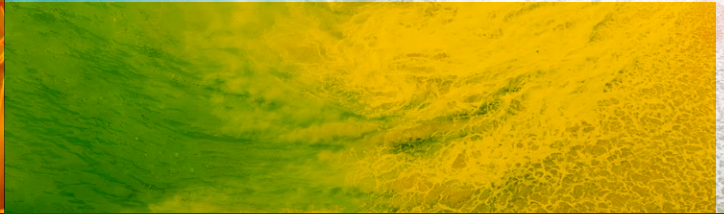




Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University



Climate Action Plan 2021-2026





We will embed sustainability at the core of our university, in its teaching and learning, research, development and innovation, its operations and promoting it through its national and international engagements

DCU SUSTAINABILITY CHARTER





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Executive Summary

In our strategic plan 2017-2022, DCU identifies Sustainability as a cross-cutting theme across all of the University's strategic goals.

The DCU cross institutional Sustainability Council has developed a new Sustainability Charter and Climate Action Plan (2020-2022) for DCU to enable and demonstrate our commitment to transforming ourselves, our institution and the community surrounding us to meet these sustainability challenges. The COVID 19 pandemic has brought many rapid and transformative changes to our personal and working lives and with those many challenges and opportunities for sustainability.

In this, the first Climate Action Plan for Dublin City University, the sheer scale of the challenge across all University activities is identified and the initial actions we will undertake to address these challenges and deliver on the objectives of the Government's Climate Action Plan and Europe's commitment to being the first carbon neutral continent by 2050. This is a challenge that will present itself to every business and private citizen in the country in the period ahead – DCU is simply deciding to take a leading role in this regard and to share our learned experiences and to use the power and reach of education to help engage and educate current and future generations about the Climate Crisis Challenge.

We are committed to ensuring that all our graduates understand the challenges of environmental sustainability and have the sustainability competencies that will equip them to be global citizens, inspired and empowered to take the actions necessary for a sustainable future. We are equally committed to undertaking sustainability focused research and to demonstrating sustainable solutions within our Living Lab campuses.

DCU is committed to demonstrating leadership in the operational sustainability of our campuses and to understanding the impacts of all our activities, establishing science based targets and action plans to reduce and mitigate these impacts.



It has become apparent through the work of the Sustainability Council that meeting our science based targets (4.2% annual reduction to 2030 based on a 1.5deg scenario) will be extremely challenging given the current practices and resources available.

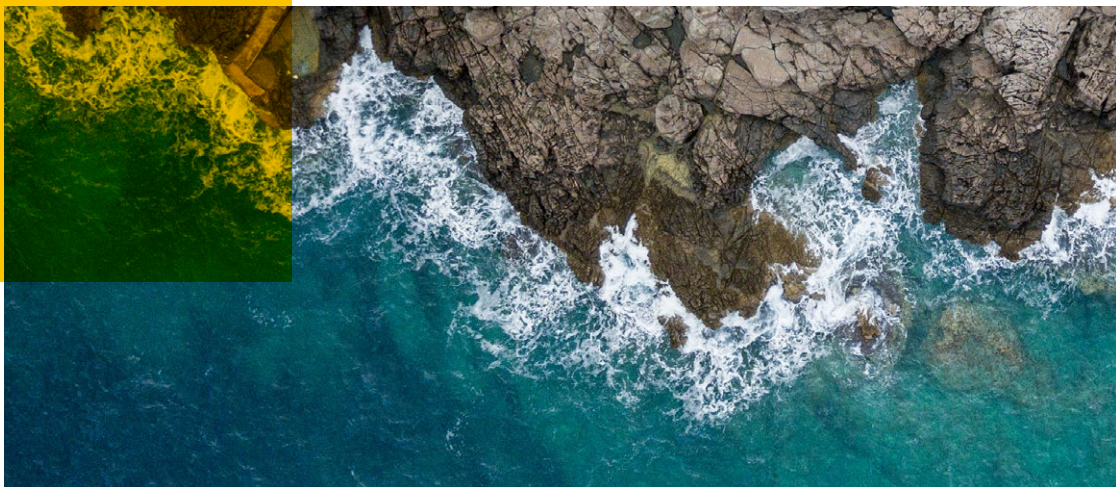
DCU cannot deliver this alone - To meet these challenges systemic changes, both within the University but also at policy level with Government, its Departments and the semi-state sector e.g. Eirgrid, Ervia, National Transportation Authority, Office of Government Procurement etc and within Irish society, will be required.

This current iterative plan, revised in the light of the COVID 19 pandemic, cannot address the systemic Government-level changes but can only focus on the actions that can be implemented by DCU to begin our own journey.

1. Introduction

Dublin City University, originally established in 1989, is located to the north of Dublin City and is the most significant and comprehensive provider of university education on the rapidly growing and economically important Eastern corridor. There are five campuses - three academic (DCU Glasnevin, DCU St Patricks and DCU All Hallows), one innovation focused (DCU Alpha) and one focused on sports (DCU Sports). All are within a 2.5 km radius with over 75 buildings (~300,000m²) on 128 acres. In 2020 DCU has over 18,000 students and 2,500 staff.

The estimated carbon emissions associated with all DCU activities in 2019 is just over 52,000tCO₂e. To provide some idea of scale, assuming, very broadly, that six trees will fix approx. 1tCO₂, over 300,000 trees would be needed to fix our emission for 2019 alone for the trees entire lifetime i.e. we would need 380,000 additional trees to fix the emission from 2018 (64,000tCO₂e).





2. Strategic Plan 2017-2022

The current DCU Strategic Plan: TALENT, DISCOVERY, AND TRANSFORMATION (2017 – 2022)¹ identifies Sustainability as a cross-cutting theme across all of the University's strategic goals.

This reflects not only our commitment to play our part as a responsible organisation but also our realisation of the messages we can convey as an exemplar organisation to both our students and society around us. The DCU cross-institutional Sustainability Council plays a key role in the identification and implementation of a system wide series of actions to support our transformation to a University with Sustainability at the core.

3. Sustainability Charter²

DCU is a young, dynamic and ambitious university with a distinctive mission to transform lives and societies through education, research and innovation. Since admitting its first students in 1980, DCU has grown in both student numbers and size and is now a multi-campus university located just north of Dublin city centre.

This charter includes the following principles and commitments:

We will **embed sustainability at the core of our university**, in its teaching and learning, research, development and innovation, its operations and promoting it through its national and international engagements,

We will communicate and promote the **United Nations Sustainable Development Goals** and will encourage all staff and students to engage in the delivery of these goals,

We will **actively advocate for climate action through all our circles of power and influence**, encouraging and supporting our staff and students in their actions,

We will **demonstrate our commitment** through our own actions,

We will measure our **environmental impact** and publish an annual carbon footprint,

We will establish and work to achieve them **science-based targets** to meet the 1.5 degree scenario requirements as per the Paris Climate Change Agreement,

We will identify and implement, in so far as possible, all measures to **reduce our carbon footprint**,

We will **share knowledge and best practice** with national and international partners and communities and work together to reduce all our impacts,





We will encourage and **promote progressive actions** undertaken elsewhere and where possible emulate these,

We will identify the **carbon footprint of goods and services** consumed by our university and work with our suppliers to reduce these,

We will support our **staff and students** in the identification of their personal carbon footprints and identify and support appropriate measures to reduce our impacts,

We will assess the institutional risk associated with climate change/sustainability and include where deemed necessary said risk on the DCU **risk register** and examine all our **policies, practices and major decisions** on a systematic basis to ensure that they do **not lock us into future high carbon pathways** but identify a pathway to a zero-carbon organisation,

We will actively **communicate, both internally and externally,** about climate change and our actions to mitigate our impact and adaptation measures needed for a sustainable future for all.



We will communicate and promote the United Nations Sustainable Development Goals and will encourage all staff and students to engage in the delivery of these goals

DCU SUSTAINABILITY CHARTER

4. Baselines

It is important to establish baselines to enable the monitoring of progress, however the establishment of baselines to assess DCU's contribution to sustainability, in core university activities (T&L/RD&I) is difficult as there are no internationally agreed metrics as compared with campus operational metrics. The table below identified the current metrics being used.



Table 1: Metrics for sustainability assessment

Area	Metric(s)	Source	Baseline Yr
Teaching and Learning	Total no of courses addressing some element of sustainability	UI Green Metrics	2018
	Programme/Module Thematic analysis	New Project	2019
Research, Development and Innovation	Sustainability related research funds	TORA/ UI Green Metrics	2018
	Sustainability related publication	Google Scholar/ UI Green Metrics	2018
Operations	Carbon Emissions	DCU Carbon Footprint	2018
Engagement	No of sustainability related engagements	DCU Sustainability Report	2018

The baseline year for the DCU Climate Action plan has been agreed as 2018. The primary reason being the prior to 2018 there was only limited data recorded on carbon emission at DCU. Appendix 1 provides a detailed summary of this baseline data.

