OLLSCOIL TEICNEOLAÍOCHTA
BHAILE ÁTHA CLIATH

TECHNOLOGICAL
UNIVERSITY DUBLIN

CLIMATE ACTION ROADMAP

OCTOBER 2025

FOREWORD

At Technological University Dublin (TU Dublin), we are shaping a future where people and communities can live, work, and thrive in balance with our planet. For us, sustainability is not simply a priority; it is a defining purpose that informs our core mission of educating students, driving research and innovation, and serving society.

Our fourth Climate Action Roadmap sets out how TU Dublin will directly contribute to Ireland's climate goals. In line with national and EU policy, we are working towards a 51% reduction in energy-related greenhouse gas emissions and a 50% improvement in energy efficiency by 2030; full decarbonisation of Scope 1 and 2 emissions by 2040; and climate neutrality, including Scope 3 emissions, by 2050.

What makes TU Dublin distinctive is how we do this. We embed sustainability across teaching, research, operations, and community engagement, guided by the UN Sustainable Development Goals and our pillars of People, Planet, and Partnership. Our model directly links education to the world of work: students learn in professionally simulated environments, undertake live projects and placements, and utilise real employer data. This ensures graduates leave ready to drive Ireland's workforce, address climate challenges, and support the transition to a green economy.

Our impact extends beyond our campus. By working in partnership with government, industry, and communities, TU Dublin generates applied research and practical solutions that help Ireland mitigate and adapt to the climate crisis. These partnerships also keep our programmes responsive to workforce needs, ensuring alignment between national skills strategies and the evolving demands of an economy that will be increasingly challenged by the climate crisis.

We recognise that progress requires both innovation, agility and investment. Despite the challenging financial landscape in higher education and the constraints of our current operating environment, TU Dublin remains committed to planning strategically, collaborating widely, and driving forward new solutions. With the right support, we are ready to accelerate progress at the speed the climate emergency demands.

The challenge is immense, but by harnessing the creativity of our people, the expertise of our partners, and the ambition of our students, TU Dublin is demonstrating the role higher education can play in delivering Ireland's transition to a sustainable, carbon-neutral future.

"Through our work, TU Dublin is delivering on the Public Sector Climate Action Mandate while also advancing TU Dublin's broader sustainability goals, empowering our people to become informed, responsible citizens ready to support a carbon-neutral future."

Dr Deirdre Lillis

Uachtarán, Ollscoil Teicneolaíochta Bhaile Átha Cliath
President, Technological University Dublin

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EuropeanUnion and national policy provide the framework for our climate action, but the urgency to act has never been greater. Ireland has made important progress in reducing emissions, yet much more is required—particularly within higher education and other public-sector institutions. To close the emissions gap and remain within our Carbon Budgets, we must accelerate action, strengthen governance, and ensure accountability.

Universities have a unique role to play as anchor institutions within their communities. By building transparent processes and strong partnerships, we can mobilise collective action, foster resilience, and bridge gaps where policy alone cannot deliver. At TU Dublin, we are responding to this need with a renewed emphasis on societal engagement and collaboration to drive meaningful and urgent climate action.

This call is echoed in Ireland's Climate Action Plan 2025, which highlights the scale of change required in this decisive decade. Transformational and, in many cases, unprecedented shifts in systems and behaviours are needed. Strong leadership will be vital—not only to set direction but also to secure the investment required for technological universities to harness their campuses, develop innovative technologies, and scale solutions through research and knowledge sharing.

TU Dublin is committed to achieving full decarbonisation of our Scope 1 and 2 energy-related emissions by 2040. Through targeted engagement, training, and investment, we will deliver rapid reductions within our operational boundaries. TU Dublin is currently undergoing a Section 64 review process under the HEA Act 2022 under which TU Dublin was requested to prepare a Recovery Plan to address concerns raised by the HEA in relation to managing and controlling the financial deficit in TU Dublin. We recognise that some constraints remain, including those linked to the Section 64 review processes. Nevertheless, TU Dublin will continue to plan proactively, analyse evidence, and prepare to act decisively when resources allow.

At the same time, we will harness the expertise and creativity of our students, academics, researchers, and professional staff to advance policy, foster responsible behaviours, and shape a sustainable campus environment. In doing so, we aim to significantly reduce our indirect Scope 3 emissions and achieve climate neutrality by 2050.

"In response, TU Dublin is taking bold and urgent climate action, committing to full decarbonisation across our operations, empowering societal resilience through an inclusive and transformative education model, advancing open research and innovation, and strengthening citizen agency at every level to drive meaningful, lasting change."

Jennifer Boyer

Vice President for Sustainability

CONTENT

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 INTRODUCTION

1.1 TU DUBLIN INTENT

This fourth iteration of TU Dublin’s Climate Action Roadmap, informed by the requirements of the Public Sector Climate Action Mandate, demonstrates our pathway and intent as a large public sector body to protect our planet. It focuses on energy management and reducing greenhouse gas (GHG) emissions. In this roadmap, TU Dublin continues to prioritise reducing total energy-related emissions and fossil fuel emissions from our operations, in line with the targets in the national Climate Action Plan.

Under the National Climate Action Plan 2025, the Public Sector Climate Action Mandate sets out the targets for public bodies as:

- Reduce energy related GHG emissions by 51% in 2030.
- Improve energy efficiency in the public sector by 50% by 2030.
- Update Climate Action Roadmaps annually within six months of the publication of the Climate Action Plan.

Alongside transforming our campus environment and operations to reduce carbon emissions reductions, TU Dublin recognises its vital role in delivering Quality Education (UN SDG 4). Our learners, educators, researchers, and partners share our ambition to be responsible global citizens, committed to taking action on climate change in their daily lives. Our learners, educators, researchers, and partners share our ambition to be responsible global citizens, committed to taking action on climate change in their daily lives.

1.2 TU DUBLIN CLIMATE ACTION ROADMAP PROGRESS SUMMARY

1.2.1 EXECUTIVE SUMMARY

Technological University Dublin (TU Dublin) is committed to becoming one of the world's most sustainable universities. With the recent achievement of (AASHE) STARS ® Gold accreditation, this fourth iteration of TU Dublin's Climate Action Roadmap (2025) continues to advance TU Dublin's strategic response to the climate crisis, aligning with national and international mandates, including Ireland's Climate Action Plan 2025 and the UN Sustainable Development Goals (SDGs). This roadmap outlines the progress made since the third iteration in June 2024 and sets a clear trajectory for achieving full decarbonisation of scope 1 and 2 emissions by 2040 and achieve climate neutrality, including Scope 3, by 2050.

In response to the National Climate Action Plan 2025 TU Dublin aims to deliver on the mandated 2030 target to 'Reduce greenhouse gas (GHG) emissions by 51%' and 'Improve energy efficiency by 50%'.

These targets are underpinned by a robust governance structure, led by TU Dublin's Vice President for Sustainability and supported by the University Executive Team, the University Sustainability Council, the Green Team and a network of student and staff led programmes and initiatives.

Decarbonisation Roadmap

This update includes a detailed and revised Decarbonisation Roadmap, an analytical tool developed by TU Dublin to better understand our energy and carbon use. It collects more granular data on operational usage and allows us to model future energy and carbon scenarios. By testing project estimates, TU Dublin can identify and prioritise resources effectively. Through this modelling, we anticipate significant GHG emissions savings from low cost, high-impact measures, such as improving buildings controls, optimising operations and shallow retrofits.

Progress and Achievements

Since the first iteration of TU Dublin's Climate Action Roadmap (2023) TU Dublin has:

- Engaged an estimated 26,000+ people in sustainability activities.
- Secured an additional €7 million in external climate and sustainability funding.
- Delivered 388 sustainability events with 3,586 staff completing Sustainability Education training.
- Achieved ISO 50001 certification across all campuses.
- Connected two more buildings to the Renewable District Heating System in Tallaght.
- Earned 12 My Green Lab Certifications.
- Ranked 1st in Ireland for SDG 13 (Climate Action) and SDG 7 (Affordable and Clean Energy) in the Times Higher Education (THE) Impact Rankings.
- The First Association for the Advancement of Sustainability in Higher Education (AASHE) accredited Centre for Sustainability Across the Curriculum in Europe.
- Ranked 1st in Europe for sustainability in Higher Education (AASHE STARS® Gold rating).
- Platinum International University Sports Federation (FISU) Healthy Campus Certification.
- Maintains An Taisce Green Flag accreditation across all campuses.
- Achieved Silver in the NTA's Smarter Travel Mark across all campuses.

Decarbonisation and Energy Efficiency

TU Dublin's decarbonisation strategy includes:

- Transitioning to renewable district heating systems at Tallaght, Grangegorman, and Blanchardstown campuses.
- Implementing deep retrofit projects, including Áras Fíos in Blanchardstown.
- Expanding on-site renewable energy generation (e.g., solar PV).
- Enhancing energy data granularity through submetering and smart infrastructure.
- Despite a slight increase in energy-related emissions in 2024, TU Dublin continues to make progress through operational efficiencies, fuel switching, and space optimisation.

Sustainable Campus and Infrastructure

The roadmap outlines a cost of €550 million required for the complete infrastructure investment programme to achieve 2030 targets, which include investments supported by EU and national funding sources, including SEAI, HEA, LIFE, and Peace+ programmes. In 2023, the Tallaght district heating system delivered over 800 tCO_2e of savings, representing more than 40% of our total annual carbon reductions, and has contributed over 18% towards our statutory 51% emissions reduction target by 2030.

Carbon emissions figures for 2024 show an increase of 59 tCO_2e (1%) from our 2023 emissions with minor improvements made in control and operations optimisation. This minor increase in carbon emissions must be considered in the context of having made significant reductions in 2023 due to the connection to the district heating system in Tallaght. District heating projects are complex and require long lead in periods to develop but then deliver large savings immediately upon connection. Rather than a steady decline in carbon, we expect large steps in carbon reductions due to the nature of our energy transition strategy.

Our People and Programmes

TU Dublin is embedding sustainability across its curriculum, research, and operations. Key initiatives include:

- Climate Action Leadership Training for senior staff and Sustainability Education programmes for educators.
- Green-Campus, Healthy Campus, Living Lab and action research programmes.

Governance and Reporting

This Climate Action Roadmap is a live document, updated annually and aligned with SEAI and EPA guidance. TU Dublin reports progress through the SEAI Monitoring & Reporting (M&R) system and its Annual Report, ensuring transparency and accountability.

1.2.2 OVERVIEW OF DELIVERY

1.2.2.a OUR PEOPLE

Leadership and Governance

A University Accountability Model enables a transparent distribution of responsibilities to achieve mandated climate and sustainability targets. Led by the Vice President (VP) for Sustainability as the Climate & Sustainability Champion and accountable member of the University Executive Team (UET), TU Dublin is developing the University accountability model to ensure a whole of institution approach in the implementation of climate and sustainability targets. The model is consistent with the timelines set out in this Climate Action Roadmap and our broader Sustainability Strategy. It includes the establishment of annual programmes of work and the identification of resources to deliver targets. An 'Actions Scorecard' will structure and track the deliverables and timelines as set out in the Climate Action Roadmap to provide oversight against execution. It is expected that this will be included in the 2026 Climate Action Roadmap.

Engaging and Training Staff

Senior Management Climate Action Leadership Training - Since March 2024, TU Dublin initiated the rollout of a bespoke training programme for 262 out of all 289 senior staff at Principal Officer/ Senior Lecturer 3 level and above. This initiative provides the national and global context of climate action against the progress and opportunity for TU Dublin to lead by example. Further training was extended to all Assistant Principal Officers (APOs) and Senior Lecturer 2 levels in 2025 and further training for Senior Managers will continue in 2026.

Green Public Procurement Training – In March and April 2023, TU Dublin's Procurement team and members of the Sustainability 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 2025-2026.

EU Levels Commitments – In April 2023, TU Dublin signed its organisational commitment 'to taking initial actions to address the environmental impact of construction' under EU Levels. Training was undertaken between June and September 2023 by members of the Campus & Estates, Campus Planning, and Sustainability 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.

Living Labs and Research – Since 2024, training on the integration of the Living Lab methodology into research and innovation activity has been offered through TU Dublin's Researcher Development Programme. To date, 27 academics and researchers have attended. Training delivery will continue in 2025-2026 to develop our capability to engage wider society in processes of innovation to accelerate the climate transition.

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 colleagues to align research outputs to key policies including the National Development Plan, EU Missions, and the UN SDGs to demonstrate relevance and impact. This programme is run three times annually, with three cohorts per session. Since January 2023, 250 students have successfully completed Module 1 (Starting your Research), and 150 students have successfully completed Module 4 (Completing your Research).

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 200 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. This module is in addition to the Climate Action Leadership Training for Senior Managers which was delivered in 2024.

The UET have undertaken focused workshops on Climate Action, Energy, Double-Materiality Reporting, and Sustainability Leadership since January 2022. UET members have undertaken additional Climate Action Leadership Training in 2024.

Climate Fresk - Climate Fresk is a dynamic, science-based workshop that makes the complexities of climate change understandable, collaborative, and empowering. Over the course of three hours, participants work together to explore the causes and consequences of climate change, drawing directly from the latest IPCC reports. Over 400 students and staff have completed the workshop since 2023 and 19 staff are now trained as Climate Fresk Facilitators.

Stepping into the Doughnut - This interactive and engaging workshop explores planetary boundaries including climate emissions, and the Sustainable Development Goals. In 2024/25 this workshop was delivered to 655 people, including Kate Raworth, the co-founder of the Doughnut Economics Action Lab and the author of Doughnut Economics.

Embedding Climate Action and Sustainability in the curriculum - The Sustainability Team delivers a range of workshops developed to empower academic staff to incorporate sustainability and address climate action in their disciplines. In 2024, the Sustainability Education team delivered 48 workshops/presentations to 980 educators in TU Dublin. Since 2022, 82 sessions have been attended by 1529 staff.

Educating for Sustainability Staff CPD - TU Dublin's Sustainability Education Team has developed and delivered several accredited courses. The team has built a bank of teaching, learning and assessment resources through the development of the Educating for Sustainability Staff continuous professional development (CPD). This CPD programme is delivered annually in a hybrid format and has been completed by 110 TU Dublin academic staff.

Educating for Sustainability Digital Badge -
TU Dublin also delivers the National Forum's Education for Sustainability Digital Badge in collaboration with two other Universities. The Digital Badge is delivered in six weekly one-hour webinars and is supported through self-directed learning and peer engagement. It is delivered annually at TU Dublin and has been completed by 54 TU Dublin academic staff. Over 300 academic staff from Universities and the Further Education Sector have now completed the Digital Badge. Over 60 participants nationally are now training to become facilitators which will allow the badge to be rolled out on a national scale.

1.2.2.b OUR TARGETS

Achieving Carbon Emissions Reductions

This update to the Climate Action Roadmap reflects 2024 consumption figures from the Sustainable Energy Authority of Ireland (SEAI) M&R tool. M&R indicates that TU Dublin's energy related GHG emissions have increased nominally by 59 tCO_2e from 8,160 tCO_2e in 2023 to 8,219 tCO_2e in 2024. As noted in section 1.1 above, TU Dublin's statutory carbon reduction targets relate to electrical and thermal energy related carbon.

Therefore, these reductions in carbon emissions relate to emissions generated as a result of the fossil fuels the University burns directly in its buildings and vehicles (Scope 1) and from purchased electricity (scope 2) and excluding fugitive emissions. Indirect emissions (Scope 3) are not currently measured against statutory targets.

The estimated impact of New Build projects was reduced by 248 tCO_2e, with 72 tCO_2e reclassified under 'Reuse and Retrofit' to better reflect project categories. Deep Retrofit project impacts remained unchanged.

Carbon reductions were achieved through:

- Space Management (-245 tCO_2e) (previously Buildings and Space Rationalisation)
- Control Operations Optimisation (-295 tCO_2e) (previously Control and Operations)
- Renewable Thermal Energy Projects (-363 tCO_2e)

For the first time, weather adjustments in the SEAI M&R tool added 222 tCO_2e. Carbon associated with Medium Retrofit projects has risen by 177 tCO_2e. Medium retrofit projects have been carried out to the extent that funds are available to progress them, however, this does not keep pace with the scale of works required to make energy savings to reach targets required. Although this represents an increase in carbon emissions, this needs to be considered in the context of the significant savings in the previous year due to district heating connection. As noted above, we expect carbon savings to occur as large, stepped reductions rather than a steady decline due to our strategic approach to transitioning our energy systems.

In 2024, emissions reductions were driven by Tallaght Main Building's connection to the decarbonised district heating system and energy management improvements achieved through enhanced control operations. The rise in carbon impacts associated with medium retrofit projects is due to more granular data availability this year.

The expected impact of the Government of Ireland's 77% decarbonisation of the electricity grid has reduced by 840 tCO_2e as the electrical energy efficiency savings have a reverse impact on the percentage of carbon saved by this activity. The carbon baseline has risen from 10,063 to 10,086 tCO_2e. The baseline figure realignment is a result of the slice update to the carbon conversion factors provided by the SEAI M&R platform.

TU Dublin Decarbonisation Roadmap

The Decarbonisation Pathway scope 1 and 2 emissions in section 3.1h has been updated to include information on the Building Stock Register as reported to the SEAI M&R reporting tool in January 2024.

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.

1.2.2.c OUR WAY OF WORKING

Sustainability Activities Report

In 2024/2025, TU Dublin made significant progress in sustainability and climate action. Over 17,250 people were engaged in sustainability activities, with €7 million in external investment secured. The institution hosted 188 sustainability events and activities, with over 6,000 students receiving sustainability orientation.

Two new labs received My Green Lab Certification, bringing to 12 the number of labs certified across the University, and a grassroots project launched a new microgrid renewable energy system that connects solar and wind power directly to Tallaght Main Building electricity grid. Recognition included Silver in the NTA's Smarter Travel Mark, Platinum International University Sports Federation (FISU) Healthy Campus Certification. TU Dublin was shortlisted for five EAUC Green Gown Awards, receiving two Highly Commended awards, and ranked 1st in Ireland for SDG 7: Affordable and Clean Energy and SDG 13: Climate Action in the Times Higher Education (THE) Impact Rankings. TU Dublin also became the first AASHE Centre for Sustainability Across the Curriculum in Europe.

In May 2025 TU Dublin was awarded the highly prestigious Gold accreditation from the Association for the Advancement of Sustainability in Higher Education (AASHE) through its global Sustainability Tracking, Assessment and Rating System (STARS®). This award places TU Dublin as Europe's highest-ranked university and 17th globally in a field of nearly 600 participating institutions worldwide. Scoring 83.66 points in its first-ever STARS® submission, TU Dublin's accreditation marks a defining moment in the University's strategic journey, reinforcing its status as a national and international leader in sustainability performance, policy, and education.

Other achievements included 11 Student Learning with Communities + (SLWC+) projects, 11 Green-Campus Open Call projects, 11 Living Lab workshops, and 0.75 acres of community gardens engaged thousands within local communities.

