

# Climate Action Roadmap Delivery

Delivering on our 2030  
Carbon Emission Targets





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# Executive Summary

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## Leading by example

Under the Climate Action Plan, the public sector has been tasked with “Leading by Example” and achieving an absolute emissions reduction of 51% by 2030.

The eight university members of the Irish Universities Association (IUA) collectively are the 4th largest emitter of greenhouse gases (GHG) in the Irish public sector and the 2nd largest emitter if commercial state bodies are omitted.

As reported in the 2023 Annual Report on Public Sector Energy Performance, the eight universities emissions in 2022 came to 101,954 tCO<sub>2</sub>. This amounts to almost four fifths of all emissions from the 34 public bodies under the aegis of the Department of Further & Higher Education, Research, Innovation and Science departmental grouping.

The member universities of the IUA are committed to delivering on their Climate Action responsibilities and to taking a leadership role in driving Climate Action.

## Campus concentration creates unique opportunity

Unlike other significant public sector emitters, university buildings tend to be clustered within campuses, with a range of built and social infrastructure facilities including offices, classrooms, laboratories, car parking and commuter facilities, residential accommodation, catering and retail outlets, heritage buildings, sports facilities, assembly halls, and a range of outdoor spaces.

With each campus under the control of a single organisation we have a unique opportunity to demonstrate leadership and achieve tangible results in the period to 2030 in the most effective and efficient way.

The campus environment together with established connections with local communities provides opportunities for solutions that are scalable.





**The member universities of the IUA are committed to delivering on their Climate Action responsibilities and to taking a leadership role in driving Climate Action.**

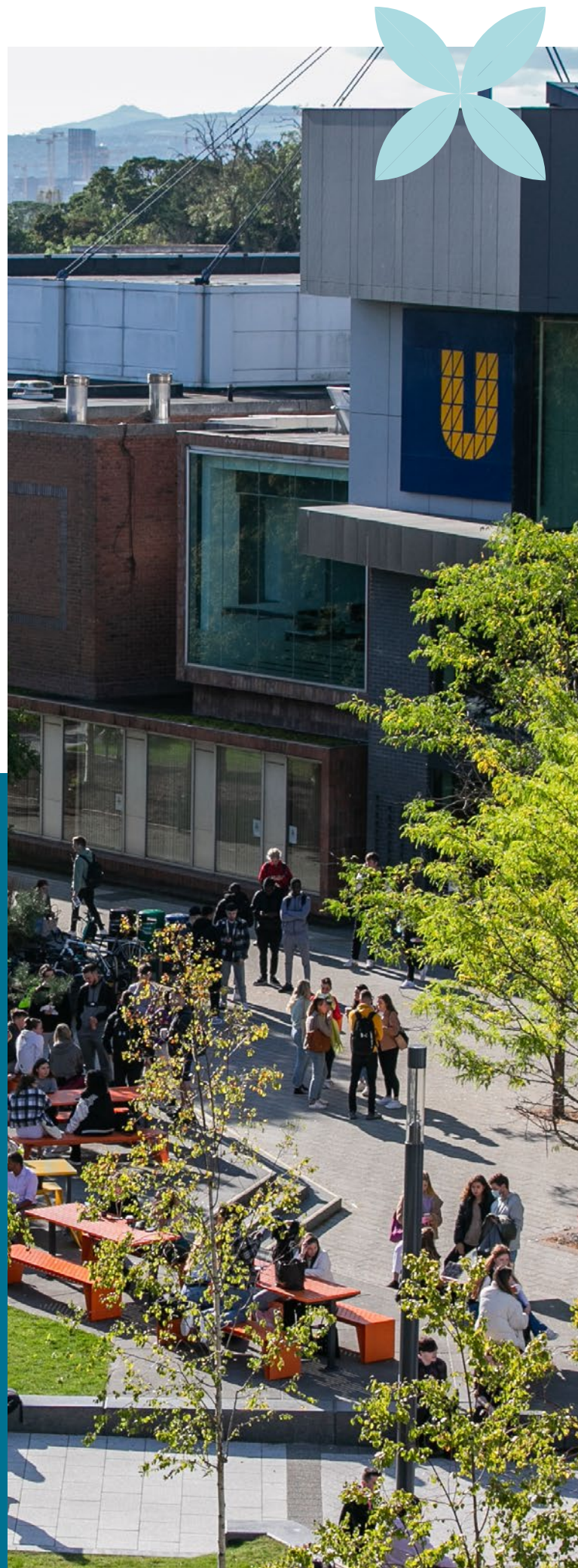


# We can deliver 61% emissions reduction by 2030

With their extensive experience and record of managing large and complex estates, the University campus buildings and estates teams excel in the measurement and verification of energy data and the delivery of complex capital projects.