Teaching and Learning Baseline

It is important when assessing the level to which sustainability is addressed in the DCU curriculum to clearly articulate the distinction between education for environmental sustainability and education for sustainable development. Many of the DCU education programmes address environmental sustainability where topics such as environmental impacts, climate change, planetary boundaries, carbon footprints etc. are covered. Education for Sustainability is somewhat different in that it seeks to integrate curricula and pedagogic approaches that enable higher education students to critically consider the interconnectedness of, and the interdependencies and challenges within sustainability across social/cultural, economic, political, and environmental contexts.

At the moment there is no systematic assessment of sustainability across the DCU programmes, Table 2 below provides an indicative assessment of a number of programmes addressing sustainability in some form in DCU as reported under the UI green metrics.

Table 2: Estimation of number of programmes in DCU that address sustainability themes as reported under UI Green Metrics.

	2017	2018	2019
Number of courses/subjects related to sustainability offered	50	64	64
Total number of courses/subjects offered	122	147	147
Sustainability %	41%	44%	44%



Research, Development and Innovation Baseline

The table below provides some baseline data for RD&I activities at DCU and the focus on sustainability. The core research income data is from the DCU TORA system using the 'Thematic Areas' field to identify sustainability related research – note this has become more difficult as DCU research moved away for the thematic pillar model. It may be useful to include an alternative field on TORA to allow researchers to select a thematic area or possibly a Sustainable Development Goal (SDG) theme that their research could contribute to.

Table 3: Metrics to estimate engagement levels in RD&I at DCU

	2017	2018	2019
Sustainability Hub Research Income ('000€)*	2,911	5,529	9,463
Total Research Income ('000€)	27,195	26,369	59,285
	11%	21%	16%
Publications**	1,970	2,090	2,320
incl patents	2,000	2,130	2,370
incl citations	1,990	2,110	2,330
include patents and citations	2,020	2,140	2,380

*Based on previous three-year average

** Based on keyword search on Google Scholar (as per UI Green Metrics Ranking system)

The publications are based on a keyword search (green OR environment OR sustainability OR "renewable energy" OR "climate change" "Dublin City University") using Google Scholar – this method is defined under the UI Green Metric reporting system. It should be noted that there will be some erroneous data but that the trend should be reflective of research at DCU.





Operations Baseline

Operations focuses on campus activity such as Energy, Water, Waste, and Transport and translates the data from these activities into a carbon equivalent (CO₂e) to enable transparency and comparability across activities on the DCU campuses. The table below identifies the total consumption for 2017 and 2018 and identified the change from 2017 to 2018. It can be seen that absolute energy consumption reduced by 0.2% while consumption of water reduced by 14% and the production of waste reduced by 12%. It should be noted that our carbon footprint was revised from 2017 (24,659 tCO₂e) to 2018 (64,212 tCO₂e) as a result of improved measurement and not an actual increase in emissions.

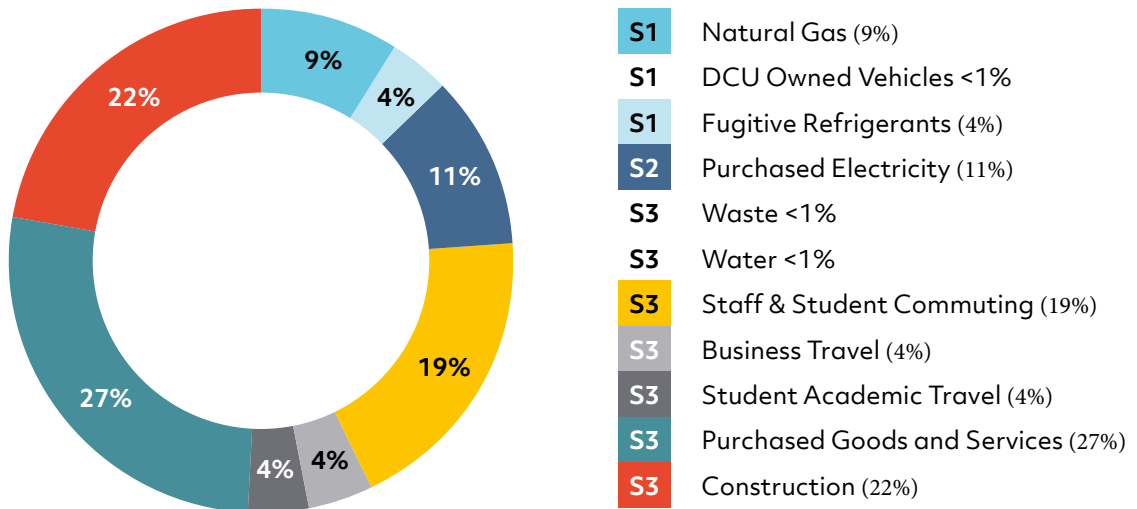
Table 4: DCU Operations 2017 and 2018

		2017 (tCO ₂ e)	2018 (tCO ₂ e)	% change
Scope 1	Natural Gas	5,685	5,739	1%
	DCU Owned Vehicles		16	NEW
	Fugitive Emissions		2,266	NEW
Scope 2	Purchased Electricity	8,180	7,174	-12%
Scope 3	Staff and Student Commuting	9,346	12,291	32%
	Business Travel	1,113	2,284	105%
	Academic Travel		2,300	NEW
	Waste	58	52	-9%
	Water	277	237	-15%
	Purchased Goods and Services		31,851	NEW
	Totals	24,659	64,212	160%

(NOTE: NEW categories indicate additional categories include in the 2018 footprint analysis)



Figure 1. Further breakdown of DCUs carbon footprint



Engagement

Civic engagement is best defined as a mutually beneficial relationship between the university and the community, understood in its broadest sense to encompass local, national and global individuals and associations committed to social, economic, political and cultural development. It encompasses a range of activities through which staff and students engage with the needs of communities and also seek a development of their own social understanding through active and global citizenship. In brief, civic engagement means working to ‘make a difference’ in the civic life of our communities through the development of appropriate knowledge, skills and values. See Appendix 1 for detailed list of current engagements.



5. Targets and Actions

This section sets out the overarching targets and some of the short and medium term actions (2019-2022) for each of the following Teaching and Learning, Research, Development and Innovation, Operations and Engagement.

Teaching and Learning

DCU is undertaking a radical restructuring of the DCU undergraduate curriculum to future-proof and enhance capacity. The 'DCU Futures' plan will transform the learning experience of undergraduate students at DCU, reconceptualising learning opportunities, creating authentic connections between the classroom and enterprise, and embedding the digital literacies, disciplinary competencies and transversal skills (including sustainability competencies) required to truly future-proof our graduates for the rapidly changing workplace.

A key element of the DCU Futures plan will, in the first instance, be to pilot a radically redesigned undergraduate curriculum across 9 new or reconceptualised degree programmes and 5 existing degree programmes.

As part of this we aim to Develop our portfolio of programmes to include those with a strong emphasis on sustainable development.

We will introduce a new undergraduate engineering programme in Sustainable Systems and Energy and two cross-disciplinary programmes which focus on the intersection of Social Science and Technology and the impact of technology on individuals (BSc in Global Challenges and Psychology and Distributive Technology). Each of these will have a strong sustainability theme throughout the curricula.



In parallel, under the Transversal Skills aspect of the Programme we will:

- Design and implement an assessment model for programmes to identify existing opportunities to develop competencies, including contributions to education for sustainability;
- Develop resources to support embedding key dimensions of transversal skills in curricular or co-curricular activities (eg. a Sustainability-related module/micro module) and provide staff and students with access to the resource(s);
- Develop and roll out workshops to support the infusion of prioritised transversal skills and competencies, including sustainability competencies to academic staff;
- DCU futures is a blueprint for the future of DCU education. Evaluation is an intrinsic part of the project, and will be used to feed into plans to roll out the model across the university, ensuring that DCU undergraduates graduate with a high competency in sustainability (to be assessed by Sulitest or similar) by 2030.

DCU recognises that there is a distinction between environmental sustainability education and education for sustainability (EfS) – we are committed to addressing both.



Environmental sustainability: Online Sustainability resources, drawing on elements of existing programmes and the development of some new resources will be reframed as resources for the 14 Futures degrees and, when systems allow, as a series of stackable micro-modules. This series of micro-modules could include for example:

- Principles of Sustainability- Social, Cultural, Economic and Environmental
- Sustainable Development Goals (SDGs) and Global Challenges
- Climate Change, Planetary Boundaries, Carbon Footprints and Budgets
- Global Justice, Human rights, Equality
- Biodiversity (including national and international biodiversity loss and the importance of eco-systems)
- Sustainability DCU (and introduction/review of the actions being taken by DCU to address its own environmental sustainability including An Taisce Green Campus programme etc.)

Education for Sustainability (EFS): As opposed to environmental education ESD is more focused on the development of sustainability competencies that seek to equip learners with the knowledge, skills and values that will inspire and empower them to take action to be Global citizens understanding their global and generational interdependencies. These competencies include Systems thinking, Anticipatory or futures thinking, Normative competency, Strategic competency, Collaboration competency, Critical thinking competency, Self-awareness competency, Integrated problem-solving competency many of which are included already in the DCU Graduate Skills competencies and will be further addressed under the DCU Futures Plan for Transversal Skills 'ways of thinking and tools for thinking'.