Each academic year begins with a range of sustainability and climate action activities. During orientation, first-year students took part in 25 interactive workshops and completed a survey on their knowledge of the UN SDGs. These activities introduce students to TU Dublin's sustainability initiatives and encourage ongoing involvement.

The Sustainability Education team also led Climate Action Challenges across all five campuses, with over 400 students participating in activities focused on biodiversity, emissions reduction, and climate resilience. In terms of impact, the First Year Survey showed that 86% of students recalled the Sustainability presentation, 73% of students said the presentation was relevant to them, and 72% said they would recommend the presentation to a friend.

During the TU Dublin Sports & Societies Festival, held each September, students and staff are encouraged to join clubs, societies, volunteer groups, and committees many of which support sustainability. These include, but are not limited to, the Sustainability Society, SDG Literacy, STAND, the Environmental, Planning and Sustainability (EPS) Society, the Students' Union, Student Volunteering, LGBTQ+ Society, Healthy Campus, and Green-Campus.
Beyond campus-led activities, students and staff are also informed about opportunities to engage with national and international sustainability advocacy organisations such as the National Youth Council of Ireland, An Taisce, and UN Youth Delegate Programmes.
TU Dublin hosted a dynamic series of in-person events, conferences, and engagement activities to advance sustainability awareness and action across the university. TU Dublin has participated in several major initiatives, including EU Mobility Week (September), Climate Action Week (October), and Green Week (March).

In March 2025, TU Dublin celebrated its seventh annual Green Week. The programme brought together over 1,621 students, staff and community members with over 50 events and activities focused on promoting local and national environmental action.

TU Dublin continues to support and promote ongoing campaigns and events such as:

- Smarter Travel for Campuses: Walktober, Bike Week, and Marchathon.
- Health and wellbeing: Quit Smoking Month, Wellbeing Weeks, Equality, Diversity & Inclusion Week, and health and fitness challenges.
- Decarbonisation: #TUDublinisSwitchingOff, Planning Week, Biodiversity Week.

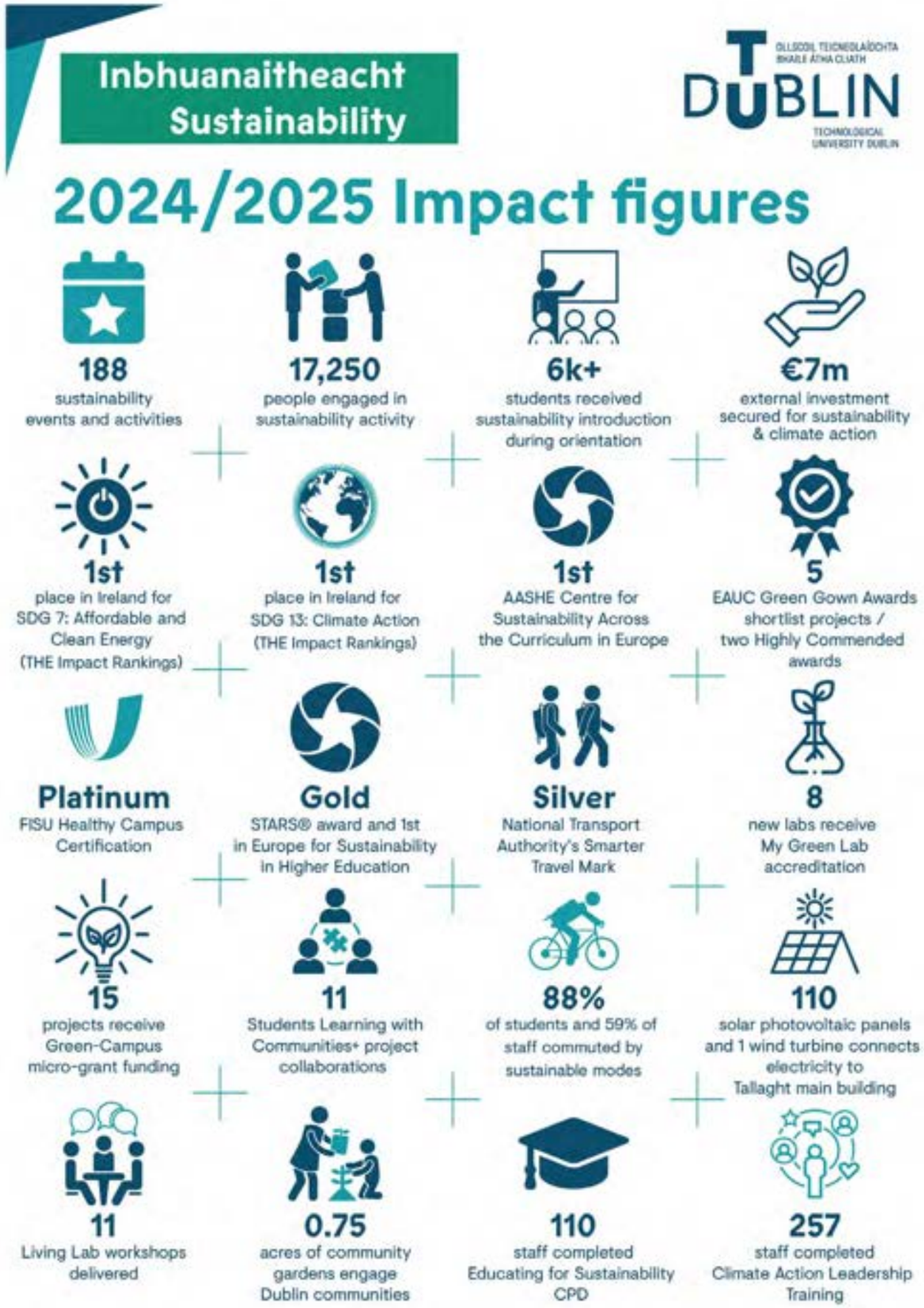


Figure 1: TU Dublin Sustainability Impact Figures 2024/2025

Emissions Associated with Air Travel

A review of the TU Dublin Travel and Subsistence Policy is underway to incorporate Circular 01/2020: Procedures for Offsetting the Emissions Associated with Official Air Travel. The revised policy is ongoing and envisaged to be in place in 2026. 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. A decision tree to assess travel against strategic outcomes, resource costs, and environmental impacts is in development.

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 completed by 2025. That process will continue to be developed to bring granularity to services, floor, and room level information. 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 University pilot project funded by the HEA in Smart Infrastructure will advance TU Dublin's building information reporting capability on energy, occupancy, and thermal comfort. This work aims to provide scalable building level solutions to expand across all TU Dublin owned buildings in subsequent years.

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

- Tallaght Main Building
- Central Quad
- Blanchardstown - Áras Fíos
- Bolton Street
- East Quad

These audits are due to be completed by the end of 2025 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

ISO reaccreditation was undertaken across each campus location whereby ISO 50001 certifications by campus have been awarded as of 09 April 2024.

My Green Labs accreditation

My Green Lab Certification is being sought across a variety of TU Dublin lab spaces and 12 certifications have been awarded to date. With levels awarded ranging from Silver to Green, eight My Green Lab Certifications have been achieved across the four Schools of the Faculty of Sciences & Health, incorporating 26 undergraduate laboratory spaces in total. Two have been awarded to Research Hubs (FOCAS and SHRH) and a further two certifications awarded to the Nanolab Research Centre and the Radiation and Environmental Science Centre. These awards recognise the achievements made in reducing the environmental impact of laboratory spaces and for successfully engaging with the My Green Lab Certification programme.

		Campus	School/research area	Lab	Score	Award
Faculty of Sciences & Health	1	Tallaght	School of Chemical & BioPharmaceutical Sciences	Chemistry Lab Suite	74	Platinum
	2	Tallaght	School of Chemical & BioPharmaceutical Sciences	Biological Sciences Lab Suite	74	Platinum
	3	Tallaght	School of Chemical & BioPharmaceutical Sciences	Apprenticeship Lab	90	Green
	4	Grangegorman	School of Chemical & BioPharmaceutical Sciences	Chemical Sciences	64	Gold
	5	Grangegorman	School of Biological, Health & Sports Sciences	Biological Sciences Lab Suite	68	Gold
	6	Grangegorman	School of Physics, Clinical & Optometric Sciences	Junior Lab Suite	58	Silver
	7	Grangegorman	School of Food Science & Environmental Health	Biology Lab Suite	79	Platinum
	8	Grangegorman	School of Food Science & Environmental Health	Chemistry Lab Suite	62	Gold
Research & Innovation	1	Grangegorman	Sustainability and Health Research Hub (SHRH)	Research Hub: Core Lab Area	53	Silver
	2	Aungier Street	Facility for Optical Characterisation & Spectroscopy (FOCAS)	Research Hub: Core Lab Area	79	Platinum
	3	Aungier Street	Nanolab Research Centre	Research Centre	92	Green
	4	Aungier Street	Radiation & Environmental Centre (RESC)	Research Centre	96	Green

Table 1: TU Dublin labs certified by Green Lab

1.2.2.d OUR BUILDINGS AND VEHICLES

Promote the use of bicycles and shared mobility options – TU Dublin is progressing two new bicycle and e-mobility hubs on the Blanchardstown campus, and at the Tallaght campus due for completion in 2025 with a third hub scheduled for installation on the Bolton Street campus in 2026. TU Dublin has 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 18 of the buildings that represent our significant energy users. These buildings account for 90% of the floor area of our buildings stock and include areas frequently accessed by the public. Current DECs will be updated in Q3, 2025.

Fossil Fuels after 2023 in heating systems - The new Sports Science, Health & Recreation building in Tallaght, which opened in September 2023, complies with the requirement for no fossil fuel heating systems. It is connected to the adjacent HeatWorks recovered heat supply. Three buildings on Blanchardstown campus, Áras Aontas, Áras Croí and LINC have been fitted with gas replacement boilers as they were failing, and replacements were required for operational continuity. These works did not constitute 'major refurbishment' as defined in the regulations. Broader building stock plans are being developed for all existing buildings together with Energy Strategies per campus which propose decarbonised district heating systems at each.

Existing Buildings – TU Dublin has received funding for two pilot projects through the HEA/SEAI Energy Efficiency and Decarbonisation Pathfinder Programme funding stream which supports two proposed projects to progress to design phase, these include the Áras Fíos Deep Retrofit Project and the Geothermal District Heating Project for buildings on the Grangegorman campus. TU Dublin is actively working with its SEAI Partnership Support Manager to develop its decarbonisation roadmap and renovation targets.

Procurement and Fleet Transition - SI381/2021 Clean Vehicles Directive - TU Dublin's two diesel powered vehicles owned at the time of the last report have been replaced with electric vehicles. In 2023, a diesel van was purchased for use in research. This van has since been returned and the MARL laboratory has now purchased an electric van.

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_2 / CO_2e	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
$kgCO_2e/m^2$	Kilograms of carbon dioxide equivalent per square meter
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_2	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_2 / tCO_2e	Tonnes of carbon dioxide / Tonnes of carbon dioxide equivalent
TF-IDF	Term Frequency - Inverse Document Frequency
$TgCO_2$	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

ACRONYMS

WEEE	Waste Electrical and Electronic Equipment
WTE	Whole-Time Equivalent
ZEB	Zero Energy Buildings

BUILDING IDS

Aungier Street	
AU	Aungier Street
FS	FOCAS
Blanchardstown campus	
BA	Aras Aontas (Block A)
BK	Aras Ceangal (Connect) Reception Fáiltiú
BC	Aras Croí (Block C)
BD	Aras Doras (Block D)
BE	Aras Eolas (Block E)
BF	Aras Fíos (Black F)
BS	Aras Spraoi (Block S) Sports Pavilion
BH	Horticulture Building (Block H)
BB	LINC Buntus (Block B)
BG	Aras Geal (Block G)
Bolton Street	
CP	81 Capel Street
EB	E Block
LN	Linenhall
BT	Beresford Street
AV	Aviation Technology Centre
Grangegorman campus	
LH	Lower House
CT	Clocktower
KH	Kirwan House
RD	Rathdown House
SL	St Laurence's Church
GL	Glassmanogue
BR	Bradogue
OH	Orchard House
PH	Park House
BM	Broombridge Sports Changing
EC	Energy Centre 1
HB	Hub 2
GW	Greenway Hub
EQ	East Quad
CQ	Central Quad
EY	Estates Yard & Store
PW	Printmaking Workshop
FC	Field Sports Changing & Estates 1
BW	Design & Construct (Broombridge
GB	The Golden Bandstand
AH	Academic Hub
WQ	West Quad
UA	University Accommodation Phase 1 Gg
Tallaght campus	
TM	Tallaght Main
TS	Synergy CASH
TU	Tallaght Student Hub
TC	Tallaght Creche
TT	Technical Development Centre (Whitestown)
TP	Premier House
TG	Synergy Global
TA	Airton Close
TH	Tallaght Sports, Science & Health
TN	Tallaght North House

VERSION CONTROL

VERSION NUMBER	VERSION DESCRIPTION / CHANGES MADE	AUTHOR	DATE
CAR V1	*Climate Action Roadmap March 2023*	*Sustainability Team*	*30/03/2023*
CAR V2	*Climate Action Roadmap Sept 2023*	*Sustainability Team*	*30/09/2023*
	2.1b Clarification on EPO role	*Sustainability Team*	*30/09/2023*
	3.1 Total estimated carbon emissions moved from 52,112 tCO_2e in 2021 to 38,216 tCO_2e in 2022. *Updated area of new and leased building stock.*	*Sustainability Team*	*30/09/2023*
	3.1a Table 1 emissions figures updated	*Sustainability Team*	*30/09/2023*
	3.1b total energy related emissions updated from 7340 to 10,895 tCO_2e	*Sustainability Team*	*30/09/2023*
	3.1f Year on year emissions reductions increased to 576 tCO_2e / yr	*Sustainability Team*	*30/09/2023*
	3.1e Analysis of Significant emitters has been broken down to building level using a methodology of allocating campus level energy readings to buildings per building area.	*Sustainability Team*	*30/09/2023*
	3.1.f Increase in emssions in 2022 noted	*Sustainability Team*	*30/09/2023*
	3.1g Blanchardstown District Heating network proposal added.	*Sustainability Team*	*30/09/2023*
	3.2d Building stock updates including areas and numbers of buildings	*Sustainability Team*	*30/09/2023*
	3.2d Analysis of significant energy users has been broken down to building level using a methodology of allocating campus level energy readings to buildings per building area.	*Sustainability Team*	*30/09/2023*
	3.2e Gap to target updated with 2022 figures added.	*Sustainability Team*	*30/09/2023*
	3.2f Demand reduction campaign names added. Progress on space occupation analysis has been added.		*30/09/2023*
	3.2f My Green Labs certification and progress have been updated.	*Sustainability Team*	*30/09/2023*

VERSION NUMBER	VERSION DESCRIPTION / CHANGES MADE	AUTHOR	DATE
	5.0 Progress on Display Energy Certs has been added for 12 of TU Dublin buildings stock representing 73% of floor area of total building stock. Remaining due to be complete for Q1 2024.	*Sustainability Team*	*30/09/2023*
	5.0 Date for replacement of Diesel vans updated to November 2023	*Sustainability Team*	*30/09/2023*
	5.0 Parking review study across all campuses and building locations added.	*Sustainability Team*	*30/09/2023*
	6.0 Increased emissions in 2022 are noted in conclusion	*Sustainability Team*	*30/09/2023*
	6.0 Clarification on emissions figures updated.	*Sustainability Team*	*30/09/2023*
	Version Control added	*Sustainability Team*	*30/09/2023*
CARv3	*Climate Action Roadmap June 2024*	*Sustainability Team*	*28/06/2024*
	Foreword from Interim President	*Sustainability Team*	*28/06/2024*
	Executive summary updated	*Sustainability Team*	*28/06/2024*
	Carbon Emissions Reductions figures for 2023 reported	*Sustainability Team*	*28/06/2024*
	Sustainability Activities Report updated	*Sustainability Team*	*28/06/2024*
	ISO50001 Accreditation awarded	*Sustainability Team*	*28/06/2024*
	My Green Labs accreditation progress reported	*Sustainability Team*	*28/06/2024*
	Decarbonisation Roadmap Scope 1&2 updated	*Sustainability Team*	*28/06/2024*
	Progress on e-Mobility Hubs reported	*Sustainability Team*	*28/06/2024*
	Fossil Fuels after 2023 in heating systems updated	*Sustainability Team*	*28/06/2024*
	Existing Buildings upgrades Pathfinder Programme Funding updated	*Sustainability Team*	*28/06/2024*
	Procurement and Fleet Transition updates	*Sustainability Team*	*28/06/2024*
	University Sustainability Council updates	*Sustainability Team*	*28/06/2024*

VERSION CONTROL

VERSION NUMBER	VERSION DESCRIPTION / CHANGES MADE	AUTHOR	DATE
CAR V3	*Engaging and training staff updates*	*Sustainability Team*	*28/06/2024*
	Energy related carbon emissions baseline changes reported	*Sustainability Team*	*28/06/2024*
	Total emissions and thermal emissions updated	*Sustainability Team*	*28/06/2024*
	Building Register and Building Stock Plan submission reported	*Sustainability Team*	*28/06/2024*
	Analysis of significant emitters updated	*Sustainability Team*	*28/06/2024*
	Gap to Target updated	*Sustainability Team*	*28/06/2024*
	Geothermal Project Pathfinder Funding Reported	*Sustainability Team*	*28/06/2024*
	Decarbonisation Roadmap activities over time updated	*Sustainability Team*	*28/06/2024*
	Decarbonisation Roadmap Scope 1 &2 updates as listed:	*Sustainability Team*	*28/06/2024*
	Building ID updated – 21 buildings: BRS-BM; H2-HB; GWH-GW; EYS-EY; BST-BL; CS-CP; LHM-LN;BDS-BT; ATC-AV; AS-AU; FCR-FS; TMB-TM; TSC-TS; TSH-TU; TDC-TT; TPH-TP; SG-TG; TAC-TA; TPA-TZ; TSB-TH; BCB-BK.	*Sustainability Team*	*28/06/2024*
	Building name changed – 15 buildings: Broombridge Sports-Broombridge Sports Changing; Energy Centre-Energy Centre 1; Field Sports Changing & Estates-Field Sports Changing & Estates 1; Bolton St Main-Bolton Street Main; 81 Capel St-81 Capel Street; E-Block-E Block; Beresford St-Beresford Street; Aungier St-Aungier Street; FOCAS Camden Row-FOCAS; Tallaght Main Building-Tallaght Main; Synergy Global City West-Synergy Global; Tallaght Sports Building-Tallaght Sport, Science & Health; Tallaght North Block-Tallaght North; LINC/Buntus (Block B)-LINC Buntus (Block B); Aras Geal (Block G) – Teaching-Aras Geal (Block G).	*Sustainability Team*	*28/06/2024*
	Building floor area updated – 5 buildings: Kirwan House: 0-172; Linenhall: 9,797-9,921; FOCAS: 3,015-3,223; West Quad: 21,700-20,725; Indoor Sport: 6,500-8,145.	*Sustainability Team*	*28/06/2024*
	New building on the list: Broombridge Warehouse (6,200 sqm)	*Sustainability Team*	*28/06/2024*
	Old buildings removed from the list: Church of Ireland,	*Sustainability Team*	*28/06/2024*
	Linenhall Offices, Tallaght Creche	*Sustainability Team*	*28/06/2024*
	Buildings info updated: Aviation Technology Centre: Will be continued after 2030-To be divested 2025; Estates Yard & Store: To be divested 2029-Will be continued after 2030; Printmaking Workshop: To be divested 2029 - Will be continued after 2030.	*Sustainability Team*	*28/06/2024*
	Building level carbon emissions refined: since more granular details of building information became available		*28/06/2024*
	New buildings carbon emissions refined using new methodologies	*Sustainability Team*	*28/06/2024*
	Buildings ownership updated: University Accommodation Phase 1 GG: PPP-Owned.	*Sustainability Team*	*28/06/2024*
	Carbon Emissions Table 2022 Data: Based on SEAI GTT data of 20230516-Based on SEAI GTT data of 20231023.	*Sustainability Team*	*28/06/2024*
	Carbon Emissions Table 2023 Data: Based on TU Dublin Energy Consumption Platform (Energy Elephant).	*Sustainability Team*	*28/06/2024*
	Building Stock Inventory updated	*Sustainability Team*	*28/06/2024*
	Deep Energy Retrofit Pilot progress updated.	*Sustainability Team*	*28/06/2024*
	Section 15(1) Screening update	*Sustainability Team*	*28/06/2024*
	All graphs and figures are updated: from 2022 figures to 2023 figures.	*Sustainability Team*	*28/06/2024*
	Food waste commitments added	*Sustainability Team*	*28/06/2024*
	Water conservation measures commitments added	*Sustainability Team*	*28/06/2024*
	Other materials commitments added	*Sustainability Team*	*28/06/2024*
	Fleet conversion updates added	*Sustainability Team*	*28/06/2024*
	Conclusion updated	*Sustainability Team*	*28/06/2024*

