serves as both the Energy Performance Officer and the University's designated Climate and Sustainability Champion. He plays a central role in coordinating and advancing energy and climate-related initiatives across campus.

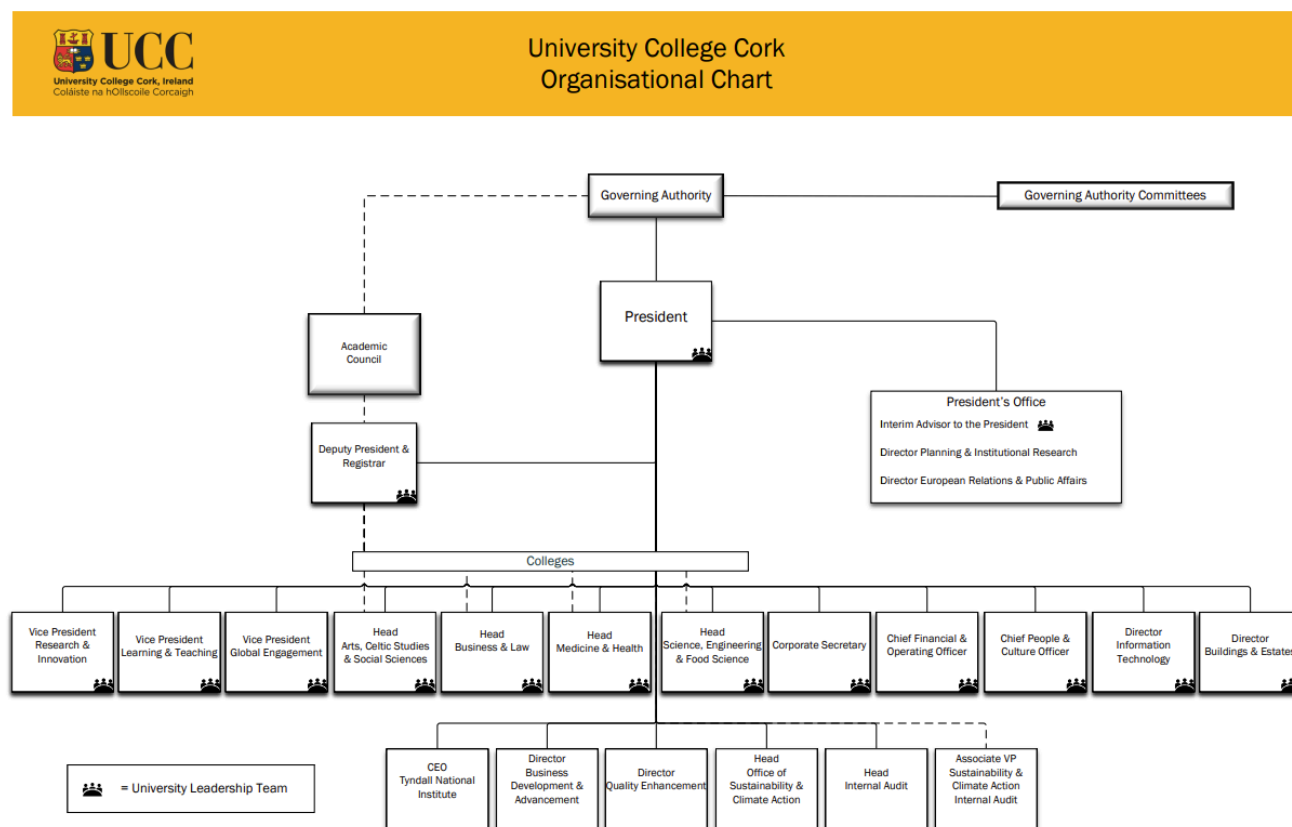
A Sustainability and Climate Action Office, located within the President's Office, is responsible for driving UCC's sustainability agenda. The Head of this Office reports directly to the President and is tasked with delivering the University's Sustainability and Climate Action Plan.

Governance capacity is further strengthened by Professor Brian Ó Gallachóir, who serves as Associate Vice President for Sustainability, providing strategic leadership and academic alignment in sustainability matters.

To monitor progress and ensure consistent delivery of initiatives, a Sustainability Operations Group meets every two months. This group, chaired by the Climate and Sustainability Champion, tracks the implementation of sustainability projects and operational improvements.

Complementing this formal structure is the long-established, student-led Green Campus Committee, chaired by the Students' Union Deputy President. The committee meets regularly to develop ideas and lead campaigns that promote sustainability across the University. Its work feeds into the Green Campus Forum, which meets twice annually and brings together students, staff, and service partners. The Forum serves as a collaborative space for generating innovative projects that support and enhance UCC's overall climate performance.

UCC Organisational Chart



2.2 Engaging and training staff

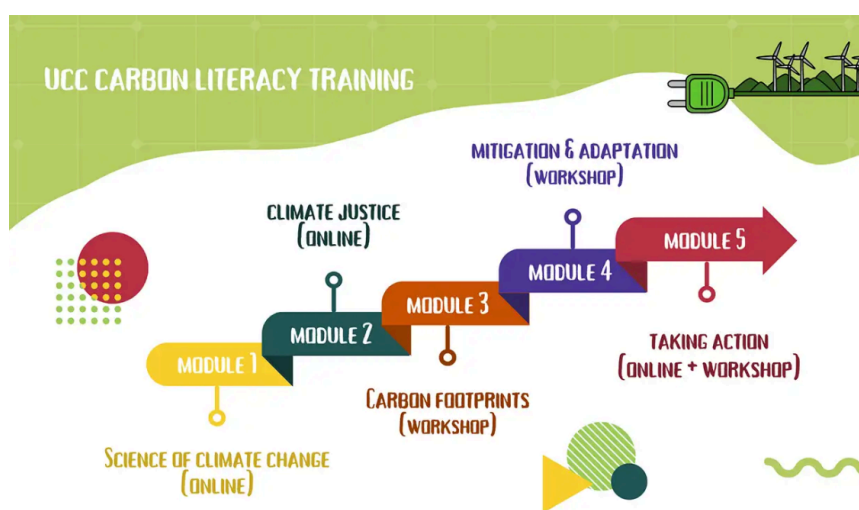
As part of a joint initiative between the Office of Sustainability, the Sustainability Institute, and the Sustainability Academy, UCC developed and delivered a Climate Leadership Training Course for the University's Leadership Team in the 2023/24 academic year. This training was extended to the College Executive Management Teams in both the College of Business and Law and the College of Arts, Celtic Studies and Social Sciences.