DCU will work to address the infusion of education for sustainability in programmes and working together with the micro modules on environment sustainability will provide the environmental context and understanding of sustainability within programmes.



Identify Sustainability as a key area of research at DCU and work to provide the necessary supports to increase the number of researchers working in this area and the level of research income.

Research, Development and Innovation

DCU is committed to promoting and supporting sustainability research across the University. To achieve this DCU will seek to:

- Identify **Sustainability as a key area of research at DCU** and work to provide the necessary supports to increase the number of researchers working in this area and the level of research income
- Foster and support researchers to address sustainability issues through DCU **engagement in national and international sustainability focused networks** such as the European Consortium of Innovative Universities (ECIU) and the Global Consortium for Sustainability Outcomes (GCSO)
- Investigate the **scale and focus** (eg SDG Thematic Areas) of **sustainability related research activity** ongoing across the DCU research community
- Continue to identify **potential funding instruments** that address sustainability challenges and bring these to the attention of relevant researchers



Radical changes to current practices will be required if 'Net Zero' or 'Zero Carbon' targets are to be reached.

Operations

This section will deal with the operational emissions of the DCU Campuses and the proposed actions to be taken to meet the targets set.

Assessment of Sustainability/Climate Change Risk

It is anticipated that there will be significant operational challenges for DCU due to the impact of climate change in both the short, medium and longer terms. Under current procedures, DCU will continue to assess the risks associated with Climate Change, such as extreme weather events or absolute emission reduction targets to be set by government, and include such risks in the DCU Strategic Risk Register as are deemed necessary.

Campus Development Plan

In addition to current challenges, as identified in table below, there are significant near future challenges of meeting new space requirements to accommodate increasing student numbers and research activity while reducing overall emissions. While efficiencies can have some impact they will not be enough for example the Irish Public Sector over the past decade has reported 25-30% improvement in energy efficiency (47% at DCU in 2019) which has resulted in over 750,000 tCO₂e of avoided emission but with no absolute reduction in actual consumption levels. The construction of new buildings such as the Future Tech or the Campus Residences development even at BREEM Excellence standard and exceeding the national requirement of Near Zero Energy Buildings (NZEB) will not be carbon neutral and therefore lead to further increases in DCU's annual GHG emissions.

Radical changes to current practices will be required if 'Net Zero' or 'Zero Carbon' targets are to be reached. While such changes will be difficult, DCU has demonstrated its ability to implement radical change during the COVID 19 public health emergency – the scale of changes necessary to meet the climate and biodiversity emergency may be even greater and much longer in duration.

The table below identifies operational science based targets based on DCU's GHG emissions in 2018. Over all these targets indicate a 4.2% annual reduction year on year for DCU to be aligned with the 1.5deg scenario for 2030.³

Table 4: Operational Targets

		Total GHG Emissions 2018 (tCO2e)	% of total	Science Based Target Reduction per annum (tCO2e)
Scope 1	Natural Gas	5,739	9%	241
	DCU Owned Vehicles	16	0%	1
	Fugitive Emissions	2,266	4%	95
Scope 2	Purchased Electricity	7,174	11%	301
Scope 3	Staff and Student Commuting	12,291	19%	516
	Business Travel	2,284	4%	96
	Academic Travel	2,300	4%	97
	Waste	52	0%	2
	Water	237	0%	10
	Purchased Goods and Services	31,851	50%	1,338
		64,212	100%	2,697

Scope 1: Natural Gas, DCU owned Vehicles, Fugitive Refrigerants

Natural gas is 9% of the DCU total carbon budget and the primary source of space heating. The challenge to decarbonise heat is immense both in scale of works needs and cost.

DCU is piloting the use of air-source heat pump technology on the All Hallows Campus to provide 300KW of renewable energy.

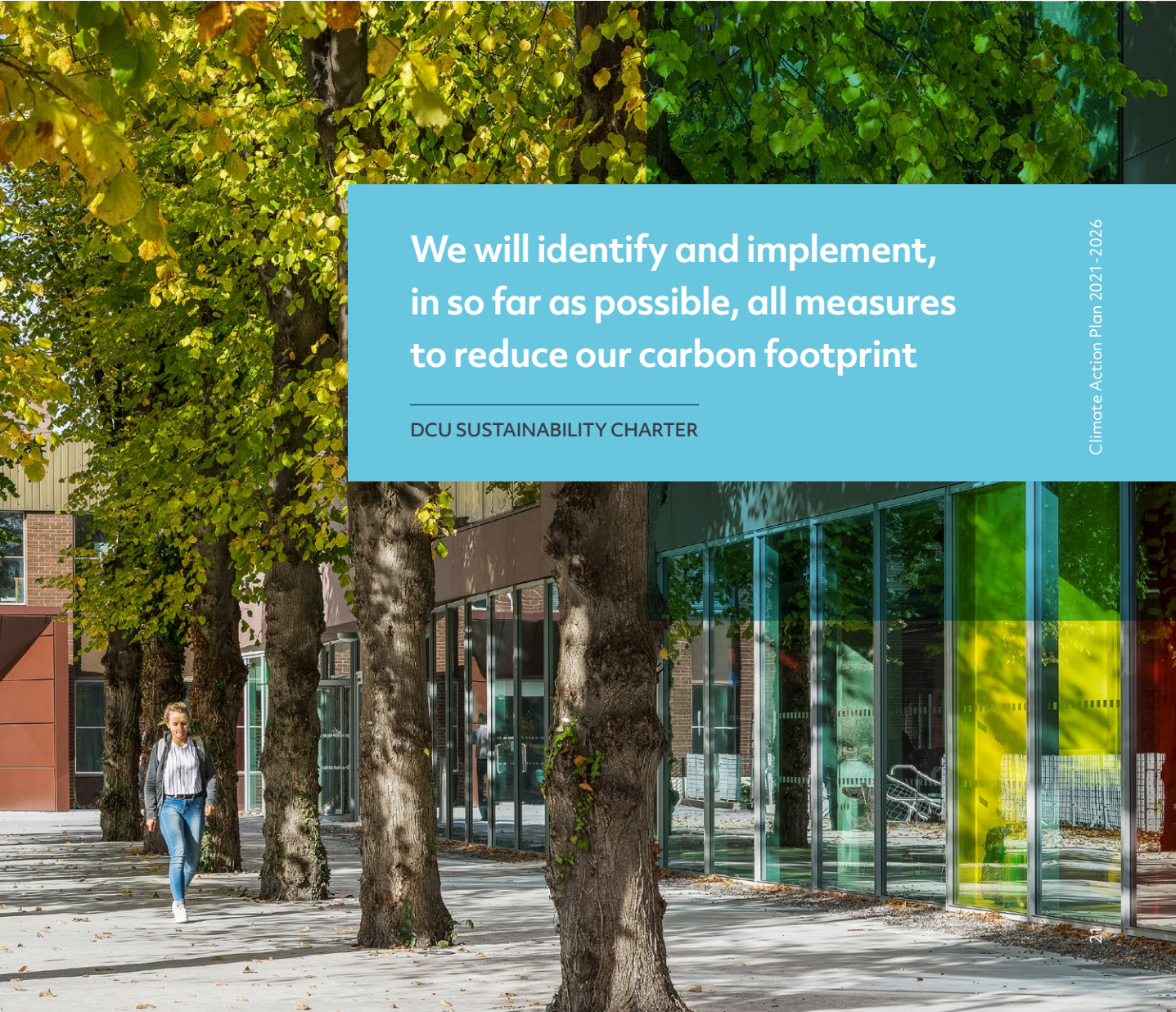
In the National Climate Action Plan it is proposed that all public sector building would be retrofitted to a building energy rating (BER) of B2, DCU currently have two B2 or above buildings – The U Student Centre and the NRF. A ‘back-of-envelope’ calculations for a retrofit programme at DCU would give:

10 buildings at ~ 5000 sq. metre per building = 50,000 sq. metres

50,000 sq. metres @ €2,000 per sq. metre to retrofit to B2 = €100,000,000

To quantify this challenge more accurately, DCU is undertaking a full **feasibility study of retrofitting the Marconi Building to B2 standard**. There are some additional points to consider here – this is only to B2 standard, and while significantly better than current majority D-F ratings, building will continue to be carbon emitting rather than neutral or net positive. All retrofit and new buildings at DCU will undertake a full assessment of proposed **energy source** to ensure that DCU does not align with a high emission future. Under the National Climate Action plan it is proposed that the electricity grid will move to 70% renewable over by 2030⁴. In addition Gas Networks Ireland have, in Oct/Nov 2019, launched a ‘Vision 2050’⁵ strategy aiming to evolve to become net zero carbon by 2050. In all assessments the full lifecycle impacts of proposed new or retrofit technologies should be utilised to ensure appropriate decision making – for example the direct emission reductions that would result for the installation of solar panels may not off-set the full embodied impacts of solar panel production, installation, maintenance etc.⁶ Also the above calculation does **not include any decanting costs** of buildings while they are being deep retrofitted. We anticipate, although not confirmed, that there will be grant aid/funding available to help meet this challenge. We have estimated that this grant aid would need to be within the 50-80% bracket to enable DCU to proceed with such projects.