Through the IUA universities' Climate Action Roadmaps, a detailed analysis has identified the opportunity to reduce our GHG emissions by c.71,000 tCO<sub>2</sub>, a reduction of c. 61% on 2022 baseline emissions, by 2030 through:

- Enhanced building controls and operations to deliver a reduction of 4,166 tCO<sub>2</sub>
- Medium and deep building retrofits to deliver a reduction of 9,226 tCO<sub>2</sub>
- The installation of heat pumps to deliver a reduction of 12,457 tCO<sub>2</sub>
- On-campus renewable thermal heat sources to deliver a reduction of 3,334 tCO<sub>2</sub>
- The installation of on-campus electrical power generation to deliver a reduction of 1,022 tCO<sub>2</sub>
- Taking into account c. 40,352 tCO<sub>2</sub> from the greening of the national electricity grid





## Need for Partnership and funding...

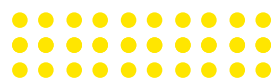
The scale of the challenge in delivering on our collective climate targets and achieving full net zero reduction targets from 2030 to 2050 for IUA universities **is projected to cost upwards of €2.5 billion**<sup>1</sup>. Costs estimated to achieve the shorter-term targeted emissions reductions between now and 2030 in the first instance are **estimated at €475 million**. IUA universities simply do not have the financial capacity to deliver a programme of investment of this scale to successfully achieve the 2030 targets.

**Delivering on this opportunity therefore requires an equally ambitious multi-annual sectoral partnership and funding from Government over a 5-year period.** The IUA is therefore calling for:

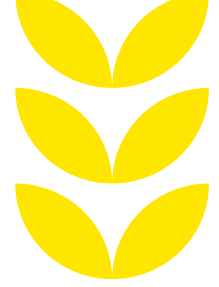
- A Higher Education **decarbonisation major project fund of €275m** for IUA universities
- A **targeted decarbonisation investment programme of €100m** for IUA universities in key areas of focus including renewable electrical energy generation, renewable thermal generation/district heating schemes, digital transformation of the built environment, design and planning of post 2030 deep retrofit projects.
- A new specific **devolved grant of €20m per annum over the 5-year period to 2030** for IUA universities **for sustainability related minor works.**

The costs, estimated carbon reductions and related funding requirements outlined in this paper are reflective of the portfolio of initiatives identified by IUA member universities only. These would have to be scaled up accordingly to be reflective of the costs and funding requirements of the broader Higher Education sector.

Given existing funding challenges facing IUA member universities and the urgent need for investment to support the core research and education missions of universities, there is no capacity within our universities to secure matched funding or loan finance for this decarbonisation programme. **It is, therefore, essential that this specially designated fund is provided for, as part of central government's National Climate Action Programme.**



<sup>1</sup> Projected values estimate based on portion of IUA members of total HE/FE figures as considered by the National Public Sector WG, Heat & Built Environment Taskgroup 2024.



# 1.0

# Ireland's Climate Action in Context

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Climate change and sustainability, by any measure, are the greatest challenges for this and future generations to address. The impact of climate change is increasingly widespread, rapid and intensifying, with 2023 recorded as the hottest year on record worldwide, amidst an alarming increase in extreme weather events.

Ireland is legally bound to achieve carbon neutrality by 2050 and to stay within three sequential carbon budgets between 2021 and 2035 (see Fig 1.). Under the Climate Action Plan, the public sector has been tasked with “Leading by Example” and achieving an absolute emissions reduction of 51%.