VERSION CONTROL

VERSION NUMBER	VERSION DESCRIPTION / CHANGES MADE	AUTHOR	DATE
CARv4	*Climate Action Roadmap October 2024*	*Sustainability Team*	*08/07/2025*
	Energy related carbon emissions baseline changes reported	*Sustainability Team*	*08/07/2025*
	Total emissions and thermal emissions updated	*Sustainability Team*	*08/07/2025*
	Building Register and Building Stock Plan submission reported	*Sustainability Team*	*08/07/2025*
	Analysis of significant emitters updated	*Sustainability Team*	*08/07/2025*
	Gap to Target updated	*Sustainability Team*	*08/07/2025*
	Decarbonisation Roadmap activities over time updated	*Sustainability Team*	*08/07/2025*
	Decarbonisation Roadmap Scope 1 &2 updates as listed:	*Sustainability Team*	*08/07/2025*
	Change of building name from "Broombridge Warehouse" to "Design & Construct (Broombridge Warehouse)". Move of "Design & Construct" from the new builds list to a conversion project.	*Sustainability Team*	*08/07/2025*
	Add of buildings "The Golden Bandstand (GB)", "Camden Row Workshops & Stores" & "Youthreach CDETB" as NOT IN USE.	*Sustainability Team*	*08/07/2025*
	Move of "Research Hub 2", "Indoor Sports" from buildings before 2030 to after 2030.	*Sustainability Team*	*08/07/2025*
	Remove of buildings from decanting list "Aviation Technology Centre"	*Sustainability Team*	*08/07/2025*
	Add of buildings to decanting list "81 Capel Street", "E Block", "Tallaght Student Hub", "Premier House"	*Sustainability Team*	*08/07/2025*
	Remove of "Linenhall Offices" as reported with "Linenhall".	*Sustainability Team*	*08/07/2025*
	Remove of "Priorsgate Apt" from building list.	*Sustainability Team*	*08/07/2025*
	Instead of showing PV Solar carbon savings as a project saving for the entire campus, it is now attributed to each building as their own saving/generation of electricity in 2030.	*Sustainability Team*	*08/07/2025*

VERSION NUMBER	VERSION DESCRIPTION / CHANGES MADE	AUTHOR	DATE
	Actual floor area changes: "Camden Row Workshops & Stores" – 980 m²; "Youthreach CDETB" – 1,287 m²; "Synergy CASH" – 2,520 m²; "Tallaght North" – 5,182 m²; "Aras Geal (Block G)" – 4,080 m².	*Sustainability Team*	*08/07/2025*
	Baseline carbon emission change from 10,064 to 10,086 due to the slice update to the carbon conversion factors provided by the SEAI M&R platform.	*SUSTAINABILITY TEAM*	*08/07/2025*
	2023 Electricity & Thermal figures were updated according to SEAI M&R to replace our estimation based on Energy Elephant Platform (the variation was mainly due to the carbon conversion factors SEAI used for the calculation is released much later than when we did our estimation in the last CAR).	*Sustainability Team*	*08/07/2025*

OUR TARGETS

2

Under the National Climate Action Plan 2025, the Public Sector Climate Action Mandate sets out the targets for public bodies as:

- Reduce greenhouse gas (GHG) emissions by 51% in 2030.
- Improve energy efficiency in the public sector by 50% by 2030.
- Update Climate Action Roadmaps annually within six months of the publication of the Climate Action Plan.

For the purposes of the Mandate, greenhouse gas emissions are taken to be energy-related carbon dioxide-equivalent (CO_2e) emissions. The baseline for TU Dublin is the average of 2016-2018 emissions.
The total target for TU Dublin is derived as follows:

- 51% reduction of direct fossil fuel related CO_2e emissions (thermal and transport consumption); plus
- projected supply side reductions in indirect fossil fuel related CO_2e emissions from electricity.

This Climate Action Roadmap is designed to ensure that TU Dublin meets both the 51% reduction in direct fossil fuel related emissions (thermal and transport) target and the overall total emissions reduction target.

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

For TU Dublin to accurately report its GHGs 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 distribution of needs of the local catchment areas,

TU Dublin groups its activities under the Tallaght campus, Blanchardstown campus, and Grangegorman, Bolton Street, and Aungier Street campus locations. All campuses are within a 10 km radius, comprising 47 buildings (~210,000 m²) on 185 acres. For the purposes of calculations within this report, in the 2024/25 academic year TU Dublin had 27,486* students and 3,438 staff members on campus and approximately 450 community, enterprise, industry, academic and research partners.

**This figure does not include overseas students.*

The estimated carbon emissions associated with TU Dublin in 2023 were just over 48,500 tCO_2e, which is about 2,700 more than as shown in table 1 from our Climate Action Roadmap publication in June 2024.

Primary reasons for discrepancies are:
1. Emissions conversion factors: Last year, we used EE data to calculate scope 1 (thermal) and scope 2 (electricity) emissions. At that time, the conversion factors applied differed from SEAI's latest figures. This year, we switched to SEAI M&R data, which has resulted in the observed differences.

2. Procurement data accuracy: When preparing last year's roadmap, we used estimated figures while financial statements were being finalised. With statements now published, our procurement data for 2022 and 2023 is more precise. Similarly, on a provisional basis 2023 figures have been used for 2024, while the 2024 financial statement is being finalised.

3. Business travel figures: Business travel data for 2023 was unavailable at the time of last year's calculations, so 2022's figures have been used. These are now accessible in the M&R 'Business Travel' section and have been updated accordingly. In this fourth iteration of the Climate Action Roadmap, we report our total estimated carbon emissions associated with TU Dublin in 2024 is now 52,966 tCO_2e, an increase of more than 4,380 tCO_2e. A combination of increased travel since 2022 post COVID and our improving ability to extract relevant business travel data from our financial reporting systems may account for this increase. At this report, while scope 1 and 2 emissions have increased by just 59 tCO_2e, we note in section 1.2b. ii OUR TARGETS that estimated scope 3 emissions have increased by over 4,300 tCO_2e in 2024.

TU Dublin has direct operational control over all its campus buildings, except for two newly constructed buildings at Grangegorman (totaling 52,344 m²) and nine leased properties. TU Dublin's East Quad and Central Quad were built on brownfield sites at Grangegorman. The two Grangegorman buildings were delivered through a 25-year Public Private Partnership (PPP) arrangement, under which the State retains ownership and operational responsibility. Additionally, there are eight leased buildings across other locations, covering a total area of 8,561 m².

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 is reviewed and updated annually.

2.1.1.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- not including fugitive emissions) began in 2018 when the three original institutions of Dublin Institute of Technology (DIT), Institute of Technology Blanchardstown (ITB), and Institute of Technology Tallaght (ITT) 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. Table 2 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 and 2 emissions) of 10,088 tCO_2 and scope 3 emissions of 42,139 tCO_2 bring TU Dublin's total emissions baseline to 52,227 tCO_2. 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 TU Dublin in 2019. It should also be noted that these figures exclude fugitive emissions which are not counted towards statutory carbon emissions targets.

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_2 emissions.

When we estimate scope 3 emissions as part of the TU Dublin carbon footprint, we find that 15.6% of TU Dublin's total emissions are attributable to energy-related emissions in scope 1 and 2 emissions including fugitive emissions, with the remaining 84.4% emissions arising from combined scope 3 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 emissions.

Baseline - GHG Campus Environment & Operations inventory		Baseline Year 2018* (tCO_2e)	2022 (tCO_2e)	2023** (tCO_2e)	2024 (tCO_2e)	
Scope 1	Thermal	**4,069**	6,031	4,181	3,801	
	Owned Vehicles/Generator	**2**	2	2	2	***
	Fugitive Emissions	**N/A**	127	55	55	***
Sub Total		**4,071**	6,160	4,238	3,858	
Scope 2	Purchased Electricity	**6,017**	4,916	3,979	4,418	
Sub Total		**6,017**	4,916	3,979	4,418	
Sub Total Scope 1 & 2		**10,088**	**11,076**	**8,217**	**8,276**	
Scope 3	Student and Staff Commuting	**11,503**	10,810	10,175	13,967	
	Business Travel	**1,603**	410	657	1,186	****
	Waste	**9**	9	9	9	***
	Water	**22**	62	10	10	***
	Purchased Goods and Services	**29,002**	*25,958*	*29,518*	*29,518*	*****
Sub total		**42,139**	37,248	40,369	44,690	
Total Scope 1, 2 & 3		**52,227**	**48,324**	**48,586**	**52,966**	

Table 2: TU Dublin baseline emissions campus environment and operations since 2018

* The baseline figure realignment is a result of the slice update to the carbon conversion factors provided by the SEAI M&R platform.

** 2023 Electricity & Thermal figures were updated according to SEAI M&R to replace our estimation based on Energy Elephant Platform (the variation was mainly due to the carbon conversion factors SEAI used for the calculation is released much later than when we did our estimation in the last CAR).

*** Using previous year's figure due to lack of updated data.

**** Business travel data for 2023 were unavailable at the time of last year's calculations, so we used 2022's figures. They're now accessible in the M&R "Business Travel" section and have been updated accordingly.

***** The 2022 and 2023 procurement figures were updated following last Roadmap. On a provisional basis 2023 figures have been used here for 2024, while the 2024 financial statement is being finalised.

SEAI and government emission targets typically account for scope 1 and 2 emissions related to electricity and thermal energy only. For example, the 8,219 tCO_2e figure cited in this section reflects this limited scope. In contrast, Table 2 presents a broader scope 1 and 2 figure of 8,276 tCO_2e, which also includes emissions from vehicles, generators, and fugitive gases. Additionally, total institutional emissions, used in other parts of this report, include scope 3 sources such as commuting, procurement, and waste. These distinctions should be kept in mind when interpreting or comparing emission figures.

2.1.1.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 10,086 tCO_2. This means that the maximum emissions below which TU Dublin must operate in 2030 are 3,281 tCO_2. The actual total energy-related emissions recorded in 2024 were 8,219 tCO_2. This does not include emissions generated from new additional buildings. Refer to figure 5.

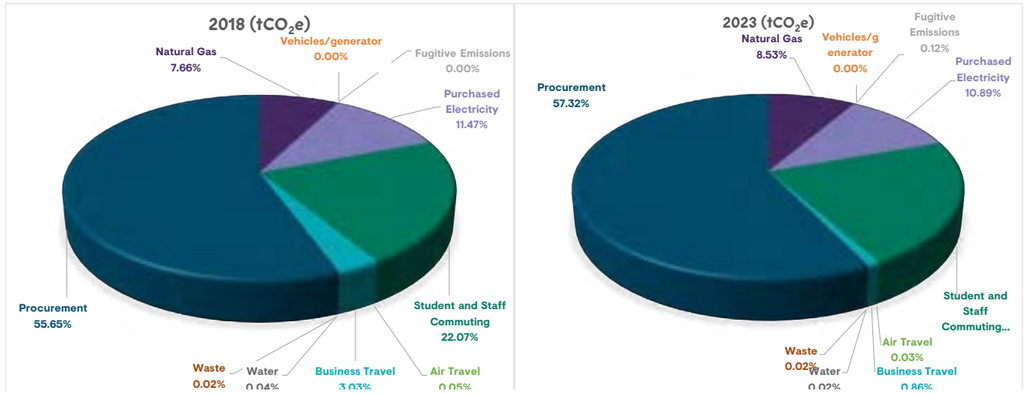


Figure 2: TU Dublin baseline emissions shown as a total across Scope 1, 2, and 3 activities for 2018 and 2024

2.1.1.c EXPECTED GROWTH IN EMISSIONS BASED ON PLANNED INCREASE/GROWTH IN SERVICES

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 to the nature of activities supported. There are three new building projects currently underway and two planned for future use to 2030. The Tallaght Sports Science & Health Building was launched in September 2023. Three projects have recently completed and in various stages of occupation at three campus locations – Áras Geal / Block G in Blanchardstown, the Academic Hub in Grangegorman and Tallaght North Building, in Tallaght.

A Buildings Register and a Building Stock Plan has been submitted to the SEAI M&R Platform. The buildings information and work programme detailed in this Climate Action Roadmap align with these documents. The Building Stock Plan will continue to be developed as per the reporting timelines outlined by the SEAI. One new building project, the West Quad, is planned for the Grangegorman campus and is due to commence in 2027. The new Research Hub 2 and the Indoor Sport buildings are estimated to be completed by 2030. The new West Quad building will facilitate the divestment of older, energy inefficient buildings on the Aungier Street building on Camden Street, which currently uses fossil fuel-based thermal heating systems. This new building will participate in the district heating system in Grangegorman which is planned to move to fully renewable thermal heating sources before 2030. The University has plans to repurpose and retrofit a large warehouse structure on the Broombridge site named the Broombridge Design & Construct building. This site will be home to the Design and Construct project (6,000 m²), which will upskill the construction sector in modern methods of construction and cater for Apprenticeship expansion. It is anticipated that the project will be completed by 2030. University residential accommodation (circa 60,000 m²) is provided for in the Grangegorman Masterplan, discussions to develop these residential sites are ongoing. TU Dublin has applied to enable the development of 17,700m² of University accommodation in Grangegorman by 2030 and is awaiting a response.

2.1.1.d GREENHOUSE GAS EMISSIONS REDUCTION ACTIVITIES

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

- Develop a Register of Decarbonisation Opportunities.
- 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.

2.1.1.e ANALYSIS OF SIGNIFICANT EMITTERS

In order of buildings with the highest level of emissions down to the least, our significant emitters are the Central Quad, Aungier Street, Tallaght Main Building, East Quad, Bolton Street Main Building, Park House, Linenhall, Greenway Hub, Áras Doras (Block D) and Lower House. These ten buildings emit 78.53% 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.

However, the period leading up to the 2024 data highlighted an increase in emissions, attributed to infrastructural expansions and increased operational activities. The strategies and interventions will be further elaborated in section 3.1.h. 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.

2.1.1.f ACCOUNTING FOR GROWTH AND PLANNED PROJECTS

The gap between the 2030 total GHG target of 3,281 tCO_2e and the 2030 non-electricity GHG target of 94 tCO_2e and electricity target is 1,287 tCO_2e. This figure is 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 2024, we estimate year-on-year emissions reductions of current building stock and additional emissions from new campus development to require an average reduction of 823 tCO_2e per year to 2030.

Between 2018 and 2024, avoided emissions calculated totalled 1,867 tCO_2e, which set out year on year reduction of 311 tCO_2e per year during that period.

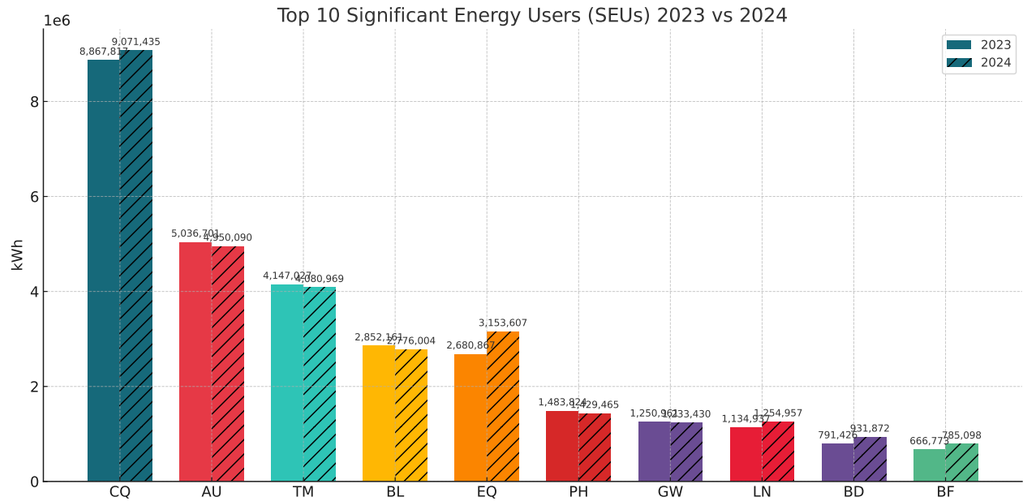


Figure 3: Combined Top 10 Significant Energy Users (SEUs) 2023 vs 2024.