- **Retrofit:** DCU to develop a high level prioritised retrofit plan for buildings on campus and over the next three years, with grant support, will seek to reduce our campus carbon emissions by 3% over the three years. In 2020, following a proposal to the HEA from the DCU Estates team et al under the Higher Education Energy Efficiency and Decarbonisation Pathfinder Programme (EEDPP), DCU have been successful in securing funding for of up to €1m (incl. VAT) towards the €1.5M refurbishments of the Marconi Building including a deep retrofit and BER upgrade. This will have significant impact on the energy consumption and carbon emissions of this building as well as making it a more comfortable building to work in.



We will identify and implement,
in so far as possible, all measures
to reduce our carbon footprint

DCU SUSTAINABILITY CHARTER



- **Fugitive Refrigerants:** Fugitive emissions from refrigerators, air conditioning units and cold rooms account for 4% of DCU's total CO₂FP due to the impact of the specific gases used in these devices. The average GWP for DCU refrigerants is 2161. This is as a result of older systems not being adequately funded for forward maintenance renewal programmes. Consequently, DCU is reliant on high GWP refrigerants such as R22, R410a and R404a to provide cooling. Aligning to EU refrigerant phase-down and EPA guidance, planning suitable replacement equipment and procuring same with energy and GWP as an explicitly evaluated criteria is now and will remain as Estates office function independent of the FM provider. Going forward, DCU will procure new refrigeration equipment with the stipulation of low and ultra-low GWP refrigerants as standard, as the Estates Office has recently begun to do. A GWP of <10 is the benchmark that should be used in any RFP which allows for the specification of low GWP synthetic refrigerants like R1234ze. Over the next decade, refrigeration systems will move towards CO₂ as refrigerant (GWP of 1) but commercially available solutions currently do not allow a migration to CO₂. As the market becomes available, DCU should seek to move towards CO₂ where the opportunity arises.
- **DCU e-Fleet:** Over the coming three years DCU will investigate the potential to move its vehicle fleet (0.02% of total DCU CO₂FP) to electric, given the scale of the DCU Fleet (5 vehicles) this will have some but limited overall impact.

Over all this will lead to proposed emission reduction of just under 4% over the three year to 2022. This is **significantly shy of the 4.2% annual reduction required** under our science based targets for a 1.5deg scenario by 2030.



Scope 2: Purchased Electricity

Purchased electricity at DCU accounts for 11% of our total carbon footprint in 2018. As with Scope 1 above, it is very expensive to reduce the carbon emission of purchased electricity and there is no single project that can accomplish this task by itself.

With grant support, DCU aim to reduce our carbon emission from purchased electricity by just over 5% over the three year to 2022 through the continued deployment of energy efficiency measures including:

- **LED lighting:** several buildings have been identified for retrofitting for LED lighting in 2019/2020 (Sports and Library). This model will continue to be rolled out across all buildings.
- **Local generation:** Following on the success of air source heat pump on the All Hallows DCU will continue to investigate the local generation of energy including solar and all heat pumps technologies.
- **Solar Panels:** Assess the potential for installing Solar PV/Thermal. Assessments have been undertaken in the past that did not prove viable but advancements in technology and deployment models this may now be a viable solution for some buildings at DCU.

It is imperative that the targets set under the National Climate Action Plan for decarbonising the national grid e.g. 70% renewable by 2030 are met.

Scope 3: Staff and Student Commuting

Staff and student commuting account usually for approx. 20% or 12,500 tCO₂e of the total DCU carbon footprint in 2018. It is expected that 2020 will see a marked reduction in this due to COVID 19 restrictions but we propose to continue to work on the assumption that there will be a return to more 'normal' levels post COVID. With a reduction target of 4.2% or 516 tCO₂e per annum we will need to for example remove 337 cars (approx. 9% of current cars) completely from the road OR move 749 car users (approx. 20% of current car users) to bus. There are a number of initiatives supporting smarter travel that have running at DCU for several years now which include:

- **Working from Home Policy** – A working from home policy has been developed by DCU HR in the context of the COVID-19 pandemic, the extension of such a policy post COVID will be examined.
- **Promotion of active commuting to DCU**
 - Showers and changing facilities on all campuses
 - Free cycle clinics
 - Free introduction to cycling in Dublin with Cycle Ireland trained instructors
 - Bike to Work scheme
 - High quality locks available on DCU campuses

We will demonstrate
our commitment through
our own actions

DCU SUSTAINABILITY CHARTER





- **Public Transport:** DCU will continue to work with the NTA to maximise the level of DCU connectivity via public transport including the identification of additional potential routes and the promotion of public transport as a viable commuting mode taking into account COVID 19 restriction. Ultimately the construction of the Metrolink would dramatically improve the public transport links available to DCU staff and students.
- **Car Pooling:** Working with partner organisation, DCU will investigate the development and implementation of a car sharing app across all campuses.
- **Upgrade of cycle parking facilities** –Sheffield stands as standard across all campuses, secure cycle parking cage installed in DCU Glasnevin Multi-storey Car Park [Qtr4 2019], additional cycle parking for St Patricks Campus pitch side [Q2 2021] with support from the NTA.
- **Ecar Charging points:** Fast charge point to be installed on the DCU Glasnevin and DCU St Patricks Campuses where ecars can charge to 80% within 20-30 mins.[Qtr4 2020]
- **Car Parking:** Investigate the introduction of demand reduction initiatives on all campuses.

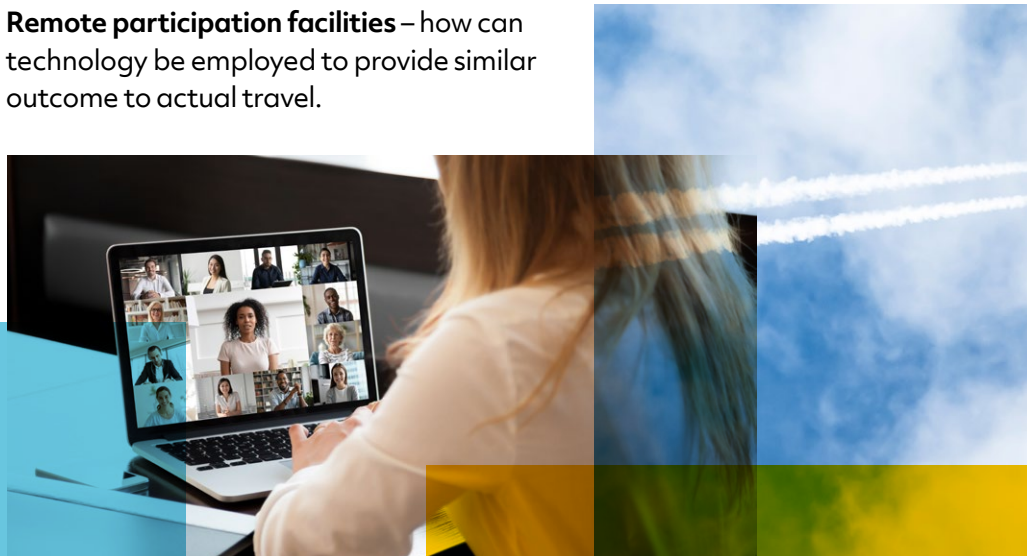
Scope 3: Staff Business Travel and Student Academic Travel

In 2018 DCU's aviation related emissions were 1,893 tCO₂e, accounting for 4% of total emissions⁷. This initiative would systematically review university-related air travel (whether directly paid by the university or external sources) categorising across faculties and professional units. An agreed framework to be developed to establish short- and medium-term benchmarks for aviation emissions reduction, commensurate with the constraints of climate science and global justice. In tandem with this additional resources would be invested in remote participation technology to support academic/staff participation in international meetings. A one-year monitored pilot programme will be rolled out with an agreed school – currently interrupted by COVID. Following a review of the impacts of the pilot and any adjustments to required emission reductions that programme will be rolled out across DCU.

<https://blogs.lse.ac.uk/impactofsocialsciences/2019/06/21/do-the-best-academics-fly-more/>

Similar to DCU business travel, student academic travel accounts for 4% of the total DCU Carbon footprint. Student academic travel arises from student traveling as part of their education programmes at DCU for placements, semesters abroad etc. Addressing these emissions is difficult given the significant positive impact of such engagement for the individual students. Some possibilities could be:

- **Flying less** – promotion of lower carbon intensive transport models, identification of alternative exchange locations to address transport requirements. The COVID 19 pandemic restrictions have enforced significant changes in this area in particular, where feasible, these changes should be embedded rather than reverting to pre-COVID actions.
- **Remote participation facilities** – how can technology be employed to provide similar outcome to actual travel.