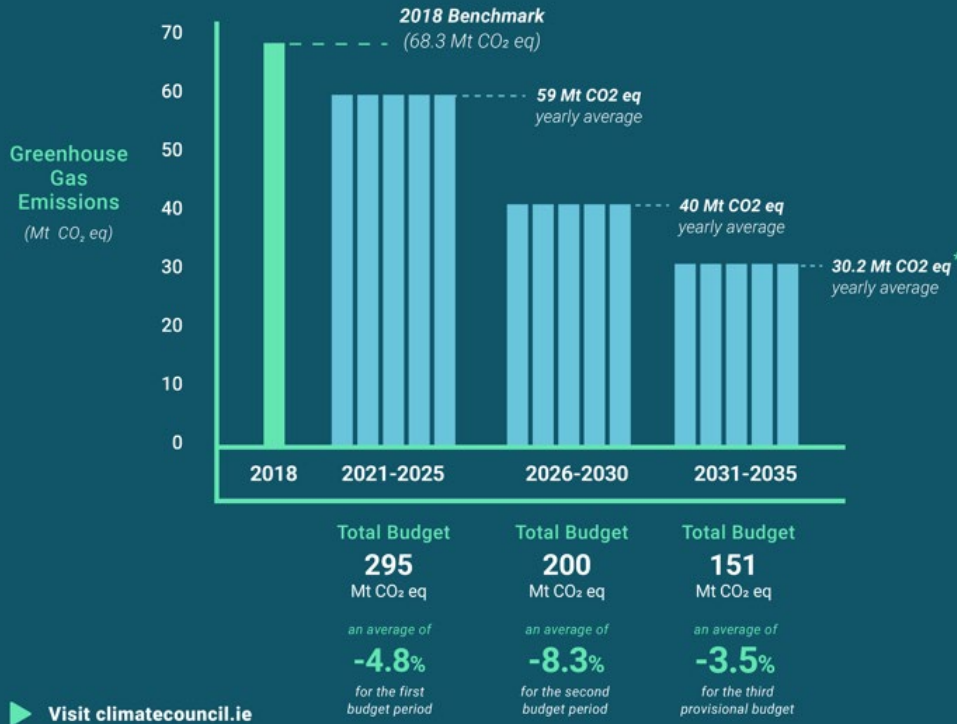




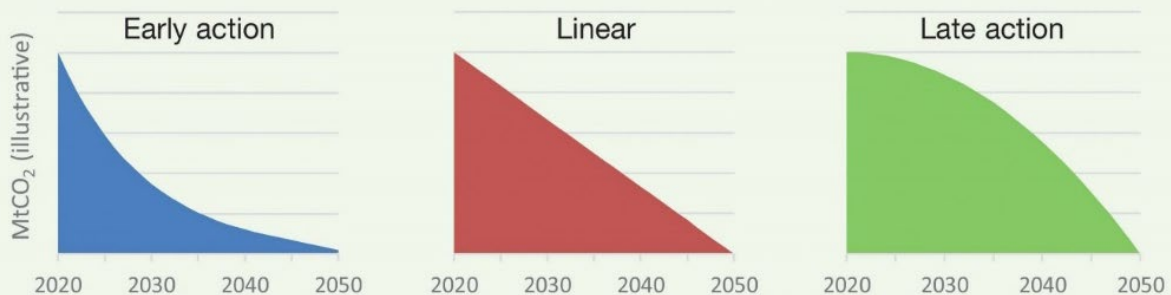


# Carbon Budgets

In the Context of: **2018 Benchmark**



**Fig 1.** Ireland's Carbon Budgets (Climate Change Advisory Council Ireland, Oct 2023)



Each pathway above reaches the same 2050 goal of net-zero CO<sub>2</sub> emissions, but in the late action pathway, cumulative emissions are double that of the early action pathway, leading to double the warming impact

**Fig 2.** Impacts of pathways to overall cumulative emissions. (Climate Change Advisory Council's carbon budgets MaREI discussion paper, Oct 2021) Referenced on the following page.



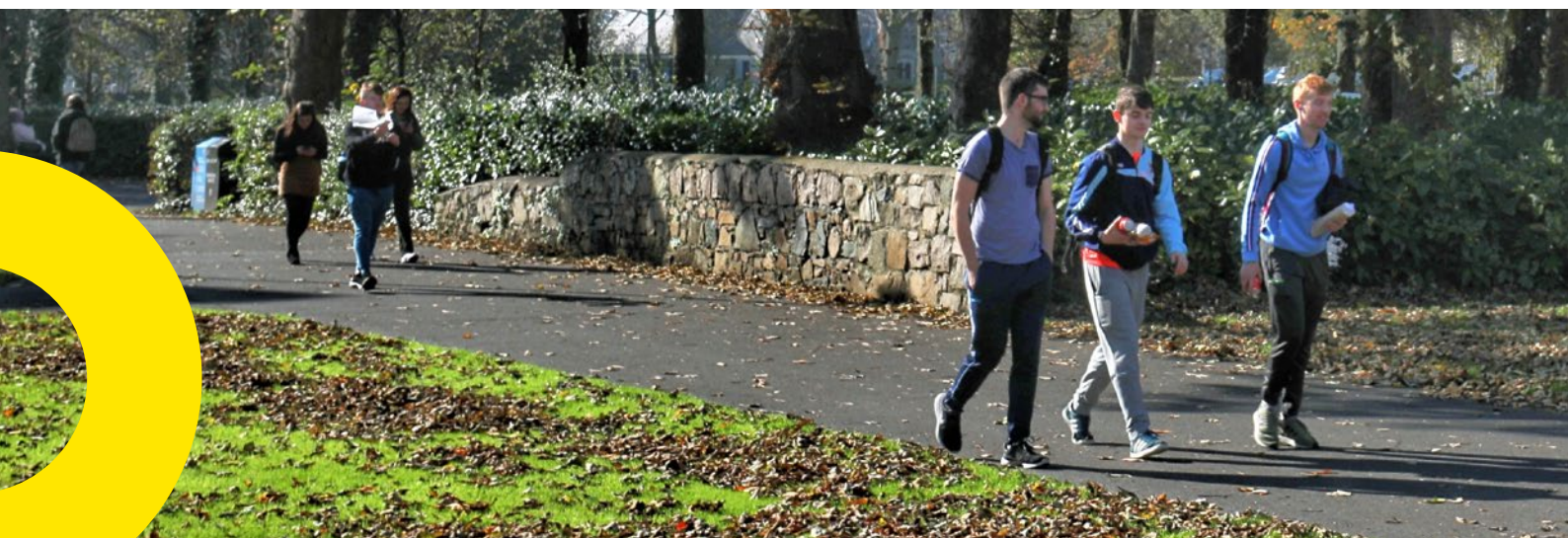
In the absence of strict carbon budgets beyond the 2035 timeframe, it is essential to remember that it is the cumulative emissions that matter in terms of warming and the real-world impact of climate change (See Fig 2.). Additionally, the European Commission has recommended that the EU adopts a target of cutting greenhouse gases (GHG) by 90% by 2040 based on 1990 levels, which would require eliminating fossil fuels in ground transport and buildings. From an investment perspective, realised benefits from €/tCO<sub>2</sub> abated by acting early through increased investment will have greater medium- and long-term impact for public assets to generate energy and carbon related savings.