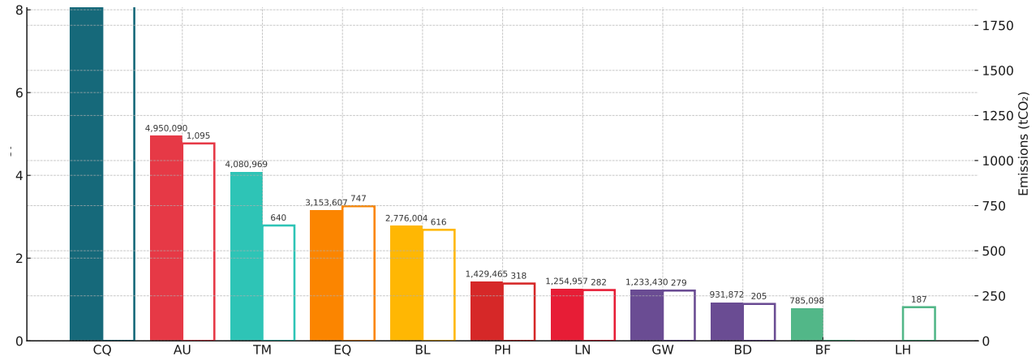


Figure 3a: Top 10 Energy Users vs Emitters - see Building IDs on page 30

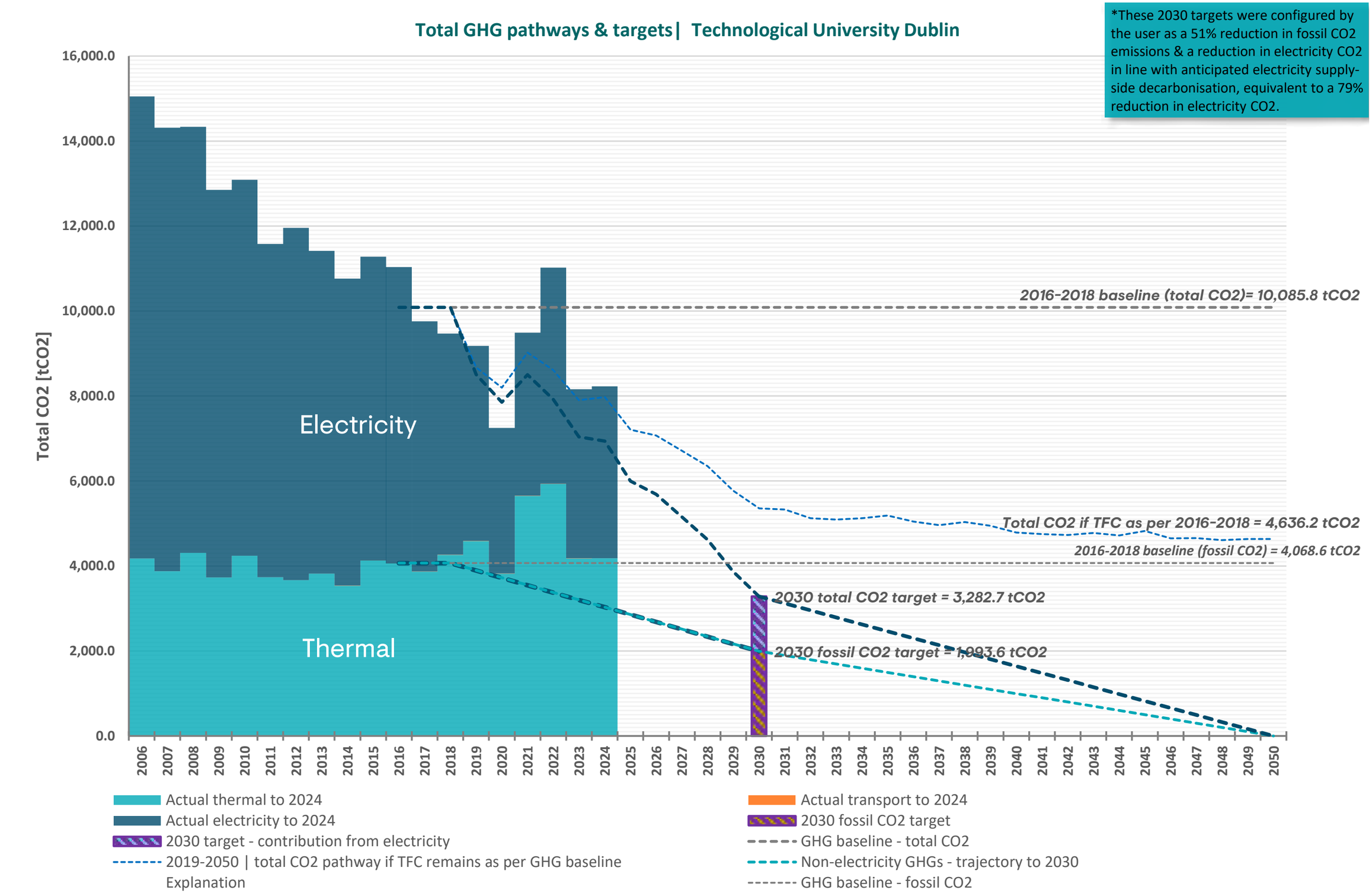


Figure 4: TU Dublin GHG pathways and targets as per SEAI M&R (2023)

2.1.1.g TU DUBLIN DECARBONISATION ROADMAP PATHWAY

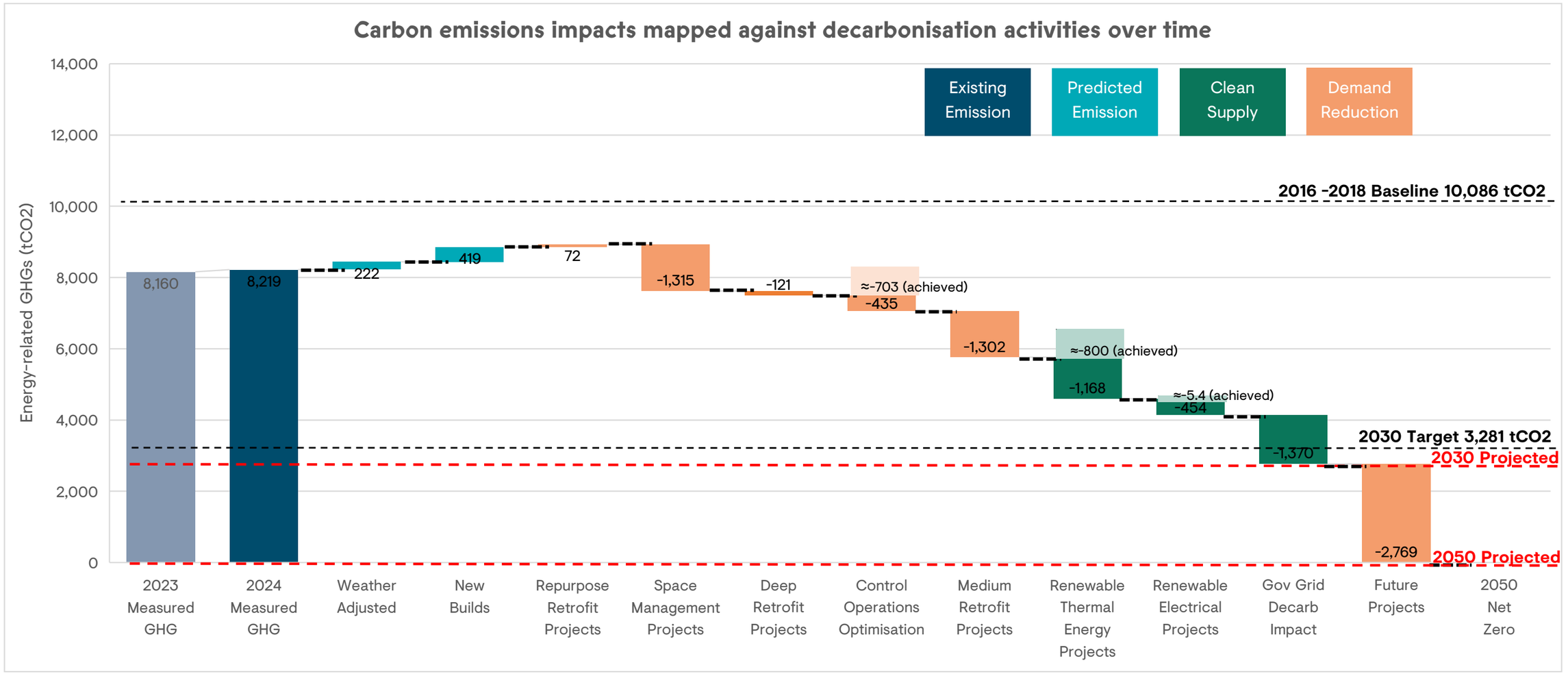


Figure 5: Carbon emissions impacts mapped against decarbonisation activities over time

TU Dublin's decarbonisation pathway strategy begins with a detailed understanding of our operational usage data. To support this, a submetering programme – currently underway and partially completed - is being implemented to provide more granular information, enabling the allocation of carbon usage at the individual building level. This programme will continue to evolve, aiming to bring data granularity down to the floor and room level.

In addition, Space Management Projects are being developed to contribute to overall carbon savings. These include the decanting of Aungier street into a new and more energy efficient building in West Quad to be completed by 2030 as well as the consolidation of some smaller buildings into existing premises. Through optimised controls and operational efficiencies, it is anticipated that carbon emissions can be reduced by at least 25% compared to usage figures at the start of the Climate Action Roadmap process in 2023. Further savings of approximately 20% are expected from a medium retrofit programme, as outlined in the Sustainable Energy Action Plan and its accompanying Register of Energy Efficiency Opportunities. Reaching TU Dublin's carbon targets requires only one Deep Retrofit project to be completed as part of the Repurpose and Retrofit Programme- the Aras Fios Deep Retrofit project- in order to reach our minimum deep retrofit target.

Renewable Thermal and Electrical Energy Projects form part of the Sustainable Campus Programme's Energy sub-programme of work, supporting the decarbonisation of both thermal and electrical energy supplies, an essential element of our decarbonisation pathway.

The planned transition to renewable-based district heating systems on our campuses, as described in section 2.1.1.h below, will provide the reductions needed to achieve the 51% carbon reduction goal to 2030. This is the single most impactful programme of work to achieve our statutory emissions reduction targets. In parallel, we are actively exploring opportunities to increase the production of renewable 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 to reach its statutory targets without an extensive deep retrofit programme being carried out. As the cost per tonne of carbon saved by deep retrofit projects is the highest, this will allow TU Dublin the necessary time to develop a comprehensive building stock plan and deep retrofit programme, informed by learnings from several pathfinder projects on key buildings. It will also allow time for an in depth consideration of the wider benefits afforded by a deep retrofit programme and the potential to avail of space consolidation as part of that programme of work. The waterfall chart in figure 5 sets out the high-level estimated savings from each activity, which we will track and refine over time as further insights are gained. Refer also to Appendix 1 for the list of buildings affected in these programmes of work and the associated carbon savings and costs per building, project and programme.

2.1.1.h PROPOSED ACTIONS TO ACHIEVE ENERGY RELATED CARBON TARGETS

Natural gas is currently the primary source of space heating for TU Dublin. Decarbonising thermal energy presents a significant challenge, both in terms of the scale of work required and the associated costs. Like all public bodies, TU Dublin's emissions savings are dependent on the Government's National Climate Action Plan to decarbonise the national grid to 77% renewable electricity by 2030.

However, sectoral risk arises from the increasing reliance on the national grid for decarbonisation. To mitigate this risk, TU Dublin must develop a portfolio of additional measures to decarbonise its activities in parallel. As part of this, TU Dublin continues to review opportunities to implement renewable energy initiatives on campus. TU Dublin has already developed district heating (DH) network systems on its Grangegorman and Tallaght campuses. These networks provide the flexibility to use different, more sustainable, centralised heating sources.

The Tallaght campus is heated by a district heating (DH) network developed with South Dublin County Council, which uses waste heat recovered from a nearby data centre, supplemented by water-source heat pumps. In 2024, renewable thermal energy purchased from the non-for-profit energy utility Heat Works amounted to 2,727,700 kWh. TU Dublin is also participating in the development of a district heating (DH) network for the Blanchardstown campus, in partnership with Fingal County Council and CODEMA, modelled on the existing Tallaght network. Learnings from Tallaght campus are anticipated to accelerate the delivery of this project.

At the Grangegorman campus, TU Dublin is working in partnership with Geological Survey Ireland (GSI), with the assistance of CODEMA and the Grangegorman Development Agency (GDA) to explore deep-bore geothermal heating. An initial trial borehole to 1 km depth yielded promising results, with a temperature of 38.5°C. Together with project partners, TU Dublin is actively exploring funding opportunities to develop a full production deep bore geothermal well, which would substantially decarbonise heating on the local DH network.

In addition to thermal projects, TU Dublin generates renewable energy on-site through photovoltaic (PV) Solar installations on two buildings, with generation totalling 55,173 kWh in 2024.

TU Dublin also secured funding in 2023 through the HEA/SEAI Energy Efficiency and Decarbonisation Pathfinder Programme to partially fund a deep bore geothermal well on the Grangegorman campus. This well will supply renewable heat to the already installed DH network, replacing gas-fired boilers. The chosen technology involves a deep bore open geothermal doublet, extracting heat at 2.5 km and returning water to a depth of approximately 1 km. A portion of funding to drill the exploratory borehole, comprising half of the doublet, is being provided through the EU Peace+ initiative, in partnership with GSI, Geological Survey Northern Ireland (GSNI), and CODEMA. This live research and innovation project will serve as an exemplar for the public sector, with the potential replication across TU Dublin's other campuses, other higher education institutions, and broader large-scale public infrastructure developments.

Through these and related performance-enhancing initiatives, and subject to securing necessary funding, TU Dublin aims to provide at least 70% renewable space heating on-site by 2030 and will also explore opportunities to extend these benefits to local Sustainable Energy Communities (SECs) and Renewable Energy Communities (RECs).

2.1.1.i DETAILED PROJECTS PIPELINE TO ACHIEVE ENERGY RELATED CARBON & ENERGY EFFIENCY TARGETS TO 2030

TU Dublin employs a programme approach to detailing specific projects and timelines for achieving its 2030 targets for Energy Efficiency and Decarbonisation. These programmes are part of a capital sub-portfolio (tabulated in detail in Appendix 1) within the wider University Transformation Portfolio for the University to achieve the ambitions outlined in our University Strategy. The New Build projects are listed as a discrete programme, while the demand reduction and clean supply projects are contained within the University Sustainable Campus Programme. These programmes of work align with the decarbonisation activities represented in the TU Dublin Decarbonisation Pathway diagrammed in section 2.1.1g and figure 5.

Figure 6 visually maps the sub-programmes and project groups together with the predicted carbon and energy performance impacts of each project. Newly/nearly completed buildings include Tallaght North, Aras Geal (Block G) and Academic Hub. Pre-approval new build projects include West Quad and University Accommodation. All projects listed in the Sustainable Campus Programme are approved by the University Transformation and Investment Board to proceed to be developed and are in early development stages subject to phased financial sourcing and approval. Refer to Appendix 1 for the key data as indicators allocated per building together with broad timelines and costs for projects implementation. This appendix also sets out notes regarding resource allocation per project.

2.1.1.j RESOURCES IN PLACE OR TO BE MOBILISED

Staff are required as noted in Appendix 1 project resource notes detailed by project and synopsised here.

The New Build Programme requires Capital Project Managers, acting as project co-ordinators on project teams. These projects also require ongoing technical input into the project briefs and outputs to ensure compliance with the University needs. Building Technologists are required to fulfil BIM mandate requirements and asset management requirements.

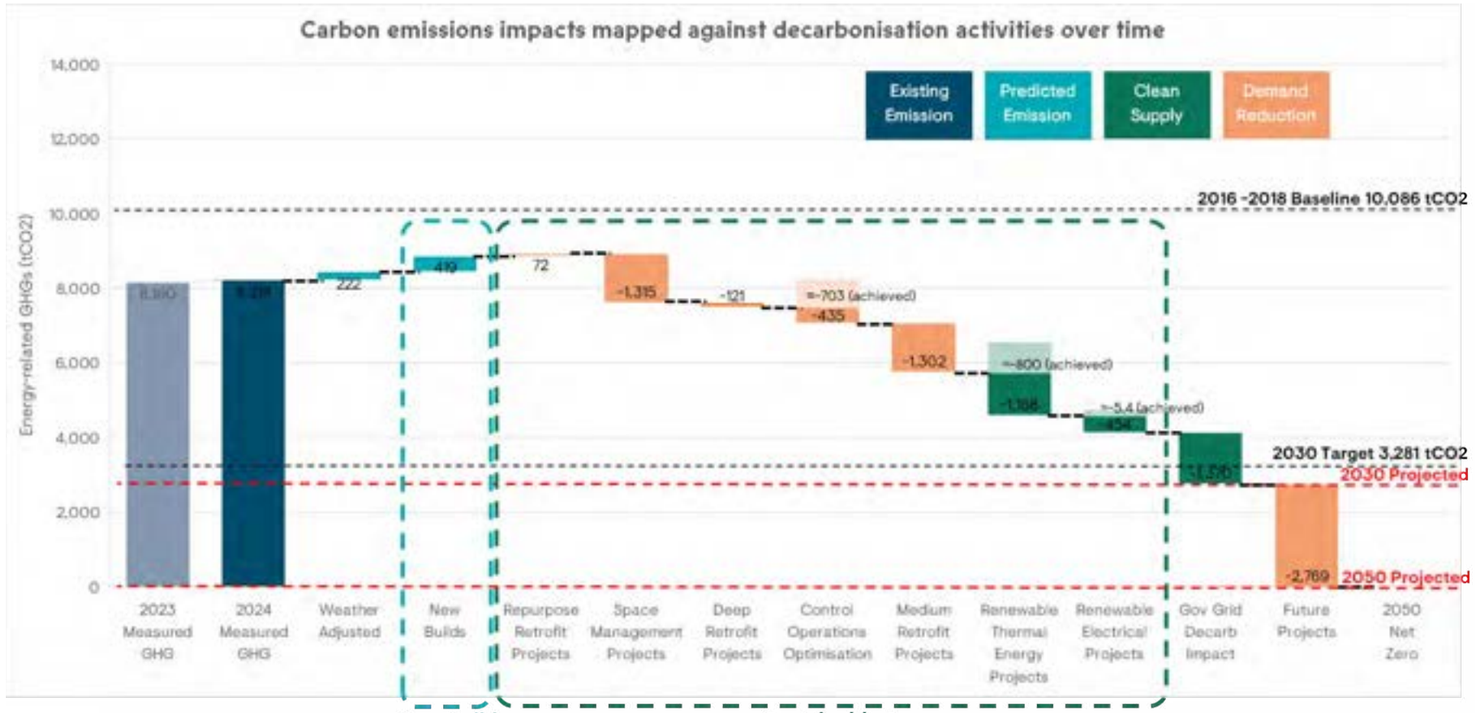
The Sustainable Campus Programme, requires full time Programme Management resource, complemented by Capital Project Managers and Operational Facilities Managers to manage the projects as outlined in addition to Building Technologists. Specialised expertise is required for dedicated timetabling management resources and space occupancy data collection and analysis as well as dedicated resources to engage with space users. For the energy sub-programme, additional, dedicated expertise is needed for operationalising the district heating (DH) installations, and Certified Measurement and Verification (CMVP) expertise to manage proposed Energy Performance Contractors (EPCs) as well as procurement support and finance support for the overall programme of works. These requirements are estimated and summarised in a tabulated fashion in table 3. Property Managers and energy management teams requires speciallists to deliver the buildings and retrofitting projects. Architectural designers are required to develop the learnings and models from the Pilot Deep Retrofit project into a building stock delivery programme and a priority framework for implementation to 2040 and 2050. Architectural/building technologists and data analysts are required to support the holistic digitisation and feedback mechanisms required to monitor and activate energy savings management.