Scope 3: Waste

In the 2018 carbon footprint for DCU, waste accounts for 0.08% (52 tCO₂e). Although this was only a small fraction of our total carbon footprint it is a very visible reflection of our approach to sustainable consumption and a very engaging focus for staff and students alike⁸. Below are some of the actions we will continue/commence in 2020/2021:

- **Single use plastics (catering):** Removing 700,000 non-recyclable coffee cups from the DCU waste stream aims to reduce total waste by 1.5%. Focus for 2020/2021 will be the provision of a reusable option (cups/plates/bowls, cutlery) at all cafes where practical alternatives are available, the acceptance of a personal cup/lunch box and the introduction of a levy for single use compostable cups, bowls, cutlery.
- **Waste Segregation:** A phased introduction of segregation bins across DCU along with a series of education programmes of recycling.
- **Binless Offices:** Investigate the possibility of removing office bins replacing with floor level segregated bins.
- **Paper reduction programmes:** This is a multi-strand project including ISS printers' initiative, promotion and encouragement of paperless assessment with TEU, paperless person pilot – one year no printing.
- **Sustainable Kitchens:** Investigating the energy/water/waste nexus in kitchens. Initially focusing on framework and methodology this project would seek to address consumption habits and potentially investigate the Food/Planet/Health⁹ nexus.
- **DCU Green Labs:** Single use plastics (laboratory), commencing in 2020/2021 this DCU Green Labs project will investigate the potential for reducing single use plastics in laboratories.
- **Zero waste to landfill:** Just over 6% of DCU waste goes to landfill. A waste audit will be undertaken to identify key component of this and implement initiative to eliminate all waste to landfill from DCU by 2025.





We will identify the carbon footprint of goods and services consumed by our university and work with our suppliers to reduce these,

DCU SUSTAINABILITY CHARTER

Scope 3: Water

In 2018, the consumption and disposal of water at DCU accounts for 237tCO₂e or 0.37% of our total carbon footprint. Similar to waste, water does not have a large impact on our total carbon footprint but has significant visibility and public engagement. Measures being actioned at DCU include:

Proposed Actions

- **Leak testing on campuses:** DCU intends to focus on leakage and waste control within each building across all campuses for 2019. The university aims to reduce consumption even further on all campuses with a target set to reduce 25,000 m³ of annual water consumed within the next 2/3 years (2020-2022).
- **Cistern Displacement Device (CDD):** procurement and installation of CDDs across all DCU facilities. Estimates savings of 9,000m³ of water or 3% of total water use.¹⁰
- **Standardise low flow taps:** Estates agreed retrofit procedure across all campuses with particular focus on Sports and Residences.



Scope 3: Purchased Goods and Services

As the largest element of the 2018 DCU carbon footprint, procured goods and services accounted for 50% of our total carbon footprint or 31,851 tCO₂e. Of these emissions 45% is directly related to construction related procurement and 55% to other university procurement such as business services, catering, printing etc. With support from the DCU Procurement Office, these carbon emissions have been estimated using a financial model and while this gives us an overview of the total emission the level of detail is limited. It is therefore proposed, in order to support better decision making regarding procurement choices, that DCU will undertake the following:

- **Procurement Policy:** Sustainability is currently taken into consideration under the [DCU Procurement Policy](#)¹¹. DCU will seek to enhance and continue to enforce this policy.
- **DCU Supply Chain/Tender actions:** Investigate the introduction of a voluntary clause, in the first instance, in all tender actions/ large orders to include:
 - All tenders request the inclusion of a validated carbon footprint of the product or service, with Scope 1 and Scope 2 required and where possible Scope 3 emissions also to be included,
 - Engage with OGP to support the development and implementation of the Green Public Procurement Policy.
- **Packaging:** Include requirement where feasible, that suppliers should remove packaging following delivery ensuring that such packaging is appropriately disposed of.
- **Potential Procurement bans:**
 - Prohibit the procurement of all single use plastics (catering) from all departments where practical alternatives are available.



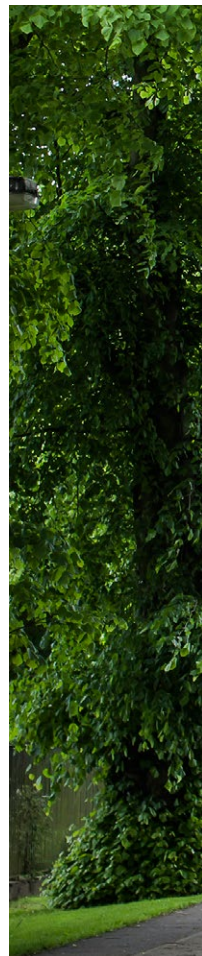
Scope 3: Biodiversity

The overall aim of DCU's Biodiversity Action Plan¹² is to enhance and protect biodiversity, and to ensure that every member of the DCU community understands its importance in our lives.

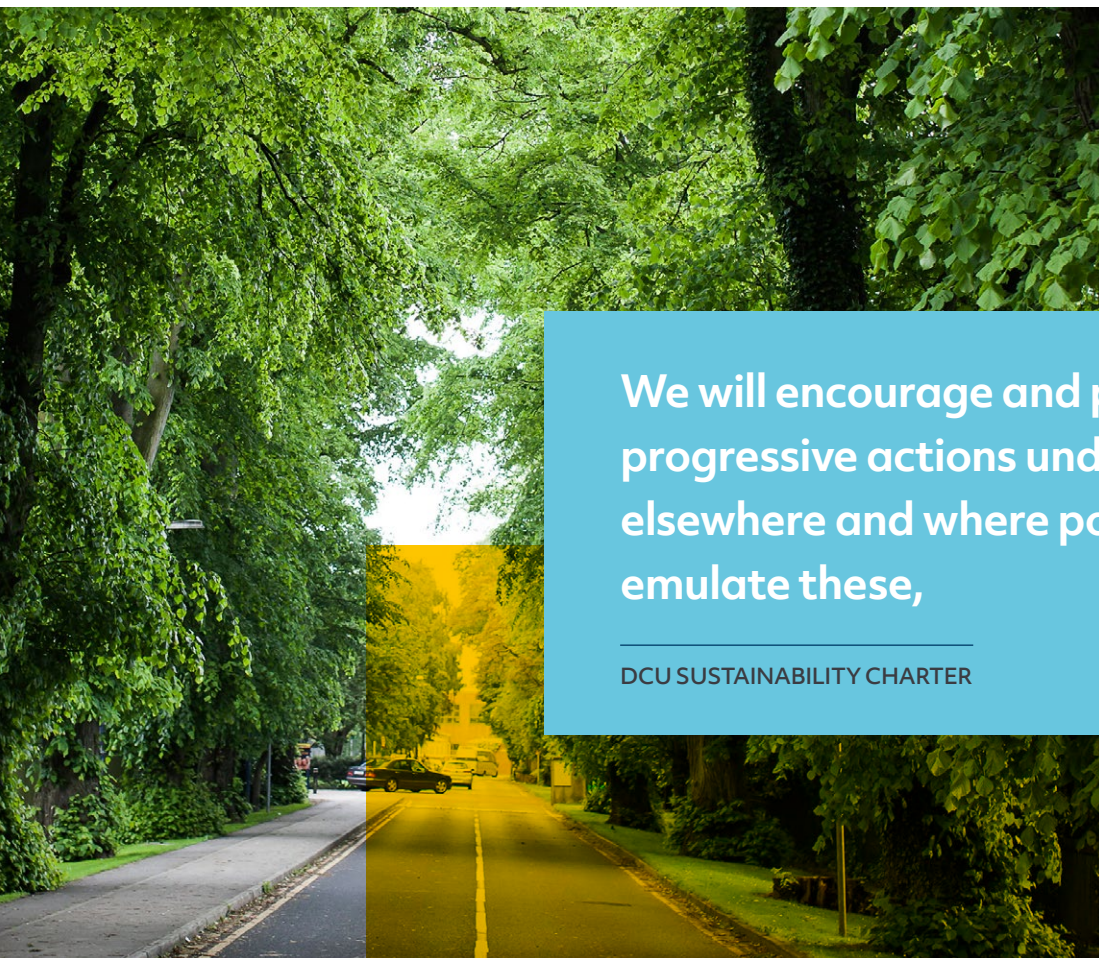
The Convention on Biological Diversity state that biodiversity is the critical foundation of the Earth's life support system on which the welfare of current and future generations depends. Humans depend on biodiversity and the ecosystem services that stem from it for many basic needs. Biodiversity is important for sustainable development and relates to all 17 Sustainable Development Goals but there are two proposed goals that explicitly refer to it; Goals 14 (Life below Water) and Goal 15 (Life on Land).

DCU is committed to protecting biodiversity and embedding this protection into decision making across all sectors of the University including: building and grounds management, public realm spaces and in the construction of new buildings. The use values associated with biodiversity are immense and can be categorised as economic, socio-cultural and health values, with each category having a number of benefits associated with it.

- **Habitats for pollinators:** to provide habitats where pollinators and can survive and thrive, DCU will reduce the frequency of mowing and collecting clippings, introduce artificial solitary bee nests and bird boxes and introduce and maintain a wildflower meadow.
- **Invasive alien species:** DCU aims to identify and monitor all medium and high impact invasive plant species and remove where feasible. This measure will align with the DCC Climate Actions Plan.



