



# CLIMATE ACTION ROADMAP

SEPTEMBER 2023



# FOREWORD

Technological University Dublin (TU Dublin) seeks to make the world a better place to live, work and prosper. In our role and working with stakeholders – our students, staff, communities, industry and governments – we are committed to taking climate action. As we transform to become one of the world’s most sustainable universities, TU Dublin acts as a leader and a voice for sustainability and climate action, promoting a new way of living and working that protects our planet for future generations. With the United Nations’ (UN) sustainable development pillars of People, Planet, and Partnership at the core of TU Dublin’s Strategic Intent 2030, we advocate for and drive sustainability through our academic, research, operational and engagement practice to address societal challenges in collaboration with local, national, and global partners.

TU Dublin’s Climate Action Roadmap outlines our response to reducing our environmental impact, increasing our knowledge and skills, and developing solutions for mitigating and adapting to climate change. Through our work, we address the Public Sector Climate Action Mandate and through the wider sustainability strategy we are developing, we outline larger ambitions of our University to achieve sustainability targets, educating and informing our students to become responsible and capable members as we transform into a carbon-neutral society.



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**“Our vision is to create a better world together; where underpinned by the key Sustainable Development Goal (SDG) of Quality Education, TU Dublin is becoming one of the World’s most sustainable universities.”**

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**Professor David FitzPatrick**

TU Dublin President



While European Union (EU) and Irish policy establishes our working regulatory context, the March 2023 'Synthesis' report published in by scientists working internationally on the Intergovernmental Panel for Climate Change (IPCC), warns that human-induced climate change is now widespread, rapid, intensifying, with some areas of impact now irreversible. In describing the report as a 'code red for humanity', the UN Secretary-General spoke of the need to act now to avert climate catastrophe. This message is reflected nationally in Ireland's latest Climate Action Plan 2023, citing that to achieve the emissions reduction targets required to address climate change, 'the scale of systems and behavioural change required is transformational and 'unprecedented''. TU Dublin acknowledges the increasing urgency and call-to-action for all developed countries to implement significant change and bring forward long-term targets. In aiming for this, TU Dublin has committed to becoming carbon-neutral across our Scope 1 and Scope 2 emissions by 2040, where with appropriate engagement, training, and investment, we will rapidly reduce our impact within the areas of our organisation boundary. Through our talented students, academic, research, and professional staff, we will advance policy, promote responsible behaviours, and develop our University environment to reduce our Scope 3 impacts to become a carbon neutral by 2050.

In response, TU Dublin commits to take urgent climate action to achieve carbon neutrality across its operations, foster societal resilience through an inclusive and inspiring education model, develop open research and innovation, and enhance citizen agency at all levels for positive change.



**“Now is a time for courageous leadership and unprecedented collaboration at all levels to protect the fate of our planet for future generations.”**

**Jennifer Boyer**

Vice President for Sustainability





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# 1 INTRODUCTION

## 1.1 TU DUBLIN INTENT

This second iteration of TU Dublin's [Climate Action Roadmap](#), informed by the requirements of [Public Sector Climate Action Mandate](#), demonstrates our pathway and intent as a large public sector body to protect our planet with a focus on energy management and greenhouse gas (GHG) emissions reduction. In this roadmap, TU Dublin will focus most attention on our plans for reducing total energy related emissions and fossil fuel related emissions from our operations in line with the targets in the national Climate Action Plan.

Under the National Climate Action Plan 2023, the Public Sector Climate Action Mandate sets out the targets for public bodies as:

- Reduce GHG emissions by 51% in 2030.
- Increase the improvement in energy efficiency in the public sector from the 33% target in 2020 to 50% by 2030.
- Update Climate Action Roadmaps annually in line with updated Public Sector Climate Action Mandate.

In addition to transforming our campus environment and operations to deliver on carbon emissions reductions, TU Dublin recognises the role we play as a university in providing [Quality Education \(UN SDG 4\)](#), where our learners, educators, researchers, and partners share our ambition to be responsible global citizens who transform themselves to take action to address climate change in their daily lives.

## A CALL TO CLIMATE ACTION

“Transformational changes are more likely to succeed where there is trust, where everyone works together to prioritise risk reduction, and where benefits and burdens are shared equitably... We live in a diverse world in which everyone has different responsibilities and different opportunities to bring about change. Some can do a lot while others will need support to help them manage the change.”

**Hoesung Lee**

IPCC Chair

‘Urgent climate action can secure a liveable future for all’ - Press release

## 1.2 TU DUBLIN CLIMATE ACTION ROADMAP PROGRESS SUMMARY

### 1.2a EXECUTIVE SUMMARY

This update to TU Dublin's Climate Action Roadmap for September 2023 sets out progress made against plans as outlined in the first iteration of the Roadmap from March 2023. It assesses our progress against meeting the Public Sector Climate Action Mandate requirements and sets out our aims in terms of the timelines for delivery and achievement of those actions.

A detailed Decarbonisation Roadmap is included in this update which is an analytical information tool developed by TU Dublin which enables us to gain a better understanding of our energy and carbon usage through collection of more granular data on operational usage. This tool also allows TU Dublin to test future energy and carbon scenarios, by inputting modelled project estimates for reductions and prioritise resources. Through this modelling, we anticipate that significant savings in GHG emissions can be achieved through low cost, high impact measures such as improving buildings control and operations and shallow retrofitting measures. Since publication of the first Climate Action Roadmap our [Tallaght campus has connected to the district heating system provided through the public utility HeatWorks](#) which uses waste heat from the Amazon web services data center in South Dublin. This initiative has provided evidence for implementing district heating systems in our three campus locations as central to achieving our 51% carbon reductions by 2030. For this reason, significant efforts will continue to be directed towards identifying and securing funding to progress and expand the development of sustainable energy through campus-based district heating projects. In parallel, we are actively exploring opportunities across a range of renewable energy pathfinder projects on key buildings and to schedule the implementation of those activities in such a way as to minimize disruption to the University's core activities.

Initial measures have been taken to improve the metering of our electricity and natural gas usage to improve our baseline data and understanding of our significant

energy users and carbon emitters at a building level. Initial steps are being taken to make that data available as central to drive behavioural change of energy users and managers on campus. Initial engagement has begun with building users to increase the understanding through the public display of building energy certificates and through pilots in My Green Labs within academic programmes.

### 1.2b OVERVIEW OF DELIVERY

#### 1.2b.i OUR PEOPLE

##### **Leadership and Governance**

*University Accountability Model to achieve climate and sustainability targets* - Led by the Vice President (VP) for Sustainability, TU Dublin is developing a University accountability model to ensure implementation of the climate and sustainability targets in a manner that is consistent with the timelines set out in this Climate Action Roadmap and the broader Sustainability Strategy. This includes the establishment of annual programmes of work and the allocation of resources and budgets to deliver on those targets. A Sustainability 'Actions Scorecard' is being developed to structure and track the deliverables and timelines as set out in our Climate Action Roadmap to ensure their execution. It is expected that this will be included in the Climate Action Roadmap in the next update.

##### **Engaging and Training Staff**

*Senior Management Climate Leadership Training* - In May 2023, TU Dublin welcomed colleagues from across Higher Education Institutions (HEIs) and sector representative bodies to a workshop to progress the development of a bespoke training programme. This initiative has the potential to bring the nation's leading subject matter experts and best-practice learning and teaching professionals together to deliver a valuable and scalable programme. Discussions with Department of Further and Higher Education, Research, Innovation and Science (DFHERIS) around timescales for delivery are in progress. Alternative training options are planned by TU Dublin in parallel, with commencement before December 2023.



## 1.2b.ii OUR TARGETS

*Green Public Procurement Training* – In March and April 2023, the TU Dublin Procurement team completed certified Green Public Procurement Training. Training for Senior Managers and purchasers within the University is to be programmed within the staff training requirements for 2023-2024.

*EU Levels Commitments* – In April 2023, TU Dublin signed its organisational commitment ‘to taking initial actions to address environmental impact of construction’ under EU Levels. Training has begun by members of the Campus & Estates, Campus Planning, and Procurement teams and is being run through the Irish Green Buildings Council. Training includes the areas of; Life Cycle Assessment, Life Cycle Costing, Indoor Air Quality, and Circularity with respect to design, construction, and facilities management.

*Sustainability Training for Researchers* – Since 2019, all new researchers at TU Dublin undertake two modules within their required Professional Development Training Programme for Researchers which train researchers to align research outputs to key policies including the National Development Plan, EU Missions, and the - the United Nations (UN) Sustainable Development Goals (SDGs) to demonstrate relevance and impact. This programme is run three times annually, with three cohort per session.

*Employee Induction Training* – Since April 2023, a module in Sustainability covering an introduction to the SDGs and climate change has been delivered to more than 140 staff and is run twice annually as part of all new Employee Induction Training.

*Senior Leaders Development Programme* – In January and May 2023, a module in Sustainability covering an introduction to the SDGs and Climate Change has been delivered to over 80 Senior Managers as part of a Senior Leaders Development programme.

*The University Executive Team* have undertaken focused workshops on Climate Action, Energy, Double-Materiality Reporting, and Sustainability Leadership since January 2022.

### **Achieving Carbon Emissions Reductions**

*Carbon emissions figures* - This update to the Climate Action Roadmap reflects the latest reporting to the SEAI M&R reporting tool which indicates that TU Dublin’s GHG emissions have risen from 9,496 tCO<sub>2</sub>e in 2021 to 10,895 tCO<sub>2</sub>e in 2022. Significant work has been involved since publication of the first Climate Action Roadmap to ensure that buildings and meters reported to the reporting tool reflect the current buildings stock register since amalgamation of the three separate Institutes of Technology into the new University structure. The 2021 reported emissions figures did not include the energy usage associated to the two newest buildings on the Grangegorman campus, the Central Quad, and the East Quad. This reporting period has amended that omission.

### **Improvement in energy efficiency**

The ongoing activities identified in section 3.2 have been initiated and will identify areas of focus and priority to deliver on this target.

**TU Dublin staff are passionate about climate action and sustainability. We are committed to serving our students and delivering on the targets in our Climate Action Roadmap.**





## 1.2b.iii OUR WAY OF WORKING

### Sustainability Activities Report

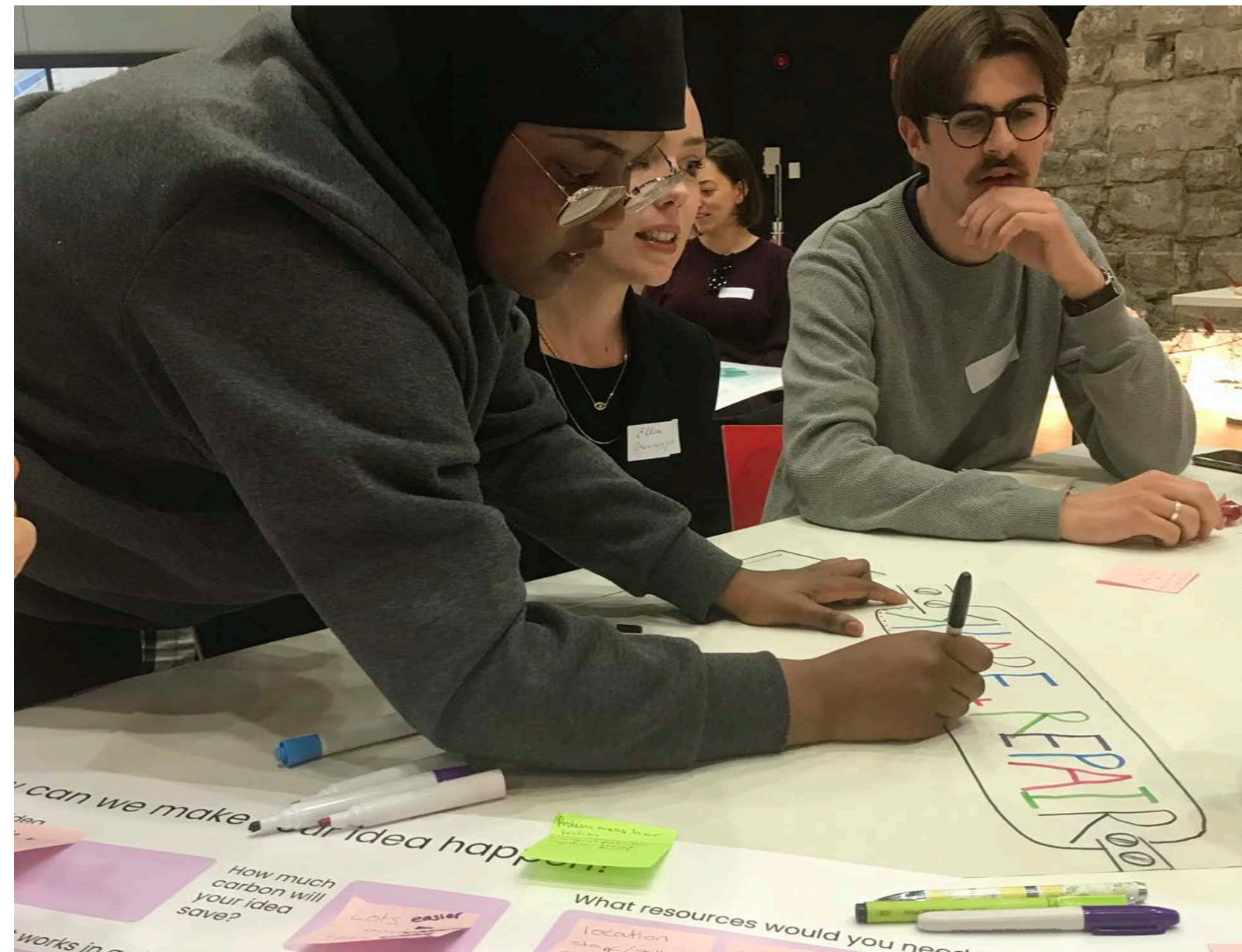
Since its formation in 2021, the Sustainability Office further developed and enhanced an already dynamic and engaging calendar of sustainability and climate action activity. Students, staff and the wider TU Dublin community learn about TU Dublin's vision and progress towards achieving our climate action goals on the [Sustainability section](#) of the TU Dublin website. The website features the Sustainability Office's four key service areas of Sustainability Education, Sustainable Campus (Decarbonisation), Vision & Progress (Sustainability Intelligence), and Societal Engagement (a service jointly led by the VP for Sustainability and the VP for Partnerships), as well as detail on Strategic Projects. The [Sustainability News and Events section](#) features all sustainability and climate action activity on campus, and is promoted to students and staff through a monthly newsletter. In timing with the launch of this Climate Action Roadmap, the Sustainability Team will launch [a series of engagement and participation activities](#) to groups within the University.