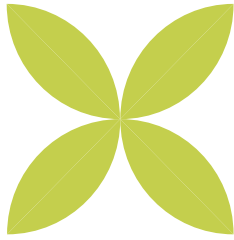
Within this context, as IUA Universities situated within a wealthy country in global terms, we have a moral and legal imperative to act and lead by way of example to address climate change. Therefore, it is critical that the legally binding targets for greenhouse gas emission reductions set nationally for 2030 and 2050 are met by IUA Universities. On the current trajectory, **it is highly unlikely that Ireland will meet the 2030 target** of 51% GHG reduction **without significant upscaling, up-skilling, and rapid acceleration of investment and associated policy measures directed towards implemented climate action.**

There are significant fiscal risks for Ireland associated with failing to meet its climate targets. Recent estimates suggest that based on current plans the cumulative cost of non-compliance by 2030 could be up to €3.5 billion and approximately €0.7 billion p.a. by 2030.<sup>2</sup> Early investment in decarbonisation measures will be far more cost-effective use of public funding. This is likely to be further compounded by the potential reputational damage to Ireland and its related implications for attracting inward investment and talent. The impact of such reputational damage will be particularly far reaching for the university sector.

The necessary technologies are all readily available; the cost of undertaking this work will increase exponentially the longer it is delayed, and the programmes of work to 2030 are known and quantified. **It is therefore essential that we act now.**

<sup>2</sup> What climate change means for Ireland's public finances' report by Irish Fiscal Advisory Council, October 2023.