This two-hour session is designed to support senior leaders in embedding sustainability into their areas of influence. It includes:

- An overview of the role and importance of sustainability and climate leadership in higher education
- A detailed analysis of UCC's carbon footprint, with a particular focus on Scope 3 emissions
- An introduction to the concept of climate leadership and how participants can apply it within their schools or departments.
- An interactive exercise exploring how their specific unit can contribute to UCC's broader climate goals.

To improve accessibility and uptake, the UCC Climate Literacy Training which was previously delivered through two in-person workshops is now being redeveloped into a fully online course. This version will provide a flexible, foundational introduction to climate change for the UCC community.

The goal is to create a stacked training model, where the online Climate Literacy course acts as a prerequisite, and the two-hour Climate Leadership Training builds upon it for managers and senior leaders.



UCC continues to play a leading role in equipping teaching staff with the knowledge and tools to integrate sustainability competencies into their modules and programmes. In 2024, David Nyaluke was appointed as UCC's first full-time Education for Sustainable Development (ESD) Officer.

David now oversees the delivery of the "Teaching and Learning with the SDGs" online course and facilitates SDG training sessions throughout the academic year.



UCC also plays an active role in shaping ESD nationally. The University has collaborated in both the co-development and co-delivery of the National Forum for Teaching and Learning's digital badge, titled "Embedding the SDGs across the Curriculum". This course is available to teaching staff across higher education institutions in Ireland and supports educators in aligning their curriculum with the SDGs.

Eco Schools Project Sites



The Office of Sustainability has actively participated in two Erasmus+ Cooperation Projects aimed at advancing sustainability within higher education.

1. **Eco-Schools as New European Bauhaus Labs** — This project focused on engaging both the campus and the wider community with UCC’s building retrofit activities, transforming these initiatives into a “Living Lab” for sustainability learning and innovation.
2. **SDGs4U** — This project centred on expanding the UCC SDG Toolkit to an international audience and delivering a series of training and engagement activities on campus to promote the broader themes of sustainability and the UN Sustainable Development Goals (SDGs).

Through these initiatives, a wide range of impactful engagement and training events were delivered, including:

- Green tours of the North Mall Campus, where the Enterprise Centre retrofit project was showcased. Over 300 staff and students participated in these tours.
- An indoor air quality campaign highlighting how energy retrofits can enhance comfort and air quality. More than 100 participants completed related surveys.
- An Online “Train the Trainer” course, designed to equip academic staff with tools and methods to embed the SDGs into teaching, research, and institutional practice. The course was delivered over four interactive modules, enabling participants to collaborate and share best practice.

These activities complement UCC’s ongoing engagement programmes delivered through the Green Campus initiative — including flagship events such as Green Week and Climate Action Week.

Summary Table: Our People

Requirement	12 month lookahead
Establish and resource Green Teams, reporting to senior management, to become integrated drivers of sustainability in every public sector body	Establish location and function specific Green Teams across the University, e.g., IT Green Teams, Laboratory Green Teams, and others to embed sustainability practices within individual departments and operational areas.
Nominate a member of the Management Board as the Climate and Sustainability Champion with responsibility for implementing and reporting on the mandate.	No action required
Incorporate appropriate climate action and sustainability training (technical and behavioural, including green procurement training) into learning and development strategies for staff.	- To provide a staff training workshop for local buyers in relation to GPP with a priority focus on key goods/services and works for UCC. - To deliver sustainability training through UCC Managers Insights Hub platform. - Sustainability Office and Sustainability Academy to expand training opportunities across the University, in collaboration with European partners, to further embed sustainability knowledge and practice at all levels. - Increase participation rates for online Climate Literacy Training.
Ensure all senior management (P.O. level or equivalent and above) and members of State Boards, complete a climate action leadership training course.	Continue to roll out climate leadership training across the remaining Colleges.

3. Our way of working

3.1 Annual Performance Reporting

Through the UCC Presidents [annual report](#), UCC communicates its performance against the public sector mandate, under goal 5 - Our Place, Our Footprint.

In addition, UCC reports to several sector-specific certification and benchmarking bodies, including the AASHE STARS Programme, UNFCCC Race to Zero, UI GreenMetric, and FEE / Green Campus Ireland. These frameworks assess and recognise UCC's progress across a broad range of climate action indicators, including the implementation of the UN Sustainable Development Goals (SDGs) and the advancement of research and innovation in climate action.



3.2 SEAI M&R reporting

UCC fully complies with the reporting requirements for public bodies under the Public Sector Climate Action Mandate, providing annual updates on the implementation of its Climate Action Roadmap.

The latest report can be accessed [here](#) and by entering PSO-00500 in the search field.

3.3 Energy & Environmental Management Systems.

As the world's first university to achieve ISO 50001 certification, UCC has operated a structured Energy Management System (EnMS) since 2011.

Over this time, the EnMS has delivered significant benefits by embedding a culture of continuous improvement in energy performance across the University. Through data-driven optimisation programmes, the system has enabled the identification and implementation of targeted energy efficiency measures, ensuring resources are directed where they deliver the greatest impact.

UCC Energy management - ISO certified since 2011



The EnMS remains a core management tool for the Energy Management Team, providing the structure and oversight needed to maintain focus on improving the energy performance of UCC's Estate and supporting the University's broader decarbonisation and sustainability objectives.

3.4 Green Public Procurement

Identified as a key stakeholder within UCC’s Sustainability and Climate Action Plan, the UCC Procurement Office plays a pivotal role in minimising the University’s environmental footprint. Having successfully implemented Green Public Procurement (GPP) principles for many years, the office remains committed to further expanding their application across all suitable tenders. The newly updated UCC Corporate Procurement Plan sets out clear objectives to embed sustainable procurement practices, incorporating the recommendations and actions outlined in the *Buying Greener: Green Public Procurement Strategy and Action Plan 2024–2027*.

In 2024, the Office successfully used GPP criteria across 75% of tenders and the office will continue to monitor and strive to improve this percentage year on year.

Extract for UCC Corporate Procurement plan - 2025

- 6. Sustainable Procurement**
- 6.1 Promote a sustainable approach to procurement based on a needs assessment which encourages a circular and socially responsible approach to procurement where appropriate.
 - 6.2 Continue to include GPP criteria in all national and OJEU competitions where possible.
 - 6.3 Incorporate life-cycle costing into procurement decisions where appropriate.
 - 6.4 Encourage discussions on possible sustainable alternative solutions for the University which may help to minimise the impact of our procurement decisions on our local, regional, national and global footprint.
 - 6.5 Continue to adopt and report on evolving sustainable procurement requirements to meet government policy objectives including those actions set forth in the *Buying Greener Green Public Procurement Strategy and Action Plan 2024-2027*.
 - 6.6 Provide leadership on any insights, guidance or case studies that can be shared with other procurement practitioners and our suppliers to assist them on their sustainable journey.