The start of this academic year kick starts sustainability and climate action activity. As part of [Orientation](#) in September 2023, the Sustainability Education Team will host a range of immersive sustainability and climate action activities, designed to instil passion, purpose, and build capacity and camaraderie among incoming students. All incoming first-year students will undertake a Sustainability and Climate Action Challenge to introduce them to the concepts of the Sustainable development Goals in a practical, engaging activity. During this orientation period, students will also engage in education for sustainability, learning about the dimensions of sustainability, the UN SDGs, and how to cope with anxiety related to the climate crisis. A short course on Sustainability and Climate Action will be available as part of the Student Success module on our Brightspace Virtual Learning Environment.

As part of the [TU Dublin Sports & Societies Festival](#), which also takes place in September, students and staff are encouraged to join various clubs, societies, volunteer groups, and committees which focus on different approaches towards sustainability or climate activism. These include, but are not limited to: the Sustainability Society, SDG Literacy Community, STAND, the Environmental, Planning and Sustainability (EPS) Society, the Student's Union, Student Volunteering, LGBTQ+ Society, Healthy TU Dublin

and the Green-Campus Committee. Separate to activity coordinated on campus, students and staff are also made aware of national campaigning organisations such as the National Youth Council of Ireland, An Taisce, Extinction Rebellion, Fridays for Future, and the Act Now Collective.

From January 2023, TU Dublin has hosted [a dynamic series of in-person sustainability and climate action events](#), conferences, and engagement activities to support TU Dublin's objective to stimulate sustainability awareness and action on campus. This academic year TU Dublin celebrated and raised awareness of 37 UN International days, linking our own research and action directly to the call to action outlined in these campaigns. TU Dublin took part in many high impact sustainability and climate action initiatives including [EU Mobility Week](#) in September, [Climate Action Week](#) in October, and [Green Week](#) in March. Ongoing campaigns and national events also include; [Walktober](#), [Quit Smoking Month](#), [Marchathon](#), [#TUDublinSwitchingOff](#) (Reduce your Use), [Workplace well-being Week](#), [Equality, Diversity, and Inclusion Week](#), [Planning Week](#), [Fashion Revolution Week](#), [Bike Week](#), and Biodiversity Week.





### **Emissions Associated with Air Travel**

A review of the TU Dublin Travel & Subsistence Policy is underway to incorporate Circular 01/2020: Procedures for Offsetting the Emissions Associated with Official Air Travel. The revised policy is envisaged to be in place by Q4 2023. TU Dublin is engaging with our contracted travel suppliers to include green criteria as part of purchase information and to collect relevant data in relation to carbon emissions for reporting on progress.

### **Energy and Environmental Management Systems and Accreditation**

*Operational Energy Usage Data* - TU Dublin is making progress towards increasing the granularity and accessibility of our operational energy usage data. The first project to enable that outcome is the installation of submetering of both thermal and electrical energy readings to the buildings level which is due to be complete by Q1 2024. That process will continue to be developed to bring granularity to the floor and room level. We will continue to develop digital construction practices to enable data gathering and evidence-based decision making. TU Dublin is preparing an Energy Data Collection Plan to support the ISO Certification process which will structure the gathering of data. An energy information and data repository is being established to make that data accessible to energy managers and end users and to make the data open to the greatest extent possible for living lab opportunities. The development of a Smart Infrastructure and Green Technology Strategy will expand that work.

*SI426 audits / SEU Audits* - SI426 compliant audits are being carried out for buildings representing 85% of our energy use as follows:

- Tallaght Main Building
- Central Quad
- Blanchardstown - Aras Fios
- Bolton Street
- East Quad

These audits are due to be completed in Q4 2023 and the information provided in these audits will feed into the register of energy efficiency opportunities and the Buildings Retrofit Programme which will be included in the next update.

### **ISO50001 accreditation**

Reaccreditation process is underway with a view to achieving ISO50001 accreditation for all campuses by December 2023.

### **My Green Labs accreditation**

My Green Labs certification is being sought for 26 lab spaces in TU Dublin. The Chemistry Lab suite in the [School of Chemistry and Biopharmaceutical Sciences has achieved Platinum level](#) and eight other labs are midway through the certification process.

## **1.2b.iv OUR BUILDINGS AND VEHICLES**

**Promote the use of bicycles and shared mobility options** – TU Dublin is progressing a new bicycle and e-mobility hub on the Blanchardstown campus, due for completion in 2024. TU Dublin have applied for further funding to expand the bicycle and e-mobility hubs across all campus locations.

**DECs** - Display Energy Certs have been carried out for 12 of the buildings that represent our significant energy users. These buildings account for 73% of the floor area of our buildings stock and include areas frequently accessed by the public. The remaining buildings are schedule to be audited with completion due for Q1 2024.

**Fossil Fuels after 2023 in heating systems** - The new Sports Building in Tallaght, opening in September complies with the requirement for no fossil fuel heating systems. It is connected to the adjacent HeatWorks waste heat supply.

**Existing Buildings** – TU Dublin is awaiting response on the EEPD deep retrofit funding proposal completed in January 2023. TU Dublin is actively working with our SEAI mentor to develop our decarbonisation roadmap and renovation targets.

**Procurement and Fleet Transition** - SI381/2021 Clean Vehicles Directive - TU Dublin's two diesel powered vehicles will be replaced in Q4 2023 with electric vehicles. In 2023, a diesel van was purchased for use in research. The van will be returned by the end of 2023.



## ACRONYMS

°C	Degrees Celsius
AASHE	Association for the Enhancement of Sustainability in Higher Education
BER	Building Energy Rating
CASH	Centre for Applied Science in Health
CO <sub>2</sub> / CO <sub>2</sub> e	Carbon dioxide / Carbon dioxide equivalent
COVID-19	SARS-CoV-2 / Coronavirus Disease 2019
CPD	Continuous Professional Development
CSO	Central Statistics Office
DECC	Department of the Environment, Climate and Communications
DEFRA	UK Department for Environment, Food and Rural Affairs
DEC	Display Energy Certificate
DCC	Dublin City Council
DH	District Heating
DFHERIS	Department of Further and Higher Education, Research, Innovation and Science
EC	European Commission
EDI	Equality, Diversity, and Inclusion
EMAS	Eco-Management and Audit Scheme
EnPI	Energy Performance Indicator
EMS	Energy Management System
EPA	Environmental Protection Agency
EPS	Environmental, Planning and Sustainability
ESD	Education for Sustainable Development
EPBD	Energy Performance of Buildings Directive
EU	European Union
FCC	Fingal County Council
GDA	Grangegorman Development Agency
GHG	Greenhouse gas
GPP	Green Public Procurement
HEI	Higher Education Institutions
ICT	Information and Communication Technologies
IPCC	Intergovernmental Panel on Climate Change
IUA	Irish University Association
kgCO <sub>2</sub> e/m <sup>2</sup>	Kilograms of carbon dioxide equivalent per square meter
KPI	Key performance indicator
Kt	Kiloton
LED	Light Emitting Diode

LCA	Life Cycle Assessment
kW / kWh / kWe	Kilowatt / Kilowatt-hour / Kilowatt electric
M&R	Monitoring and Reporting
MoU	Memorandum of Understanding
NTA	National Transport Authority
NLP	Natural language processing
OERs	Open Education Resources
OGP	Open Government Procurement
PPP	Public Private Partnership
R&I	Research and Innovation
RAI	The Relative Activity Index
RECs	Renewable Energy Communities
RDI	Research, Development, and Innovation
RKs	Root keywords
SEF	Sustainability Education Framework
SCO <sub>2</sub>	Supercritical carbon dioxide
SDCC	South Dublin County Council
SDG	Sustainable Development Goal
SEAI	Sustainable Energy Authority of Ireland
SECs	Sustainable Energy Communities
SUDS	Sustainable Urban Drainage Systems
STEM	Science Technology Engineering and Maths
tCO <sub>2</sub> / tCO <sub>2</sub> e	Tonnes of carbon dioxide / Tonnes of carbon dioxide equivalent
TF-IDF	Term Frequency - Inverse Document Frequency
TgCO <sub>2</sub>	Teragrams of carbon dioxide
TFI	Transport for Ireland
TU Dublin	Technological University Dublin
TPER	Total Primary Energy Requirement
TFC	Total Final Consumption
UEM	University Education Model
UET	University Executive Team
UN	United Nations
USC	University Sustainability Council
VP	Vice President
WEEE	Waste Electrical and Electronic Equipment
WTE	Whole-Time Equivalent
ZEB	Zero Energy Buildings







## 2 | OUR PEOPLE

### 2.1 LEADERSHIP AND GOVERNANCE FOR CLIMATE ACTION

#### Key Roles in Sustainability

In 2021, TU Dublin appointed a Vice President (VP) for Sustainability to provide leadership, strategic direction and oversight for the coordination and management of the University’s activities in relation to sustainability, across both professional services and academic domains. The VP for Sustainability is responsible for developing and overseeing the implementation of a cohesive university sustainability strategy and establishing TU Dublin as one of the world’s most sustainable universities. The VP for Sustainability is TU Dublin’s Climate and Sustainability Champion and a nominated member of the [University Executive Team](#) (UET) with responsibility for implementing and reporting on the Public Sector Climate Action Mandate. Reporting directly to the President of the University, The VP for Sustainability has responsibility for implementing and reporting on the Public Sector Climate Action Mandate. Other key roles for sustainability leadership in TU Dublin is set out in the diagram below and show the commitment of the University to climate action.

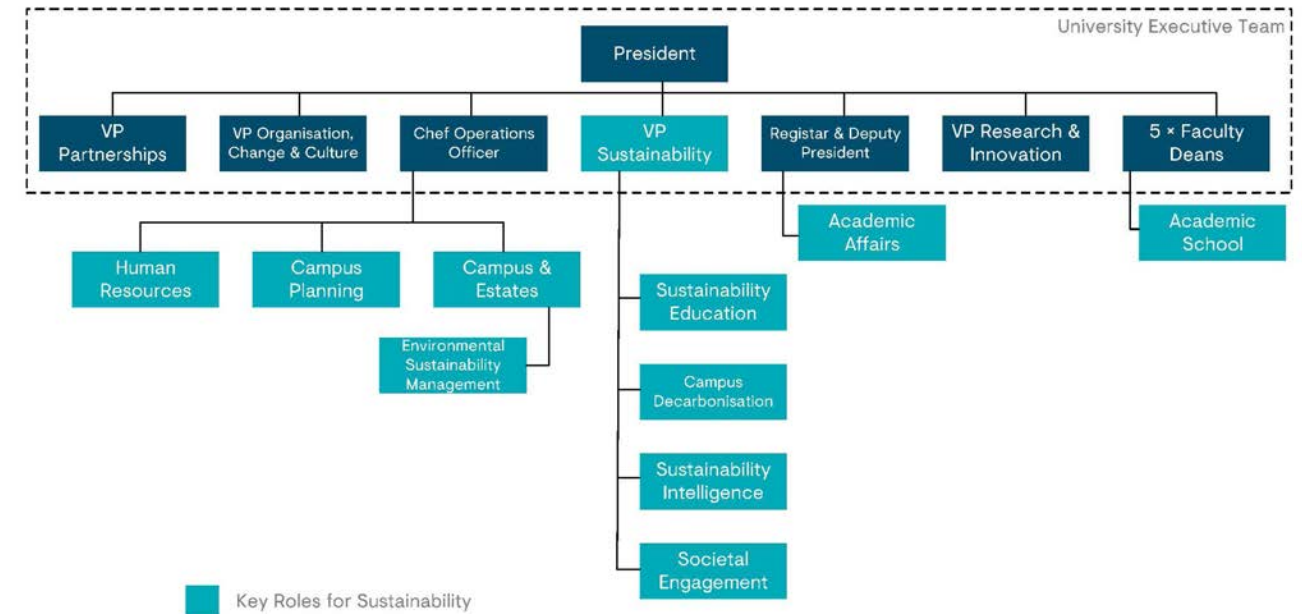


Figure 1: Key roles in TU Dublin for sustainability leadership

**The Sustainability Team is designed to bring expertise, build capacity, and advance impact across several key areas, represented by the four functional pillars:**

- Sustainability Education (capacity building).
- Campus Decarbonisation (campus operations and planning).
- Sustainability Intelligence (performance reporting and technology infrastructures).
- Societal Engagement (embedding sustainability activities with partners and supporting thought leadership).

#### Responsibilities of the Team include:

- Overseeing, coordination and reporting on the implementation of the TU Dublin Climate Action Roadmap and Sustainability Strategy.
- Developing new policies and setting University direction to becoming carbon neutral.
- Developing frameworks to support the development of our students, staff, and communities to be responsible global citizens.
- Enhancing information quality and flow for enhanced organisational performance to deliver our key goals.
- Measuring and communicating our climate and sustainability impacts and achievements.



## 2.1.b CAMPUS & ESTATES

Campus & Estates aims to be to the forefront in ensuring the University becomes a ‘Beacon for Sustainability’ working closely with the VP for Sustainability to achieve this goal. There is a dedicated section within the service focused on environmental sustainability management, acting as a champion for sustainability, as the Energy Performance Officer, and Environmental Policy Implementation Lead. Campus & Estates is responsible for the operational implementation and delivery of the elements of the Climate Action Plan that fall within their remit, implementing environmental policies and energy action plans and supporting the University in meeting global sustainability standards such as the AASHE STARS programme, and delivering ISO 50001 and 14001 accreditation processes. Campus & Estates has a specific remit in the delivery of energy related projects, managing energy related data and processes and providing support for planning, regulation, monitoring, development and management of energy and the reduction of the University’s carbon footprint.