Additional posts quantified below will need to be considered through a prioritisation process with options to redeploy existing staff with appropriate knowledge and skills to be considered in this context. The use of performance-based financing mechanisms, if available and suitable, may mitigate some human resource requirements. Estimated costs to provide required human resources for five years to 2030 are €2,150,000 per year or a total cost of €10,750,000 to achieve the works.

Programme	Projects	Prog Mgr	Proj Mgr	Ops Mgr	Tech	Procure ment	Finance	Timetabling expert	DH expert	CMVP expert
New Builds Programme						**0.5**	**0.25**			
	New Builds		**2-4**		**1-2**					
Sustainable Campus Programme		**1-1.5**				**0.5**	**0.25**			
	Repurpose & Retrofit Sub programme		**4-6**	**2-3**	**1-2**			**1**		**1**
	Energy Sub programme		**1-2**	**1**					**1**	
Total		**1**	**7-12**	**3-4**	**2-4**	**1**	**0.5**	**1**	**1**	**1**

Table 3: Resources requirements for programme to 2030

Portfolio Approach to Programmes of Work



New Builds Progamme

Strategic Plan- People Pillar KPIs- **PE3b**
-An integrated **University Masterplan** to be completed and approved by 2024
-**Delivery of capital infrastructure**- 22, 000m2 to be complete by 2028
-Delivery of capital infrastructure- 15, 000m2 to construction stage by 2028
-**Optimal Use** of Capital Infrastructure- 50% of buildings at optimal use by 2028

New Builds Programme to 2030 [+ 667 tCO2]

- GDA/TU Dublin Project Team Academic Hub 12,600 m2 (+60 tCO2e +28 EnPI +xxx students)
- NDFA/TU Dublin Project Team Tallaght North 5,200 m2 (+47 tCO2e +22 EnPI +xxx students)
- NDFA/TU Dublin Project Team Aras Geal (Block G) 4,040 m2 (+37 tCO2e +17 EnPI +xxx students)
- GDA/TU Dublin Project Team West Quad 20,730 m2 (+119 tCO2e +56 EnPI +xxx students)
- GDA/TU Dublin Project Team University Acc Ph 1 GG 17,700 m2 (+156 tCO2e +73 EnPI +500 beds)

+60,270 m2
-31,320 m2 =
+28,950 m2

Carbon impact to 2030=
+419 tCO2e
EE improv= + 197 EnPI
+6400 students (33,000 tot)
check predicted stud nos

Sustainable Campus Programme

Strategic Plan- Planet Pillar KPIs- (Statutory Targets) **PL1b**
-Climate Action Roadmap Carbon 2030 Target- **51**% GHGe reduction, **[Target 3,343 tCO2e]**
-Climate Action Roadmap EE 2030 Target- **50%** improvement Energy Efficiency **[Target 1,317 EnPI]**
- Climate Action Roadmap Target- **Fully Decarbonised by 2040** (Net Zero by 2050)

REPURPOSE RETROFIIT SUB-PROGRAMME

REPURPOSE RETROFIT Projects to 2030
- 25SC P05 Project Team Apprenticeship Expansion Project
- 25SC P08 Project Team Design & Construct 6,000 m2 (+72 tCO2e +52 EnPI +xxx students)

(+72 tCO2e +52 EnPI +xxx students)

SPACE MANAGEMENT Projects to 2030
- 25 SC P13 Project Team Space Management Project
- Project Team Buildings Decanting Programme -31,320 m2 (-1309 tCO2e -289 EnPI xxx students)
- Project Team Leased Buildings Options Analysis (-5 tCO2e -1 EnPI)

(-1315 tCO2e -290 EnPI -xxx students)

-31,320 m2

DEEP RETROFIT PILOT Projects to 2030
- 25SC P06 Project Team Aras Fios Deep Retrofit Pilot Project (-121 tCO2e -26 EnPI +xxx students)
- **25SC P07** Project Team Bolton Street/Linenhall Retrofit Comparison Study
- 25SC P10 Project Team Tallaght Main Building Deep Retrofit Feasibility Study

(-121 tCO2e -26 EnPI +xxx students)

CONTROL & OPERATIONS OPTIMISATION Projects
- Project Team PPP Buildings Performance Improvemer (-435 tCO2e -111 EnPI)
- Project Team Minor Works Upgrades
- Energy mgmt team

(-435 tCO2e -111 EnPI)

MEDIUM RETROFIT Projects to 2030
- Project Team Tallaght Campus Medium Retrofit EPC (-350 tCO2e -105 EnPI)
- Project Team City and GG Campus Medium Retrofit EPC (-581 tCO2e -128 EnPI)
- Project Team Blanch Campus Medium Retrofit EPC (-370 tCO2e -81 EnPI)

(-1302 tCO2e -315 EnPI)

Carbon impact to 2030= -633 tCO2e
EE improv= -90 EnPI

ENERGY SUB-PROGRAMME

RENEWABLE THERMAL ENERGY Projects to 2030
- 25SC P02 Project Team Decarb DH Tallaght Campus (-2 tCO2e - 0 EnPI)
- 25SC P01 Project Team Decarb DH Blanchardstown Campus (-216 tCO2e - 6.5 EnPI)
- GDA/TU Dublin 25SC P03 Project Team Decarb DH Grangegorman Geothermal (-950 tCO2e - 29 EnPI)

(-1168 tCO2e - 35 EnPI)

RENEWABLE ELECTRICAL ENERGY PROJECTS to 2030
- Project Team PV Solar Projects Tallaght Campus (-29 tCO2e - 7 EnPI)
- Project Team PV Solar Projects Blanchardstown Campus (-193 tCO2e - 49 EnPI)
- Project Team PV Solar Projects Grangegorman + City Campus (-231 tCO2e - 59 EnPI)

(-454 tCO2e - 115 EnPI)

Figure 6: Decarbonisation activities differentiated by energy type and mapped over time

2.1.1.k PROJECT READINESS

TU Dublin is adding five new buildings to our property portfolio by 2030, two of which are already completed, in the commissioning stages and have been occupied since the last energy reporting period and a third which is due to be occupied by end 2025. These buildings are Tallaght North - occupied since Q4 2024, Áras Geal (Block G) at the Blanchardstown campus which was occupied in Q2 2025 and Academic Hub at Grangegorman campus due to be occupied in Q4 2025. The two remaining projects include West Quad at Grangegorman campus which is developed to tender stage and University accommodation which is at its early inception stages.

With regard to the Sustainable Campus Programme, the Repurpose and Retrofit Projects include the Apprenticeship Expansion Project which is ready to begin subject to approval of HEA grant funding application. The Design + Construct Project is ready to begin subject to approval of HEA grant funding application. The Deep Retrofit Pilot Projects include the Áras Fíos Deep Pilot Retrofit Project which has completed design documents to CWMF stage 2a and a design team in place to progress to the next stages. The feasibility study projects for Bolton Street and Tallaght Main Building Retrofit are at their earliest inception stage. The Control and Operations Optimisation Projects are currently being carried out by TU Dublin's Property Manager and Energy Management Teams. The Medium Retrofit Projects are being developed through a European funded innovation project called 'EasyPro' which provides technical assistance to bring these projects to procurement stages in 2026 and market engagement to ensure readiness of contractors.

District Heating projects across TU Dublin are at various stages of maturity. The fully developed renewable district heating (DH) system at the Tallaght campus is ready to immediately onboard additional buildings on that campus.

At the Grangegorman campus, the DH system already has a fully operational energy centre and distribution network. Design services, market facilitation, and stakeholder engagement teams are also in place to implement the exploratory borehole and the first phase of the geothermal heat-producing system.

Because it is a fully contained TU Dublin Grangegorman campus system, the Grangegorman DH system can be utilised as soon as the geothermal project is operational. The Blanchardstown DH project depends on the wider Fingal County Council Blanchardstown District Heating Project. A 'District Heating Campus Planning, Feasibility and Analysis' is being carried out for the Blanchardstown campus to ensure the timing of implementation to achieve our 2030 decarbonisation targets in line with this Roadmap. This will include a phasing and timeline analysis, consideration of requirements for a campus energy centre, associated heat supply options, technical and financial analysis and evaluation of operation and governance options for a potential campus energy centre. This study aims to align the campus system with the neighbourhood-wide DH network and explore phasing options for its implementation, as described in Section 2.1.2f.

2.1.1.l PROJECT FINANCING REQUIREMENTS AND RESPONSIBILITY

There are significant financial costs for TU Dublin to achieve its statutory targets for energy efficiency and decarbonisation. Initial funding is secured for some but not all of these costs. TU Dublin cannot guarantee availability of financial or human resources but this roadmap sets out our capital investment and human resources delivery needs for the purpose of quantifying requirements to allow us work closely with government bodies and private finance to demonstrate climate attractive capital funding options to reach statutory targets. TU Dublin is committed to delivering on climate change commitments but recognises that current Section 64 processes have the potential to delay on advancing efforts within the obligated timelines where capital and resourcing commitments are significant. Through a combination of securing grants and available funding mechanisms related to delivery of ongoing performance improvements, TU Dublin can reach targets while also staying on track to reach our financial recovery targets.

Financing costs for the New Builds and Sustainable Campus Programmes are set out in Appendix 1 for high level project budget costs and allocation against TU Dublin's resources, percentage of public grant monies required, and percentage of private financing expected. These costs are synopsised below.

Public Private Partnership financed buildings which have recently been completed at Grangegorman campus, including East Quad and Central Quad, require the University to fund an ongoing Unitary Charge for approximately the next 21 years. These recurrent charges help ensure the buildings' efficient energy performance and need to be considered part of the University's overall costs in meeting its energy efficiency targets. It is estimated that the unitary charge costs will be approximately €56 million for the next 5 years and have been budgeted for to 2030.

The New Builds programme to 2030 which includes the completion of construction of Academic Hub, West Quad and the first phase of University Accommodation are at pre approval stage and in total are estimated at between €340 - €390 million.

The energy efficiency and decarbonisation works outlined in the Sustainable Campus programme are estimated at approximately between €70 - €94 million. The total value of the combined new builds and sustainable campus programmes still to be financed (excluding Academic Hub between €90 - €100 million) is estimated at between €320 - €384 million to meet both the National Climate Action Plan and TU Dublin targets by 2030. When human resources costs as estimated at €10 million (see section 2.1.1k) are included the costs approach a maxium of €394 million. Further investment will also be required beyond 2030 to deep retrofit the remaining building stock and achieve the University's goal of climate neutrality for scope 1 and 2 emissions by 2040.

Given the ability to do so and to achieve the quantum of work required to reach our 2030 targets, TU Dublin is sourcing grant aid from the European Union (EU) in the form of research and innovation projects. TU Dublin is currently engaged in projects funded by SEUPB Peace+ (GEMINI) and EU LIFE funding (EasyPro) and has used EU Interreg NWE funding to realise the mature HeatWorks DH system in Tallaght. ELENA funding is currently being sought by the consortium involved in the Blanchardstown DH scheme to enable the development of the network, and we continue to seek LIFE CET funding to realise the ambition of the overall programme of work. SEAI and HEA grant funding from Energy Efficiency and Decarbonisation Pathfinder funds has been awarded to support the Áras Fíos deep retrofit project and the Grangegorman DH project.

The HEA Performance fund has supported the digital systems to enable the first stage of piloting energy efficiency works on our campuses.

TU Dublin is currently working with SEAI to determine how the newly revised SSHR scheme can support ambitions to install DH distribution network at the Blanchardstown campus. This year the University will consider entering into the Energy Efficiency Obligation Scheme to work with obligated parties to realise projects. The above schemes and funding streams provide a variety of financial resources to assist TU Dublin in advancing the EED Programmes as outlined. Additional core capital funding and targeted EED sectoral funding for will become essential to achieve full implementation by 2030.

TU Dublin is actively exploring options and benefits to working with private sector financiers using mechanisms such as Energy Performance Contracting, Power Purchase Agreements and Heat Supply Agreements where appropriate and to engage with our partners at the sectoral and central government level to enable this work to be achieved within the timelines required.

We are also actively exploring the possible benefits of working with our neighbouring SEC's so that together we can find supports in mechanisms like the Community Energy Grant Scheme, Better Energy Communities Schemes and the Renewable Energy

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

2.1.2.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 (ITB), and Institute of Technology Tallaght (ITT) 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 ten attributable consumers of energy reported during that baseline period are charted in figures 7 and 8 for electricity and non-electrical energy consumption. With regards to electricity, top significant users include the five buildings at 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 Kevin Street, the five buildings at the Tallaght campus reported as one user, six buildings at 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 at the Grangegorman campus. The remaining three significant energy users are the five buildings at 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.

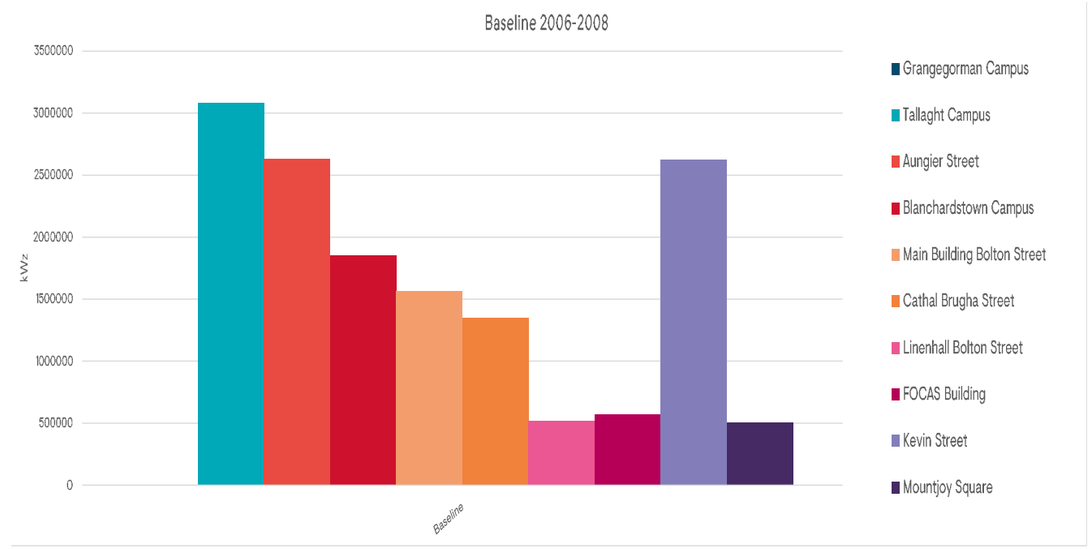


Figure 7: Top 10 MPRNs - Attributable consumption (kWh) baseline (2006-2008) as per SEAI M&R

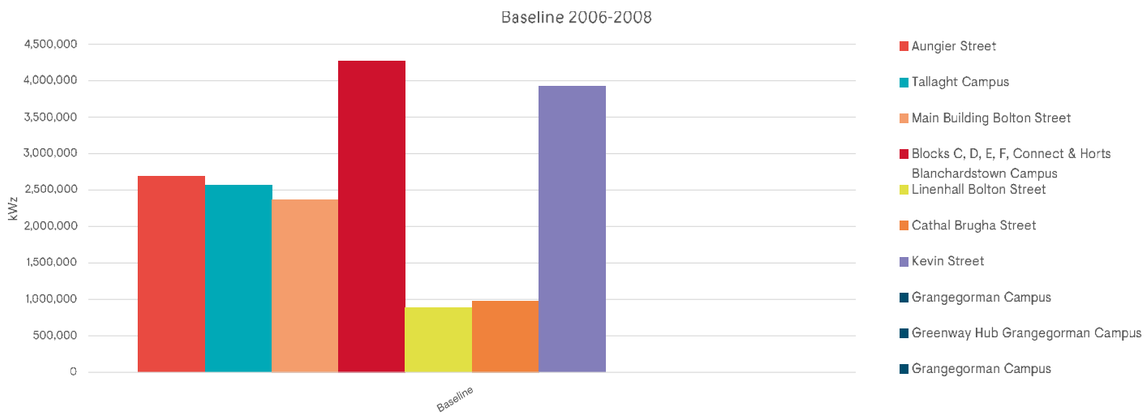


Figure 8: Top 10 GPRNs- Attributable consumption (kWh) baseline (2006-2008) as per SEAI M&R

2.1.2.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)[2] 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 2024 was 37,682,895 kWh and the EnPI was 1,977.2.

In pursuit of the 2030 51% energy efficiency target, TU Dublin commenced the Deep Retrofit of the Áras Fíos (Block F) Building in 2024 supported by the HEA/SEAI Pathfinder fund. This will contribute 1.9% of the 3% per annum retrofitting target for our existing stock.

In April 2024, ISO 50001 certification was achieved for all three campuses.

2.1.2.c GROWTH IN ENERGY USE BETWEEN BASELINE AND TARGET YEARS BASED ON PLANNED INCREASE OR GROWTH IN SERVICES.

The growth in services will include the New Builds Programmes and Repurpose Retrofit Projects:

- Expected growth includes five new buildings
- Expect EnPI increase is just under 200.
- Total additional consumption will be approximately 5,200,000 kWh.
- In addition to the New Builds, there is a Repurpose Retrofit Projects that will add roughly 780,000 kWh of consumption and increase the EnPI by over 50.

2.1.2.d 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)).
- Develop TU Dublin Building Stock Retrofit programme (and associated targets).
- 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.
- 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.
- Maintain certification of ISO 50001 processes at required intervals.

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.

2.1.2.e ANALYSIS OF SIGNIFICANT ENERGY USERS

TU Dublin Building Stock

TU Dublin's building stock currently includes 216,123m² 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 three new buildings and to divest five older buildings. This will potentially bring the entirety of the building stock to 45 buildings by 2030.

TU Dublin Campus	Site (m^2)	Gross Internal Area (m^2)				No. of Buildings					
		Existing	New Planned	To be Discountinued	Total	Current Owned	Current PPP/Leased	NEW Planned Owned	NEW Planned PPP/Leased	To be Discountinued	Total
	As of 2024	As of 2024	By 2030	By 2030	By 2030	As of 2024	As of 2024	By 2030	By 2030	By 2030	By 2030
TU Dublin Grangegorman	266,100	85,252	69,680	-616	154,316	12	7	6		-1	24
TU Dublin Tallaght	191,300	29,478	5,200	-1,209	33,469	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		-1,200	40,319	5	1			-1	5
TU Dublin Aungier Street	14,300	29,065		-29,065	0	2				-2	0
Sub Total	725,262	210,887	78,920	-32,090	257,717	35	11	6	2	-5	49

[2] 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

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 at the Tallaght campus, ten at 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 SEAI M&R platform provides MPRN and GPRN readings for 2024, 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.

