



## Sustainability at University College Cork

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**Abstract.** UCC has been a leading institution for sustainability in Ireland and beyond for a number of decades. The approach at UCC has been to integrate sustainability within the operations, teaching, research and engagement activities of the University. Operationally UCC implements best practice in managing water consumption and disposal. Through our Green Campus programme, students, academic and professional services staff are actively engaged in environmental management on campus. Our water conservation efforts have followed the approach taken with energy management through our Saver Saves scheme. This scheme established Green Teams within Buildings and a revolving fund mechanism whereby teams were incentivised to reduce consumption and supported to implement projects specific to their individual setting. A major exercise to baseline water consumption was undertaken a number of years ago and drawing on these findings, specific projects have been implemented to improve efficiency. This paper will explore sustainability at UCC across operations, teaching, research and engagement with a specific focus on water.

### Keyword:

Sustainability, energy consumption, single-use plastics, university

## 1. Introduction

Universities are increasingly being called upon to act as “agents” of sustainability” (1) reimagining their operations, research, teaching and engagement activities to drive the “transformative change” that is now necessary for a better future. (2) University College Cork (UCC) is a comprehensive, research-intensive University located in the Republic of Ireland. It is an urban campus with a population of over 24,000 students and approximately 3,300 staff. In 2010, UCC was the first University in the world to be awarded a Green Flag from the Foundation for Environmental Education, Copenhagen and in 2018 became the first University outside of North America to be awarded a STARS Gold rating from the Association for the Advancement of Sustainability in Higher Education. Both achievements are detailed in Reidy et al. (2014) and Kirrane et al. (2019) respectively.(3,4) UCC has consistently been

ranked in the top ten of the UI Green Metric Ranking and in 2022 was named Sustainability Institution of the Year UK and Ireland by the Environmental Association for Universities and Colleges.

From the beginnings of the Green Campus programme, which was instigated by student activists in 2007, to the present day, sustainability at UCC has evolved from a niche “nice to have” initiative to a core value of the University. In February 2023, UCC’s new Strategic Plan “Securing our Future” was launched. The plan highlights sustainability as one of the core values of the University and Goal 5: “Our Place, Our Footprint” outlines how the University intends to “radically reform our practices and use of space and technology to meet our ambitious sustainability and climate action goals.” (Fig 1.) (5) UCC’s Sustainability and Climate Action Plan (2023-28) commits the University to becoming carbon neutral across all scopes of emissions by 2040 and to be a certified “zero waste” campus by 2030. The University is mandated by the Irish Government to reduce its absolute scope 1 and scope 2 carbon emissions by 51% by 2030. (6)

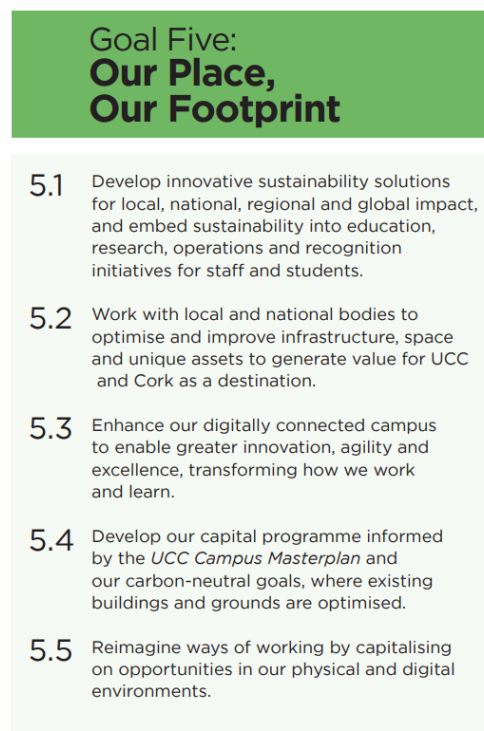


Figure 1. Goal 5 of UCC Strategic Plan 2023: Securing our Future

In 2022, the University established an Office of Sustainability and Climate Action within the President’s Office as well as a University Leadership Team Subcommittee on Sustainability and Climate Action, to act as a decision making body for the University. In 2023, an Associate Vice President for Sustainability and Climate Action was appointed. These new structures complement the existing student-led Green Campus Committee and more staff-focussed Green Forum. As such there is an ever evolving “ecosystem” of sustainability management and coordination in the University, which provides ample opportunity for students and staff, at all levels, to engage. Ultimately the University aims to act as a “Living Laboratory” for sustainability, integrating the SDGs within teaching, research, operations and engagement. This paper will focus on the *practice* of sustainability within our

operations, with two examples from recent years.