## 2.1.c CAMPUS PLANNING

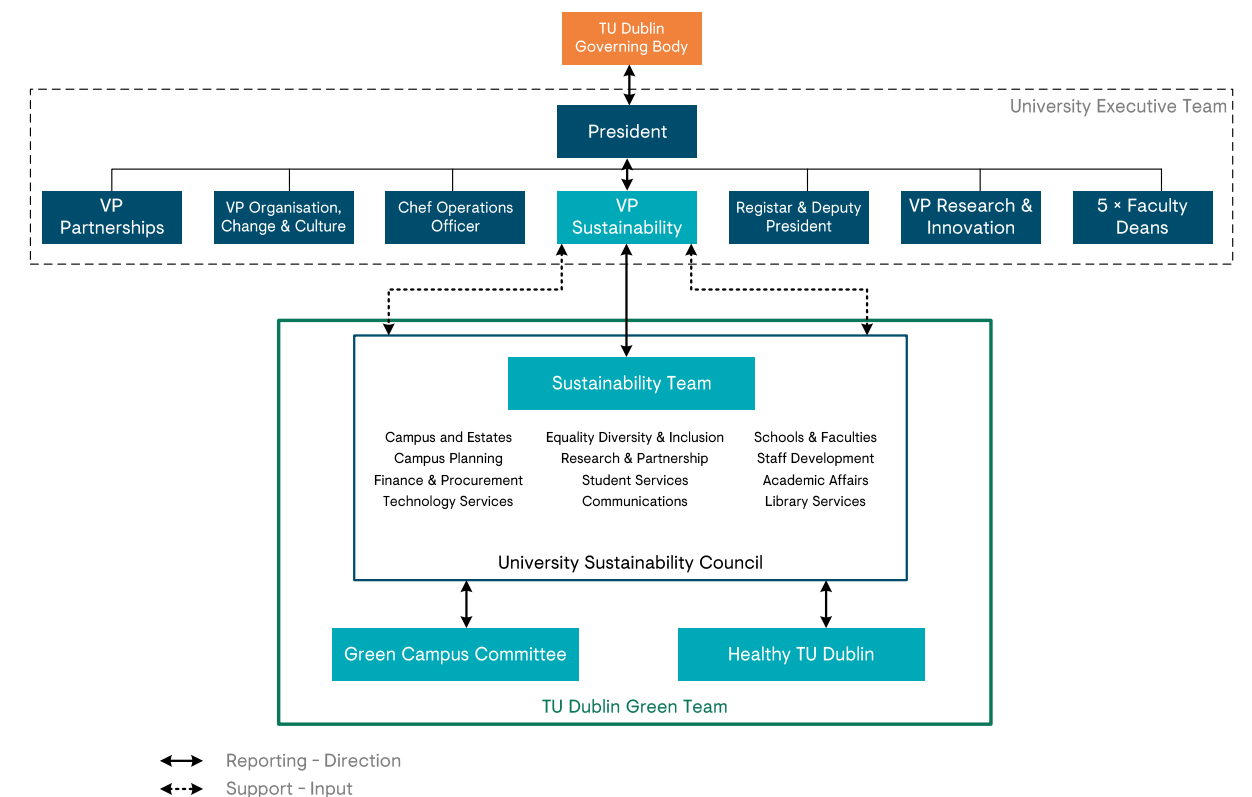
Campus Planning supports the UET in the planning and development of the physical infrastructure of the University. It seeks to ensure that all new university buildings are sustainable, ‘and also to identify improvements in the sustainability of existing buildings across all campuses, working closely with the Sustainability Team to decrease the overall University carbon footprint, including the incorporation of requirements and plans for sustainable transport, and commuting. Achieving and exceeding carbon and sustainability targets will require the optimisation of existing infrastructure and the introduction of cutting-edge clean energy technologies such as district heating, deep bore geothermal, digital twins, and advanced solar technologies.

## 2.1.d GRANGEGORMAN DEVELOPMENT AGENCY

The development of TU Dublin’s Grangegorman campus forms part of the overall development of a new Urban Quarter in Grangegorman. The Grangegorman Development Agency (GDA) is a fixed purpose government agency, established in 2006, acting as the contracting authority to develop the Grangegorman site for and on behalf of our stakeholders including TU Dublin, the Health Service Executive, and the Department of Education. The objective of the GDA is to develop the social and urban renewal of the 30 hectares of the former St. Brendan’s Hospital site in Grangegorman and its surrounding areas, driven by the relocation of TU Dublin and the provision of modern primary and residential healthcare facilities. The GDA have established sustainability as a core objective and continue to develop a Climate Action Roadmap and associated implementation plans in close coordination with stakeholders including TU Dublin.

## 2.1.e GOVERNANCE FOR CLIMATE ACTION

The following diagram sets out the internal governance within the University.





## 2.1.e.1 UNIVERSITY SUSTAINABILITY COUNCIL

To reflect the scale and pace of transformation needed to advance sustainability and deliver on climate action, the establishment of the [TU Dublin University Sustainability Council \(USC\)](#) will be a core enabler for establishing integrated delivery, ownership, and function-level accountability. With membership drawn from across the University, the terms of reference for the USC are currently being drafted.

## 2.1.e.2 THE TU DUBLIN GREEN TEAM

The [TU Dublin Green Team](#) is an extended group within the University designed to advocate, communicate, and mobilise activities to engage students and staff in the Climate Action Roadmap and [Sustainability Strategy](#) deliverables. Involving membership from the USC, the [Green-Campus Committee](#) and the University's [Heathy TU Dublin workgroup](#), the Green Team will draw on students and staff representatives, priority taskforces, and nominated sustainability champions to grow the network of knowledgeable and committed students, staff, and external partners for climate action priorities.

## 2.1.f ACTIONS PLANNED

The following actions are planned to support sustainability leadership, governance, and implementation in TU Dublin:

- Establish multi-annual programmes of work and allocate resources, including budgeting to deliver on short-, medium-, and long-term targets.
- Align and utilise external funding opportunities to deliver on climate action mandate and sustainability objectives.
- Continue to build whole-of-University capacity and culture by empowering change at every level, through transformational change initiatives.

## 2.2 ENGAGING AND TRAINING STAFF

[TU Dublin Sustainability Education Framework \(SEF\)](#) is being developed to embed sustainability through a whole-of-University approach to deliver on Ireland's national ['ESD to 2030'](#) strategy. It aims to ensure our student and staff acquire the knowledge, skills, attitude, and values necessary to build resilience for climate change and shape a sustainable future. To ensure our graduates can lead the sustainability agenda with passion and purpose, we must empower and build capacity among staff to deliver innovative programmes that address the global challenges set out in the UN (United Nations) Sustainable Development Goals (SDGs). We will also support all staff so that sustainability education will be delivered in a learning environment where our campus is a living lab to develop best practice in sustainability.

The SEF is aligned with government policy on sustainability<sup>1</sup> and with the technical, behavioural and leadership training requirements encompassed in Public Sector Climate Action Mandate. The objectives are set out below:

- To advance sustainability by leveraging collective knowledge, skills, and ambition to empower staff.
- To embed sustainability and the UN SDGs at the heart of the student experience and throughout all academic programmes.
- To provide wider societal capacity building in sustainability through open engagement, open education, and partnership.

In 2023 we will engage all senior management (PO and SL3 and above) in climate leadership training. Since 2021, the UET have engaged in multiple sustainability and climate workshops.



## 3 | OUR TARGETS

Under the National Climate Action Plan 2023, the Public Sector Climate Action Mandate sets out the targets for public bodies as:

- Reduce GHG emissions by 51% in 2030.
- Increase the improvement in energy efficiency in the public sector from the 33% target in 2020 to 50% by 2030.
- Update Climate Action Roadmaps annually in line with updated Public Sector Climate Action Mandate.

### 3.1 ACHIEVING THE CARBON EMISSIONS REDUCTION TARGETS (51% REDUCTION BY 2030)

For TU Dublin to accurately report its greenhouse gas (GHG) emissions and consider how best to address these, it must first define its organisational boundary within Ireland, and a summary of this is provided at this point.

The University operates across five main locations spanning three local authority areas in the Dublin region – Grangegorman, Bolton Street, and Aungier Street (Dublin City Council), Blanchardstown (Fingal County Council), and Tallaght (South Dublin County Council) with a regional catchment area of more than one million people. When considering the needs of the local catchment areas and distribution of needs, TU Dublin groups its activities under the Tallaght campus, Blanchardstown campus, and Grangegorman, Bolton Street, and Aungier Street campus locations.

In our first Climate Action Roadmap, it incorrectly reported our total estimated carbon emissions associated with TU Dublin in 2021 to be just over 52,112 tCO<sub>2</sub>e, however this figure was our total baseline emissions from 2018 as shown in the Sustainable Energy Authority Of Ireland (SEAI) Monitoring and Reporting (M&R) reporting history.



The estimated carbon emissions associated with TU Dublin in 2021 was just over 41,333 tCO<sub>2</sub>e as shown in Table 1 from our Climate Action Roadmap publication in March 2023. In this second publication of the Climate Action Roadmap, we report our total estimated carbon emissions associated with TU Dublin in 2022 is now just over 43,490 tCO<sub>2</sub>e. While estimated Scope 3 emissions have decreased, we note in section 1.2b.ii OUR TARGETS that Scope 1 & 2 emissions have increased in 2022.

All campuses are within a 10 km radius, comprising over 47 buildings (~204,000 m<sup>2</sup>) on 185 acres. As of February 2023, TU Dublin has almost 28,000 students and over 3,000 staff, and up to 450 community, enterprise, industry, academic, and research partners. The total estimated carbon emissions associated with TU Dublin in 2022 is just over 38,216 tCO<sub>2</sub>e.

TU Dublin directly controls all but two buildings procured through public private partnership and four leased buildings within its campuses. The exception to this direct operational control is with respect to two new buildings in Grangegorman (52,344 m<sup>2</sup>), whereby the State has procured the construction of the buildings under a 25-year Public Private Partnership (PPP). TU Dublin's East Quad and Central Quad were built on brownfield sites in Grangegorman and we will continue to do so where practical. Additionally, there are four leased buildings across other locations, covering a total area of 5,683 m<sup>2</sup>.

This Climate Action Roadmap encompasses the entire portfolio of assets and activities of the University and is treated as a live document that is continually expanded and developed through active engagement with buildings planning, operations, and end users. This will be reviewed and updated annually.



### 3.1.a ENERGY RELATED CARBON EMISSIONS BASELINE (AVERAGE 2016-2018 EMISSIONS)

Baseline years for measuring TU Dublin’s sustainable campus environment and operations impact through GHG emissions (Scope 1 and some Scope 2) began in 2018 when the three original institutions of Dublin Institute of Technology, Institute of Technology Blanchardstown, and Institute of Technology Tallaght reported as separate entities. In 2021, the first joint reporting through the SEAI M&R tool was conducted, where all campus locations were reported under one organisational footprint.

TU Dublin’s operational GHG emissions baseline focuses on campus activities such as energy, water, waste, and transport and translates the data from these activities into a carbon equivalent to provide an amalgamated figure. The table below identifies the total consumption from the baseline year (average 2016-2018 for energy-related emissions and 2018 approximations for Scope 3 activity). From this, total calculated energy-related emissions (Scope 1 & 2) of 9,973 tCO<sub>2</sub> and Scope 3 emissions of 42,139 tCO<sub>2</sub> bring TU Dublin’s total emissions baseline to 52,112 tCO<sub>2</sub>. It should be noted that baseline emissions have been amalgamated from the three separate campus reporting figures (captured as Dublin City Campus, Tallaght Campus, and Blanchardstown Campus) since the formation of the TU Dublin in 2019.

Fugitive emissions refer to the number of fugitive gases escaping from closed refrigerated systems. These systems include air-conditioning systems used in buildings. Mechanical contractors report any additional gases delivered and injected into systems on campus. A delivery to top-up a system must be recorded; this volume equates to the amount of gas lost. Fugitive emissions from refrigerators, air conditioning units and cold rooms account for less than 1% of TU Dublin’s total CO<sub>2</sub> emissions.

When we estimate Scope 3 emissions as part of the TU Dublin footprint, we find that 28.5% of TU Dublin’s total emissions are attributable to energy-related emissions in Scope 1 & 2, with the remaining 71.5% emissions arising from combined Scope 3

Baseline - GHG Campus Environment & Operations inventory		2018 Sector Baseline Year (tCO <sub>2</sub> e)	2019* (tCO <sub>2</sub> e)	2020 (tCO <sub>2</sub> e)	2021 (tCO <sub>2</sub> e)	2022 (tCO <sub>2</sub> e)
<b>Scope 1</b>	Natural Gas	3,993	4,299	3,295	5,610	6,052
	TU Dublin Owned Vehicles/Generator	2	2	1	1	2
	Fugitive Emissions	N/A	N/A	38	79	127
	<b>Sub Total</b>	<b>3,995</b>	<b>4,301</b>	<b>3,334</b>	<b>5,691</b>	<b>6,181</b>
<b>Scope 2</b>	Purchased Electricity	5,978	4,491	3,231	3,886	4,843
	<b>Sub Total</b>	<b>5,978</b>	<b>4,491</b>	<b>3,231</b>	<b>3,886</b>	<b>4,843</b>
<b>Sub Total Scope 1 &amp; 2</b>		<b>9,973</b>	<b>8,792</b>	<b>6,565</b>	<b>9,577</b>	<b>11,024</b>
<b>Scope 3</b>	Student and Staff Commuting	11,503	11,827	10,949	11,271	10,810
	Expensed Air Travel	24	27	8	10	14
	Business Travel	1,579	1,556	293	27	396
	Waste	9	8	7	8	9
	Water	22	22	22	19	62
	Purchased Goods and Services	29,002	12,933	21,809	22,578	15,901
	<b>Sub total</b>	<b>42,139</b>	<b>26,373</b>	<b>33,086</b>	<b>33,913</b>	<b>27,192</b>
<b>Total Scope 1, 2 &amp; 3</b>		<b>52,112</b>	<b>35,165</b>	<b>39,651</b>	<b>43,490</b>	<b>38,216</b>

Table 1: TU Dublin baseline emissions campus environment and operations since 2018

emissions, which include procurement, waste, water, and travel related to student and staff activities and commuting. Energy-related emissions are evenly distributed between gas and purchased electricity, with vehicles and fugitive emissions contributing small amounts to the overall total.