- **Landscape management:** to maintain and enhance biodiversity DCU will prioritise native plants in new planting schemes (at least 75% of plants to be pollinator friendly), reduce hedge cutting and cut between November and January and keep fertilisers, pesticides and herbicides well away from trees, hedges and verges, identify locations on each campus that are mown under a pollinator friendly regime (5 cut and lifts per year after 15th April), and identify areas on each campus that can be converted to perennial planted border.
- **Dublin City Council's Climate Action Plan:** DCU will work with DCC and other local stakeholders such as Drumcondra Tidy Towns, local residence associations etc. and will assess the feasibility of further green walls, potential for wetland and seek to create and promote a DCU Tree Trail.
- **Biodiversity Team:** DCU will seek to build a biodiversity team with representatives from the student body, expert academic and professional staff. This team would continue to log existing and new 'Actions for Pollinators' on the mapping system (pollinators.ie) and promote these across all campuses, provide or facilitate training on biodiversity and how to take action to protect it.



We will encourage and promote progressive actions undertaken elsewhere and where possible emulate these,

DCU SUSTAINABILITY CHARTER

Engagement

DCU is an important regional asset and a key stakeholder of Dublin City. "Cities are where the battle for sustainable development will be won or lost if we all fail." (U.N Deputy Secretary-General Jan Eliasson, 2015). Our role in addressing sustainability and tackling climate change is multi-faceted. Engagement with our internal and external communities is key to enable a boarder community understanding and recognition of the changes necessary to create a sustainable future and the actions that are required to achieve them. To enable this DCU will work toward the following:



- **4 x 4 Engagement Strategy:** supporting whole of community engagement - incorporate DCU's climate and sustainability related research and activities into the 4x4 Engagement Strategy.
- **Student Engagement:** Sustainability DCU to implement an annual engagement activity with the DCU student population to gain their input and feedback on the DCU Climate Action Plan.
- **DCU Sustainable Energy Community:** Disseminate the learnings and expand the reach of the DCU Sustainable Energy Community to the local community in north Dublin (in partnership with local libraries?)
- **Partnerships:** Continue to research, test and transfer sustainability solutions across contexts through partnerships with city and council councils, the Dublin metropolitan Climate Action Regional Office and the Eastern and Midlands Regional Authority.
- **Civic Engagement:** Implement the principles and objectives of the sustainability charter through the civic engagement activities of DCU; Student Volunteer: DCU in the Community, NorDubCo; North South Social Innovation Network.
- **DCU Community Gardens:** Develop the DCU Community Garden at Glasnevin as a living lab for the demonstration of new and innovation solutions; social, cultural, economic and environmental, hosting social enterprises such as GrowDome and Garden Gnomes. Develop a further community garden on the DCU All Hallows campus.
- **SDGs:** Explore the possibility of working with the Artist in Residence, Visual Arts Officer, and local community to communicate the principles and objectives of the SDG's in a public space.



6. Conclusions

There are some preliminary data from 2019 indicating that DCU has reduced its carbon emissions – total emission reductions of 28% on 2018 data. However, this is predominately due to the lack of construction work undertaken in 2019, when construction is removed the reduction is approx. 4%. It is also expected that the carbon footprint for 2020 will show an even greater reduction albeit it is not expected that these reductions will be sustained. With a national, European and global challenge to reach net zero by at the 2050 there remains to be a lot more to do.

Radical changes to current practices will be required if 'Net Zero' or 'Zero Carbon' targets are to be reached. While such changes will be challenging, DCU has demonstrated its ability to implement radical change, not least during the recent COVID 19 public health emergency – the scale of changes necessary to meet the climate and biodiversity emergency may be even greater and much longer in duration.

Appendices

Appendix 1: Baselines

This appendix provides the background on the establishment of the baselines across Teaching and Learning, Research, Development and Innovation, Operations, and Engagement, these baselines are based on 2018 data.

Teaching and Learning

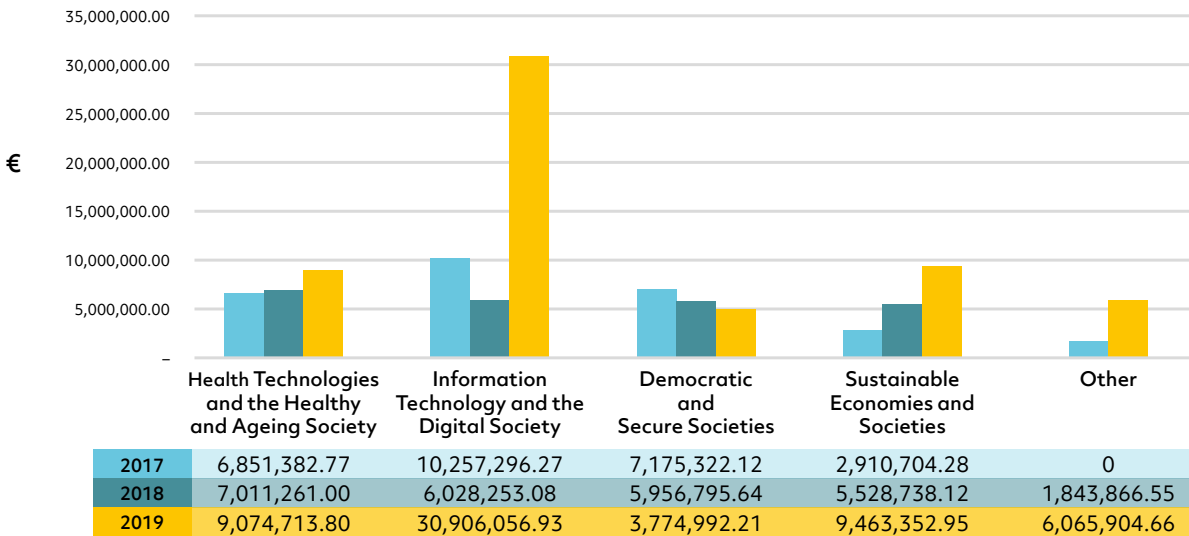
It is important when assessing the level to which sustainability is addressed in our curriculum to clearly articulate the distinction between education for environmental sustainability and education for sustainable development. Many of our education programmes address environmental sustainability where topics such as climate change, planetary boundaries, carbon footprints etc are covered. Education for Sustainability is somewhat different in that it seeks to integrate curricula and pedagogic approaches that enable higher education students to critically consider the interconnectedness of, and the interdependencies and challenges within sustainability across social/cultural, economic, political, and environmental contexts.

There is currently no assessment of ESD across the DCU programmes, an indicative assessment of programmes addressing sustainability undertaken for UI green metrics reporting indicated that in 2016 36% of programmes at DCU (UG and PG) addressed some aspect of sustainability, in 2017 it was reported at 41% of programmes.

Research, Development and Innovation

To create a baseline for **Research, Development and Innovation**, information from the TORA¹³ system was assessed. A summary of the DCU priority research areas including Sustainable Economies and Societies is shown below. However, it is important to note that it is highly likely that projects classified under other priority research areas include elements of sustainability.

Figure 3: Research Funds



	2017	2018	2019
Sustainability Hub Research Income (€) *	2,910,704	5,528,738	9,463,353
Total Research Income (€)	27,194,705	26,368,914	59,285,021
	11%	21%	16%

Research Publication

On recommendation from UI Green Metrics guidance, DCU searched for sustainability publications for the last 3 years (2016, 2017, 2018) for Dublin City University using key words: green, environment, sustainability, renewable energy, climate change. Using this method on google scholar as recommended yielded.

	2017	2018	2019
Publication	1,970	2,090	2,320
incl patents	2,000	2,130	2,370
incl citations	1,990	2,110	2,330
include patents and citations	2,020	2,140	2,380

As a comparison, this same methodology was applied to search on Scopus and yielded 975 results (average of 325 per year).

Operations

Operations focuses on Energy, Water, Waste, Transport, Biodiversity and Carbon footprint of the DCU campuses. The table below identifies the total consumption for 2017 and 2018 and identified the change from 2017 to 2018. It can be seen that absolute energy consumption reduced by 0.2% while consumption of water reduced by 14% and the production of waste reduced by 12%. It should be noted that our carbon footprint was revised from 2017 (24,659 tCO₂e) to 2018 (64,212 tCO₂e) as a result of improved measurement and not an actual increase in emissions.