## 2. Methodology

As mentioned, the University was awarded a Green Flag from the Foundation for Environmental Education in 2010 and ISO50001 certification for its energy management programme in 2011. Both programmes are based on continual improvement in environmental performance and a combined approach to both has in turn formed the basis of a comprehensive university wide engagement programme for broader sustainability. This paper will therefore detail aspects of that programme in relation to:

- 1) Our approach to energy management on campus, the Saver Saves scheme.
- 2) How this approach has been applied to other environmental impact areas most notably water.
- 3) Our approach to removing single use plastics on campus, thereby preventing plastic pollution at source.

### 2.1 Energy and Water Consumption

UCC's energy management approach has been to work with Significant Energy Users (SEUs) across campus to support our users to reduce our overall footprint. UCC campus has 134 buildings, 13 of which consume more than 80% of the University's electricity. Focusing on these SEUs has involved

- 1) Establishing green teams within each building with members of staff who are involved in day to day running of the building;
- 2) Development of a green "revolving" fund, whereby monetary savings from energy efficiency measures remain with the Green Team to be invested in further environmental measures;
- 3) Active support from the University energy manager and Sustainability and Climate Action Office to develop project ideas.

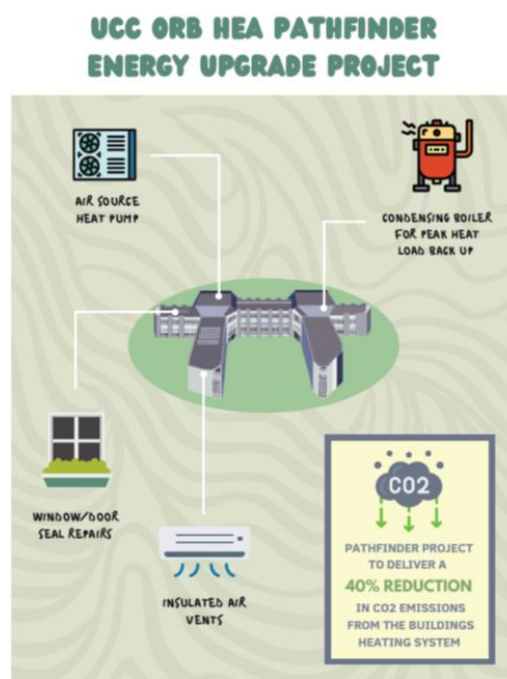


Figure 2. UCC's ORB Building Pathfinder Project

Innovative initiatives have included occupancy detection in the University's library building combined with shutting down of energy intensive spaces at quieter times of the year. In the University's Glucksman Gallery Building a programme of improved monitoring and management of special collections ensured that temperature controls were only utilised when necessary. A wide-ranging Green Labs programme is also being implemented with the aim of reducing laboratory energy consumption. In tandem with these efforts, UCC has been successful in securing significant investment from the Irish Government Pathfinder programme to implement large scale retrofit projects on campus. In 2021, UCC's O'Rahilly Building (ORB) was retrofitted with an Air Source Heat Pump in a project expected to reduce emissions by over 50%.

In bringing Green Teams together across the university, it quickly became apparent that there was a desire to drive change across a range of environmental impacts, not just energy consumption. In 2019, the University signed up to the Irish Water Stewardship Program and underwent a water mapping program to determine the significant users of water across the estate. In a similar pattern to that seen with energy consumption, the mapping revealed that out of 102 separate water accounts, 6 of which consume over 81% of the University's annual water use. The approach taken in relation to water management has included:

- Embedding water conscious behaviour in the campus community through education & awareness including the Saver Saves scheme.
- Upgrading to water efficient facilities including sensor technology & dual flush.
- Installation of water flow restrictors on tap outlets and sensor technology.
- Comprehensive underground leak detection & remediation program.
- Installation of metering and alarming systems to identify any leakage, excess consumption.
- Auto water shut offs to match building opening times.
- Use of grey water reuse systems for toilet flushing.
- Use of rainwater harvesting for toilet flushing, plant watering and use in glasshouse facilities.

## **2.2 Single Use Plastics**

The original impetus for the Green Campus programme in UCC was students' frustration with waste management and recycling on campus. Waste continues to be a topic that excites the student body. In 2017, UCC library's Green Team, which had been set up as part of the Saver Saves scheme made the decision to tackle waste within their building. An audit of all bins in the library was undertaken which revealed that there were small waste bins across the building and that the level of recycling was negligible. A decision was taken to remove all waste bins from the building and to install two recycling stations at the entrance and exit of the building. Concurrently the use of disposable cups was banned within the building.