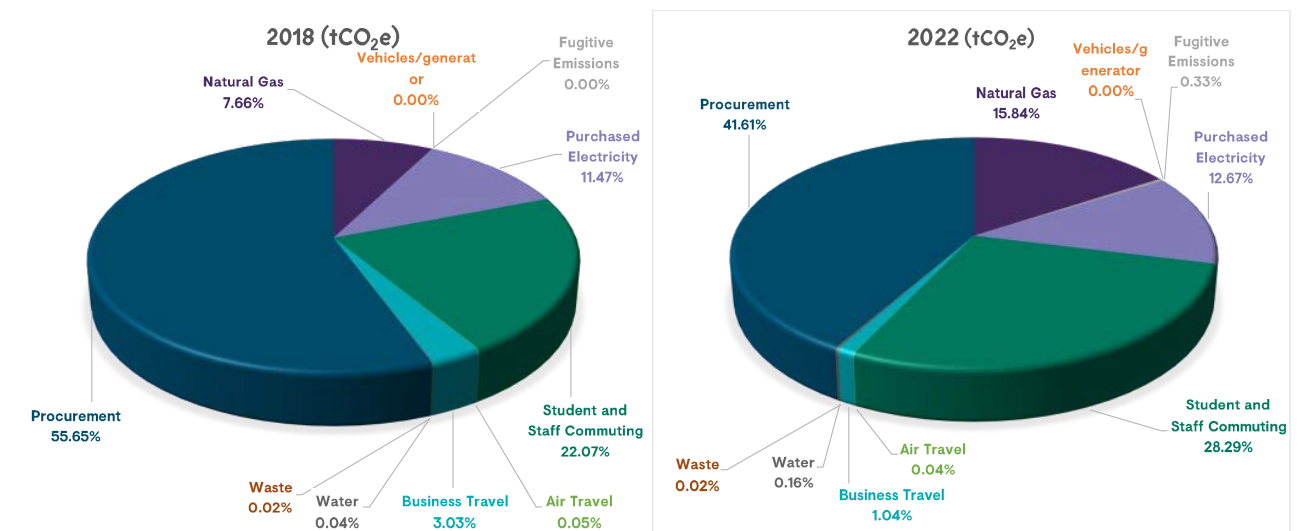


Figure 3: TU Dublin baseline emissions shown as a total across Scope 1, 2, and 3 activities for 2018 and 2022



### 3.1.b TOTAL EMISSIONS AND THERMAL (HEATING AND TRANSPORT) EMISSIONS

The SEAI M&R reporting tool indicates that the average emissions over the GHG baseline period were 9,971 tCO<sub>2</sub>. This means that the maximum emissions below which TU Dublin must operate in 2030 are 3,306 tCO<sub>2</sub>. The actual total energy-related emissions recorded in 2022 were 10,895 tCO<sub>2</sub>. This does not include for emissions generated from new additional buildings.

### 3.1.c EXPECTED GROWTH IN EMISSIONS

This section provides an overview of planned increased growth in services planned between baseline and target years. It is expected that TU Dublin's planned projects will assist in decreasing operational emissions to reach our 2030 targets more globally and in some cases may qualify for deduction due the nature of activities supported. An initial analysis of the energy and emissions impacts of these divestments and new building projects forms part of the work of this Climate Action Roadmap for 2023.

There are three new building projects currently underway and four planned for future use to 2030. The new Tallaght Sports Building was formally launched in September 2023. Three projects are currently under construction in three campus locations – Áras Gael in Blanchardstown, the Academic Hub in Grangegorman and the Tallaght North Block, originally named Culinary Arts, Engineering and Teaching Building, in Tallaght.

Three new building projects are planned for the Grangegorman campus and due to commence in 2027. These include the West Quad, the new FOCAS GG building and the Indoor Sport building. These new buildings will facilitate the divestment of older, energy inefficient buildings on the Aungier Street campus and the FOCAS building on Camden Street, both of which currently use fossil fuel based thermal heating systems. These new buildings will participate in the district heating systems in each location which are planned to move to fully renewable thermal heating sources before 2030. In terms of additionality, the University has plans to renovate a large warehouse structure on the Broombridge site named the Broombridge Design & Construct building as a

home for a Design and Construct project (6000 m<sup>2</sup>) to upskill the construction sector in modern methods of construction. It is anticipated that the project will be completed by 2026. University residential accommodation (circa 60,000 m<sup>2</sup>) is provided for in the Grangegorman Masterplan, discussions to develop these residential sites are ongoing.

### 3.1.d PLANNED ENERGY RELATED CARBON REDUCTION ACTIVITIES (NEXT TWO-THREE YEARS)

Energy related carbon reduction activities will include, and not be limited to, the following activities:

- Develop a Register of Decarbonisation Opportunities.
- Develop a Building Stock Plan (as defined by EPBD) by the end of 2023.
- Update the Decarbonisation Pathway in line with TU Dublin's Risk Management Policy and Public Sector Climate Action Mandate.
- Establish Energy Efficiency Decarbonisation (EED) Expert Advisory Group drawn from TU Dublin Academic Researchers and Partners.
- Develop green criteria, evaluation, and prioritisation tools to review all campus development requirements against total emissions reductions impact to inform investment in line with our academic mission and concerning the total cost model (people, € invested, emissions avoided).
- Specify low-carbon construction methods and low-carbon cement material as practicable for directly procured or supported construction projects from 2023.
- Use digital construction practices to enable associated carbon data gathering and facilitate sustainability-based decision making through digital logbooks, materials passports, and environmental product declarations.
- Incorporate Life Cycle Assessment criteria and Whole Life Carbon design into all new buildings and major renovations.

### 3.1.e ANALYSIS OF SIGNIFICANT EMITTERS

In order from buildings with the highest level of emissions down to the least, our significant emitters are the Central Quad, the Tallaght Main Building, Aungier Street, Park House, Bolton Street, the East Quad, the Lower House, Linenhall, Synergy CASH and the Greenway Hub. These ten buildings emit 87.11% of TU Dublin’s carbon emissions. As energy is currently being metered at the campus rather than the building level, energy usage per building has been allocated as an estimate based on building area.

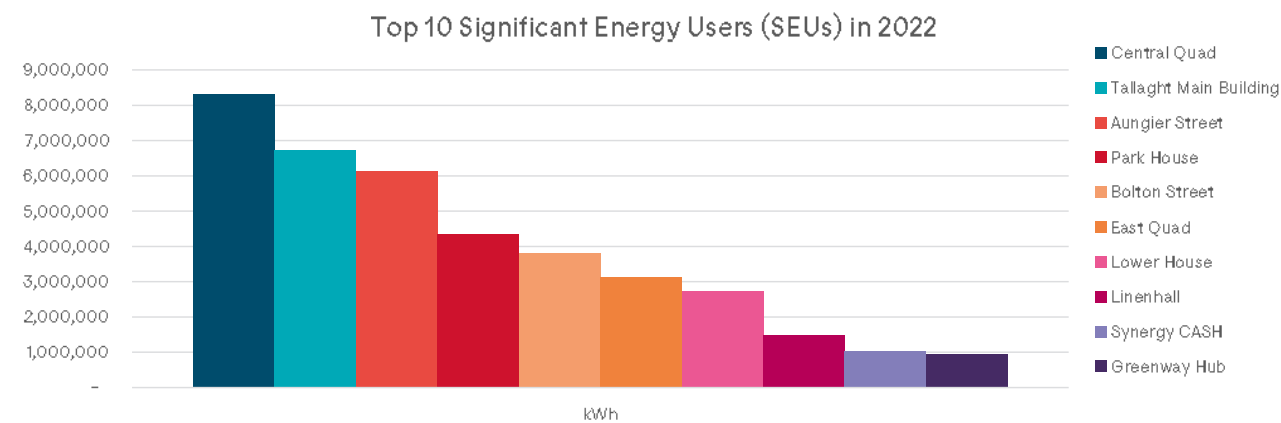


Figure 4: Combined electrical and non-electrical converted CO<sub>2</sub> emissions significant emitters.

### 3.1.f GAP TO TARGET TO BE ADDRESSED (NEXT TWO-TO-THREE YEARS)

The gap between the 2030 total GHG target of 3,306 tCO<sub>2</sub>e and the 2030 non-electricity GHG target of 1,957 tCO<sub>2</sub>e is 1,349 tCO<sub>2</sub>e. This figure represents TU Dublin’s target for carbon emissions related to electricity. It takes into account the grid’s proposal to significantly reduce the carbon footprint of its electricity supply.

Based on current baseline figures from 2023, we estimate year-on-year emissions reductions of current building stock and additional emissions from new campus development to require an average reduction of 576 tCO<sub>2</sub>e per year to 2030. Between 2018 and 2021, avoided emissions calculated totaled 2,631 tCO<sub>2</sub>e, which set out year-on-year reduction achievement of 877 tCO<sub>2</sub>e reduction per year during that period.

However, the period leading up to the 2022 data highlighted an increase in emissions, attributed to infrastructural expansions and increased operational activities. The strategies and interventions will be further elaborated in the 3.1.h section. Preliminary analysis indicates that with the relevant measures taking place, over the next two to three years, we anticipate we will achieve the target by 2030.

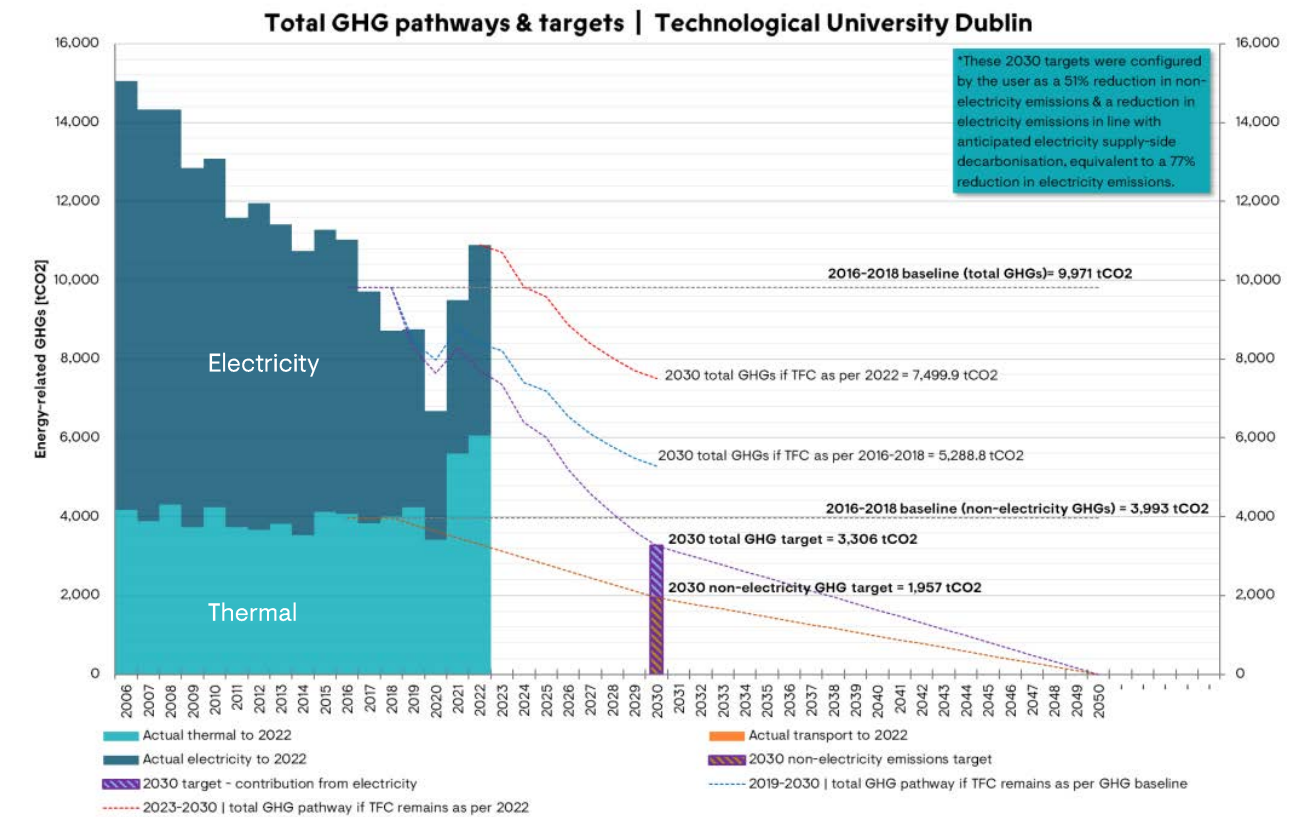


Figure 5: TU Dublin GHG pathways and targets as per SEAI M&R (2023)



### 3.1.g PROPOSED ACTIONS TO ACHIEVE ENERGY RELATED CARBON TARGETS

Natural gas is currently the primary source of space heating for TU Dublin. The challenge to decarbonise thermal energy is immense in terms of both the scale of work and related costs. As all public bodies have been instructed to do, our emissions savings relies on Government targets set out in the National Climate Action Plan to decarbonise the national grid to 70% renewable electricity by 2030 is met.

Sectoral risk arises from anticipated increased reliance on the national grid to decarbonise, and therefore, to distribute risk, a portfolio of additional measures to decarbonise our activities must also be developed in parallel. To that end, TU Dublin continues to review opportunities to implement renewable energy initiatives on campus. TU Dublin has developed district heating (DH) network systems on the Grangegorman and Tallaght campuses. These networks give the flexibility to use different, more sustainable centralised heating sources.

The Tallaght campus is heated by a DH network developed with South Dublin County Council, which uses waste heat generated from a nearby data centre, currently supplemented by water-source heat pumps. TU Dublin is participating in the development of a DH network modelled on the existing network in Tallaght with Fingal County Council and CODEMA to service the Blanchardstown campus. Learnings from the project on the Tallaght campus are anticipated to accelerate the timeframe for implantation for this project. On the Grangegorman campus, the potential for deep-bore geothermal heating is being explored in partnership with Geological Survey Ireland (GSI), with the assistance of CODEMA and the Grangegorman Development Agency (GDA). An initial trial borehole to 1 km depth showed promising results , with a temperature of 38.5°C at 1 km depth. In partnership, we are actively exploring funding opportunities to develop a full production deep bore geothermal well that would largely decarbonise heat on the local network.