# 2.0

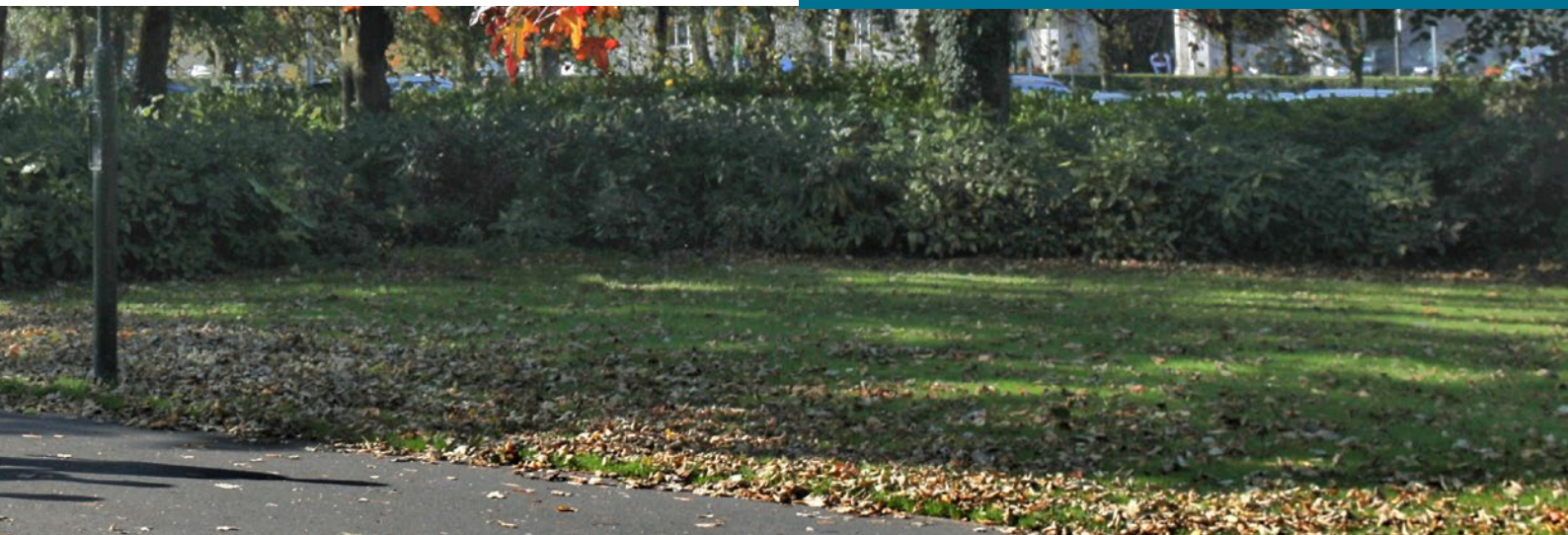
## IUA Universities Respond

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The eight university members of the Irish Universities Association (IUA) collectively are the 4th largest emitter of GHG in the Irish public sector, with emissions in 2022 of 101,954 tCO<sub>2</sub>, as reported in the 2023 Annual Report on Public Sector Energy Performance. The eight universities collectively account for approximately 79% of the 129.9 ktCO<sub>2</sub> GHGs attributed to the Further & Higher Education, Research, Innovation and Science departmental group for the 34 public bodies it represents. It is worth noting that other significant public sector emitters tend to be far more distributed geographically than universities, whose buildings tend to be clustered within campuses and which therefore provide a unique opportunity to act as kick-starters for systems-based solution innovations which have the potential to extend to wider communities.

The scale of the IUA members impact to deliver on climate actions are nationally significant. IUA members have direct control and influence across:

- More than 750 buildings (from heritage to modern) with a total gross internal area of more than 2.0 million square meters
- Total campus estates areas of approximately 1,000 hectares
- Student population of over 170,000 (figures from 2022/23 academic year)
- Staff population of over 21,400 FTE's or more than 30,000 people

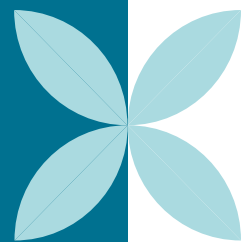


The collective staff and student population in the IUA universities is broadly equivalent to the population of Limerick city and county. The university campuses are in themselves a microcosm of Irish society with a range of built and social infrastructure facilities including offices, classrooms, teaching and research laboratories, car parking and commuter facilities, residential accommodation, catering and retail outlets, heritage buildings, sports facilities, assembly halls, and a range of outdoor spaces, but with the unique characteristic of being under the control of single organisations whose communities are naturally multi-cultural and inter-generational.

From the perspective of implementing Climate Action, the potential reach and sphere of influence of the university sector, through undergraduate and postgraduate education and research, is unparalleled in the State in terms of scale for regional impact and ability to demonstrate national progress. Working in coordination, IUA Universities can provide a strategic approach to GHG reduction, utilising the existing internal capital project management capability, to deliver real climate action impact at scale and pace. Universities by their nature are fundamentally driven by the creation, testing, and dissemination of new knowledge. Universities promote cultures of curiosity, critical thought, and innovation where we are committed to sharing best practices, experience, and learnings from our climate action journeys for the wider public and private sectors in Ireland and beyond.

Through the compilation of the IUA universities' Climate Action Roadmaps a detailed study has identified key solutions and steps to reduce their GHG emissions by c.71,000 tCO<sub>2</sub> by 2030 which include:

- 4,166 tCO<sub>2</sub> from enhanced building **controls and operations**
- 9,226 tCO<sub>2</sub> from medium and deep **building retrofits**
- 12,457 tCO<sub>2</sub> through the installation of **heat pumps**
- 3,334 tCO<sub>2</sub> from on-campus **renewable thermal** heat sources
- 1,022 tCO<sub>2</sub> from the installation of on-campus **electrical power generation**
- Taking into account c. 40,352 tCO<sub>2</sub> from the **greening of the national electricity grid**



The ambition resides within the IUA universities, but to deliver on our responsibilities we require an equally ambitious multi-annual sectoral partnership approach from Government, rather than the current standalone intermittent competitive grant application processes that have dominated to date, to deliver meaningful GHG reductions over the period 2025-2030, and successfully achieve the first milestone to national Climate Action targets for 2030.