3.5 Construction

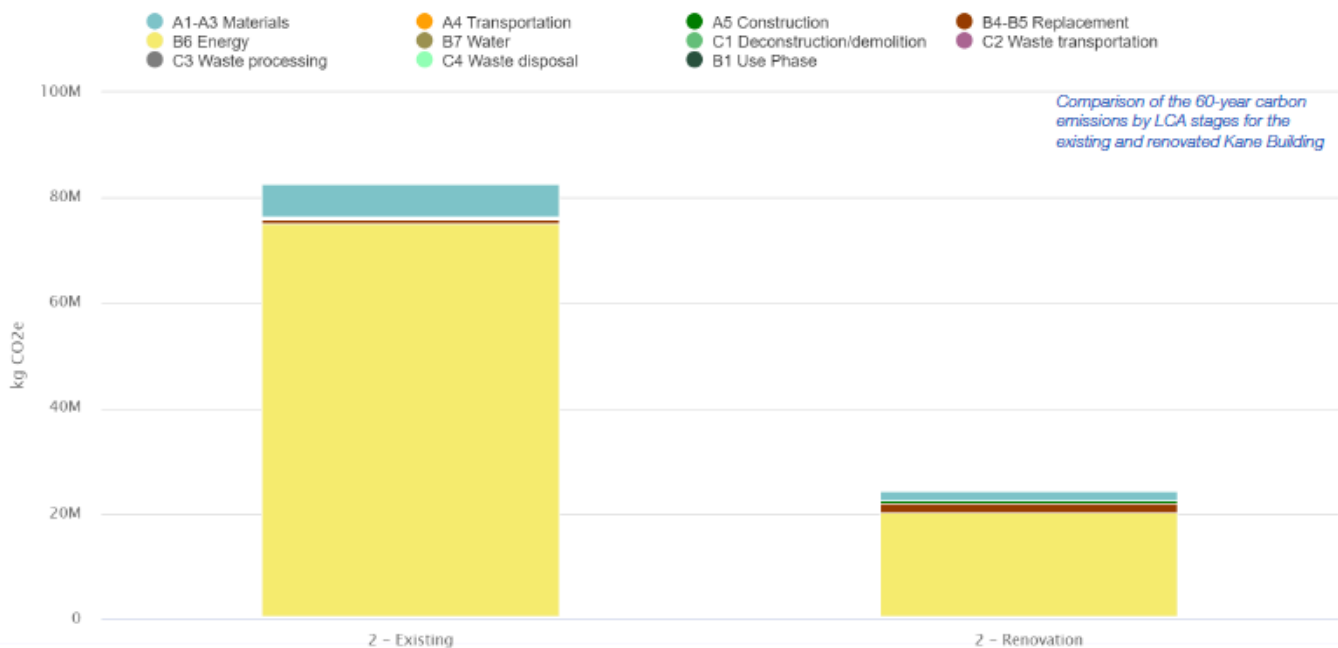
Significant construction projects at UCC are managed by the Capital Projects Office, which has established a comprehensive framework to ensure the delivery of low carbon construction across all capital development initiatives. This framework is aligned with national policy and the Capital Works Management Framework (CWMF), particularly in relation to the specification of low carbon construction methods and materials, including the use of low carbon cement, for all projects directly procured or supported from 2024 onwards.

Depending on the scale and complexity of each project, a Carbon Co-ordinator is appointed as part of the design team. This role may be fulfilled either as a specialist skills provider to the Quantity Surveyor, or as a principal service provider, with responsibility for supporting the project in achieving a low carbon design and construction, and in meeting zero or near-zero operational carbon emissions targets.

Typical design considerations to minimise embodied carbon include selecting low carbon or recovered materials, prioritising materials with valid Environmental Product Declarations (EPDs) and verified low embodied carbon values while considering alternative structural systems, such as timber, where appropriate.

This approach demonstrates UCC’s commitment to embedding sustainability and climate action into the core of its built environment strategy.

Kane Building carbon lifecycle for existing and renovated building.



The principles and practices set out in the EPA's Resource and Waste Management Plans are embedded within UCC's construction contract documents, ensuring that sustainability and circular economy goals are addressed from project initiation through to completion. For example, in the recently tendered Tyndall expansion project, tenderers were required to provide a detailed earthworks dig plan to maximise the reuse of excavated materials on site and to develop a designated waste segregation area to facilitate the recycling of construction waste.

Artist Image of the planned Tyndall Expansion with existing bottling plant at ground level



In addition, design choices on the project were made to support waste minimisation and a significant portion of the existing Bottling Plant structure was retained, thereby reducing demolition waste and preserving the embedded carbon from the existing building.

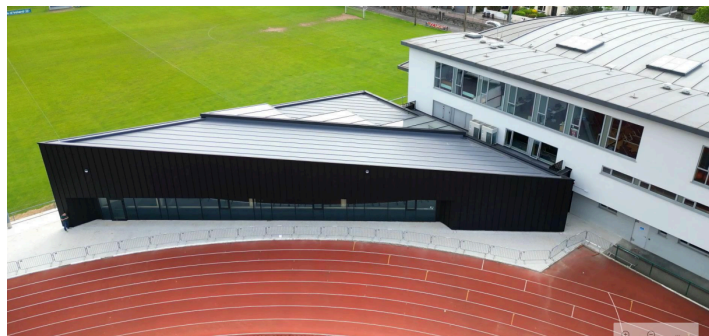


Mardyke Arena Strength & Conditioning Gym

The Project

To meet the growing needs of UCC's sports clubs and local sporting organisations, the Mardyke Arena identified the need to expand its footprint to accommodate a new 400 m² high-performance strength and conditioning gym.

Given the physical constraints of the site and the relatively low operational energy demand of the proposed space, the Capital Projects Office encouraged the design team to adopt low embodied carbon construction methods and off-site fabrication solutions, supporting UCC's broader sustainability and decarbonisation objectives.

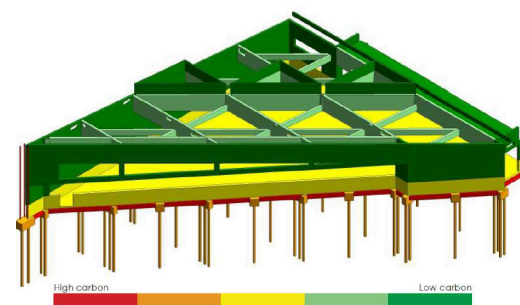


The Process

The appointed design team, led by O'Connell Mahon Architects, carried out detailed embodied carbon and constructability assessments to inform the final design approach. These assessments identified Cross Laminated Timber (CLT) as the optimal primary material for the wall and roof panels, offering significant reductions in embodied carbon while meeting structural and performance requirements.