TU Dublin have submitted for funding in 2023 through the SEAI energy efficiency and decarbonisation [Pathfinder](#) programme to part fund a deep bore geothermal well on

the Grangegorman campus to provide renewable heat to the already installed DH network, replacing existing gas-fired boilers. The chosen technology is a deep bore open geothermal doublet, extracting heat at 2.5 km and return water to a depth of approximately 1 km. It is anticipated that a portion of funding will come from an EU Peace+ initiative where TU Dublin work close partnership with GSI, Geological Survey Northern Ireland (GSNI), and CODEMA includes research and innovation, on a live submission. This will be an exemplar public sector project, with the potential to be replicated across other public sector locations, including universities, and large-scale infrastructure.

Through these and related performance enhancing initiatives, and subject to the securing of funding, TU Dublin aims to provide a minimum of 70% renewable space heating on site by 2030 and will engage in opportunities to extend these benefits to local Sustainable Energy Communities (SECs) and Renewable Energy Communities (RECs).





### 3.1.h TU DUBLIN DECARBONISATION ROADMAP

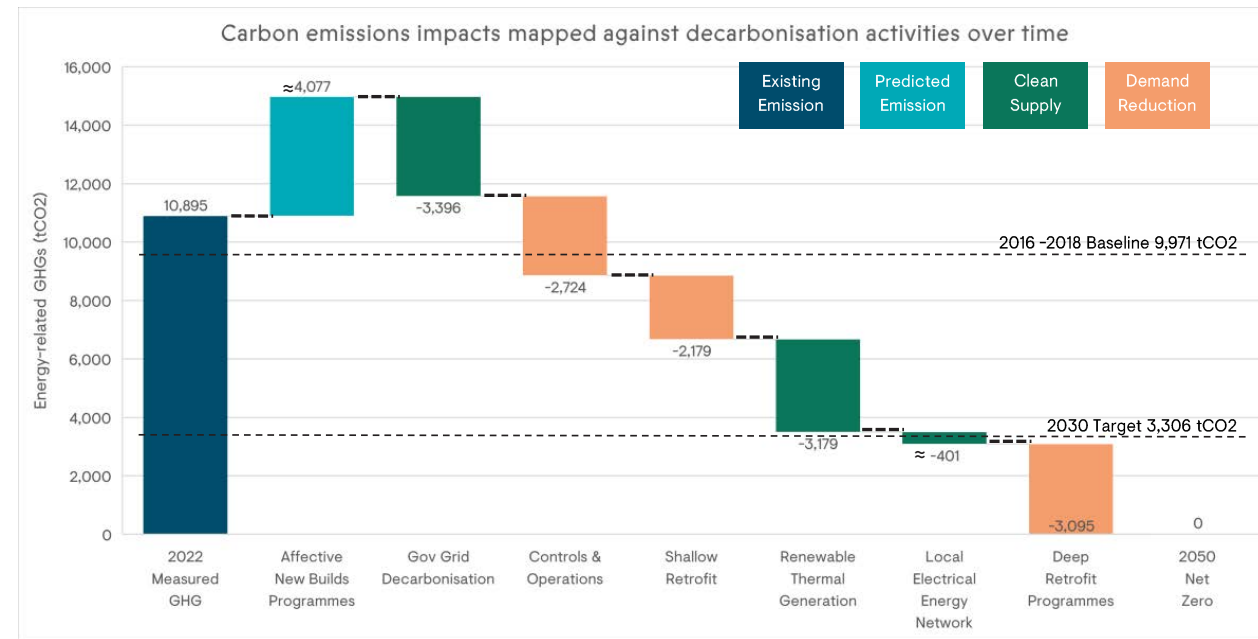


Figure 6 Carbon emissions impacts mapped against decarbonisation activities over time

TU Dublin’s decarbonisation roadmap strategy begins with gaining a better understanding of our operational usage data. To that end a submetering programme is underway to provide more granular information that allocates carbon usage at the individual building level and will continue to be developed to bring the granularity of that data to the floor and room level. It is anticipated that carbon emissions can be reduced by at least 25% through optimising controls and operational efficiencies. A shallow retrofit programme to be outlined in our Energy Efficiency Action Plan and accompanying Register of Energy Efficiency Opportunities is expected to achieve an additional 20% of current carbon emissions.

The Register of Decarbonisation Opportunities sets out our programme of work to achieve decarbonisation of our energy supplies, both thermal and electrical. The decarbonisation of our thermal heating through the provision of renewable based district heating systems on our campuses as described in section 3.1g above will provide the reductions needed to achieve the 51% carbon reduction goal to 2030. In parallel, we are actively exploring opportunities to increase production of thermal electricity on our campuses and sites as well as looking at our ability to manage

demand and distribution through local energy networks. This strategy allows TU Dublin sufficient time to develop our deep retrofitting programme in response to learnings gained through several pathfinder projects on key buildings. The waterfall chart in figure 6 above sets out the high-level estimated savings per activity which we intend to track over time and refine through understandings gained.

To illustrate TU Dublin’s current and anticipated energy demand relative to an overall decarbonisation pathway to net zero, an overview by campus and buildings is being continually refined to indicate key targets with milestones for reviewing our emissions profile across 2025, 2030, 2040 and 2050 time horizons. (Figure 7)

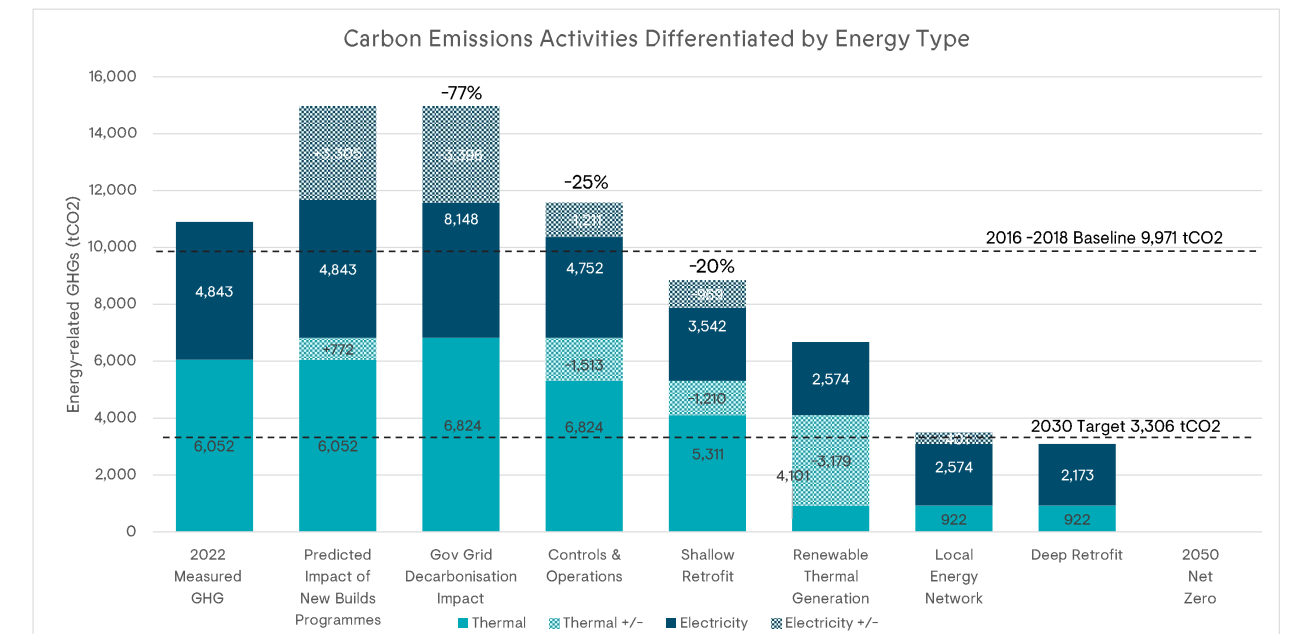


Figure 7 Decarbonisation activities differentiated by energy type and mapped over time



# DECARBONISATION ROADMAP SCOPE 1 & 2

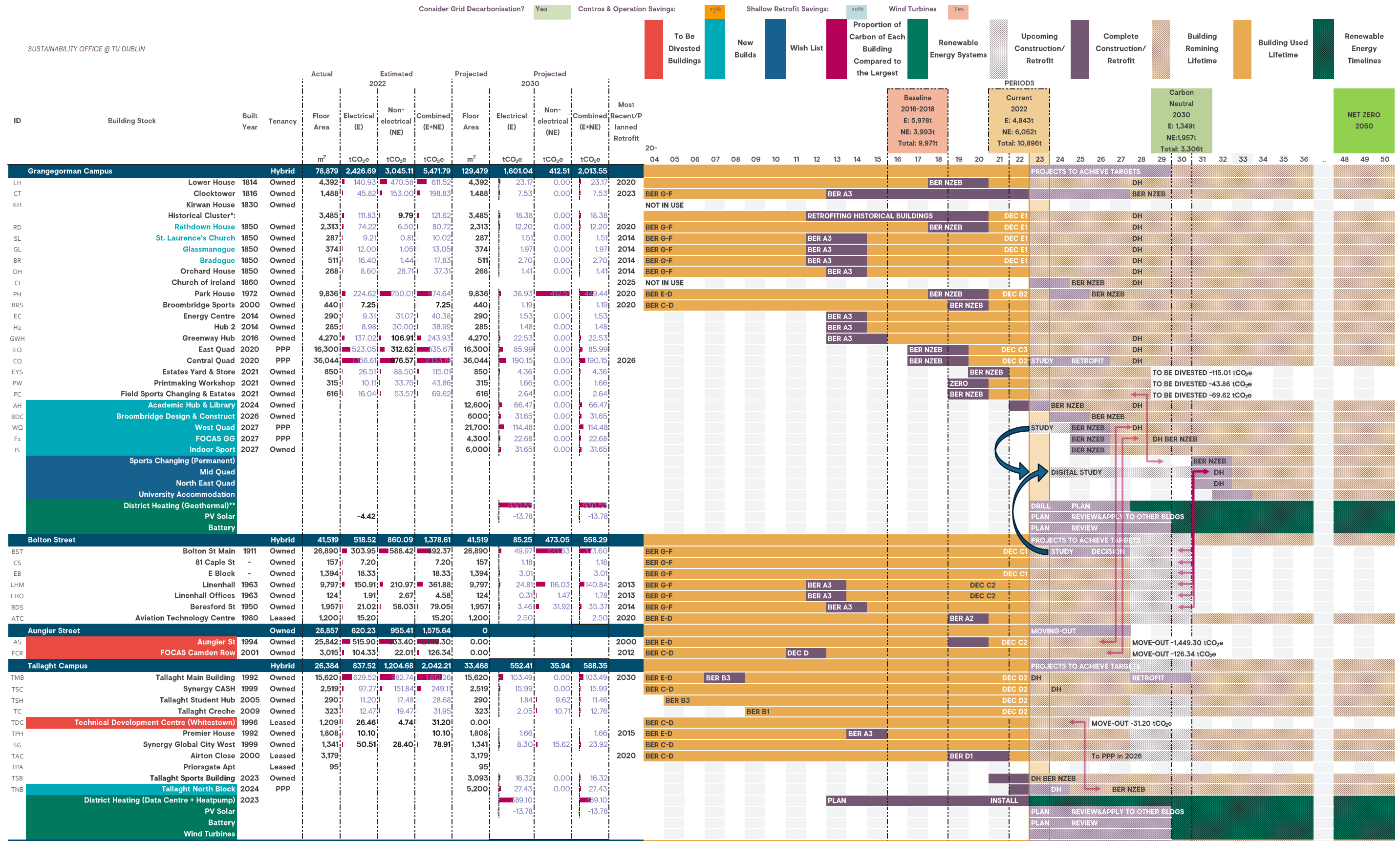
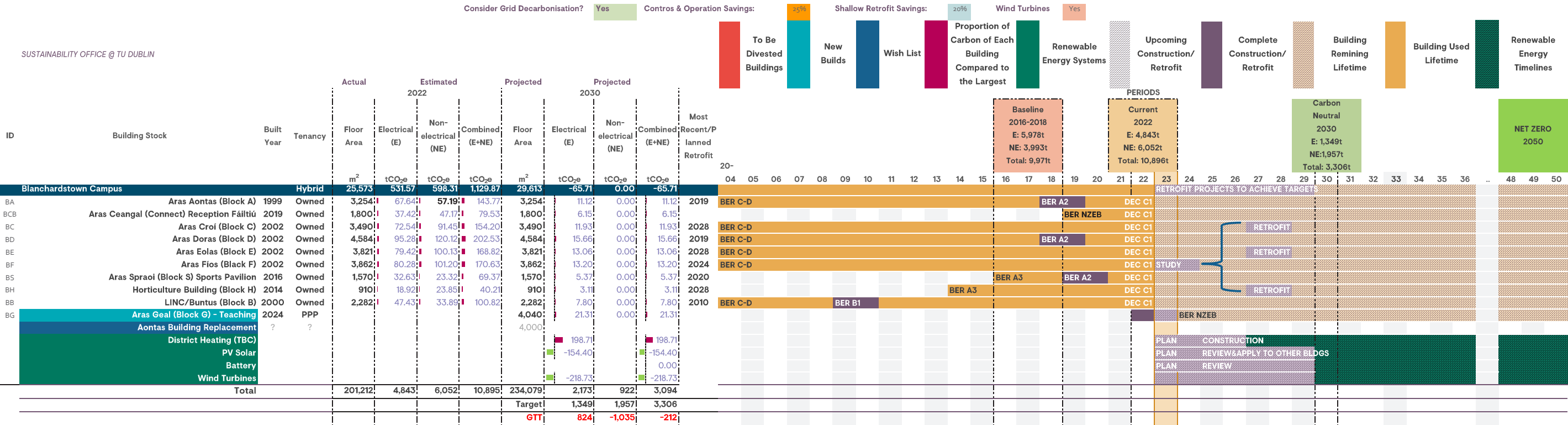


Figure 8: Decarbonisation Roadmap as of September 2023 - continued overleaf

# DECARBONISATION ROADMAP SCOPE 1 & 2



\* The Historical Cluster comprises 18th-century buildings, including Rathdown House, St. Lawrence's Church, Glassmanogue, and Bradogue. These structures are located close to one another and currently share a combined energy measurement system.