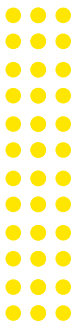
# 3.0

## A Unique Sectoral Opportunity for Impact

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The Irish university sector is strategically positioned to create socio-economic value for government from investment in decarbonisation initiatives. Beyond merely enhancing public assets, investment will leverage the unique ecosystem of education, research, innovation, and community engagement inherent in our universities, enabling citizen engagement to accelerate national sustainability efforts to catalyse sector-wide innovations and strengthen community cohesion. As microcosms of society, universities are demonstrating sustainable practices and deploying green technologies in politically and financially controlled environments, making them **observable and scalable models for broader adoption across the public sector and society** more generally. Investing in university capital infrastructures will provide ‘live’ teaching resources, enabling students to learn from real-world on-campus applications. With a wealth of internal expertise and a strong culture of collaboration, universities can drive innovation through public infrastructure.





**Universities are Living Labs for Open Innovation ecosystems**, where academic research and student learning meet operational challenges, fostering real-world solutions vital for societal transformation. These “living labs” facilitate the testing, development, and refinement of sustainable technologies and practices in real-life settings, enhancing the applicability and impact of research findings. With their **extensive experience and a proven track record** of managing large and complex estates, the University campus buildings and estates teams excel in the measurement and verification of energy data. They adopt strategic partnerships with academic researchers to transition campus estates practices from traditional asset monitoring and reporting systems of energy data to advanced, integrated approaches that also encompasses carbon emissions tracking.

By translating this energy data into accessible public platforms and digital dashboards, Universities can communicate impacts to campus users and ensure rapid conversion of raw data into actionable insights, promoting informed decision-making and effective progress across campuses.

Universities can **identify and mobilise large programmes of work for collective impact** to provide a sectoral pipeline of projects, aggregated by technology such as heat pumps, solar PV, battery installations, and fabric upgrades and by contracting typology: Energy Performance Contracting, Power Purchase Agreements, etc. This strategic approach enables a coordinated, and efficient rollout of sustainable energy solutions across the sector through aggregated scale to provide value for investment. Campuses with multiple buildings can be connected through networks to sustainable energy sources, thereby harnessing the shared infrastructure solutions such as district heating. Campuses as connected systems set the standard for governance, establish parameters for community participation, support growth planning, and provide proof for expanding the business case for future development.



With a collective footprint across multiple campuses, the university sector can **demonstrate climate action at scale**. The IUA universities are prepared and ready to leverage investment in decarbonisation to position Ireland as a leader in climate action and higher education. **This plan details the prioritised projects, timelines, and costs to deliver on that vision.**

### 3.1 Immediate Focus on delivering against Scope 1 and 2 requirements under CARs

Given the imperative to act quickly on decarbonisation as set out above, IUA universities have focussed efforts in the first instance on the delivery of scope 1 and 2 requirements under Climate Action Roadmaps. Addressing scope 1 and scope 2 requirements provides an opportunity to deliver tangible reductions in GHG emissions, aligns with the government's focus on energy related emissions reductions and has therefore been identified as the initial priority area of focus.

This prioritisation recognises that:

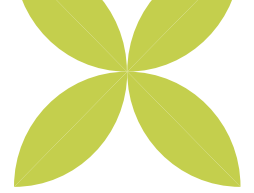
1. There are mandated requirements with regard to scope 1 and 2 emission reductions;
2. As significant emitters there is potential for significant impact in terms of GHG emissions;
3. Scope 1 and 2 are areas which are more readily within the direct control of universities;
4. Requirements are well understood with plans in place and opportunities for collaboration;
5. The programmes are deliverable and achievable with appropriate funding support and financing.

### 3.2 Mapped high level delivery plan to 2030

Decarbonisation of IUA universities has begun with rationalisation and maximisation of the existing buildings and spaces, to interrogate fully what energy performance improvements can be achieved through accommodating growing student numbers within our current capital asset portfolios.

However, to achieve our climate action targets within the timeline to 2030, this exercise must happen in parallel with **targeted decarbonisation measures** within our building stocks quickly and with minimal disruption to service delivery.

It is anticipated that significant carbon emissions can be reduced through five areas of activity; including **optimising controls and operational efficiencies**, coupled with a **medium retrofit programme** including M&E and HVAC upgrades enabled by smart infrastructure installations and, in many cases, **heat pump installations**, where we expect to achieve collective savings of over 25,000 tCO<sub>2</sub>e. **Renewable thermal projects** constituting various fuel switching options will contribute additional savings over 3,300 tCO<sub>2</sub>e and importantly, will significantly advance the opportunities to implement renewable district heating systems that can expand and evolve over time.