The use of CLT complimented the low-carbon glulam roof structure, both of which could be sourced from a single mass timber supplier, ensuring material consistency and efficient delivery. However, to address flood protection requirements, the construction method at the base of the external walls was revised to incorporate mass concrete, providing the necessary durability and resilience for the site conditions.

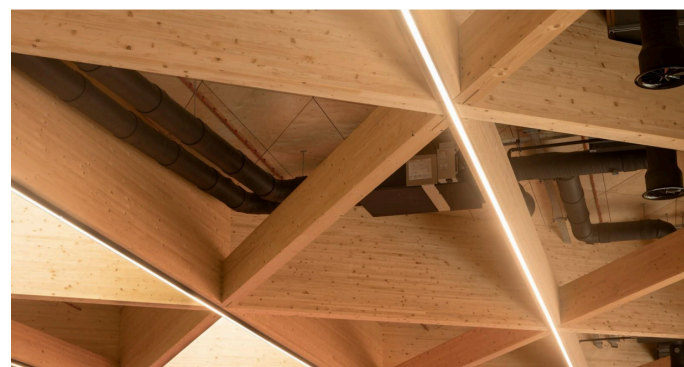
Carbon content of Mardyke S&C Gym structural elements.



The Result

The project achieved a 46% reduction in embodied carbon compared with a traditional construction approach. The use of off-site fabricated timber structures significantly improved constructability, enabling a faster and more efficient delivery of the extension.

Beyond its technical and environmental benefits, the timber finish has created a warm and welcoming environment, which has received very positive feedback from the sporting organisations and users of the facility.



3.6 Organic Food

Since 2016, UCC's contracted provider KSG have been growing root vegetables on 8 acres of University land. Managed by local farmer Nigel Martin of Waterfall Farms, this farm produces over 80 tonnes of locally grown produce, all of which is exclusively supplied to the KSG-operated cafés on campus.

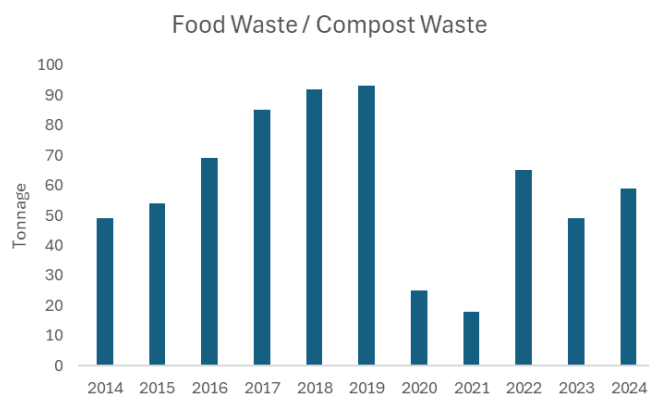
A sustainable food policy is currently under development, aiming to assess the carbon footprint of UCC's food outlets while supporting the University's Healthy Campus Charter.



3.7 Food waste

Despite a rise in student numbers, food waste volumes at UCC have decreased, thanks to the installation of enhanced collection facilities and increased efforts to reduce waste at its source. Currently, food waste accounts for 11% of the total annual waste generated at UCC.

In the main catering outlet, KSG have implemented a smart data measurement platform powered by AI to track both the type and quantity of food waste produced. By analyzing this data and making targeted adjustments to the menu, the team has successfully reduced food waste in the main kitchen facilities by 20%.



KSG is also proud to be a signatory of the EPA Food Waste Charter, further demonstrating their commitment to sustainable practices.

3.8 ICT Equipment

UCC avails of centrally managed procurement frameworks for the purchase of ICT equipment wherever possible. These frameworks include a mandatory requirement that all equipment is EPEAT-certified, ensuring compliance with recognised environmental performance standards.

To date, UCC has conducted only one standalone tender for ICT-related equipment — the supply of audiovisual systems for the University. In this procurement, GPP criteria were fully integrated into the evaluation process. Among the sustainability requirements, all display units were required to feature an automatic power-down function, while tenderers were obliged to provide services for the re-use and recycling of audiovisual products, including functional testing, repair, upgrading, and preparation of components for re-use.

3.9 Paper

Several initiatives have already been implemented over the last decade including the installation of managed print services for students and staff which reduced the annual printing demand by 21 million pages for students and 13 million for staff.

The University's Digital Masterplan 2023–2028 has strengthened digital capabilities through the adoption of cloud-based applications, enabling greater automation and the expansion of digital workflows to replace paper-based processes. A notable example of this transformation is the digitisation of the Cork University Dental School and Hospital's patient records system, which has eliminated the need for paper files and manual labelling.

This initiative is estimated to save approximately €18,000 in paper costs and over 10,000 labels annually, while also improving efficiency and data accessibility. This transformational project was shortlisted for the Project Management Institute, Public Sector Project of the Year in 2024.

A Sustainable Print Policy is also in place to minimise the environmental impact associated with printing activities. Through this policy, a managed print service ensures that all devices are configured to the most environmentally responsible settings by default, such as duplex and black-and-white printing. Print volumes are actively monitored and allocated to individual departments to encourage accountability and reduce unnecessary printing. In addition, a toner collection and recycling service operates across campus to ensure that all used cartridges are properly recovered and recycled.

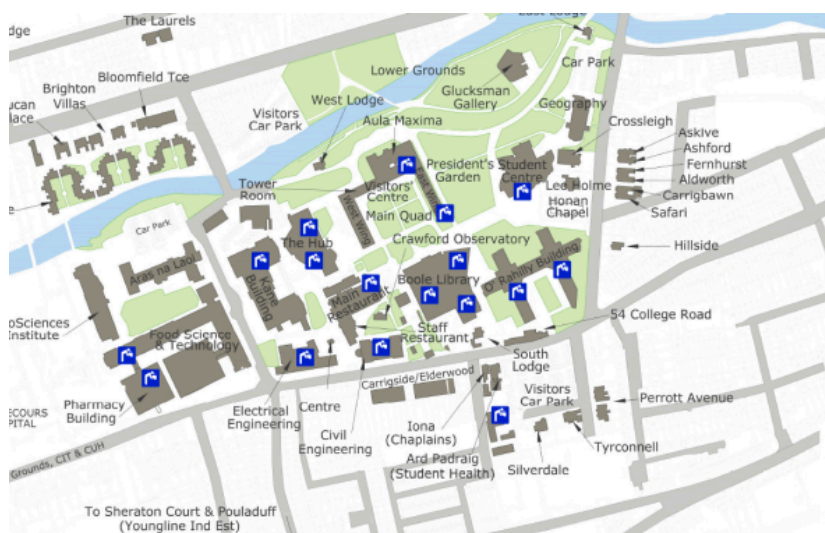
Securing Our Future UCC Digital Master Plan



3.10 Water

The University's annual water consumption averages just over 200,000 m³, with the main uses being toilets and showering facilities across the campus. Several deionised (DI) water plants, which consume water to produce DI water for laboratory use, are installed in research-intensive buildings. In addition, the wave tanks at the Beaufort Building and the swimming pool at the Mardyke Arena contribute notably to overall water demand. A member of the Energy Management Team has achieved certification under Uisce Éireann's Water Stewardship Programme, strengthening UCC's capacity to manage water resources responsibly and efficiently.