\*\* From September 2023 to September 2024, the borehole drilling will be conducted. In September 2024, a decision will be made regarding the choice between deep or shallow geothermal systems. (Assuming in place in 2028)

Abbr.: DH - DISTRICT HEATING; PF - PATH FINDER; LCCR - LIFE CYCLE CARBON REVIEW

The M&R platform provides MPRN and GPRN readings for 2022. From these readings, we estimate the energy consumption for each building based on its square meterage. The top energy users, based on these estimations, are displayed in figures for the Top 10 Electrical and Non-electrical Energy Users, respectively.

Figure 8 (continued): Decarbonisation Roadmap as of September 2023

The Decarbonisation Roadmap Scope 1 & 2 illustrated in figure 8 above, created by TU Dublin Sustainability Team, is a graphic tool used to represent relevant data and activities to reach our decarbonization targets. It assigns estimated and projected energy use differentiated by type against energy users and producers for all of our campuses and locations. It reflects the total quantitative impact of strategic activities such as addition of new buildings, decanting of existing buildings and activation of renewable energy systems and their impact on our operational performance through scope 1 and 2 emissions. It brings together multi campus activity in a way that increases overall understanding of inter-related programmes of work for enhanced decision making.



## 3.2 ACHIEVING THE ENERGY EFFICIENCY TARGET (50% IMPROVEMENT BY 2030)

### 3.2.a ENERGY EFFICIENCY BASELINE

Baseline figures for measuring TU Dublin’s energy efficiency improvements constitute an average usage between 2006–2008. During this period, the three original institutions of Dublin Institute of Technology (DIT), Institute of Technology Blanchardstown, and Institute of Technology Tallaght reported as separate entities. In 2021, the first joint reporting through the SEAI M&R tool was conducted, where all campus locations were reported under one organisational footprint.

The top 10 attributable consumers of energy reported during that baseline period are charted in Figures 9 and 10 for electricity and non-electrical energy consumption. With regards to electricity, top significant users include the five buildings on the Tallaght campus reported as one user, DIT Aungier Street, DIT Kevin Street, the entirety of the Blanchardstown campus buildings as one user, DIT Bolton Street main building and DIT Cathal Brugha Street.

With regards to non-electrical energy consumption, significant users at the baseline period include DIT main building Kevin Street, the five buildings on the Tallaght campus reported as one user, six buildings on the Blanchardstown campus reported as one user, DIT Bolton Street main building and DIT Aungier Street.

Of the top five significant energy users from the baseline period, Kevin Street and Cathal Brugha Street have been divested and accommodated in new buildings on the Grangegorman campus. The remaining three significant energy users are the five buildings on the Tallaght campus, the nine buildings on the Blanchardstown campus and the main building at Bolton Street. The top user of electrical energy during the baseline years used on average more than 2,350,000 kWh/year with the top five users combined using approximately 11,800,000 kWh/year. The top user of non-electrical energy used on average just under 3,200,000 kWh/year with the top five users

combined using approximately 15,800,000 kWh/year. Total energy consumption of the top five energy users during that period was approximately 27,600,000 kWh/year.

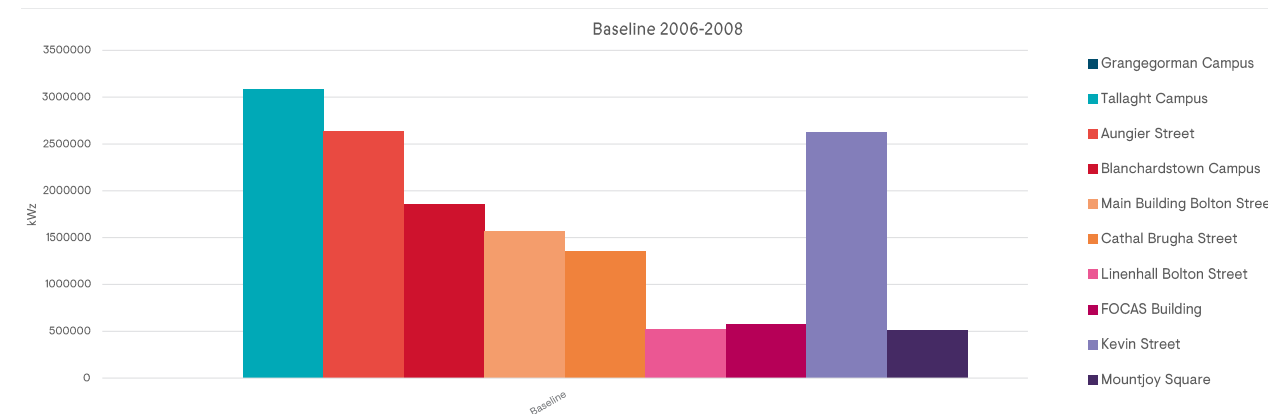


Figure 9: Top 10 MPRNs - Attributable consumption (kWh) baseline (2006-2008) as per SEAI M&R

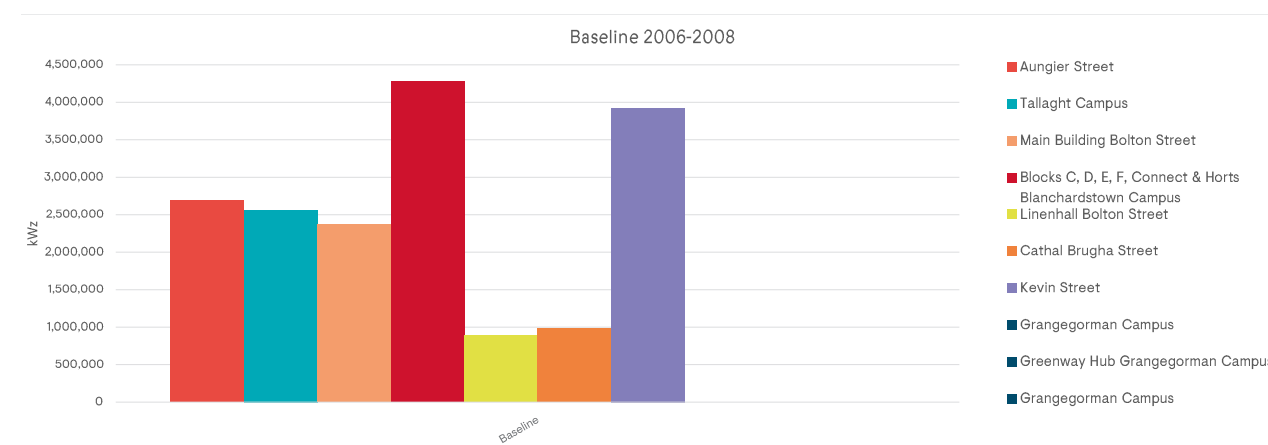


Figure 10: Top 10 GPRNs- Attributable consumption (kWh) baseline (2006-2008) as per SEAI M&R

### 3.2.b ENERGY EFFICIENCY IN TARGET YEAR IF NO NEW PROJECTS IMPLEMENTED

The SEAI M&R reporting tool indicates that the average annual Total Final Consumption (TFC) over the energy efficiency baseline period was 36,983,394 kWh/year and the Energy Performance Indicator (EnPI)<sup>2</sup> was 2,633.84. This means that the maximum EnPI which TU Dublin must achieve in 2030 is 1,316.92. The actual annual TFC recorded in 2022 was 44,299,367 kWh and the EnPI was 2,317.08.

### 3.2.c PLANNED ENERGY EFFICIENCY ACTIVITIES

Actions to achieve increased energy efficiency will include, and not be limited to, the following activities:

- Track and update the Register Energy Efficiency Opportunities.
- Track and update the Building Stock Register (as defined by Energy Performance of Buildings Directive (EPBD)) by the end of 2023.
- Develop TU Dublin Building Stock Retrofit programme (and associated targets) to be completed by the end of 2023.
- Achieving a national standard Nearly Zero Energy Buildings (NZEB) targets for buildings built, retrofitted, or leased from 2025 and a national standard Zero Energy buildings by 2030, by scheduling a minimum of 3% of existing buildings stock per annum to undergo energy improvements, subject to funding being made available.
- Subject to funding and resourcing, commence a deep retrofit of at least one building in 2023 in pursuit of the 2030 51% target.
- Achieve Display Energy Certificate (DEC) A rating or better for 60% of our building stock by 2030.
- Optimise the use of our existing campus infrastructure assets to achieve optimal utilisation of buildings in line with our academic mission.
- Recertify ISO 50001 certification by 2023.

#### Existing Buildings

- Undertake data gathering and consider the long-term (to 2050) retrofit key performance indicators to upgrade all building stock to Nearly Zero Energy Buildings (NZEB) or Zero Energy Buildings (ZEB) as outlined in the recast EPBD and Energy Efficiency Directive.

### 3.2.d ANALYSIS OF SIGNIFICANT ENERGY USERS

#### TU Dublin Building Stock

TU Dublin's building stock currently includes 204,305 m<sup>2</sup> in 47 buildings across five campus locations. Most of these buildings are owned by TU Dublin, with a small number of leased buildings. In addition, there are live medium and long term plans to build eight new buildings and to divest of three older buildings. This will potentially bring the entirety of the building stock to 51 buildings by 2030.

TU Dublin Campus	Site (m <sup>2</sup> )	Gross Internal Area (m <sup>2</sup> )				No. of Buildings					
		Existing		New Planned		Current Owned	Current PPP/Leased	NEW Planned Owned		To be Discontinued	Total
		As of 2023	By 2030	By 2030	By 2030			By 2030	By 2030		
TU Dublin Grangegorman	266,100	78,879	50,600		129,479	17	2	3	2		24
TU Dublin Tallaght	191,300	29,477	5,200	-1,209	33,468	7	3		1	-1	10
TU Dublin Blanchardstown	230,900	25,573	4,040		29,613	9			1		10
TU Dublin Bolton Street	22,662	41,519			41,519	6	1				7
TU Dublin Aungier Street	14,300	28,857		-28,857	0	2				-2	0
<b>Sub Total</b>	<b>725,262</b>	<b>204,305</b>	<b>59,840</b>	<b>-30,066</b>	<b>234,079</b>	<b>41</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>-3</b>	<b>51</b>

Table 2: TU Dublin campuses building stock inventory

TU Dublin's current buildings register includes 47 extant buildings. The M&R reporting tool tracks data for specific buildings: two in Aungier Street, nine on the Tallaght campus, nine on the Blanchardstown campus, and five across Bolton Street and Linenhall, covering both electricity and non-electricity energy sources. Grangegorman has multiple buildings that report to a single electricity meter, with others grouped under shared gas meters. This grouping makes it challenging to disaggregate data and identify major energy consumers on a per-building basis.

The M&R platform provides MPRN and GPRN readings for 2022, from which we estimate the energy consumption for each building based on its square meterage. The top energy users based on these estimations are displayed in Figures 9 and 10 for MPRN and GPRN respectively. In terms of electricity, the Central Quad building report over 3,500,000 kWh/year as the top electricity user with the Tallaght Main Building as the second highest user with just over 1,900,000 kWh/year. The East Quad building and the Aungier Street building are the next two significant electricity users at approximately 1,600,000 kWh/year each. The Bolton Street building uses approximately 930,000 kWh/year.

<sup>2</sup>Tracking Performance Using EnPI | M&R | SEAI is calculated based on the Total Primary Energy Requirement (TPER). The Activity Metric we selected is the 'Student Number', following best practices for TU Dublin as a university



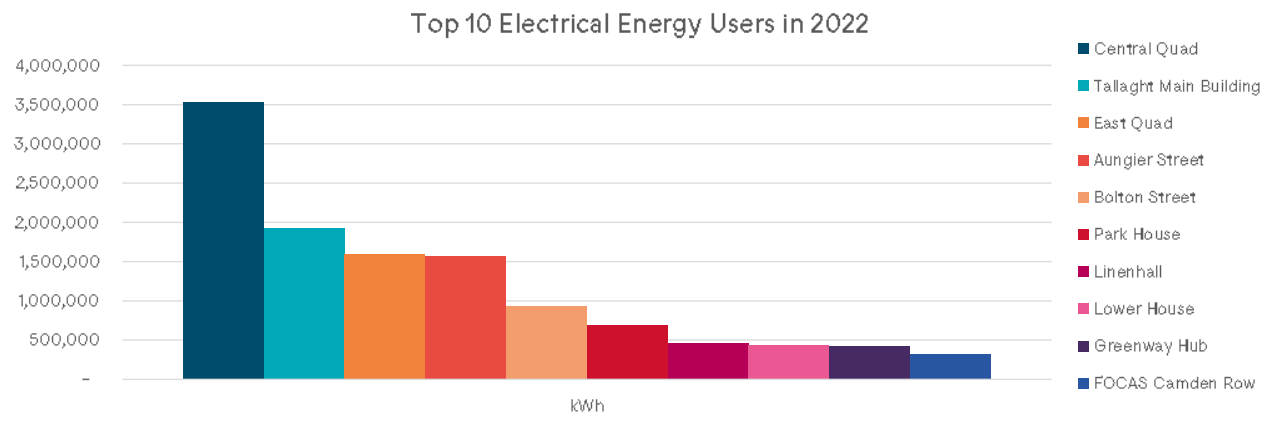


Figure 11: Top 10 Electrical Energy Users - Attributable consumption (kWh) in 2022 as per SEAI M&R (2023)

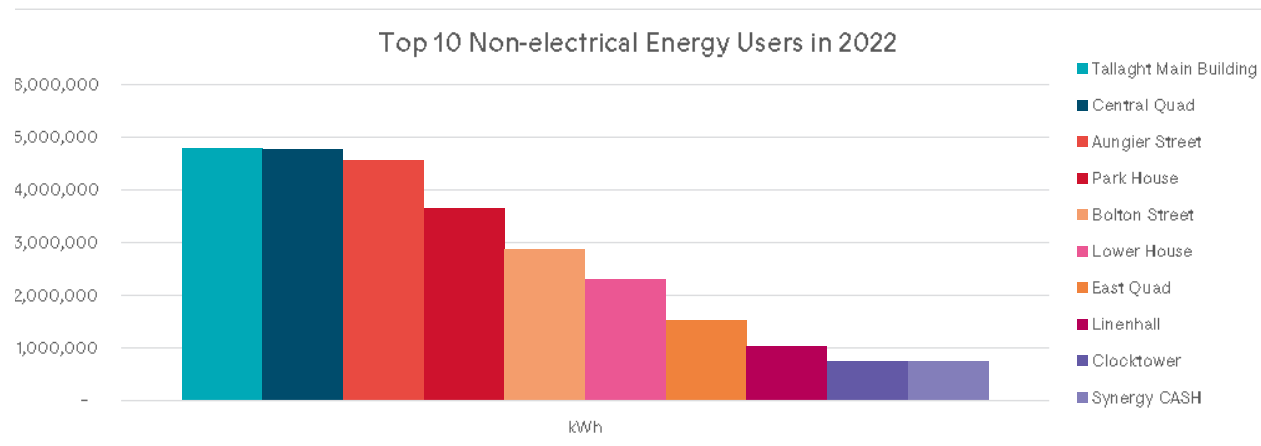


Figure 12: Top 10 Non-electrical Energy Users - Attributable consumption (kWh) in 2022 as per SEAI M&R (2023)

The Tallaght Main Building and the Central Quad building constitute the largest significant energy users of non-electrical energy using almost 4,800,000 kWh/year. The Aungier Street building is the next significant non-electricity user with over 4,500,000 kWh/year. The Park House building and Bolton Street building are the next two largest users with approximately 3,600,000 kWh/year and 2,900,000 kWh/year respectively.