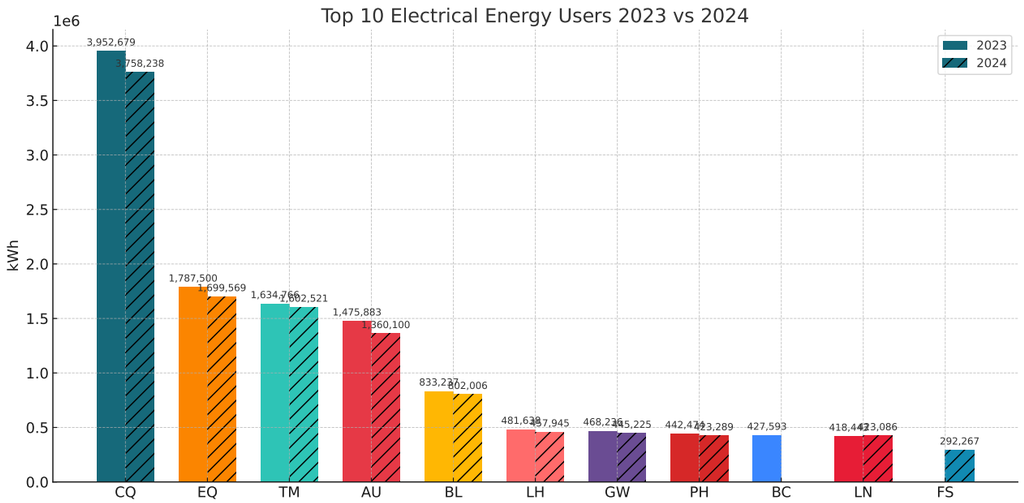


Figure 9: Top 10 Electrical Energy Users 2023 vs 2024

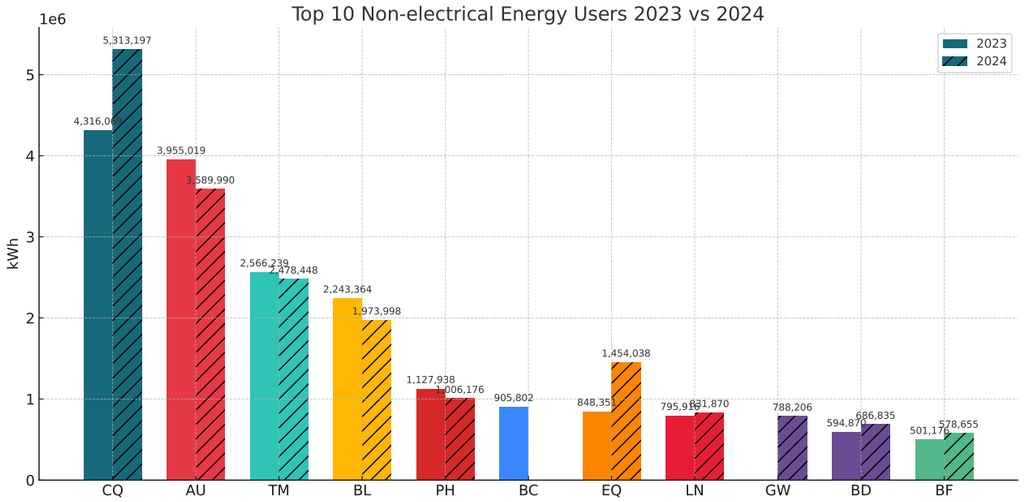


Figure 10: Top 10 Non-electrical Energy Users 2023 vs 2024

In terms of electricity, the Central Quad building reports over 3,758,238 kWh/year as the top electricity user with East Quad as the second highest user with just below 1,700,000 kWh/year. The Tallaght Main Building and Aungier Street are the next two significant electricity users at approximately 1,500,000 kWh/year each. Bolton Street Main Building uses approximately 800,000 kWh/year.

2.1.2.f 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 25% on the benchmark year. TU Dublin will continue to target a 4.2% TPER reduction per year to achieve our Energy Efficiency Target.

The Central Quad and the Aungier Street building constitute the largest significant energy users of non-electrical energy using approximately 5,300,000 and 3,600,000 kWh/ year each. The Tallaght Main Building and Bolton Street is the next significant non-electricity user with about 2,400,000 and 2,000,000 kWh/year each. East Quad and Park House are the next two largest users with approximately 1,500,000 and 1,000,000 kWh/ year each.

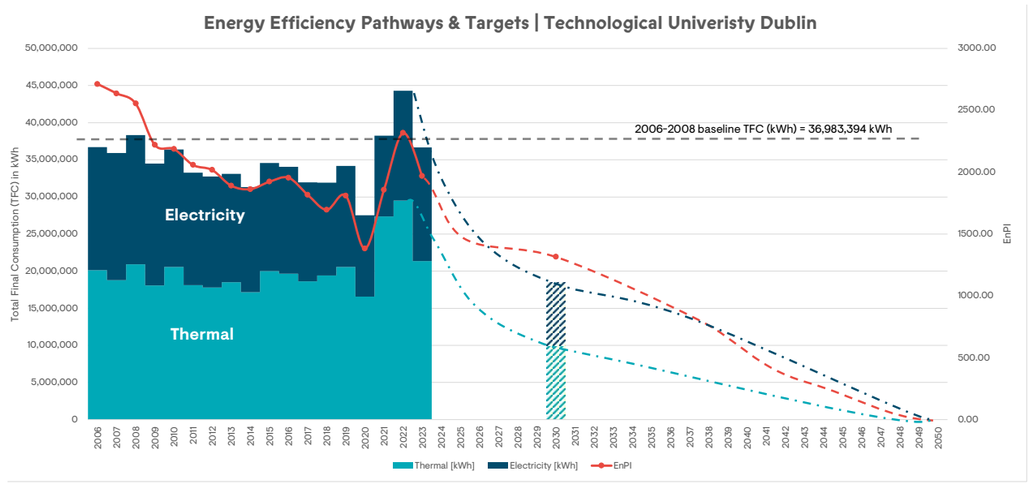


Figure 11: TU Dublin energy efficiency pathways and targets as per SEAI M&R (2021)

2.1.2.g 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. The University Sustainability Council (USC) has initiated a Green Labs Working Group to engage with all types of labs and energy intensive spaces (EIS) across TU Dublin. My Green Lab certification is being sought across all appropriate lab spaces in TU Dublin. TU Dublin is a member of the Irish Green Labs network which is a member of Sustainable European Laboratories Network. TU Dublin is also a member of the SEAI Public Sector Labs Working Group with an aim of optimising energy management in public sector laboratories.

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 a further reduction in 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 using 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 received funding in 2023 through the HEA/SEAI Energy Efficiency and Decarbonisation Pathfinder programme to commence a deep retrofit project. The Áras Fíos building comprises 3,862 m² over three levels with a rooftop 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 is to review, in depth, areas identified in the thermal survey and rectify the heat loss through deep energy retrofit measures including, additional entrance lobby doors, upgrades to the façade; replacement doors and windows and improving airtightness at junctions. 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 Modern Methods of Construction (MMC) and modularised solutions. By taking a more in-depth 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 210,000m² of accommodation space to be upgraded at a nominal cost of €2500/m² 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, the University 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. This approach recognises the goal of absolute reduction across the University boundary, ensuring 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.

2.1.3 ENSURING CONSISTENCY WITH SECTION 15(1) OF THE CLIMATE ACTION LOW CARBON ACT 2021

SECTION 15(1) SCREENING

TU Dublin will carry out a screening exercise of each of its key activities and functions to assess whether it has a material role in implementing the Climate Action Plan, the Public Sector Climate Action Strategy or the furtherance of the national Climate Objective set out in the Climate Action Low Carbon Act 2021. It will build on existing taxonomies and approaches to incorporate lessons learnt elsewhere. It will develop and use an appropriate methodology to reflect the full climate impact of decisions made both direct and indirect and including scope 1, 2 and 3 emissions. In preparing this report, it will be informed by SEAI guidance specifically relating to this action when published.

2.2 OUR PEOPLE

2.2.1 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. Reporting directly to the President of the University, 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. At present, the VP for Sustainability is also the Energy Performance Officer (EPO). Other key roles for sustainability leadership in TU Dublin are set out in figure 12 and show the commitment of the University to climate action.

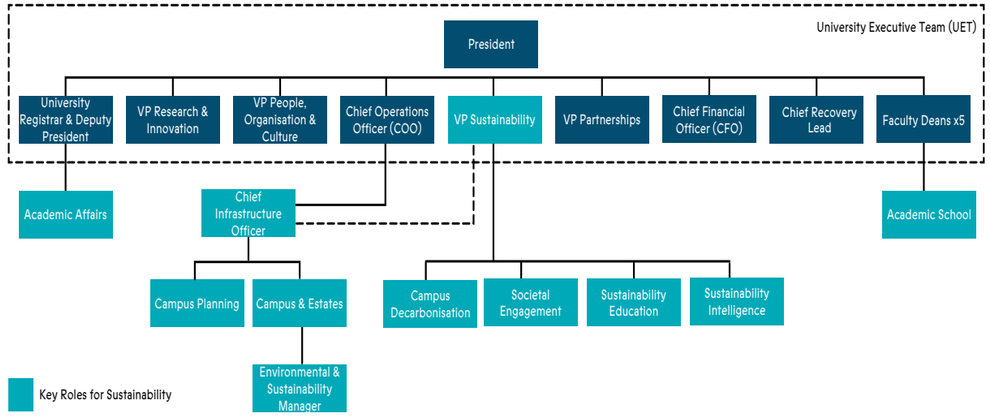


Figure 12: Key roles for sustainability leadership in TU Dublin

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 TU Dublin's Climate Action Roadmap and the 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.

2.2.1.a CAMPUS & ESTATES

Campus & Estates aims to be at the forefront of demonstrating climate action ensuring the University becomes a 'Beacon for Sustainability' and works under the direction of 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, 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 the planning, regulation, monitoring, development and management of energy and the reduction of the University's carbon footprint.

2.2.1.b 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 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 (DH), deep bore geothermal, digital twins, and advanced solar technologies.

2.2.1.c 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 (HSE), 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 has established sustainability as a core objective and continues to implement TU Dublin Climate Action Roadmap requirements and associated plans in close coordination with stakeholders.

2.2.1.d GOVERNANCE STRUCTURE FOR CLIMATE ACTION AND SUSTAINABILITY

The diagram in figure 12 sets out the internal governance and reporting lines as required under the Public Sector Climate Action Mandate within the University. The diagram in Figure 13 sets out the supporting teams available to the VP of Sustainability in her roles as EPO and Climate and Sustainability Champion and the University Sustainability Council's role in fostering cross-functional input and progress, amplifying initiatives and providing the central coordination and oversight for sustainability and climate action activities within the University. TU Dublin report Public Sector Mandate requirements in our Annual Report 2024 and submit the statement of compliance with the Public Sector Mandate 2024 on the SEAI M&R reporting tool using a comply and explain approach.

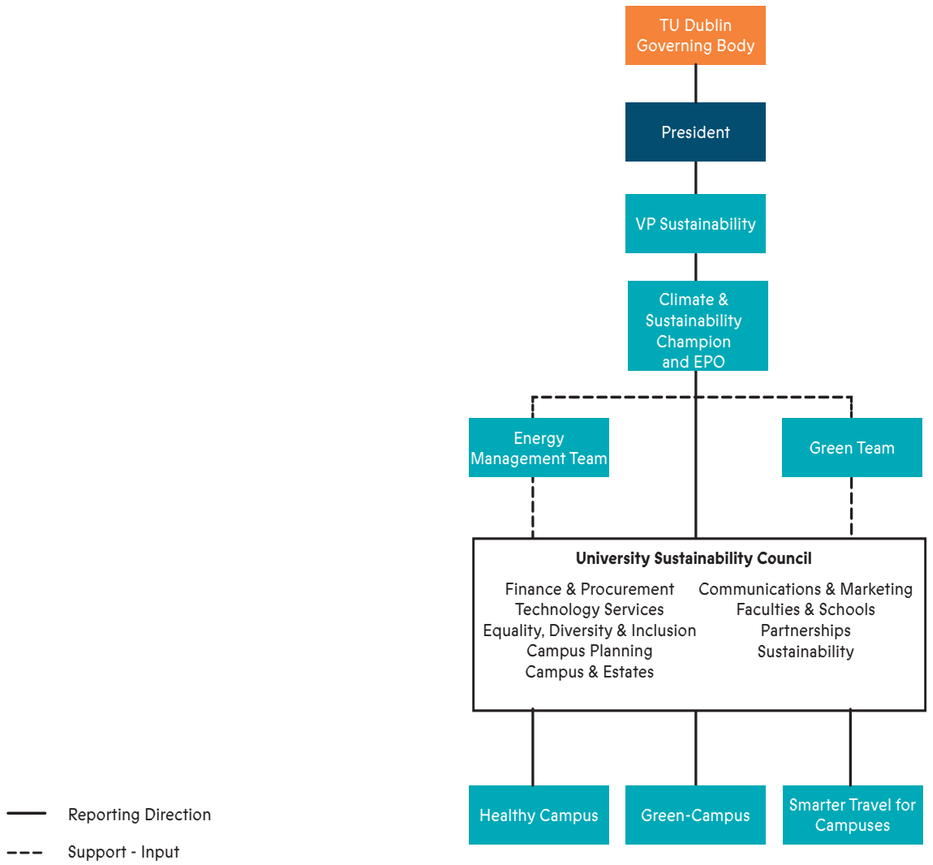


Figure 13: Key roles and supporting teams for sustainability in TU Dublin

2.2.1.e 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 have been adopted.

2.2.1.f
THE TU DUBLIN GREEN TEAM

The TU Dublin Green Team is a targeted group within the University tasked with two main objectives:

- To influence decision making in the University so that climate and environmental criteria are to the fore.
- To influence colleagues to commit to working and living sustainably.

The Green Team are accountable for the Public Sector Climate Action Mandate reporting and advocacy within the University and use the requirements of the Climate Action Mandate to set out its work programme for each year.

TU Dublin's Green Team is resourced with individuals in the following roles: VP Sustainability, Campus and Estates Environmental Sustainability Manager, Energy and Carbon Lead, Head of Decarbonisation, Operations and Services Manager, Senior Project Manager Capital Works, Buildings Maintenance and Minor Works Lead, PPP Contracts and Real Estate Manager, Estates Systems Manager, Senior M&E Services Manager, Mechanical Services Lead, Electrical Services Lead, Architecture and Design Project Lead, Procurement and Contracts Manager, Deputy Head of Technical Services, Client Services Senior Manager Technical Services, Head of Sustainability Education, Sustainability Events and Senior Media Coordinator and Green-Campus Network Co-chair. The terms of reference and charter for the Green Team are currently being developed.

2.2.1.g ENERGY MANAGEMENT TEAM

TU Dublin's Energy Team provides oversight of the University's EnMS and the objectives are: Implement, maintain and continually improve the established EnMS within their own areas and across TU Dublin;

- Develop and implement action plans to continually improve energy performance;
- Report on the performance of the EnMS and improvement of energy performance to senior management at determined intervals;
- Apply the criteria and methods under which the EnMS will be operated and controlled.
- Monitor the performance of the organisation towards meeting it public sector obligations towards 2030

Membership of the Energy team is comprised of individuals from Campus & Estates with the ability to materially affect TU Dublin's energy performance. The team is chaired by the University's Energy Performance Officer and its membership includes:

- Vice President Sustainability – EPO
- Environmental Sustainability Manager
- Estates Systems Manager
- Operations & Services Manager
- Senior Mechanical & Electrical Services Manager
- Senior Project Manager
- PPP Contracts & Real Estate Manager
- Electrical Lead
- Energy & Carbon Lead
- Mechanical Lead
- Building Maintenance & Minor Works Lead
- Assistant to the Head of Campus & Estates
- Architectural Project Leader
- Sustainability Events & Senior Media Coordinator

2.2.1h GREEN-CAMPUS COMMITTEE NETWORK

The Green-Campus Network is a collaborative initiative involving students and staff across all five campus locations. The network focuses on advancing environmental action projects, supporting environmental education, and fostering a culture of sustainability within the University community.
In May 2024, TU Dublin's Green-Campus appointed two new student and staff co-Chairs to lead a new Green-Campus Network. The newly appointed co-chairs will play a pivotal role in leading the network's activities, including coordinating events, engaging our people in pro-environmental behaviour, and capturing data for the An Taisce Green-Campus application for the Green Flag. Together with the Network, they will work to renew the University's Green Flag award at the end of 2026 under the major themes of Transport and Travel, and Biodiversity, and maintaining the previously awarded themes of Litter and Waste and Energy as minor themes.

The Co-Chairs will also join the USC to help connect the ambitions and actions of Green-Campus in a visible and transparent manner.

2.2.1.g ACTIONS PLANNED

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

- Develop a University Accountability model to assign responsibility for actions outlined in the Climate Action Roadmap and Public Sector Mandate reporting.
- 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.

2.2.1.2 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 'Education for Sustainable Development (ESD) to 2030' strategy. It aims to ensure our students and staff acquire the knowledge, skills, attitude, and values necessary to build resilience to climate change and shape a sustainable future. To ensure our graduates can lead the sustainability agenda with passion and purpose, TU Dublin must empower and build capacity among staff to deliver innovative programmes that address the global challenges set out in the UN SDGs. The University will also support all staff so that sustainability education will be delivered in a learning environment where its campus acts as a living lab to develop best practice in sustainability.
The SEF is aligned with government policy on sustainability 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.

At the end of 2024, the Sustainability Education team trained 262 of 289 senior managers (PO and SL3 and above) in climate action leadership training, and this is now being rolled out to APOs and SL2s. Since 2021, the UET has engaged in multiple sustainability and climate workshops.

A training needs analysis is being undertaken to integrate appropriate climate action and sustainability actions into learning and development strategies for staff.
Annual staff engagement workshops on climate action were held in 2025 to engage staff and students in climate action issues and in reducing the Universities carbon footprint. These include workshops, Green Week activities and an open call for climate action.

2.3 OUR WAY OF WORKING

2.3.1 ENERGY AND ENVIRONMENTAL MANAGEMENT SYSTEMS AND ACCREDITATION

TU Dublin has implemented and achieved ISO 50001 certification for all of its campuses and locations. See Energy Management Team activities in 2.2.1.g.

2.3.2 GREEN PUBLIC PROCUREMENT

- Adhere to the Circular 17/2025; Updated Green Public Procurement Instructions for Public Sector Bodies, regarding new Green Public Procurement obligations included in the GPP Strategy and Action Plan 2024-2027.
- Implement Green Public Procurement in accordance with the Green Public Procurement Implementation Mandate set out in Buying Greener: Green Public Procurement Strategy and Action Plan 2024-2027.
- Implement Green Public Procurement (GPP) using the EPA Green Public Procurement Guidance and criteria/Office of Government Procurement's online Green Public Procurement Criteria Search tool as resources.
- As set out under Section 2.2 Our People, incorporate green procurement training into learning and development strategies for staff.

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.

2.3.3 CONSTRUCTION

TU Dublin commits to the following measures:

TU Dublin specifies low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects since 2023. The University adheres to the best practice guidelines for the preparation of resource and waste management plans for construction and demolition projects for directly procured or supported construction projects from 2024. A minimum proportion of construction materials procured by the University under new contract arrangements will comprise recycled materials as informed by a Circularity Roadmap for the Construction Sector and the 2nd Whole of Government Circular Economy Strategy to be published in 2025.