There are currently 35 publicly accessible water refilling stations located across the UCC campus, both inside and outside University buildings. The Estates team continues to expand the network of bottle-filling stations in response to user demand. A dedicated maintenance and cleaning programme ensures these facilities remain hygienic and convenient, encouraging staff and students to refill their bottles and reduce reliance on single-use bottled water.



3.11 Single Use

The Single Use Policy, implemented in 2023, ensures that single use plastic items, such as water bottles, disposable cups etc are no longer available to purchase at any canteen, cafe and shop outlet at UCC. Under UCC's climate action plan, the University shall work with the UCC community and suppliers to phase out the use of other non plastic single use items such as paper plates, wooden cutlery while through the My Green Lab program, the University shall implement initiatives and policies to reduce the use of single use items in a laboratory and clinical environments.

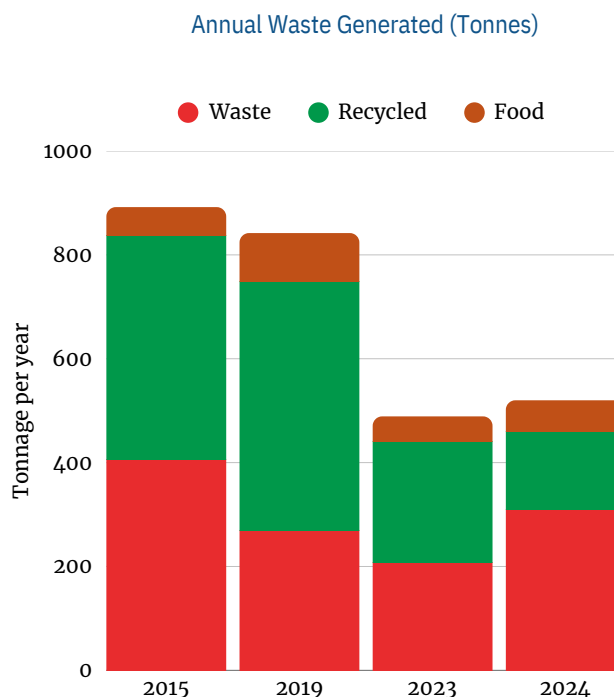
3.12 Other materials

Since 2008 UCC have been active in reducing the waste volumes collected across the campus, ensuring the correct waste collection facilities are in place at the right location, while maximising the opportunity to recover or reuse waste materials.

By the end of 2024 the University reduced the total volume of waste generated on site by 42% on 2015 levels, with the introduction of the single use policy the most significant change over the period, which eliminated 1.5 million disposable cups and 200,000 plastic bottles per year.

Further reductions were achieved through the introduction of binless offices, the implementation of a Sustainable Conferencing and Events Policy, and enhanced on-site waste collection management. These initiatives have helped to minimise waste generation at source, improve segregation rates, and promote more sustainable practices across University operations.

Since the publication of the last Climate Roadmap report, the General Services team at UCC has implemented a Furniture and Office Equipment Reuse Scheme, enabling unwanted office furniture and other items to be offered to the UCC community for rehoming within the University. The initiative has proven highly successful since its launch in late 2024, reducing waste generation and supporting a circular economy approach within the University.



Summary Table: Our Way of Working

Requirement	12 month lookahead
Report on the following in the Annual Report of the public sector body:• GHG emissions;• Implementation of the mandate;• Sustainability activities;• Compliance with Circular 1/2020: Procedures for offsetting the emissions associated with official air travel	• Develop and implement a framework to assess the effectiveness of the University's new travel policy, including key performance indicators related to emissions reduction, behaviour change, and travel cost savings. • Establish an enhanced system for tracking the number and type of flights undertaken by UCC staff and students throughout the year. This will support more accurate reporting of scope 3 emissions and inform efforts to reduce air travel where feasible. • Convene working group to review options for implementing a carbon off-setting policy to help drive a reduction in travel-related emissions.
Using SEAI's Public Sector M&R System, public bodies are to report annually on implementation of the individual mandate requirements using a "comply and explain "approach.	• Ensure timely and accurate submission of the 2025 SEAI Monitoring and Reporting data.
Achieve formal environmental certification for large public sector bodies, such as ISO 50001 (Energy Management Standard) or ISO 14001 (Environmental Management System), with a view to going beyond ISO 14001 to adopting Eco Management and Audit Scheme (EMAS).All public sector bodies with an energy spend greater than €2 million per annum to achieve ISO 50001 certification by end-2024; remaining public bodies to implement energy management programmes as per SEAI's energy management guidance (S.I. 426 of 2014) and report to SEAI annually on its M&R system.	• Review emerging ISO standards that complement UCC's existing ISO 50001 system and develop a plan to integrate the most relevant standards into the University's broader sustainability and decarbonisation framework.
Implement Green Public Procurement in accordance with the Green Public Procurement Implementation Mandate set out in Buying Greener: Green Public Procurement Strategy and Action Plan 2024-2027 , using the EPA Green Public Procurement Guidance and criteria/Office of Government Procurement's online Green Public Procurement Criteria Search tool as resources. Adhere to the Circular to be published by the Department of Public Expenditure, NDP Delivery and Reform, regarding new Green Public Procurement obligations.	• Develop a Sustainable Procurement Policy for the University. This will enhance the importance of considering sustainability across all high and low value procurement transactions across the University. • To provide a staff training workshop for local buyers in relation to GPP with a priority focus on key goods/services and works for UCC. • Continue to monitor and report on the use of GPP.