### 3.2.e GAP TO TARGET TO BE ADDRESSED

Based on the 2006-2008 benchmark year, TU Dublin is required to improve its energy efficiency, which is monitored by the EnPI, by 50% by the year 2030. In line with the 2020 targets TU Dublin has already reduced TPER by 33% on the benchmark year resulting in a gap to target of 17%. TU Dublin will continue to target a 2.4% TPE reduction per year to achieve our Energy Efficiency Target.

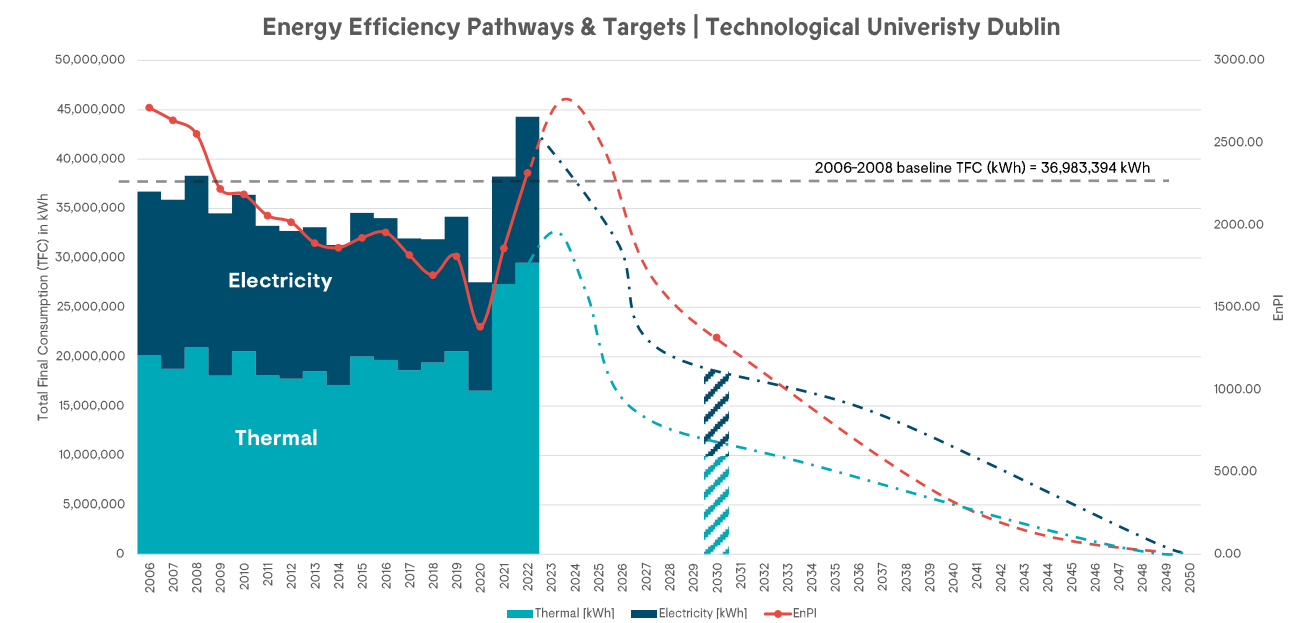


Figure 13: TU Dublin energy efficiency pathways and targets as per SEAI M&R (2021)

### 3.2.f PROPOSED ACTIONS TO ACHIEVE ENERGY EFFICIENCY TARGET

#### Using Less Energy

TU Dublin will continue to promote demand reduction wherever possible through participation in the following activities:

- The Optimizing Power @ Work initiative,
- The [Reduce Your Use campaign](#),
- The [TU Dublin is Switching Off campaign](#),
- The [My Green Lab](#) certification procedures,
- Reviewing building opening hours,
- Assessing and reviewing Information Communication Technologies (ICT) loads concerning auto-energy savings systems,
- Enhancing overall energy management systems at building level.

In addition, demand response technologies will be investigated to incorporate measures across building stock. My Green Labs certification is being sought for 28 lab spaces in TU Dublin. The Chemistry Lab suite on the Tallaght campus in the School of Chemistry and Biopharmaceutical Sciences has achieved Platinum level certification and eight other lab suites are midway through the certification process across the Faculty of Sciences and Health, and Research and Innovation. TU Dublin is a member of the Irish Green Labs network which is a member of Sustainable [European Laboratories Network](#). TU Dublin is also member of the SEAI Public Sector Labs Working Group with an aim of optimising energy management in public sector laboratories.

	Campus	School/Research Hub	Lab Name	Location	Date	Overall Score*	AWARD	
Faculty of Sciences & Health	1	Tallaght	School of Chemical & BioPharmaceutical Sciences	Chemistry Lab Suite	111, 113/115, 119/121, 129	Jun-21 Dec-22	51 74	 Platinum
	2	Tallaght	School of Chemical & BioPharmaceutical Sciences	Biological Sciences Lab Suite	131, 149, 151	Mar-23 TBD	55	 In Progress
	3	GG	School of Chemical & BioPharmaceutical Sciences	Chemistry Lab Suite	CQ-415, CQ-416, CQ-418, CQ-420, CQ-422, CQ-423, CQ-424, CQ-426	Mar-23 TBD	80	 In Progress
	4	GG	School of Biological, Health and Sports Sciences	Biological Sciences Lab Suite	CQ-217, CQ-218	Mar-23 TBD	59	 In Progress
	5	GG	School of Physics, Clinical & Optometric Sciences	Junior Lab Suite	CQ-117, CQ-118, CQ-120	Mar-23 TBD	44	 In Progress
	6	GG	School of Food Science and Environmental Health	Biology Lab Suite	CQ-226, CQ-333, CQ-335	Mar-23 TBD	39	 In Progress
	7	GG	School of Food Science and Environmental Health	Chemistry Lab Suite	CQ-113, CQ-114, CQ-115	Mar-23 TBD	52	 In Progress
Research & Innovation	1	GG	Environmental Sustainability and Health Institute (ESHI)	Core Lab Area	ESH1	Mar-23 TBD	52	 In Progress
	2	Aungier Street	Facility for Optical Characterisation and Spectroscopy (FOCAS)	Core Lab Area	FOCAS	Mar-23 TBD	38	 In Progress

Table 3: My Green Lab progress reporting for TU Dublin May 2023

#### Optimising our Assets

A review of blended working policies will ensure that full advantage from a climate action perspective can be taken to support remote/hybrid working. The review will provide information on changes in our space requirements and through optimisation may facilitate further reduce energy use. Working models will be reviewed within an assessment of TU Dublin’s building programme to ensure space optimisation is achieved. Where practical, zoned heating and lighting will be incorporated to align servicing of buildings to utilisation.

The University has undertaken an initial space occupancy analysis across all campuses and is currently finalising a strategy to undertake improving our data driven analysis through the use of new technologies for on an ongoing monitoring towards optimisation. This work is to determine how spaces are used with a view to optimising the usage of the current estate and targeting areas for improvement. The University will continue to endeavour to achieve good space utilisation and rigorously interrogate the need for additional spaces.

#### Deep Energy Retrofit Pilot for 2023

TU Dublin has submitted for funding in 2023 through the SEAI Energy Efficiency and Decarbonisation Pathfinder programme to commence a deep retrofit project. The Áras Fíos building comprises 3862 m<sup>2</sup> over three levels with a roof top plant room and was one of four buildings constructed in 2002 on the Blanchardstown campus. A thermal imaging survey was completed in January 2021 at the Blanchardstown campus on the 2001 and 2002 buildings, which identified several areas of heat loss. The project proposal is to review, in depth, areas identified in the thermal survey and rectify the heat loss through deep energy retrofit measures including, entrance areas, doors, windows and the roof. This review will include, but is not limited to, optimal operation energy efficiency utilising passive architectural solutions, optimal life cycle energy and environmental impacts from materials, optimal thermal, daylight and air quality and advanced circularity utilising MMC and modularised solutions. By taking a more indepth look at heat loss and other energy performance gaps in the pathfinder building, a programme of measures for implementation can be created to replicate at scale across other buildings within the TU Dublin building stock to decarbonise through deep retrofit measures.



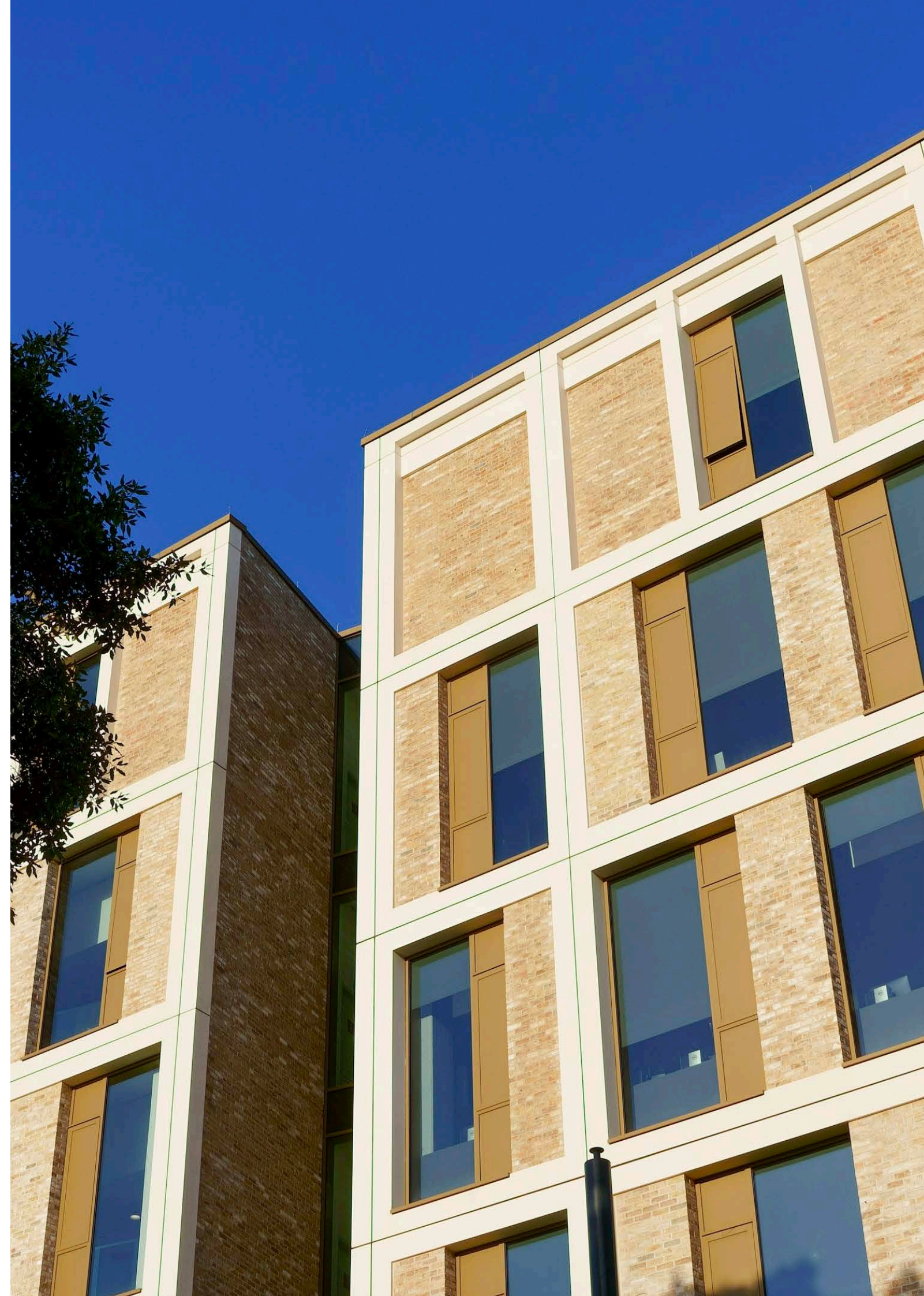
## Energy Efficient Buildings

The retrofitting of existing buildings to sufficient standards to reach our energy efficiency improvement targets will require significant financing. With 47 buildings and more than 204,000 m<sup>2</sup> of accommodation space to be upgraded at a nominal cost of €2500/m<sup>2</sup> to retrofit to BER B2 would exceed €480 million and may not provide sufficient energy reductions to meet our absolute emissions targets. To more accurately quantify the scope of works and costs, utilising the DEC advisory reports as a start, we will undertake feasibility assessments of all existing buildings to determine retrofit requirements and energy source considerations to ensure our climate action targets can be attained. TU Dublin will develop a high-level prioritised retrofit plan for buildings on all campuses as a priority action of the Energy Management Team established through the ISO 50001 process.

## Design for Efficiency

Embedding energy efficient design practice and expertise at the earliest stages of all new projects as they develop will ensure that lifecycle costs, energy efficiency and carbon reductions are considered at the outset, recognising the goal of absolute reduction across the University boundary. In this way, we will ensure maximum value for money and the greatest carbon savings as a whole life consideration across buildings, building systems, services, and materials.

We will introduce systems to include the environmental costs of carbon using the [Public Spending Code](#) guidance on measuring and valuing changes in GHG emissions in economic appraisals to feed into the business plans for proposed projects.