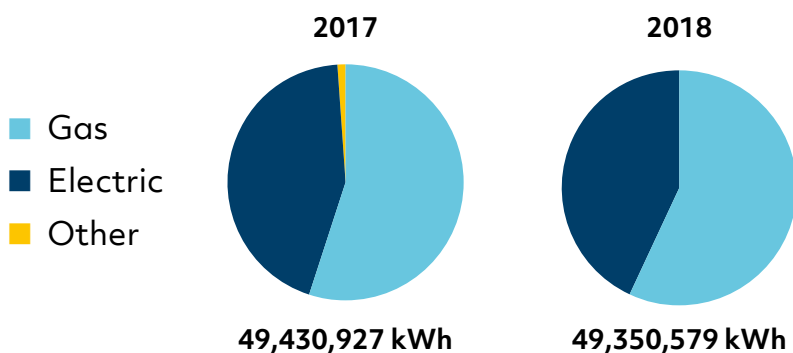
Table 2: DCU Operations 2017 and 2018 (NOTE: NEW categories indicate additional categories include in the 2018 footprint analysis)

		2017 (tCO ₂ e)	2018 (tCO ₂ e)	% change
Scope 1	Natural Gas	5,685	5,739	1%
	DCU Owned Vehicles		16	NEW
	Fugitive Emissions		2,266	NEW
Scope 2	Purchased Electricity	8,180	7,174	-12%
Scope 3	Staff and Student Commuting	9,346	12,291	32%
	Business Travel	1,113	2,284	105%
	Academic Travel		2,300	NEW
	Waste	58	52	-9%
	Water	277	237	-15%
	Purchased Goods and Services		31,851	NEW
	Totals	24,659	64,212	160%

Energy

DCU continues to work toward its agreed target of 33% energy reduction on 2010 figures by 2020, and has undertaken several infrastructural projects include LED retrofit, insulation upgrades, building fabric and glazing upgrades with several more in the pipeline. In 2017 DCU exceeded the 2020 Energy Efficiency improvement target of 33% set in 2009, reaching 35.3% and in 2018 has further improved the energy efficiency on campus to 43% above 2009 levels. This should of course not be confused with absolute energy reductions and ultimately CO₂e emissions. DCU strives to reduce overall consumption and in 2018 the total consumption across all the DCU campuses fell by 80,348 kWh (fig below). This was despite the increased need for heating that was caused at the start of the year from abnormally cold weather.

Figure 4. Energy consumed in 2017 vs. 2018

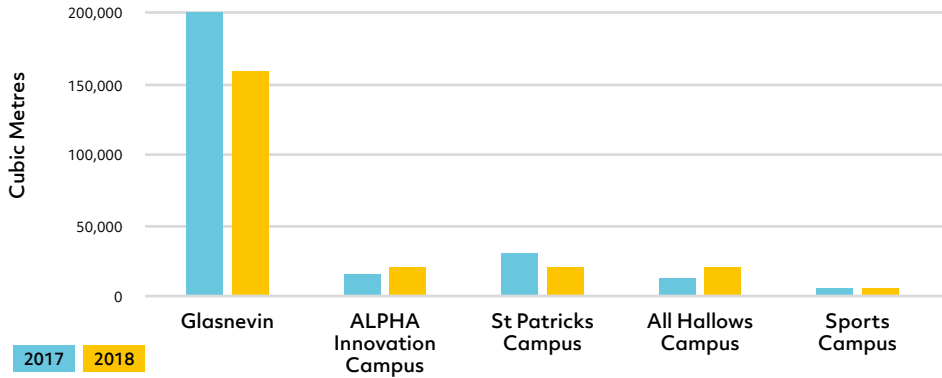


This reduction in energy is largely due to the strong energy management by the DCU Estates Office. DCU achieved ISO 15001:2011 certified in 2017 and makes efforts annually to manage and reduce their energy consumption.

Water

With a specific focus on addressing water as a theme in 2016, DCU commissioned LowFlow to undertake a full audit of water consumption on the St Patricks and All Hallows Campuses. In addition, leak detection surveys were undertaken on Glasnevin campus following the previous year's audit. DCU has saved a considerable amount of water through identifying and repairing leaks on all campuses and water consumption in 2018 reduced by 14% from 262,000 m³ to 225,000 m³ (Figure 5). This reduction of 37,000m³ of water equates to approx. 15 Olympic swimming pools (mega liters)!

Figure 5. Water consumption 2017 vs 2018 across each DCU campus



Waste

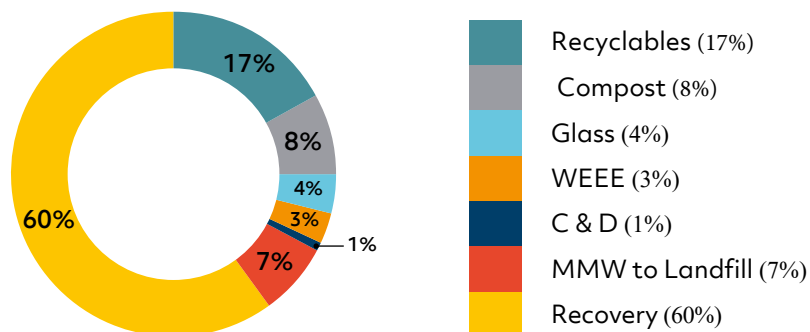
DCU continues to closely monitor its waste and is working towards reducing total waste. The table below identified the progress made between 2017 and 2018. The campus had an overall 8% reduction of waste.

Table 2: DCU Glasnevin Waste for 2017 and 2018 in metric tonnes.

	MMW to Landfill	*Recovery	Compost	Recyclables
2018	60.53 ↓	529.62 ↓	73.19 ↓	151.63 ↓
2017	65.13 ↓	578.92 ↓	81.63 ↓	189.48 ↓

	Glass	WEEE	C & D	Total
2018	33.43 ↓	31.33 ↓	6 ↑	885.73 ↓
2017	45.37 ↓	44.46 ↓	0	1004.99 ↓

Figure 7. Percentage breakdown of 2018 DCU waste all campuses



Biodiversity

As part of the Sustainability Council actions in 2018/2019 DCU commissioned a full Biodiversity plan for the campus including how such a plan should link to the national pollinator plan. This plan has not yet been approved by the DCU Sustainability Council but a copy will be forwarded just as soon as it is.

In summary this plan provides a range of action DCU can take to protect biodiversity and embedding this protection into decision making across all sectors of the University including: building and grounds management, public realm spaces and in the construction of new buildings.

The overall aim of DCU's Biodiversity Action Plan is to enhance and protect biodiversity, and to ensure that every member of the DCU community understands its importance in our lives.

This Biodiversity Action Plan has been developed to:

- I. Highlight DCU's unique biodiversity value
- II. Propose recommendations to maintain the University's biodiversity
- III. Enhance pollinator diversity and increase the carbon absorption by vegetation
- IV. Identify opportunities for the University to enhance and protect its biodiversity
- V. Communicate the importance of biodiversity to the DCU community
- VI. Support the Dublin City Council Climate Change Action Plan 2019-2024, the All Ireland Pollinator Plan 2015-2020, the EU Biodiversity Strategy and the United Nations Sustainable Development Goals

Transport

Dublin City University is now a multi campus university and the second largest commuting hub in the north Dublin region after the airport. In early 2018 DCU undertook a survey of all staff and students across all incorporating institutions to assess current transport choices vs a similar survey undertaken in 2017. This project was undertaken in conjunction with the National Transport Authority. The survey received over 2,000 responses from staff and students in 2018 with an overall response rate of 12%.

Figure 8. Percentage breakdown of each mode of transport for staff versus students

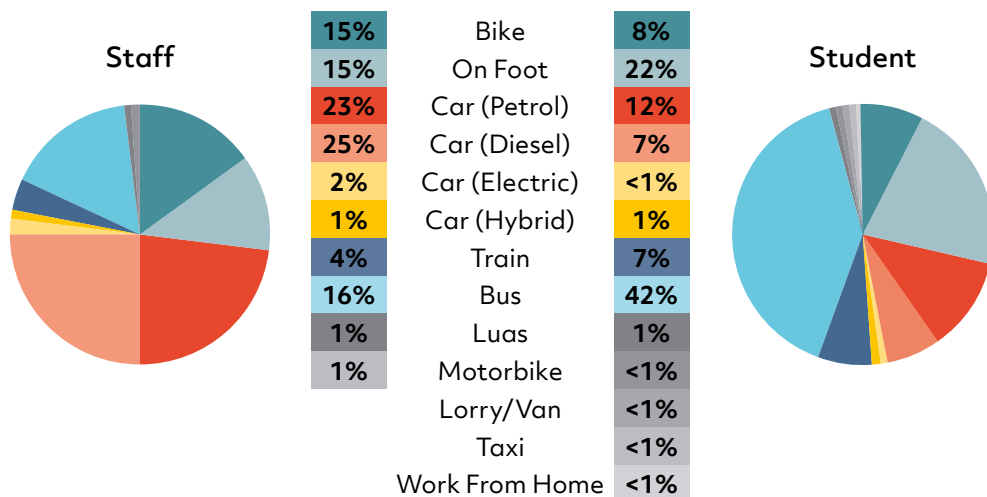


Table 5. Summary of Staff and Student sustainable and non-sustainable transport choices by percentage in 2017 v 2018

	Students		Staff	
	2017	2018	2017	2018
Sustainable Commute	76%	78%	47%	47%
Non-Sustainable	23%	19%	52%	51%
Other	1%	3%	1%	2%

Engagement

Civic engagement is best defined as a mutually beneficial relationship between the university and the community, understood in its broadest sense to encompass local, national and global individuals and associations committed to social, economic, political and cultural development. It encompasses a range of activities through which staff and students engage with the needs of communities and also seek a development of their own social understanding through active and global citizenship. In brief, civic engagement means working to ‘make a difference’ in the civic life of our communities through the development of appropriate knowledge, skills and values.