Summary Table: Our Way of Working

Requirement	12 month lookahead
Specify low carbon construction methods and low carbon cement material as far as practicable as per guidance issued by Department of Enterprise, Trade and Employment for directly procured or supported construction projects from 2024	Continue to engage the services of a carbon co-ordinator and review the effectiveness of the role for delivering carbon reductions.
Adhere to the best practice guidelines for the preparation of Resource and Waste Management Plans for construction and demolition projects for directly procured or supported construction projects from 2024	The CPO Design Team Procedures and associated Schedule of Services will be updated to reflect the following commitments: • RWMPs will be prepared for all applicable projects in accordance with the EPA's guidelines. • RWMPs will be embedded into the design, procurement, and construction stages. • Contractors will be required to report on waste quantities, recovery rates, and disposal methods. • UCC will promote circular economy principles, including reuse, recycling, and material recovery.
A minimum proportion of construction materials procured by public bodies under new contract arrangements to comprise recycled materials	To align with evolving national policy and best practice, the CPO Design Team Procedures will be updated to include the following: • Prioritisation of recycled materials in construction, particularly: • Recycled aggregates (e.g. stone, concrete, bricks) for non-structural uses such as general fill, road base, and landscaping. • Requirement for design teams to assess and document opportunities for material reuse during Stage 1 and Stage 2a design development. • Record where feasible the percentage of recycled materials used.
A minimum of 10% by value (€) of food sought under new contract arrangements (including via contractors such as canteen service providers), is to be certified organic in each of the following categories of Cereals, fresh Beef, Lamb, Pork, Poultry, Fish, Vegetables and Dairy products, where possible.	Existing contract in place. No new tenders expected over the next 12 months.

Summary Table: Our Way of Working

Requirement	12 month lookahead
Measure and monitor the food waste generated on premises from 2024, using a standardised approach to food waste measurement set out in the EPA public sector guidance.	Continued engagement with current provider who have achieved a 20% reduction in food waste.
All new contract arrangements related to canteen or food services, including events and conferences, to include measures that are targeted at addressing food waste (with a specific focus on food waste prevention and food waste segregation, taking into account Ireland's commitment to reduce	Continued engagement with current provider who have achieved a 20% reduction in food waste.
A minimum of 80% of ICT end user products (desktop computers, portable computers and mobile phones) procured by public sector bodies under new contract arrangements are certified to EPEAT Gold Standard (or equivalent), TCO Certified (or equivalent) or will have been remanufactured.	- To include the requirement to supply refurbished models in the planned mobile phone contract. - Pilot the use of remanufactured devices for general IT desktop equipment.
Review any paper-based processes and evaluate the possibilities for digitisation so it becomes the default approach. Eliminate paper-based processes as far as is practicable. Where office paper for printing and photocopying must be procured, 100% of the paper must be recycled paper. Measure and monitor paper consumption	- Transition to 100% recycled paper supplies from November 2025. - Continue to highlight the requirement for digitization and encourage everyone to look for projects to digitize any of their paper-based processes. - Develop data collection plan for tracking paper consumption. - Continued roll out of managed print service.
Provide suitable drinking water refill points for all staff and in any premises accessed by the public	Monitor usage of existing stations and increase number of stations if demand exists.

Summary Table: Our Way of Working

Requirement	12 month lookahead
Measure and monitor water usage for the organisation as a whole.	Work with UE to implement water metering platform.
Cease using disposable cups, plates and cutlery in any public sector canteen or closed facility, excluding clinical (i.e., non-canteen healthcare) environments, and in publicly funded advertising or broadcasting.	Update the single use policy to include the eliminated of non plastic SUP's in a canteen setting.
Eliminate all single use items within the organisation and from events organised, funded, or sponsored.	Update the single use policy to include the eliminated of non plastic SUP's in a catering events.
Support Ireland's Producer Responsibility Initiatives in the collection and recycling of products including the Deposit Return Scheme	Monitor utilisation of existing DRS machines on campus.
Contract waste collection services that are segregated into a minimum of 3 streams – residual/general waste, recycling waste and organic/biowaste and monitor weights collected.	Continue to measure waste volumes and take appropriate action to ensure continued reduction.

4. Our Buildings & Vehicles

4.1 Promote the use of Bicycles and shared mobility options

Progress to Date

Since 2006, a Commuter Manager has been in place at UCC, supporting the University's long-standing commitment to promoting sustainable travel. UCC has consistently worked to enhance walking and cycling infrastructure, with a strategic focus on encouraging more sustainable modes of transport to and around campus.

Over the past decade, significant investment has increased the number of bicycle racks to 1,452 while additional shower facilities were also provided to support and encourage cycling. In recent years, additional secure bike parking facilities have also been introduced to further promote cycling as a safe and convenient commuting option.

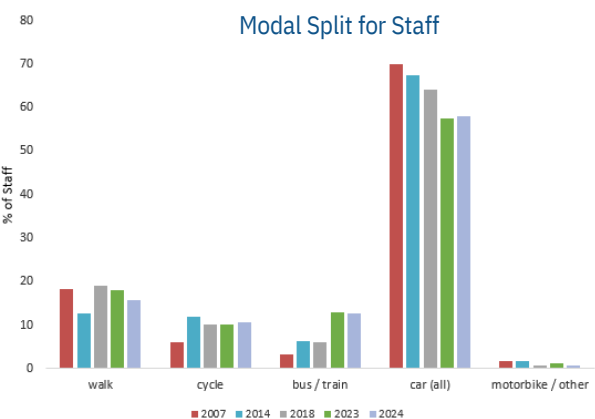
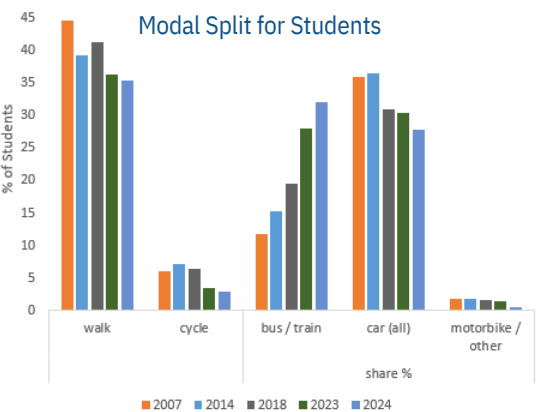
The University actively collaborates with partners including Transport for Ireland (TFI), Bus Éireann, and Munster Technological University (MTU) to identify and implement improvements to local public transport routes. These efforts aim to make public transport a more attractive and viable option for those travelling to campus.

Since 1999, UCC has operated a free Park & Ride service from satellite car parks to the main campus, available to both staff and students. This service remains highly popular, carrying approximately 64,000 passengers annually and operating throughout the year.

In addition, UCC has maintained a car pooling scheme for several years. Dedicated parking spaces for car poolers are reserved until 10:00 AM each day, encouraging shared travel. Staff also benefit from discounted rates with a car sharing service, ideal for those who only require occasional access to a vehicle.