Figure 3. UCC Library goes disposable free in 2017

The initiative attracted significant attention and inspired the student body to establish a “Plastic Free UCC” campaign, which included a petition signed by over 8,000 students and presented to university management in May 2018. The petition stated that UCC should aim to be single use plastic free by 2023. In response to the petition UCC management approved a Single Use Plastics (SUP) policy in May 2022. This policy covers SUPs sold by UCC’s suppliers and subsidiary companies and any market stalls permitted to trade on UCC campus. Laboratory SUPs are being addressed through the UCC Green Labs programme. The items covered by this policy include:

- Single-Use beverage containers i.e. coffee cups, drinks cups etc.;
- Single-Use salad containers/lunch boxes;
- Single-Use plastic cutlery;
- Single-Use plastic bottles (e.g. for water/ soft drinks);
- Further SUP items may be added to this list at a later date by the SUP Action Group, and it will be clearly communicated to all relevant stakeholders where applicable.

The policy defined an SUP or disposable item as one that is designed to be used by the consumer once and disposed of thereafter. Therefore, and importantly, given the current situation regarding postconsumer management of compostable/biodegradable waste, the policy includes compostable and biodegradable cups as an SUP.

### 3. Points of Results and Discussions

#### 3.1. Energy and Water Consumption

UCC’s Saver Saves scheme has seen the University improve energy efficiency by over 50%, but more importantly reduce absolute energy consumption by 22% (Fig 4.). This is in spite of an increase in student numbers from 16,000 in 2006 to 24,000 in 2023. Through our extensive building retrofit programme the University has significantly reduced its reliance on fossil fuel heating (Fig 4.).

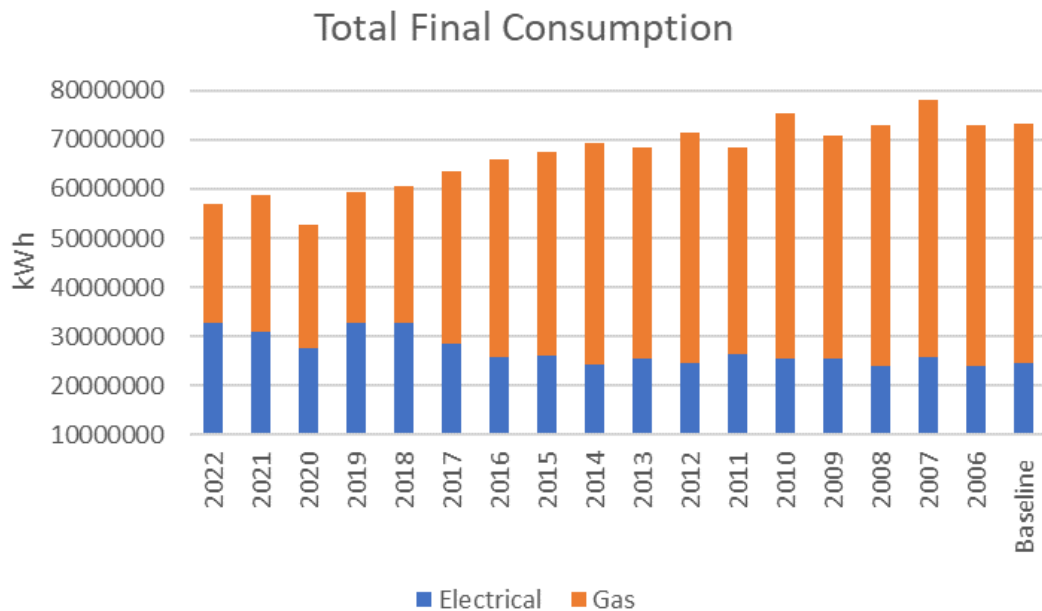


Figure 4. UCC Energy Performance to date (Source: Sustainable Energy Authority of Ireland)

The Saver Saves scheme, at broader level, has embedded a culture of sustainability within the University. Green Teams that were established to reduce energy consumption in buildings have expanded their activities to enhancing biodiversity, encouraging more sustainable modes of transport and embedding the SDGs within the curriculum. The scheme has shown that, by incentivizing action, while also devolving power to building users,

In a typical year the University uses 130,000 m<sup>3</sup> of freshwater across the estate. The main consumers of water are the cafes, restaurants, toilets systems, drinking fountains, research labs and deionized water generation plants. Between 2009 and 2019, the University saw a reduction in water consumption per weighted campus user of 64%.