“Engagement with the wider community must become more firmly embedded in the mission of higher education institutions. Higher education institutions need to become more firmly embedded in the social and economic contexts of the communities they live in and serve” (National Strategy for Higher Education to 2030) Goal 9 of the Strategic Plan describes the 4x4 Engagement Strategy which utilizes the Quadruple Helix (Enterprise, Government, Citizens, Academia) model of engagement with four of our primary communities (Local, Regional, National, Global).

Therefore, the university’s role in promoting sustainability is not confined to the teaching, research and operational activities situated within the physical footprint of DCU. DCU is an important regional asset and a key stakeholder of the city. “Cities are where the battle for sustainable development will be won or lost if we all fail.” (U.N Deputy Secretary-General Jan Eliasson, 2015). The university has a multi-faceted role to play in tackling climate change and localising the Sustainable Development Goals.

Civic engagement at DCU has developed a strong national and international profile, widely recognised as a model of best practice. The table below lists some of the existing engagement activities;

Organisation	Activity
Cloughjordan Eco Village	Memo of Understanding, Working together on shared learning journey.
CARO – Climate Action Regional Office	MOU CARO/DCU under development for partnership to support Dublin Climate Action Plan.
DCU Sustainable Living Society	Strongly linked to green committee and activities to promote sustainability to student body.
DCU Students Union	Work together with Sustainability and Green Committee to communicate message and organize and support events.
Global Consortium for Sustainability Outcome (GCSO)	The Global Consortium for Sustainability Outcomes is a non-profit international consortium of universities that collaborate to implement and scale solutions to sustainability challenges. GCSO membership spans seven countries on three continents, enabling universities to work together in partnership with each other and with governments, businesses, schools and NGOs.
Sustainable Energy Authority of Ireland (SEAI)	DCU have several links to SEAI including grant aid under the Better Energy Communities Awards, as members of the Better Energy Communities Network, and also working with SEAI to increase awareness of energy reduction and efficiency by DCU Staff through energy awareness workshops.
Union of Students of Ireland (USI)	DCU is one of the four universities participating in the EU funded SAVES (Students Achieving Valuable Energy Savings) Programme in conjunction with DCU Residences.
Other third level institutions	DCU participated in several forums and events where it worked together with other HEI's to develop and deliver the sustainability message! E.g. coffee cups campaign.

Organisation	Activity
An Taisce Green Communities	DCU, and particularly DCU community gardens, work with the An Taisce Green Communities team to provide access and support for projects in the community.
Men's Shed Association and Ballymun Men's Shed Association	DCU is working together with the Men's Shed Association and Ballymun Shed to establish a Shed at the DCU Community Garden.
Dublin City Council	DCU Sustainability/Green Committee have several engagements with DCC including the removal of hot water from public sanitary facilities, refurbishment of sheds on the DCU Glasnevin Community Garden and the Adopt a Street programme.
Drumcondra Tidy Towns Association	DCU Sustainability/Green Committee are working with the Drumcondra TT Ass. to help increase biodiversity on the Drumcondra facing perimeter of St Patricks Campus including new flower baskets, propagation of native ivy, supporting maintenance of DTT planters etc.
Phibsboro Tidy Towns Association	DCU Sustainability/Green Committee are working with the Phibsboro TT Ass. on waste and water issues.
The DCU Vegan Society	To support positive choices in the DCU restaurants.
DCU Cycling Club	To promote cycling facilities on campus and intercampus.
IBikeDCU Society	To promote biking, basic skills incl. rules of road etc.
Smarter Travel Campus Group	Working to achieve a 90% of campus users using a sustainable form of transport.
DCU Office of Student Life	Several linkages including sustainable bottle/cups, community employment and engagement.
Rediscovery Centre	Several linkages including weekly bike clinics, fashion workshop and education and awareness raising programmes.

Organisation	Activity
North Dublin Chamber of Commerce (NorDubCo)	Working on sustainable project implementation including hot water and policy recommendations.
RCE Dublin United National Regional Centre for Expertise in Education for Sustainable Development	RCE Dublin is coordinated by Dublin City University (DCU) and its partnership includes educational organisations (DCU, Educate Together), Public bodies (An Taisce, Dublin City Council), industry-academia networks (Sustainable Nation) and non-governmental organisations (FightingWords, Exchange House Ireland and ECO-UNESCO).
National Transport Authority	Smarter Travel Campuses programme and several support awards to improve transport related initiatives at DCU.
Eastern and Midlands Regional Authority	Memorandum of Understanding; DCU as a HEI has forged valuable links within the region with industry, local government, other public bodies and community. DCU can therefore contribute to the development and implementation of the Regional Economic and Spatial Strategy for the Eastern and Midlands region a number of ways.



Appendix 2: Membership of Sustainability Council (Dec 2020)

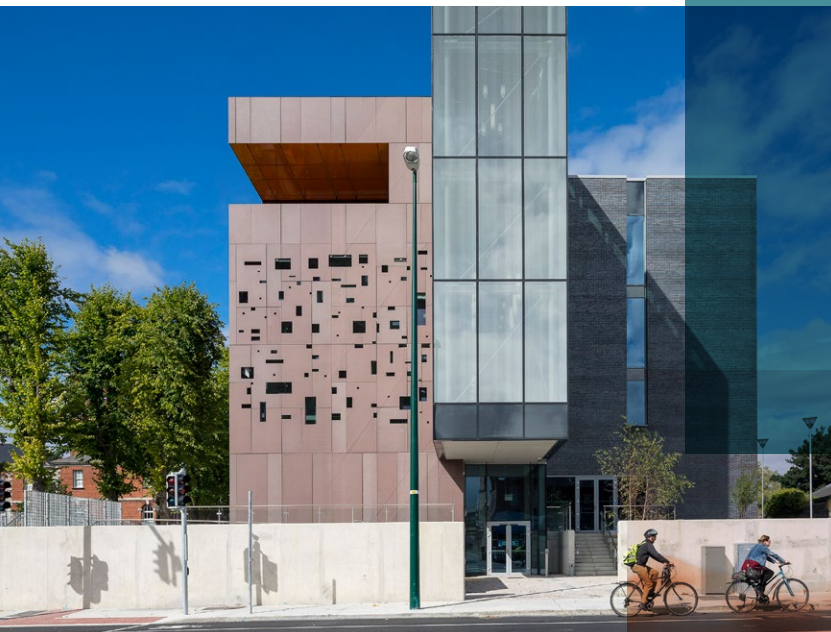
Chief Operations Officer* (Chair)	1	Dr Declan Raftery
Director of Sustainability and Transport* (Secretary)	1	Ms Samantha Fahy
Academic Staff Representatives (6)	6	
1 representatives from DCUBS (Faculty of Business)		Dr Marta Rocchi
1 representatives from the Faculty of Engineering and Computing		Dr James Carton/ Dr Lorna Fitzsimons (alt)
1 representatives from the Faculty of Humanities and Social Sciences		Dr Diarmuid Torney
1 representatives from the Faculty of Science and Health		Dr Jenny Lawler, Mr Michael Burke
1 representative from Institute of Education		Dr Orla Kelly
Representative of Faculty Administrative Peer Group	1	TBC

Representatives of DCU Estates (3)	3	Mr Stephen Toomey
		Mr Richard Kelly
		Ms Jane Barker
Representatives of Support / Service (Human Resources, ISS, Library, Research and Innovation, Finance, SS&D) offices (5)	7	
HR		Mr Gareth Yore
External Affairs		TBC
Research and Innovation		Dr Rachel Barrett
Finance		TBC
ISS		Mr Ian Spillane
Quality Office		Ms Celine Heffernan
Library		TBC
Nominees from Students' Union (2)	2	
President		Fearghal Lynch
VP Engagement and Development		Dylan Mangan
Recording Secretary (in attendance)	1	TBC
Total membership	22	

*Permanent members of DCU-SC

Footnotes

- 1 https://www.dcu.ie/sites/default/files/iss/pdfs/web_version_combined.pdf
- 2 Replacement for current DCU Sustainability Policy
- 3 www.ipcc.ch/sr15/chapter/spm/
- 4 <https://assets.gov.ie/10206/d042e174c1654c6ca14f39242fb07d22.pdf>
- 5 www.gasnetworks.ie/vision-2050/
- 6 www.etooglobal.com/wp-content/uploads/2013/06/ReNew-Solar-PV-Sustainability.pdf
- 7 It is possible that this is an underrepresentation of aviation emissions as not all flights etc are booked through the DCU Travel partner (currently Club Travel) for where this data is sourced.
- 8 In annual green committee surveys over 50% of respondents indicate a preference to engage on a waste related project.
- 9 <https://eatforum.org/eat-lancet-commission/>
- 10 With an average toilet using between 7 to 13 litres of water and each CDD can save approx. 2.5 litres per flush giving estimated savings of just under 9,000M3 of water or ~3% of total water use on campus.
- 11 www.dcu.ie/sites/default/files/finance/90%20-%20procurement_policy_fin_v1.pdf
- 12 Available at www.dcu.ie/ocoo/sustainability-dcu under Biodiversity @ DCU
- 13 TORA is the DCU research application and award management system



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