To monitor and inform its sustainable transport initiatives, UCC conducts annual travel surveys among students and staff. These surveys help track commuting trends and evaluate the effectiveness of current transport options.

As shown in the charts, walking remains the most common mode of travel among students, although its share has declined since 2007. Meanwhile, public transport use has grown significantly between 2007 and 2024, driven by improvements in route coverage, increased service frequency, and reduced costs. The number of students commuting by private car has also declined during this period, reflecting a broader shift towards more sustainable travel behaviours.



Private vehicles continue to be the primary mode of transport for staff commuting to the University. However, there are encouraging signs of change, with a gradual shift towards greater use of public transport. Supporting this transition, the staff travel pass scheme enables employees to purchase annual bus and rail tickets at discounted rates, exempt from tax, PRSI, USC, and pension-related deductions. Currently, over 40 staff members benefit from this initiative.

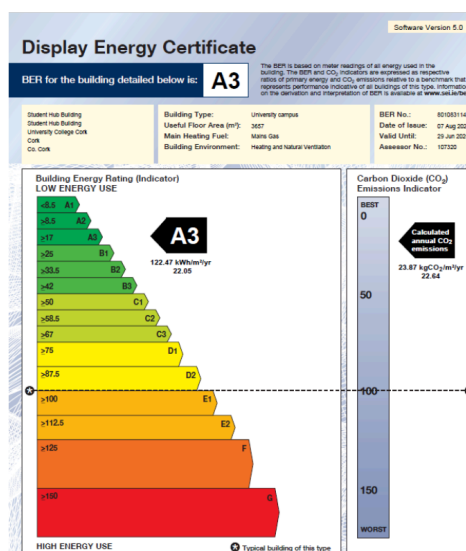
An application has been submitted by the University to attain the Smarter Travel Mark, recognising its ongoing commitment to promoting sustainable and active travel options for staff and students.

4.2 Phase Out Parking

Over the past decade, the number of parking spaces on campus has decreased as the University has expanded, leading to a growing demand for parking that exceeds available capacity. Despite improvements in public transportation, private vehicles remain the primary mode of travel for staff. The Park and Ride facilities, located 3 km from campus, help reduce traffic by avoiding an additional 108,000 vehicle trips into the surrounding area. There are currently 1,022 parking spaces across the University Estate, with a fee structure in place for 330 of these spaces. Additionally, 17 spaces have been converted to electric vehicle (EV) charging stations. The management of parking, along with ongoing improvements to public transport options for staff, will continue to be closely monitored.

4.3 Display Energy Certificate

Annual DEC renewal process has been in place since 2014 with 29 buildings assessed annually. Two buildings achieved A3 ratings, up from one in 2024. A further 19 achieved a C rating or better.



4.4 Installation of fossil fuel boilers

While the University aims to replace aging fossil fuel fed heating plant with low carbon technology, in some cases the Estates office will have to install gas fed condensing boilers as emergency measures.

In 2025 new condensing boilers were fitted in Food Science and the Main Restaurant building due to equipment failures. Given the age of the original installations, the new more efficient boilers will result in savings of around 0.1 GWh/y.

The Estates Office has developed a comprehensive strategy to replace UCC's existing steam network, which currently serves seven buildings and accounts for 25% of the University's total gas consumption. The plan involves the development of a new, larger district heating network that will eventually connect 16 buildings on the main campus. Once complete, this new system is expected to reduce UCC's gas usage by 8 GWh annually. As part of the transition, several buildings currently connected to the steam system will be temporarily decoupled and supplied with local gas boilers. This will ensure continuity of heating services during the decommissioning of the existing network and the installation of the new infrastructure.

When it comes to new buildings or buildings undergoing major retrofits, no new fossil fuel heating systems will be installed.

4.5 Procurement of energy related products, heating equipment, indoor and outdoor lighting

The Estates Office prioritises purchasing products listed on the SEAI Triple E Register. If a product is unavailable on the register, the team ensures that energy efficiency remains a key criteria when selecting an alternative. Additionally, the Estates team follows the comprehensive guidance provided by the EPA on GGP, e.g. lighting replacement projects tool kit. For major capital projects, design guidance policies provided to external design teams mandate the use of Triple E registered products. Third-party audits, conducted as part of our ISO 50001 EnMS, verify compliance with these policies.

4.6 Procurement of Cleaning Contracts

In the 2024 tender for UCC's new cleaning contract, GPP criteria were embedded, including requirements for staff training on sustainable cleaning, carbon footprint assessment, eco-friendly cleaning products, efficient equipment, and low emission vehicles.

The appointed contractor, Bidvest Noonan, is ISO certified and has a net zero plan targeting 2035 for Scope 1 and 2 emissions and 2045 for Scope 3. Their green service model eliminates chemical use for over 70% of cleaning needs, using biodegradable PVA sachets or super-concentrated, smart-dosing products where necessary. All equipment undergoes lifecycle assessment to ensure recyclability and resource efficiency, and only high-efficiency machines are used to minimise energy use and emissions. Bidvest Noonan also participates in EcoVadis and reported a carbon footprint of 132.95 tCO₂e for the UCC contract in 2024.

4.7 Existing Buildings

Under UCC's Strategic Plan 2023–2028, Securing Our Future, Goal 5 — Our Place, Our Footprint, UCC's Capital Programme is guided by the UCC Campus Masterplan and the University's carbon-neutral ambitions. A key focus of the Masterplan is the optimisation of existing buildings and grounds to support sustainable development.

As part of this strategy, UCC aims to maximise the use of its current facilities while exploring opportunities to reduce the overall number of buildings, with a particular emphasis on phasing out the use of properties not owned by the University.



Currently, ten buildings account for 78% of UCC's total annual energy consumption. These buildings are the primary focus of ongoing optimisation programmes aimed at enhancing the performance and efficiency of their building services. In parallel, building fabric upgrades are planned for several of the largest energy users identified as being in poor condition. The Food Science Building retrofit is currently at the design stage, while the Kane Building, which alone accounts for 9% of UCC's total energy use, is scheduled to undergo a major retrofit supported through the Higher Education Strategic Investment Fund (HESIF).

4.8 Procure or lease zero only emission vehicles

UCC's fleet inventory is relatively small, consisting of 24 work vehicles with a combined annual mileage of under 100,000 km. Emissions from this fleet account for less than 0.1% of UCC's total annual energy-related emissions, while a further 0.4% is attributed to fuel consumed by the Park & Ride service.