2.3.4 ORGANIC FOOD

TU Dublin commits to the following measures:

A minimum of 10% by value (€) of food sought under new contract arrangements (including via contractors such as canteen service providers), is to be certified organic in each of the following categories of cereals, fresh beef, lamb, pork, poultry, fish, vegetables and dairy products, where possible. Public bodies should track the procurement of food to monitor attainment of the GPP organic food procurement target.

The University aims to foster the growth and sustainability of the organic sector in Ireland by following the EPA National GPP criteria for Food and Catering Services as recently published.

2.3.5 FOOD WASTE

Since 2021, Healthy Campus has partnered with Empower to deliver the Healthy Food Made Easy online programme—a six-week cook-along series for TU Dublin students and staff, promoting healthy, budget-friendly cooking and food waste reduction. A Baby Food Made Easy course is also offered in collaboration with the HSE.

The Healthy Campus Cookbook is an annual competition inviting staff and students to submit healthy, low-emission recipes, with food waste tips included. Across two volumes 83 recipes have been published.

The ReFridge Project, led by TU Dublin students, tackles food waste and insecurity by redistributing surplus food to students in need. Supported by FoodCloud, N-TUTORR and Green-Campus, the initiative operates a weekly food pantry on campus, distributing over 2,600 kg of food and 7,300 meals to 650+ students.

TU Dublin commits to the following measures:

- Measure and monitor food waste generated on premises from 2024 using a standardised approach to food waste measurement set out in the EPA Public Sector Guidance.
- All new contract arrangements related to canteen or food services, including events and conferences to include measures targeted at addressing food waste, with a specific focus on food waste prevention and food waste segregation.
- Calculate TU Dublin's food waste benchmark, set a target to reduce food waste and identify actions to meet that target. We will report on progress annually.
- The Green Team will focus on food waste prevention.

- Support the National Stop Food Waste campaign on 01 March, 2025.
- Promote Stop Food Waste resources
- Encourage canteen operators to sign the Food Waste Charter.

2.3.6 ICT EQUIPMENT

TU Dublin commits to the following measures:

- A minimum of 80% of ICT end user products (desktop computers, portable computers and mobile phones) procured by TU Dublin under new contract arrangements are certified to EPEAT Gold Standard (or equivalent), TCO Certified (or equivalent) or will have been remanufactured.
- Track the procurement of ICT end user products to monitor attainment of the GPP ICT equipment procurement target.
- Follow EPA published National GPP criteria for ICT products and services.
- Use the Office of Government Procurement (OGP) framework for purchasing remanufactured laptops. This is the first arrangement of its kind in the EU.

2.3.7 PAPER

In 2025 TU Dublin adopted a new printing policy which supports the move towards paper-less processes. A Unified Managed Print Services Board has been established to provide a unified and managed print service to all students, staff and guests to replace separate systems serving each campus. The aim of the Board is to deliver a solution that promotes TU Dublin's commitment to environmental impact reduction and improved sustainability of technologies deployed.

TU Dublin commits to the following measures:

- Review any paper-based processes and evaluate the possibilities for digitisation, so it becomes the default approach.
- Eliminate paper-based processes as far as is practicable.
- Where paper must be procured, ensure that recycled paper is the default.
- Measure and monitor paper consumption. Using baseline, set a target to reduce paper use and identify and take actions to meet that target. Report on activities in our annual report.
- Measure paper waste generation (quantity and/or expenditure). Using baseline, set a target to reduce the amount of paper waste generated.

2.3.8 WATER

TU Dublin commits to the following water conservation measures:

- Provide suitable drinking water refill points for all students and staff and in any premises accessed by the public measure and monitor total water consumption in the organisation.
- The Green Team will focus on reducing water consumption.
- Put a plan in place to reduce water consumption.
- Engage in Uisce Eireann Water Stewardship programme.

2.3.9 SINGLE USE

TU Dublin will cease using disposable (single use) cups, plates and cutlery in its canteens and closed facilities. The University will progressively eliminate all other single use items within the organisation and from events organised, funded or sponsored.

2.3.10 OTHER ITEMS

TU Dublin will:

- Support Ireland's Producer Responsibility Initiatives in the collection and recycling of products.
- Use waste collection services that are segregated into a minimum of three streams residual/general waste, recycling waste and organic/biowaste.
- Track waste generation (general waste, dry recyclables, organic waste, other wastes e.g., waste electrical and electronic equipment.
- Set out plans to prevent waste to progressively reduce waste generation.

Four student- and staff-led ReTurn projects are currently operating across four TU Dublin campuses, with plans to expand to the Tallaght campus. In collaboration with Student Volunteering and Green-Campus, the initiative facilitates plastic bottle and cans for recycling, tracks impact data, and raises funds for charitable causes. Recycling and compostable waste streams are in place in main buildings at all locations.

TU Dublin is also engaging with UniGreenScheme, a UK-based asset resale service, on a pilot initiative related to the resale of specialised equipment from Research & Innovation. This equipment would have otherwise been disposed of through TU Dublin's bulky waste or WEEE waste streams and working with UniGreenScheme offers a circular economy opportunity, increasing the life cycle of this specialised equipment.

2.4 OUR BUILDINGS AND VEHICLES

2.4.1 PROMOTE THE USE OF BICYCLES AND SHARED MOBILITY OPTIONS

Sustainable Transport and Mobility

TU Dublin is a partner in the Transport for Ireland (TFI) Smarter Travel Behaviour Change Programme, promoting sustainable and active commuting among students and staff. The University supports initiatives such as Ready, Set, Cycle, Light Up Your Life, Walktober, Marchathon, and lunchtime walking groups, encouraging alternatives to car travel. TU Dublin also engages in the Cycle to Work Scheme, supports the Smarter Travel Student Awards, and hosts events during European Mobility Week and National Bike Week. To further enable active travel, the University continues to develop secure, accessible, and clearly marked bicycle parking facilities, while highlighting the health and environmental benefits of sustainable commuting.

2.4.2 PHASE OUT CAR PARKING

There are currently 171 spaces across three carparks at TU Dublin's Grangegorman campus. As part of plans to relocate Aungier Street and Bolton Street to join the Grangegorman campus, 105 spaces at Aungier Street and 53 spaces Bolton Street will reduce the total number of car parking spaces at TU Dublin.

The Tallaght campus has three main carparks with 909 spaces. Previously 53 car parking spaces were decommissioned to facilitate the construction of the new Sports, Science & Health building.

The Blanchardstown campus has 528 carparking spaces.

A Universal approach to carpark management has been developed, with some considerations made at specific carparks. From September 2025, managed car parking and permit systems will be in place across all TU Dublin campuses. Paid parking will be introduced and will be in effect 12 months of the year and permits will be available for either a full academic year or a single academic semester. Consultation and an engagement campaign for this new approach to car parking on campus was delivered by Campus & Estates and Sustainability in 2024 providing advanced notice shared to all students and staff.

2.4.3 DISPLAY AN UP-TO- DATE DISPLAY ENERGY CERTIFICATE

Display Energy Certificates

TU Dublin displays up-to-date Display Energy Certificates (DECs) in all campus buildings over 250m² and frequently visited by the public to clearly show energy use. Currently, 18 DECs cover 32 key buildings, representing 90% of the University's total floor area. These include the most publicly accessible and energy-intensive spaces. In summer 2025, all existing DECs will be updated, and individual certificates will be installed where buildings currently share a DEC.

2.4.4 INSTALLATION OF FOSSIL FUEL BOILERS

Procurement and Design Procedures

TU Dublin will update procurement policies, processes, and design specifications ensuring compliance with the requirement that no fossil fuel heating systems are installed from 2023.

2.4.5 PROCUREMENT OF ENERGY-RELATED PRODUCTS, HEATING EQUIPMENT, INDOOR and OUTDOOR LIGHTING

All public tenders for energy-related products, heating equipment, or indoor and outdoor lighting will include a requirement for end-of-life planning. Tenderers must specify environmentally sustainable options for products or their components, including recommendations for reuse, repair, and recycling.

TU Dublin will track the procurement of these products to ensure the relevant tender documentation has set out this requirement and comply with SI 626 of 2016 to procure Triple E registered products or equivalent.

2.4.6 PROCUREMENT OF CLEANING CONTRACTS

All tenders for indoor cleaning services will include a requirement for tenderers to specify the training that will be put in place to ensure that all staff involved in delivery of the contract have the knowledge and skills to apply cleaning methods, which will reduce the environmental impact of the services. TU Dublin will track the procurement of indoor cleaning services to ensure that relevant tender documentation has set out this requirement.

2.4.7 EXISTING BUILDINGS

The Decarbonisation Roadmap scope 1 and 2 emissions illustrated in figure 14, is a graphic tool used to identify TU Dublin building stock and to represent relevant data and activities related to these buildings to reach our decarbonisation targets. It provides a summary and overview of TU Dublin's buildings portfolio as identified in our latest Building Stock Plan Stage 1 including ownership status, and to identify the largest energy users in the portfolio that the public body must address to achieve their energy targets along with the key actions being taken to reduce emissions in

your buildings. It assigns estimated and projected energy use differentiated by type against energy users and producers for all campuses and locations. It reflects the total quantitative impact of strategic activities such as the addition of new buildings, the decanting of existing buildings and the 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 the overall understanding of inter-related programmes of work for enhanced decision making. The estimated carbon consumption figures for 2024 electrical usage, non-electrical usage and combined usage are taken from the SEAI M&R platform for this year's Climate Action Roadmap update.

2.4.8 PROCURE OR LEASE ONLY ZERO EMISSION VEHICLES

TU Dublin processes for vehicle procurement to meet target for purchase of zero emission vehicles where operationally feasible, as well as the minimum targets set out by SI381/2021 Clean Vehicles Directive.

Fleet Conversion

TU Dublin replaced two diesel vans with zero emission vehicles, meeting the minimum targets set out by SI381/2021 Clean Vehicles Directive.

2.4.9. INSTALLATION OF CHARGING INFRASTRUCTURE

TU Dublin's vehicle fleet charging infrastructure is installed and being utilised. Plans to develop campus car and mobility charging infrastructure are in development and subject to commercial charging models to be approved by the University.

2.4.10 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 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 2026. In preparation for this, TU Dublin is reviewing current practices and requirements for travel with 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.

DECARBONISATION ROADMAP SCOPE 1 & 2

SUSTAINABILITY OFFICE @ TU DUBLIN

Consider Grid Decarbonisation? Yes | Contros & Operation Savings: 25% | Medium Retrofit Savings: 45% | Wind Turbines Yes

To Be Divested Buildings | New Builds | Wish List | Proportion of Carbon of Each Building Compared to the Largest | Renewable Energy Systems | Upcoming Construction/ Retrofit | Complete Construction/ Retrofit | Building Remining Lifetime | Building Used Lifetime | Renewable Energy Timelines

PERIODS: Baseline 2016-2018 E: 6,009t NE: 4,053t Total: 10,063t | Current 2023 E: 3,909t NE: 4,992t Total: 8,901t | Carbon Neutral 2030 E: 1,356t NE:1,986t Total: 3,343t | NET ZERO 2050

ID	Building Stock	Built Year	Tenancy	Actual 2023 Floor Area m^2	Actual 2023 Electrical (E) tCO_2e	Estimated 2023 Non-electrical (NE) tCO_2e	Estimated 2023 Combined (E+NE) tCO_2e	Projected 2030 Floor Area m^2	Projected 2030 Electrical (E) tCO_2e	Projected 2030 Non-electrical (NE) tCO_2e	Projected 2030 Combined (E+NE) tCO_2e	Most Recent/Planned Retrofit
	Grangegorman Campus		**Hybrid**	**85,252**	**2,477**	**1,459**	**3,935**	**148,559**	**1,105**	**298**	**1,403**	
LH	Lower House	1814	Owned	4,392	151.41	33.46	184.87	4,392	45.26	8.37	53.62	2020
CT	Clocktower	1816	Leased	1,488	23.35	**45.41**	68.76	1,488	6.98	8.58	15.56	2023
KH	Kirwan House	1830	Owned	172	**2.50**							
	Historical Cluster*:			3,486	120.17	28.02	148.19	3,485	35.92	7.01	42.93	
RD	Rathdown House	1850	Owned	2,314	79.76	23.32	103.08	2,313	23.84	5.83	29.67	2020
SL	St. Laurence's Church	1850	Owned	287	9.89	1.15	11.04	287	2.96	0.29	3.24	2014
GL	Glassmanogue	1850	Owned	374	12.89	1.50	14.39	374	3.85	0.38	4.23	2014
BR	Bradogue	1850	Owned	511	17.63	2.05	19.68	511	5.27	0.51	5.78	2014
OH	Orchard House	1850	Leased	269	9.26	**10.29**	19.55	268	2.77	2.57	5.34	2014
~~CI~~	~~Church of Ireland~~	~~1860~~										~~2025~~
PH	Park House	1972	Owned	9,836	**139.10**	**230.94**	**370.04**	9,836	41.58	0.00	41.58	2020
BM	Broombridge Sports Changing	2000	Owned	440	**6.74**		**6.74**	440	2.01		2.01	2020
BW	Broombridge Warehouse	"1970	Owned	6,200								
EC	Energy Centre 1	2014	Owned	290	10.00	1.16	11.16	290	2.99	0.29	3.28	
HB	Hub 2	2014	Leased	285	9.83		9.83	285	2.94		2.94	
GW	Greenway Hub	2016	Owned	4,270	147.20	51.89	199.09	4,270	24.20	7.13	31.33	
EQ	East Quad	2020	PPP	16,300	561.94	173.69	735.63	16,300	125.98	32.57	158.54	
CQ	Central Quad	2020	PPP	36,044	1,742.61	383.68	2,126.29	36,044	278.57	65.69	444.26	2026
EY	Estates Yard & Store	2021	Owned	850	29.30		29.30	850	8.76		8.76	
PW	Printmaking Workshop	2021	Leased	315	4.94		4.94	315	1.48			
FC	Field Sports Changing & Estates 1	2021	Leased	616	21.24		21.24		6.35			
	Academic Hub	2024	Owned					12,600	74.03	0.00	74.03	
	Design & Construct	2026	Owned					6,000	57.55	14.94	72.49	
	West Quad	2028	Owend					20,730	145.10	0.00	145.10	
	Research Hub 2	2030	Owned					4,500	26.44	0.00	26.44	
	Indoor Sports	2030	Owned					8,150	23.93	0.00	23.93	
	University Accommodation Phase 1 GG	2030	Owned					17,700	169.77	44.07	213.84	
	Sports Changing (Permanent)	2031						616				
	Mid Quad											
	North East Quad											
	University Accommodation											
	District Heating (Geothermal)**											
	PV Solar					**-2.66**	**-2.66**		-13.78		-13.78	
	Battery											
	Bolton Street		**Hybrid**	**41,519**	**452.83**	**695.31**	**1,148.14**	**40,195**	**65.55**	**148.16**	**213.71**	
BL	Bolton Street Main	1911	Owned	26,890	261.95	459.31	721.26	26,890	38.65	7.64	46.30	
CP	81 Capel Street	-	Owned	157	6.84		6.84	157	2.04		2.04	
EB	E Block	-	Owned	1,394	18.03	23.81	41.84	1,394	5.39	23.81	29.20	
LN	Linenhall	1963	Owned	9,921	131.55	162.96	294.51	9,797	21.63	89.63	111.25	2013
~~LHO~~	~~Linenhall Offices~~	~~1963~~	~~Owned~~	~~124~~								
BT	Beresford Street	1950	Owned	1,957	20.84	49.23	70.07	1,957	3.43	27.08	30.50	2014
AV	Aviation Technology Centre	1980	Leased	1,200	13.62		13.62					2020
	PV Solar								-5.59		-5.59	
	Aungier Street		**Owned**	**29,065**	**555.14**	**877.19**	**1,432.33**	**0**				
AU	Aungier Street	1994	Owned	25,842	463.98	809.76	1,273.74					2000
FS	FOCAS	2001	Owned	3,223	91.16	67.43	158.59					2012
	Tallaght Campus		**Hybrid**	**29,478**	**764.16**	**334.77**	**1,098.93**	**28,063**	**155.32**	**192.39**	**331.15**	
TM	Tallaght Main	1992	Owned	15,620	513.92	258.31	772.23	15,620	81.24	142.07	223.31	2030
TS	Synergy CASH	1999	Owned	2,519	82.90	14.04	96.94	2,519	13.63	1.93	15.56	
TU	Tallaght Student Hub	2005	Owned	290	9.54	1.62	11.16	290	2.85	1.62	4.47	
~~TC~~	~~Tallaght Creche~~	~~2009~~	~~Owned~~	~~323~~								
TT	Technical Development Centre (Whitestown)	1996	Leased	1,209	**20.75**	**3.92**	**31.20**					
TP	Premier House	1992	Owned	1,808	**9.35**		**10.10**					2015
TG	Synergy Global	1999	Owned	1,341	**46.70**	**29.67**	**78.91**	1,341	7.68	16.32	24.00	
TA	Airton Close	2000	Leased	3,179	55.38		55.38		16.55			2020
TZ	Priorsgate Apt		Leased	95								
TH	Tallaght Sports, Science & Health	2023	Owned	3,093	**25.62**	27.21	52.83	3,093		27.21	27.21	
	Tallaght North	2025	PPP					5,200	49.88	3.24	53.11	
	District Heating (Data Centre + Heatpump)	2023										

Figure 14: Decarbonisation Roadmap as of September 2024 - continued overleaf

DECARBONISATION ROADMAP SCOPE 1 & 2

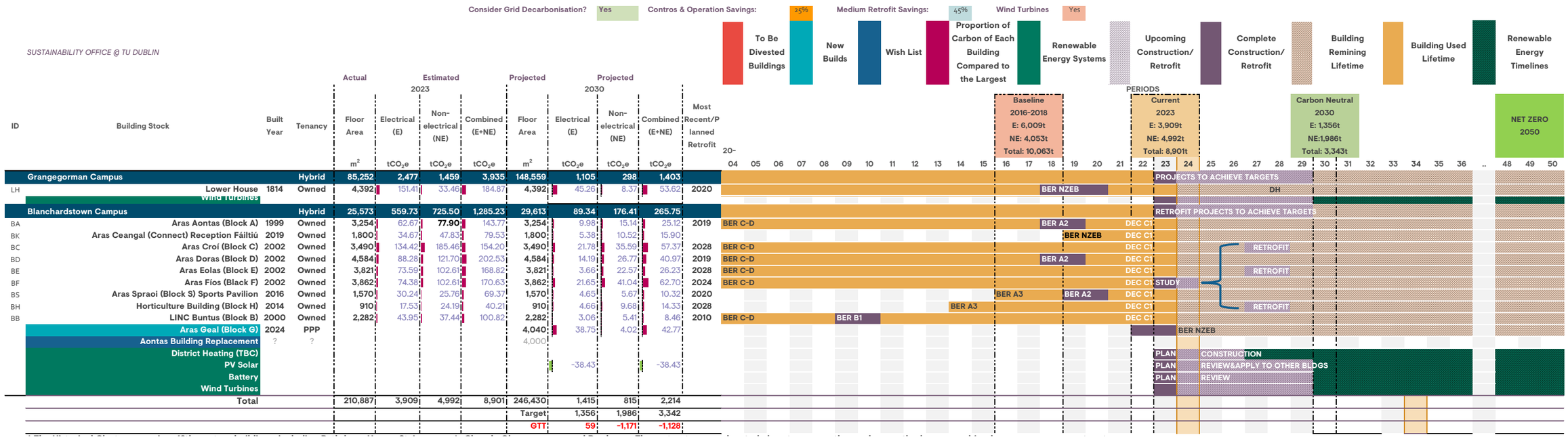


Figure 14 (continued): Decarbonisation Roadmap as of September 2024

* 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 TU Dublin Energy Consumption Platform (Energy Elephant) provides MPRN and GPRN readings for 2023. 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.