## 4 | OUR WAY OF WORKING

### 4.1 SUSTAINABILITY ACTIVITIES REPORT

TU Dublin endeavours to offer a range of sustainability activities suitable for all members of the TU Dublin community to participate in and engage with through which we highlight our commitment to 100% renewable energy. The scale, format, and location of our activities depend on the activity purpose and target audience. Sustainability activities operate as both long-term planned and ad-hoc events, including;

- Series of annual University sustainability events.
- Celebrating relevant UN international days.
- Hosting sustainability events led by community partners.
- Supporting students and staff in the development of new sustainability activities.
- TU Dublin provides a neutral platform and safe space for different political stakeholders to come together to frankly discuss challenges.
- Initiate and participate in cross-sectoral dialogue about the SDGs.

In conjunction with training and education activities planned as per section 2.2, a summary of Sustainability Roadmap Actions and Activities will be included in the [TU Dublin Annual Report](#).

### 4.2 EMISSIONS ASSOCIATED WITH AIR TRAVEL

TU Dublin is reviewing travel policies in compliance with circular 01/2020 procedures for offsetting the emissions associated with air travel. Following research and international benchmarking across University exemplars, TU Dublin's Travel & Subsistence Policy is underway to incorporate Circular 01/2020 through a revised policy which is envisaged to be in place by Q4 2023. In preparation for this, TU Dublin is reviewing current practices and requirements for travel with research staff. TU Dublin is engaging with our contracted travel suppliers to include green criteria as part of purchase information and to collect relevant data in relation to carbon emissions for reporting on progress.





### 4.3 ENERGY AND ENVIRONMENTAL MANAGEMENT SYSTEMS AND ACCREDITATION

TU Dublin will implement and achieve ISO 50001 certification by end of 2023.

### 4.4 GREEN PUBLIC PROCUREMENT

TU Dublin intends to implement Green Public Procurement (GPP) processes in new sourcing of goods, services and work to ensure a reduced environmental impact.

- Develop sustainable purchasing practices in our procurement policies and procedures supported by Environmental Protection Agency (EPA), GPP, and Office of Government Procurement (OGP) guidance.
- Develop/train staff and engage with suppliers to be knowledgeable about GPP.

We are reviewing our purchasing needs considering the changing nature of work, learning and teaching, and research, digital infrastructure, and resilience enhancement with a view to;

- Implement circular economy principles.
- Provide for the inclusion of measurable data for greenhouse gas (GHG) emissions savings in tenders and is then brought into contracts to provide figures for energy consumption, waste generated, circular economy and financial savings, with savings reviewed for ringfencing for recirculation into other sustainability projects and initiatives.

We are reviewing purchasing categories in detail, identifying ongoing contracts and critical timelines of contracts up for renewal. Where new contracts are considered they will;

- Include green criteria in our procurement processes in a manner that allows suppliers sufficient timelines and understanding to respond.
- Ensure implementation by establishing gateway signoff for business cases to procure goods and services with a minimum 10% award weighting for green award and selection criteria. Increase to 30% over time as appropriate by 2024.
- Include contract clauses requiring suppliers to monitor the environmental footprint of activities carried out by them to fulfil the contract, provide data verification, and record the improvement performance incrementally over the contract period.

- All new public sector procurement contracts for delivery and haulage should specify zero emissions vehicles where possible.

We are reviewing ongoing contracts, identifying the largest suppliers to measure emissions associated with TU Dublin purchasing and identify areas in which we can influence emissions reductions.

- We are reviewing existing contractual arrangements to ascertain how quickly green criteria can be incorporated into the provision of services and products. We are making the renewal or extension of the contract contingent on achieving TU Dublin climate action targets.

We aim to increase sustainable purchasing criteria and performance of suppliers using futureproof frameworks provided by OGP through GPP guidance.

- Apply lifecycle costing principles at pre-procurement, tender evaluation, and contract monitoring phases to mitigate key environmental impacts of purchased products and services.
- Implement innovation procurement for new green solutions to support green fuels innovative renewables processes, and circular economy initiatives.

### 4.5 RESOURCE USE

The Climate Action Mandate requires public bodies to review any paper-based processes and evaluate the possibilities for digitisation, so it becomes the default approach.

TU Dublin will review paper-based processes to understand the potential for maximizing digitisation.

TU Dublin will review purchasing requirements to reduce or eliminate single use disposables (including cups, plates, and cutlery) on campus to reduce or eliminate waste.



## 5 | OUR BUILDINGS AND VEHICLES

### Display Energy Certificates

TU Dublin will display up-to-date Display Energy Certificates (DECs) in each campus building 'frequently visited by the public' to clearly show energy use. Display Energy Certs have been carried out for 12 of the buildings that represent our significant energy users. These buildings account for 73% of the floor area of our buildings stock and include areas frequently accessed by the public. The remaining buildings are scheduled to be audited with completion due for Q1 2024.

### Fleet Conversion

TU Dublin currently owns and manages two diesel vans with 1.6L and 2.0L engine capacity. These vehicles are planned for replacement with zero emission vehicles in November 2023 through procurement process, meeting the minimum targets set out by SI381/2021 Clean Vehicles Directive. In April 2023, a diesel van was purchased for use in research. The van will be returned by the end of 2023.

### Procurement and Design Procedures

TU Dublin will update procurement policies and process and design specifications to comply with the requirement for no fossil fuel heating systems will be installed from 2023.

### Sustainable Transport & Mobility

TU Dublin will promote the use of bicycle and shared mobility options as an alternative to car use among employees and visitors by creating and maintaining facilities that support sustainable transport and mobility and promote active travel health benefits. TU Dublin will create secure, accessible bicycle parking which is simple for cyclists to recognise and increase use. TU Dublin will review all on-site car parking considering

public transport services to promote the use of sustainable transportation alternatives whilst ensuring accessible parking is maintained for those with physical mobility issues. TU Dublin is undertaking a parking review study across all campus and building locations, the report will advise on a parking policy which will regularise parking operations and activities on a University-wide basis.

### 5.1 UPDATES AND REPORTING

- This Climate Action Roadmap will be updated within three months of issuance of additional guidance from SEAI and EPA if necessary to reflect revised mandate requirements.
- The roadmap will be reviewed and updated annually, including summary progress against the plans set out in the previous year's roadmap, assess progress against meeting those requirements and include a statement on when they will be achieved or delivered.
- SEAI M&R system will be used to track progress towards energy efficiency and energy related carbon targets as well as the SI281/2021 Clean Vehicle Directive procurement targets.
- TU Dublin will report annually on progress on implementation of Green Public Procurement (GPP) using the template provided by the Environmental Protection Agency (EPA).
- Climate Action Roadmap targets and progress will feature in TU Dublin annual reports.





## 6 CONCLUSION

From the baseline analysis provided in section 3.1.a on TU Dublin carbon emissions reduction between 2018-2021, it indicated a total emissions reduction of 34%. However, the period leading up to the 2022 data highlighted an increase in emissions, attributed to infrastructural expansions and increased operational activities. TU Dublin continues to pursue renewable on-site and community networked energy solutions. However, we anticipate that even with the additional operational energy loads and embodied carbon produced from buildings planned and in construction, a programme of cross-campus deep retrofit, and the intensified use of existing buildings across our campuses, that a sustained rate of total emissions reductions over the coming years will be significantly challenging.

Our current carbon emission target, without additionality and assuming continued reductions in energy use and increases in energy efficiency, is currently projected at 3,306 tCO<sub>2</sub> from our 2016-2018 baseline of 9,971 tCO<sub>2</sub>. With the expectation that the electricity grid will decarbonise by 77% by 2030, TU Dublin's emissions reductions are estimated as 1,284 tCO<sub>2</sub>. To deliver on our climate action targets and ensure we have the resources to support the transition to carbon neutrality, significant investment is required. As set out earlier, the retrofitting of existing buildings to sufficient standards to reach our energy efficiency improvement targets will require significant financial investment, estimated at €480m, to achieve the National Climate Action Plan and TU Dublin targets by 2030 and 2040.

To more accurately quantify the scope of works and costs for all retrofit and new buildings updates will require feasibility assessments of both retrofit requirements and energy sources to ensure our climate action targets can be attained. TU Dublin will develop a high level prioritised retrofit plan for buildings on all campuses over the next

year as a priority action of the Energy Management Team established through the ISO 50001 process.

This financial investment in our building stock and sustainable energy solutions to achieve absolute reductions, rather than a separate exercise, must be accompanied by a continuing investment in our people, to nurture their sustainability mindsets and build upon their expertise to ensure we offer relevant education, research and innovation, and engagement necessary to support society at this critical time.





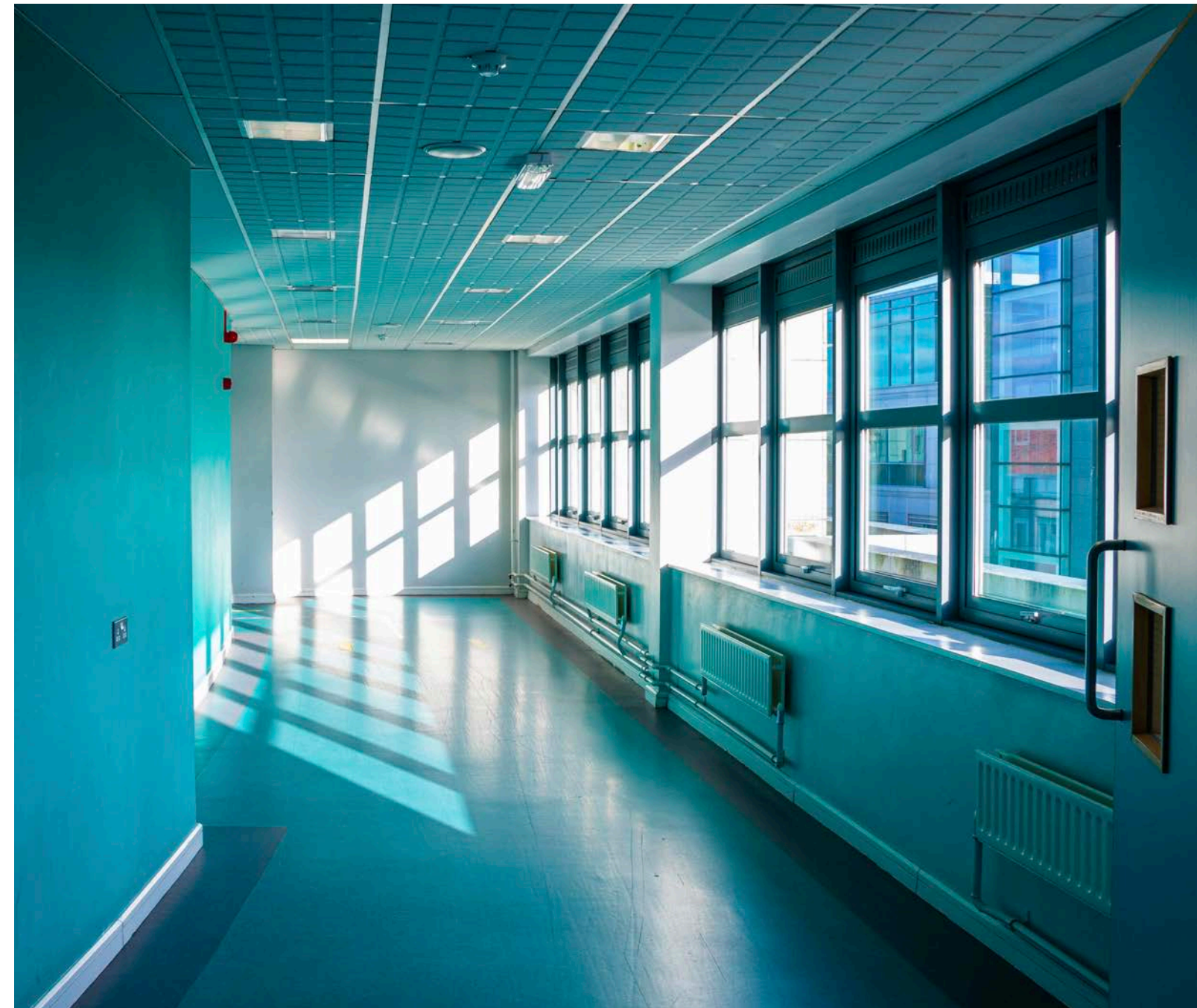
## 6.1 GAP TO TARGET FOR INVESTMENT AND ACTIONS

The detailed actions listed in this roadmap will be enabled through the following overarching gap to target supporting actions that TU Dublin intend to pursue.

- Advocate directly and through sectoral representative bodies for multi-annual budgeting for capital infrastructure requirements. This includes consolidated funding streams to deliver strategic decarbonisation impact across two-to-seven years minimum programme to ensure full life-cycle costing (€ invested/kWh/ CO<sub>2</sub> reduced) to create lasting societal value and mitigate further climate risk.
- Establish green budgeting internally to enable funding for and co-funded delivery on decarbonisation implementation programmes and timelines in line with our Climate Action Roadmap, and in anticipation of external funding opportunities. Allocation of budgeting to be informed by return-on-investment models with respect to climate action impacts on people and emissions reductions targets achieved and reported to the University Executive Team (UET).
- Develop and enhance information and reporting systems to support the measuring, monitoring of climate action plan gap-to-target performance to achieve of our targets.
- Work with the Department of Further and Higher Education, Research, Innovation and Science (DFHERIS) and other appropriate national government departments and agencies, and European Union (UN) bodies, to identify appropriate external funding vehicles to obtain private equity funding opportunities.

## 6.2 CONCLUDING REMARKS

TU Dublin's Climate Action Roadmap sets out a route towards meeting our obligations under the Public Sector Climate Action Mandate, but also more broadly our ambitions to develop responsible citizens, advance new knowledge, shape policy, and transform our campus infrastructure and operations into a living breathing beacon of sustainability. Our roadmap is an integrated driver for developing a sustainability strategy that is ambitious and holistic in the interest of public good. It calls on every person within TU Dublin – students, educators, researchers, professional services, alumni, industry, global network of partners, and our local communities to engage in climate action and to work collectively to limit global warming to ensure a safe future for our planet the next generations.





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**DUBLIN**

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BHAILE ÁTHA CLIATH

TECHNOLOGICAL  
UNIVERSITY DUBLIN