Of the 24 vehicles, eight are fully electric. The remaining 16 serve operational functions that are not yet suitable for electrification; however, as these vehicles reach the end of their service life, the University will assess technical options to transition them to electric alternatives where technical solutions are available.

UCC has already completed the electrification of its landscaping equipment, including mowers, strimmers, and related tools, which are used to maintain the campus grounds.

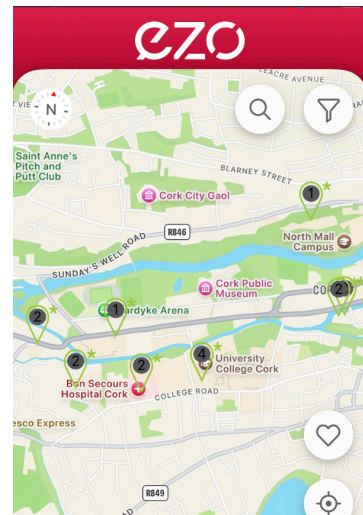
A small fleet of e-bikes are also available for operational staff to travel between UCC's campuses and sites across the city. These have proven to be a popular and efficient means of transport and reducing the need for short vehicle journeys.

4.9 Installation of charging infrastructure

Since the first electric vehicle (EV) charging installation in 2012, the University's charging infrastructure has expanded to 17 stations, strategically distributed across both the main campus and satellite locations.

In 2024, the charging system was upgraded to an app-operated platform, making it accessible not only to staff and students but also to the general public. The current infrastructure supports an average of 260 charging sessions per month.

The utilisation of the EV charging spaces will be kept under review to assess the need for additional installations.



Summary Table: Our Buildings & Vehicles

Requirement	12 month lookahead
Promote the use of bicycles (including push bikes, electric bikes, and cargo bikes) and shared mobility options as an alternative to car use among employees and visitors by creating and maintaining facilities (both inside and outside of buildings) that support such options, including secure and accessible bicycle parking, shared mobility parking, and charging stations, as appropriate, with a view to achieving the National Transport Authority's Smarter Travel Mark.	• Achieve Smarter Travel Mark (STM) accreditation to formally recognise the University's commitment to promoting sustainable commuting practices. • Increase the number of secure, covered, and well-lit bike lock stations across campus to support and encourage cycling as a primary mode of transport among staff and students. • Improve uptake of car sharing and car pooling schemes by offering targeted incentives, increasing awareness through effective communication campaigns, and making platforms more accessible and user-friendly • Launch an electric vehicle car sharing initiative to provide a low-emission, short-term transport option for the UCC community, reducing dependence on privately owned vehicles while supporting climate action goals. • Publish UCC Commuter Plan 2025-2030.
Phase out the use of parking in buildings that have access to a range of public transport services and active/shared mobility options for the majority of staff/visitors, while providing that sufficient accessible parking is maintained for those with physical mobility issues.	• Continue Local and National Engagement, including LUAS Cork Light Rail Consultation process and Cork Area Commuter Rail. • Design and implement a comprehensive data collection strategy to gain deeper insights into private vehicle journeys to and from campus. • Improve the availability and accuracy of data related to UCC car park usage. This could include real-time occupancy rates, peak usage times, and long-term demand trends to support effective car park management and inform future mobility planning.
Display an up-to-date Display Energy Certificate in every public building that is open to the public to clearly show energy use.	Renew DEC certs
The public sector will not install heating systems that use fossil fuels after 2023, in (1) new buildings, and (2) "major renovation" retrofit projects as defined in the Energy Performance of Buildings Directive (EPBD) unless at least one of the following exceptions applies: • The fossil-fuel use is only through using electricity from the grid. • There is no technically viable non-fossil alternative (generally only related to applications for a purpose other than space heating). • The installation of a renewable space heating system would increase final CO2 emissions. • The fossil-fuel use is provided for backup, peaking, or operational purposes (and makes up less than 10% of annual heating energy). • Where the direct replacement of existing fossil fuel heating is required for an emergency maintenance purpose.	• No major renovation projects planned over the reporting period. • Only the installation of local boilers is scheduled, to facilitate the decommissioning of the central steam network.

Summary Table: Our Buildings & Vehicles

Requirement	12 month lookahead
All tenders for the public procurement of energy-related products, heating equipment, or indoor and outdoor lighting to include a requirement for tenderers to specify recommendations and options for the product, when the product or components of the product comes to the end of life, that consider environmental sustainability, including options for reuse, repair, and recycling. Comply with SI 626 of 2016 to procure Triple E registered products or equivalent.	• Already implemented via ISO 50001 EnMS. • Develop procurement strategy to ensure energy efficiency is considered during the purchase of specialised research equipment.
All tenders for the public procurement of indoor cleaning services to include a requirement for tenderers to specify the training that will be put in place to ensure that all staff involved in delivery of the contract have the knowledge and skills to apply cleaning methods, which will reduce the environmental impact of the services	• Current service provider has already implemented significant environmental improvements and training. • No cleaning tender process planned for the period.
Building stock plans – all public bodies that have not yet completed a stage 1 Building Stock Plan should do so and submit to SEAI. Public bodies that have completed a BSP should update it regularly, minimum every two years. Public bodies are encouraged to include their BSPs in their Climate Action Roadmaps	• Building stock plan to be reissued no later than December 2025
Procure (purchase or lease) only zero-emissions vehicles from the end of 2022, enabling Ireland to go beyond the requirements of the EU Directive, amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles (EU Directive 2019/1161, the Clean Vehicle Directive) and act as an international leader in this area. An exception applies where the vehicle is exempt under European Communities (Clean and Energy-Efficient Road Transport Vehicles) (Amendment) Regulations (S.I. 381 of 2021) ⁶ . Public sector procurement contracts for delivery and haulage should specify zero-emissions vehicles where possible.	• Undertake a service needs analysis to identify opportunities to reduce fuel consumption and overall fuel use, including the delivery of a fuel conservation training programme to promote efficient driving practices and support ongoing emissions reduction across University operations • Issued a call to market for the provision of an electrified Park & Ride service for UCC, supporting the University's commitment to low-carbon transport and sustainable campus mobility. • Generate transition plan to replace the remaining fossil-fuelled vehicles in the University's fleet with electric or other low-carbon alternatives.
As an enabler for the switch to zero-emissions vehicles and meeting Climate Action Plan targets, in 2024 public sector bodies with a vehicle fleet should develop a plan for installation of charging infrastructure in relevant locations. The plan should align installation of infrastructure with timelines for decarbonisation of the body's fleet. The plan should be included in the body's Climate Action Roadmap.	Continue to monitor the utilisation of existing EV charging facilities and assess the demand for additional charging spaces as usage increases.