### 3.2. Single-use plastics

The single-use plastics ban across UCC catering has resulted in the avoidance of over 300,000 single use items within the first six months of implementation. The rollout of such a wide-reaching policy has not been without complications and the University has had to provide financial support for the transition. However, given the substantial reduction in single-use plastic consumption on campus it is hoped that UCC will have paved the road for other institutions to come. In 2023, the Irish Government’s Climate Action Plan called on all public bodies to remove single-use cups from their operations. UCC is now in a position to share its learnings across the sector to accelerate this endeavour. The consumption of single-use plastics is estimated to be responsible for between 60-95% of global marine plastic pollution. (7) Previous research on single-use plastic consumption within UCC highlighted the need for systemic change in tackling the issue, as opposed to a reliance on individual behaviour. (8)

### 3.3. Driving behavioural change

Kirrane et al. (2019) outlined how the combination of a bottom-up and top-down approach to sustainability in UCC had nurtured a cultural shift within the organisation toward a sustainability “ecosystem”. The examples presented here illustrate how the institution has facilitated behavioural change and can be conceptualised in accordance with the ISM model of behaviour change. The model was developed by the Scottish government

to allow practitioners to mobilise behavioural change theory and apply it in developing and delivering behaviour change interventions on the ground. It highlights the need for interventions to work at the Individual, Social and Material levels.(9)

Table 1. UCC Initiatives viewed through the ISM Tool lens

	<b>Individual</b>	<b>Social</b>	<b>Material</b>
Plastic Free UCC	Financially neutral decision for customers. Free cups and bottles distributed to students. Speaks to University affirmed values.	Student Union led petition and campaign. Policy approved by university management. Capitalises on strong relationship with university caterers.	Water fountains rolled out across campus. Mini dishwashers installed in cafes and restaurants. Deposit-return scheme implemented for reusable cups.
Saver Saves Scheme	Individual agency promoted through financial incentive. Local green teams' emotional connection to buildings. Speaks to University affirmed values.	Green Team comprised of key "trusted" individuals within building/dept. University support in terms of new financial saving model. Strong marketing and communications campaign.	Targeted and data driven efficiency measures implemented to reduce consumption. Estates team working to improve building comfort as well as sustainability. Rollout of building occupancy sensors.

#### 4. Concluding remarks

Sharp (2002) defined a "vision" of an environmentally sustainable campus as a "learning organization" and a living laboratory for the practice and development of environmental sustainability.(10) As institutions of learning it is vital that universities are supported to make brave decisions and take risks in realising this vision. UCC's successes are the result of over two decades of prioritisation and collaboration for environmental sustainability. Many universities are at the start of their journey toward sustainability, but with 7 years left to 2030 it's time to work together for decisive and real action to deliver tangible change.

#### References

- [1] McGeown C, Barry J. Agents of (un)sustainability: democratising universities for the planetary crisis. *Front Sustain.* 2023 May 15;4.
- [2] Ruiz-Mallén I, Heras M. What Sustainability? Higher Education Institutions' Pathways to Reach the Agenda 2030 Goals. *Sustainability.* 2020 Feb 11;12(4):1290.
- [3] Reidy D, Kirrane MJ, Curley B, Brosnan D, Koch S, Bolger P, et al. A journey in sustainable development in an urban campus. *Integr Approaches to Sustain Dev Univ Lev Mak Links.* 2015;599–613.

- [4] Kirrane MJ, Pelton C, Mehigan P, Poland M, Mullally G, O'Halloran J. "Reaching for the STARS": A Collaborative Approach to Transparent Sustainability Reporting in Higher Education, the Experience of a European University in Achieving STARS Gold. *Int Business, Trade Institutional Sustain*. 2020;991–1008.
- [5] University College Cork. UCC Strategic Plan 2023-28: Securing our Future [Internet]. 2023. Available from: [https://issuu.com/discoverucc/docs/ucc\\_securing\\_our\\_future\\_strategic\\_plan\\_23\\_28](https://issuu.com/discoverucc/docs/ucc_securing_our_future_strategic_plan_23_28)
- [6] Department of the Environment C and C. A Climate Action Plan for Ireland [Internet]. 2023 [cited 2023 May 30]. Available from: <https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023/>
- [7] Schnurr REJ, Alboiu V, Chaudhary M, Corbett RA, Quanz ME, Sankar K, et al. Reducing marine pollution from single-use plastics (SUPs): A review. *Mar Pollut Bull*. 2018 Dec;137:157–71.
- [8] O'Neill C, Hughes A, Kirrane M, Phy N, Mullally G, Byrne E. The road to plastic-free(dom): transformative sustainability lessons from a higher education institution.
- [9] ISM Tool. ISM: A practical tool for designing effective policy interventions [Internet]. 2020 [cited 2023 May 30]. Available from: <https://www.ismtool.org/>
- [10] Sharp L. Green campuses: the road from little victories to systemic transformation. *Int J Sustain High Educ*. 2002 Jun 1;3(2):128–45.