*** From September 2024, PV-generation estimates are allocated to each building rather than at the campus level. (For some buildings that show a green bar in 2030, the PV-generation estimate exceeds their energy consumption.)

2.5 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.

3 CONCLUSION

From the baseline analysis provided in section 2.1.1a 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. In 2023, energy related carbon emissions dropped by 19% due largely to participation in the sustainable district heating system in Tallaght and improvements in control and operations coupled with medium retrofitting measures. In 2024 energy related carbon emissions increased by 59 tCO_2e or 1%. TU Dublin continues to pursue renewable on-site and community networked energy solutions.

The additional operational energy loads and embodied carbon from buildings that are planned or under construction anticipate achieving sustained reductions in total emissions over the coming years will be highly challenging. This is despite planned cross-campus deep retrofit programmes and the intensified use of existing buildings across campuses. Our current carbon emission target, without additionality and assuming continued reductions in energy use and increases in energy efficiency, is currently projected at 3,281 tCO_2 from our 2016-2018 baseline of 10,086 tCO_2. With the expectation that the electricity grid will decarbonise by 77% by 2030, TU Dublin's nonelectrical emissions target is estimated as 1,994 tCO_2. 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 in section 2.1.1.j–m detailing our New Builds Programme and our Sustainable Campus Programme.

As set out earlier, the retrofitting of existing buildings to sufficient standards to achieve our energy efficiency improvement targets to 2030 will require significant financial investment. An estimated €550 million is required for the complete infrastructure investment programme to achieve 2030 targets. This includes a new buildings, programme estimated at approximately €446 million inclusive of unitary charges to 2030. The Sustainable Campus programme is estimated at €94 million and €10 million is required in human resources to enable that work. This total excludes further investment required to deep retrofit remaining building stock to reach University ambitions to reach full decarbonisation across scope 1 and 2 emissions for 2040 and the Government's target to reach Net Zero by 2050.

To more accurately quantify the detailed scope of works and associated costs for all retrofit and new buildings updates will require further feasibility assessments of both retrofit requirements and energy sources to ensure 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 as part of 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.

3.1 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_2 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.

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. This 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 and future generations.

Appendix 1

Capital Sub Portfolio Programmes Key Data Indicators

New Builds programme to 2030 (NB)						Estimated Project Budget			Funding Sources %			Timeline to 2030							Notes
Predicted Emissions	Buildings Affected	Carbon % Addition per annum	Carbon (tCO2) Addition per annum	EnPI Addition per annum (kWh per student)	Total Consumption (kWh) Addition per annum	from	to	Note	TU Dublin Own	Public	Private	24	25	26	27	28	29	30	Project resource Notes
	- East Quad						-	**UC to 2030**	**42**	**58**									Required agreed University Unitary Charge to 2046. Project is completed and occupied.
	- Central Quad					**56,000,000**	**56,000,000**	**UC to 2030**	**42**	**58**									Required agreed University Unitary Charge to 2046. Project is completed and occupied.
	- Academic Hub		60	28	756,000	**90,000,000**	**100,000,000**		**100**										Project is nearing completion and due to be operational by
	- West Quad		119	56	1,481,838	**130,000,000**	**150,000,000**		**100**										Project is developed to design stage
	- Tallaght North - built but remain in programme for this year		47	22	592,858		-	**Investment expended.**	**100**										Project is completed, occupied since Q4 2024 and in its commissioning period.
	- Aras Geal (Block G) - built but remain in programme for this year		37	17	460,605		-	**Investment expended.**	**100**										Project is completed, occupied since Q2 2025 and in its commissioning period.
	- University Accommodation Phase 1 GG - new build		156	73	1,949,050	**120,000,000**	**140,000,000**												Project is at early inception stage
	New Builds Sub total		**419**	**197**	**5,240,350**	**396,000,000**	**446,000,000**												

Sustainable Campus Programme						Estimated Project Budget			Funding Sources %			Timeline to 2030							Notes
Repurpose Retrofit Sub-programme																			
Repurpose Retrofit Project (RRP)																			
Demand Reduction	Buildings Affected	Carbon % Saving per annum	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	24	25	26	27	28	29	30	Project resource Notes
Apprenticeship Expansion Project						**6,000,000**	**8,000,000**			**100**									HEA Grant applied. Campus & Estates Project Manager FTE to be calculated Make up of project team and a calculation of their time in
Design & Construct Ph1	- Broombridge Warehouse Study		**72**	**52**	**780,027**	**20,000,000**	**25,000,000**			**73**	**27**								No capital own-resources committed Ongoing staff
	Sub total		**72**	**52**	**780,027**	**26,000,000**	**33,000,000**			**80**	**20**								
Space Management Projects (SMP)																			
Demand Reduction	Buildings Affected	Carbon % Saving per annum	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	24	25	26	27	28	29	30	Project resource Notes
1. Space Optimisation	- all buildings					**2,000,000**	**8,000,000**		**100**										Requires staffing commitment to manage migration
	- Bolton street consolidation																		
2. Leased Buildings	- Airton Close (25-year lease)	-10%	-5	-1	-20,104	**20,000**	**20,000**		**100**										Requires Time contribution of Property Manage
	Sub total		**-5**	**-1**	**-20,104**														
3. Buildings decanting	- Aungier Steet	-100%	-1,095	-239	-4,950,090	**800,000**	**1,200,000**												
	- FOCAS decant depends on study	-100%	-142	-33	-609,666				**100**										Requires staffing commitment to manage migration
	- Premier House decant depends on study	-100%	-18	-4	-76,263														
	- TDC (Whitestown) (Vacate 2026)	-100%	-20	-5	-80,787														
	- E Block decant depends on study	-100%	-23	-5	-111,138														
	- Capel Street - decant depends on study	-100%	-2	0	-5,735														
	- Kirwan House decant depends on study	-100%	0	0	-729														
		-100%	-8	-2	-32,448														
	- Tallaght Student Hub decant depends on study																		
	Sub total		**-1,309**	**-289**	**-5,866,856**														
	Total		**-1,315**	**-289**	**-5,886,960**	**2,820,000**	**9,220,000**		**100**										

Deep Retrofit Programme (DRP)

Demand Reduction	Buildings Affected		Carbon % Saving per annum	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	24 25 26 27 28 29 30	Project resource Notes
1. Aras Fios Deep Fabric Retrofit Pilot	- Aras Fios (Block F)			-121	-26	-547,686	10,000,000	15,000,000			100			Fabric Upgrades and M&E upgrades
		Sub total		**-121**	**-26**	**-547,686**								
2. Bolton St/Linenall deep Retrofit Study	- Bolton Street Main		Reduce to 0	0	0	0	50,000	100,000		100			Study & Plan	
	- Linenhall		Reduce to 0	0	0	0								
3. Tallaght Main Deep Retrofit Study	- Tallaght Main		Reduce to 0	0	0	0	50,000	100,000		100			Study & Plan	
		Sub total		**0**	**0**	**0**								
		Total		**-121**	**-26**	**-547,686**	10,100,000	15,200,000			100			

Control & Operations Optimisation (COO)

Demand Reduction	Buildings Affected		Carbon % Saving between 2023 and 2030	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	24 25 26 27 28 29 30	Project resource Notes
1. PPP Buildings performance improvements	- Central Quad		25%	-225	-57	-850,992	50,000	100,000		100			Optimisation	Requires time commitment from Property Manager
	- East Quad		23%Elec/25%Gas	-176	-41	-748,349								
	- Tallaght Sports Science and Health		25%	-12	-4	-74,876								
	- Tallaght North		25%	-12	-6	-148,214								
	- Aras Geal (Block G)		25%	-9	-4	-115,151								
		Sub total		**-435**	**-111**	**-1,937,582**								
	- All buildings (except those covered by EPCs)						4,000,000	4,500,000		100			Maintenance Schedule	
2. Minor works upgrades	- Rathdown House													
	- St Laurence's Church													
(list all the buildings that needs heat pumps)	- Glassmanogue													
	- Greenway Hub													
	- Printmaking Workshop		**HP**											
	- Park House		**HP- 2050**											
	- Broombridge		**HP- 2050**											
	- Broombridge Sports Changing		**HP- 2050**											
	- Bolton Street		**HP- 2050**											
	- Linenhall		**HP- 2050**											
	- Beresford Street		**HP- 2050**											
	- Technical Development Centre													
		Sub total		**0**	**0**	**0**								
		Total		**-435**	**-111**	**-1,937,582**	4,050,000	4,600,000		100				

Medium Retrofit Projects (MRP)

Demand Reduction	Buildings Affected	Carbon % Saving between 2023 and 2030	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	24 25 26 27 28 29 30	Project resource Notes
1. Tallaght Campus-													
Medium Retrofit EPC	- Tallaght Main	45%	-288	-90	-1,836,436	**760,000**	**1,010,000**				**100**	**Shallow Retrofit & Optimisation**	ringfenced. Requires Capital PM and Operational Manager with CMVP expertise.
	- Synergy CASH		-33	-8	-126,882								- M&E, HVAC Upgrades, smart infrastucture
	- Synergy Global		-29	-7	-124,122								
	- Premier House												
	Sub total		**-350**	**-105**	**-2,087,439**								
2. City & Grangegorman-													
Medium Retrofit EPC	- Bolton Street Main		-277	-61	-1,249,202	**950,000**	**1,030,000**				**100**	**Shallow Retrofit & Optimisation**	ringfenced. Requires Capital PM and Operational Manger with CMVP expertise.
	- Greenway Hub		-126	-28	-555,044								- M&E, HVAC Upgrades, Smart Infrastructure
	- Beresford Street		-26	-6	-121,414								
	- Linenhall		-127	-28	-564,731								
	- Clocktower- transfer ownership		-25	-6	-113,363								
	Sub total		**-581**	**-128**	**-2,603,753**								
3. Blanchardstown-													
Medium Retrofit EPC	- Aras Aontas (Block A)		-44	-10	-191,362	**800,000**	**875,000**				**100**	**Shallow Retrofit & Optimisation**	ringfenced. Requires Capital PM and Operational Manger with CMVP expertise.
	- Aras Ceangal (Connect) Reception		-36	-8	-164,663								- M&E, HVAC Upgrades, Smart Infrastructure
	- Aras Croí (Block C)		-70	-15	-319,264								
	- Aras Doras (Block D)		-92	-20	-419,342								
	- Aras Eolas (Block E)		-77	-17	-349,543								
	- Aras Spraoi (Block S) Sports Pavilion		-20	-5	-88,871								
	- LINC Buntus (Block B)		-30	-7	-129,174								
	Sub total		**-370**	**-81**	**-1,662,219**								
4. External lighting upgrades (Car park lighting)	- 3 campuses - Blanchardstown, Tallaght, Grangegorman - included above					**0**	**50,000**				**100**		
	Total		**-1,302**	**-315**	**-6,353,411**	**2,510,000**	**2,965,000**				**100**		

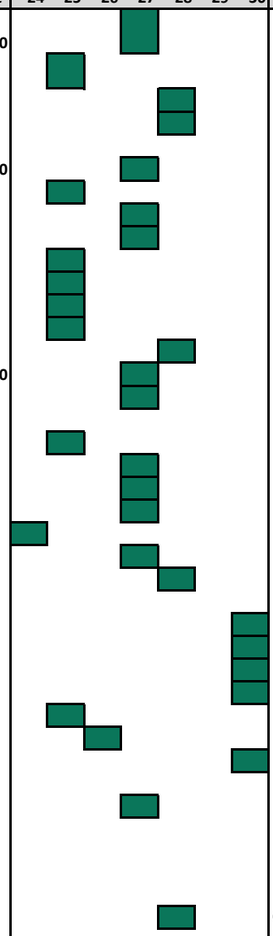
Energy Sub-programme — Estimated Project Budget — Funding — Timeline to 2030 — Notes

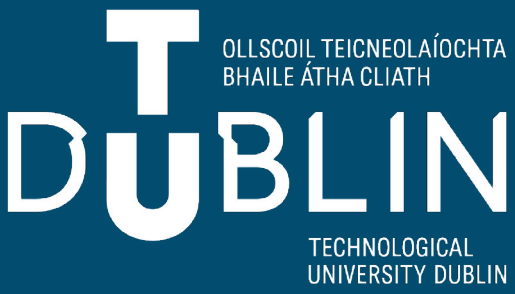
Renewable Thermal Energy Projects (RTEP)

Clean Supply	Buildings Affected	Carbon % Saving per annum	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	24 25 26 27 28 29 30	Project resource Notes
1. Decarb **DH Tallaght**													
1a.Surface Infrastructure	List of buildings on system					**450,000**	**500,000**			**100**			Requires capital PM and operational manager with DH expertise
Expansion	- Synergy CASH		-2	0									
	Sub total		**-2**	**0**	**0**								
2.Decarb **DH**													
Blanchardstown						**4,000,000**	**5,000,000**			**49**	**51**		Relies on the overall FCC Blanchardstown DH system implentation by 2030 . Will require TU Dublin to enter into a Heat Supply Agreement similar to Tallaght DH scheme. Requires Capital PM and Operational manager with DH expertise
	Ph 1 - Aras Aontas (Block A)		-17	-1									
	Ph 1 - Aras Ceangal (Connect) Reception Failtiu		-19	-1									
	Ph 1 - Aras Croí (Block C)		-36	-1									
	Ph 1 - Aras Doras (Block D)		-47	-1									
	Ph 1 - Aras Fios (Block F)		-22	-1									
	Ph 1 - Aras Eolas (Block E)		-39	-1									
	Ph 1 - Aras Geal (Block G)		0	0									
	Ph 2 - Aras Spraoi (Block S) Sports Pavilion		-8	0									
	Ph 2 - LINC Buntus (Block B)		-11	0									
	Ph 2 - Horticulture Building (Block H)		-17	-1									
	Sub total		**-216**	**-6**	**0**								
3. Decarb **DH Project**						**17,000,000**	**20,000,000**			**49**	**51**		Similar to Tallaght DH Scheme. Requires capital PM and operational manager with DH expertise.
Grangegorman	- Central Quad		-663	-20									
	- Lower House		-40	-1									
	- East Quad		-136	-4									
	- Clocktower		-12	0									
	- Greenway Hub		-54	-2									
	- Academic Hub		0	0									
	- West Quad		0	0									
	- Rathdown House		-25	-1									
	- St. Laurence's Church		-3	0									
	- Glassmanogue		-3	0									
	- Bradogue		-5	0									
	- Orchard House		-6	0									
	- Energy Centre 1		-3	0									
	- Hub 2		0	0									
	Sub total		**-950**	**-29**	**0**								
	Total		**-1,168**	**-35**	**0**	**21,450,000**	**25,500,000**			**49**	**51**		

Renewable Electrical Projects (REP)

Clean Supply	Buildings Affected	Carbon % Saving per annum	Carbon (tCO2) Saving per annum	EnPI Saving per annum (kWh per student)	Total Consumption (kWh) Saving per annum	from	to	Note	TU Dublin Own	Public	Private	Project resource Notes
1. Tallaght Campus Rooftop PV Solar Retrofits	-Tallaght Main		0.00	0.00	0	**218,500**	**280,000**				**100**	Financing options to be explored. Capital PM required
- Phase I	-Synergy CASH		-0.28	-0.07	-1,045							
Phase II	-Premier House		0.00	0.00	0							
	-Synergy Global		-28.85	-7.30	-109,000							
Phase III	-Tallaght Student Hub - Divesting		0.00	0.00	0							
2. Blanchardstown Campus Rooftop PV Solar Retrofits - Phase I	-Aras Aontas (Block A)		0.00	0.00	0	**1,100,000**	**1,275,500**				**100**	Financing options to be explored. Capital PM required
	-Aras Croí (Block C)		-86.27	-21.83	-326,000							
	-Aras Doras (Block D)		0.00	0.00	0							
	-Aras Eolas (Block E)		-37.31	-9.44	-141,000							
	-Aras Fíos (Black F)		-35.99	-9.11	-136,000							
	-LINC Buntus (Block B)		-19.49	-4.93	-73,666							
Phase II	-Aras Ceangal (Connect) Reception		-5.87	-1.48	-22,163							
	-Aras Spraoi (Block S) Sports Pavilion		-8.00	-2.02	-30,218							
	-Horticulture Building (Block H)		0.00	0.00	0							
	-Lower House		0.00	0.00	0	**1,010,000**	**1,101,700**				**100**	Financing options to be explored. Capital PM required
3. Grangegorman and City Campus Rooftop PV Solar Retrofits - Phase I	-Rathdown House		0.00	0.00	0							
	-Park House		-4.25	-1.08	-16,052							
	-Broombridge Warehouse- part of D+C											
	-Greenway Hub		-2.62	-0.66	-9,907							
	-East Quad- PPP		0.00	0.00	0							
	-Central Quad- PPP		0.00	0.00	0							
	-Printmaking Workshop	-7.66	0.00	0.00	0							
	-West Quad- PPP- part of new build		0.00	0.00	0							
Phase II	-Clocktower		0.00	0.00	0							
	-Estates Yard & Store		0.00	0.00	0							
Phase III	-St. Laurence's Church		0.00	0.00	0							
	-Glassmanogue		0.00	0.00	0							
	-Bradogue		0.00	0.00	0							
	-Orchard House		0.00	0.00	0							
	-Broombridge Sports Changing		-217.00	-54.92	-820,000							
	-Energy Centre 1		-7.61	-1.93	-28,775							
	-Hub 2		0.00	0.00	0							
	-Field Sports Changing & Estates 1- Divesting		0.00	0.00	0							
Campus PV Bolton -	-Bolton Street Main-		0.00	0.00	0							
Phase I	-Linenhall		0.00	0.00	0							
Phase II	-E Block- Divesting		0.00	0.00	0							
	-Capel Street- Divesting		0.00	0.00	0							
	-Beresford Street		0.00	0.00	0							
4. Energy Storage Feasibility Study	all campuses											Options to be explored
	Sub total		**-454**	**-115**	**-1,713,826**							
	Total		**-454**	**-115**	**-1,713,826**	**2,328,500**	**2,657,200**				**100**	
	Sustainable Campus Programme Total		**-4,722**	**-840**	**-15,659,438**	**69,258,500**	**93,142,200**					

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