Linking buildings energy efficiencies to increased capacity of district heating systems provides a novel route to supporting the business cases to carry out deep retrofit to these buildings whilst also widening the pool of end users and the opportunity to provide local balancing and flexibility services to the electricity grid.

The installation of PV solar and wind power to provide **local electrical energy generation** and microgrid projects brings greater resilience and further opportunities to provide third parties with renewable energy sources. In this way universities can provide new approaches to connected distribution networks with growth strategies that are integrally enabled by energy efficient design. **Through the suite of measures described above, universities can achieve their 2030 targets** working collaboratively to bundle activities and work programmes for acceleration and mutual benefit.

### 3.3 Preparing for further Scope 1 and 2 reductions ahead of 2050

Achieving full net zero reduction targets from 2030 to 2050 for IUA universities **are projected at upwards of €2.5 billion<sup>3</sup>**. Generally, deep retrofit projects are more complex, likely to involve longer timelines, and will require greater levels of capital investment to deliver. Therefore, the majority of benefits of deep retrofits will be realised after the 2030 deadline. However, this has the advantage of **allowing ample time for preparatory work** to identify elemental improvements with specificity, prepare the construction sector sufficiently to be ready to deploy state of the art technologies, materials and systems of delivery. This time will also enable a smart infrastructure systems implementation that is thoroughly connected to open

<sup>3</sup> Projected values estimate based on portion of IUA members of total HE/FE figures as considered by the National Public Sector WG, Heat & Built Environment Taskgroup 2024





data streams to provide and verify savings dynamically, all through transparent measurement and certification systems. This allows for the buildup of reliable energy efficiency and carbon benchmarking systems to give confidence to investment markets and to instigate meaningful behavioural change.

While the SEAI Pathfinder funding has allowed for initial pilot projects to proceed and develop and disseminate learnings across the sector, buildings identified as Significant Energy Users (SEUs) in the sector require complex solutions which have yet to attract capital funding and should be prioritised. Sectoral SEUs play an important role in demonstrating large impact which require adequate lead in and planning to deliver. SEU buildings across IUA universities located on campus situations are ripe for networking and provide an opportunity for prioritising investment to deliver impact at scale. **Feasibility, design and project management work as well as enabling of new financial mechanisms needs to begin now to deliver greatest efficiencies at lowest costs.**

**Smart infrastructure and technologies amplification and connection to open data platforms** will also be required to enable the certification and verification systems to track our progress over time and to ensure the impacts of measures dynamically against predicted carbon savings and energy improvement targets. **Aligning the measurement standards with internationally established systems ensures access to the wider investment community.** The implementation of automated metering and intelligent sensor systems to establish comprehensive digital twins of university campuses will assist in communicating the effectiveness of our digital reporting systems, provide easy access to open data and align with enhanced national reporting structures for energy efficiency and overall carbon reductions.

Planning for the longer term 2050 targets also provides an opportunity for developing more innovative and ambitious projects on a sectoral scale. These might include major sectoral renewable energy generation projects such as solar or offshore wind farms or utilisation of Waste Heat Recovery (WHR).

Some of the most ambitious approaches to addressing the climate crisis in general, and scope 1 and 2 emissions reductions in particular, however, require cross sectoral collaboration with other private and public bodies. Working with other bodies and raising our collective ambitions may have more impact and IUA universities are open to pursuing opportunities in this regard. Such opportunities may include developing district heating to meet thermal targets, coordinated approaches to sustainable accommodation and travel locally and regionally to meet transport targets, and circular economy approaches with local suppliers and waste management companies to meet resourcing targets.





# 4.0

## Call for Investment to 2030 - Anticipated costs, Timelines and Mechanisms

The challenge of decarbonising campus estates across the eight IUA member universities requires focus and funding. Our universities are poised to deliver carbon savings of 70.7ktCO<sub>2</sub> by 2030. The success in meeting those targets is heavily reliant upon the decarbonisation of the national grid with a reduction of 40.4ktCO<sub>2</sub> dependent upon supply side national grid decarbonisation. **The balance of 30.3ktCO<sub>2</sub> reductions to be delivered by universities totals a projected capital cost of c. €475million.**

The cost of decarbonisation measures outlined has been based on identified carbon savings across the five key broad thematic areas (described above in section 4.2) using a cost per tCO<sub>2</sub> abated within each heading using rates independently provided by external consulting engineers<sup>4</sup>. The rates provided are average rates and therefore are considered to represent an **indication of the order of magnitude of the scale of investment required to meet the 2030 targets**. Actual costs will depend on a number of factors including engineering approaches, technology configuration, asset complexity including the extent to which enabling works may be required and scale.



<sup>4</sup> Enviroeye Consulting Engineers, Review of IUA Decarbonisation Plans, 30 April 2024.

A summary of the cost of decarbonisation measures across the five broad thematic areas, along with transitioning fleet to Electric Vehicles, are summarised in the table below:

	TOTAL CARBON SAVINGS (tCO <sub>2</sub> )	TOTAL COST (€'m)
Renewable Energy Generation	1,022.2	5.2
Controls & Operations	4,165.9	9.5
Heat Pumps	12,456.7	177.4
Fuel Switching	3,334.2	15.1
Electric Vehicles	119.6	6.9
Retrofits & Efficiency	9,226.3	261.4
<b>TOTAL</b>	<b>30,324.9</b>	<b>475.4</b>

Fig 3. IUA Universities Climate Action Roadmap (CAR) high level cumulative decarbonisation categories and quantum, April 2024

IUA universities are committed to delivering carbon reduction requirements, however successful delivery of these targets will require significant support from government. IUA universities simply **do not have the resources or the financial capacity to deliver on a programme of investment of this scale**. A significant capital investment programme by government will therefore be required and it is essential that this specially designated fund is provided for as part of central government’s National Climate Action Programme. Accordingly, the IUA is seeking a **5-year multi-annual programme of investment of €475m** as part of such a Climate Action programme to include the following: -

## 1. A Higher Education decarbonisation major project fund of €275m.

This multi-annual fund, to be launched immediately, would be targeted at major priority decarbonisation projects across the sector that would deliver the biggest impact in terms of carbon emission reductions. This would provide real impetus to the decarbonisation of university estates. Such a multi-annual fund would provide a pipeline of investment and allow universities to build capacity and plan on a more strategic basis thereby facilitating improved medium-term planning and delivery.

## 2. Targeted investment programmes of €100m across key specific areas of focus including:

- Renewable electrical energy generation with a particular focus on PV
- Transition to heat pumps, powered by renewables
- Renewable thermal generation focusing on district heating solutions and enabling infrastructure
- Smart infrastructure and the digital transformation of university built environment
- Sustainable transport including transition to EVs and sustainable transport infrastructure.

These targeted investment programmes would support collaboration, rather than competition, across the sector and help to bring critical mass to investment in these areas, leveraging greater value for money and delivering greater synergies and impact.



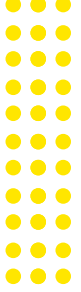
## 3. Devolved Grant Funding for Sustainability Related Minor Works of €20m p.a.

A new specific devolved grant for sustainability related minor works over the 5-year period to 2030 would support short term impact 'wins' in addressing the large range of small-scale decarbonisation and energy efficiency related works required to meet emission targets. This specialised devolved funding would allow universities the capacity and flexibility to deliver impact quickly and effectively and could support a range of important works including upgrading of lighting, shallow retrofit works and the implementation of improved building controls and operations.

These funding programmes are required to deliver on the requirements of IUA universities only and programmes would have to be scaled up accordingly to reflect the requirements of the wider higher education sector.

Whilst direct Exchequer capital funding will be critical to meeting the sector's carbon emission reduction targets, IUA recognises the scale of the investment required across the entire public sector and related constraints on public finances and therefore will work with government to consider what alternative funding mechanisms could also be considered and supported as part of the overall solution, including government provided interest free loans, Public Private Partnerships and the use of Energy Performance Contracts. The IUA will work with HEA and DFHERIS in relation to examining such initiatives.





# 5.0

## Other Key Resource and Investment Considerations

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In addition to capital funding requirements, investment will be required to build capacity to meet and retain lasting decarbonisation benefits and support the broader Climate Action and Sustainability responsibilities of universities. This investment will be required to enable expansion of Green Teams, Campus Estates Teams, and other key resources across the universities to support climate action initiatives including not only the delivery of carbon emission reduction targets but the delivery of green procurement, CSRD and carbon related monitoring and reporting, climate action training, development and upskilling of staff and the embedding of climate action skills and competencies across all education programmes.

Furthermore, if universities are to maximise efforts to deliver on the more challenging 2050 targets the sector needs to be supported to proactively plan resources now for future needs and requirements. Early investment in centralised supports to provide expert design team services, project management capabilities, energy efficient design support and carbon accountancy would support the optimization of carbon and energy efficiency design and de-risk delivery ensuring the added value of integrating energy efficiency improvements with space optimization to support evolving teaching and working practices.

Targeted funding to support these essential enabling resources is critical to meeting the sector’s Climate Action obligations and ambitions.

