# UCD Sustainable Energy Community Pobal Fuinnimh Inbhuanaithe UCD



## Green Week 3-6 March 2025

### Visit us at: www.ucd.ie/sec

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## 1 About us

The UCD Sustainable Energy Community (SEC) is a university-wide initiative focused on developing skills in energy efficiency and promoting energy sustainability research and awareness on campus. Supported by the SEAI, it brings together students, staff, and researchers to implement projects such as optimising energy efficiency, promoting renewable energy awareness and adoption, and supporting UCD's climate action plan. Our objectives include (i) developing skills and capacity in energy efficiency at a UCD community level, (ii) promoting the adoption of lower carbon options for transport and heating, (iii) promoting investment, research and education in smart and renewable energy technologies in UCD, and (iv) creating opportunities for successful collaborations in sustainable energy community initiatives.

We are a vibrant Sustainable Energy Community (SEC) composed of a diverse group of University College Dublin (UCD) students and staff committed to advancing sustainable energy solutions through research collaboration for real-world impact, starting with our campus. As a leading SEC, we bring together research and practice, industries and academia by combining global with local practices, traditional wisdom with latest technological innovations with communities at the front and centre. Founded in 2018, UCD SEC is uniquely positioned to lead transformative energy initiatives on UCD campuses and beyond. UCD combines world-class research capabilities with a diverse academic community, enabling evidence-based, multidisciplinary approaches to sustainability. Our expertise across engineering, science, social science, and policy provides a strong foundation for developing integrated, innovative energy solutions. UCD's expansive campus infrastructure serves as a living laboratory where energy efficiency projects, such as retrofitting, solar energy, and smart technologies, can be tested and scaled. With a large and engaged student and staff population, UCD fosters a culture of energy awareness and collective action. Coupled with a long-term strategic commitment to climate action and the UN Sustainable Development Goals, UCD is well-placed to act as a regional (and national) leader in sustainable energy and a model for other institutions and communities in Ireland. UCD SEC activities have multiplied over the years with support from our UCD patrons to make a visible presence in and outside UCD. We collaborate with UCD Estates for access to real-time energy supply and demand data for our energy research and are also supported by energy researchers across UCD including <u>the NexSys project team</u>.

As the UCD sustainable energy community, our core competencies of partnerships and engagement not only add to the growing profile of UCD but also makes a difference to the world around us in driving the sustainability agenda by supporting other Sustainable Energy Communities in Ireland.

## 2 Event

As a visible leader in sustainability, UCD plans to be a net zero organisation by 2040 to reduce the impacts of climate change for ourselves and others. As part of its commitment to sustainability and environmental stewardship, an annual event "Green Week" is held on campus to showcase and promote sustainable practices through a series of engaging activities and initiatives. In this year's Green Week from 3 - 6 March, 2025, a series of activities and events were held to collaborate, learn, and contribute towards a more sustainable future for our university and beyond. As part of celebrations, we in the UCD SEC organised an 'Energy Hack' event to increase awareness and encourage participation of UCD community members in sustainable energy practices. The event in UCD Village with support from UCD Estates provided an excellent opportunity to showcase the state-of-the-art energy research outcomes from different disciplines and institutions. The event created a lot of buzz and was well attended by sustainability enthusiasts in and outside UCD including visitors from other SECs in south Dublin. With twenty posters, four exhibitions from Ireland's solar, heat pump, bike and wind associations and a demonstration module on the energy calculator app from our NexSys project partner, the event covered a wide range of topics on energy sustainability spread across disciplines. Most importantly, it provided a platform for interactions and engaging in discourses around energy sustainability issues involving people from different walks of life, alumni, students, employees, industry partners, which we strive to build upon our SEC objectives.



# 2 Key activities

## 2.1 Exhibitions

With model exhibitions from representatives of Irish Solar Energy Association (ISEA), Wind Energy Ireland (WEI) and Heat Pump Association of Ireland (HPAI), the event provided a good platform for exchange of first-hand information on technical and financial details as well as long term benefits of different clean energy technologies for adoption by communities.



A big attraction for the students and visitors was the UCD Energy Calculator <u>App</u> developed by the <u>NexSys</u> team at UCD Energy Institute with support from <u>Sustainable</u> <u>Energy Authority of Ireland</u> (SEAI) and <u>Higher Education Authority</u>, Ireland.



The Energy Calculator website is a price comparison tool for domestic electricity customers with additional functionality, where users can upload data from their

home smart meter for a price comparison that is specific to their energy usage habits. Driven by the mission both to reduce energy costs for domestic customers and to reach out those furthest behind in the energy transition, the website provides an accurate and independent electricity price comparison tool to households, free of charge.



The idea is to expand research into Ireland's domestic energy market by creating an anonymised database of domestic energy information for use by researchers to investigate the impact of time of use tariffs on energy consumption in Ireland and also engage communities on issues surrounding energy transition.

At the UCD SEC Energy Hack, Gavin Harte (Dún Laoghaire-Rathdown County SEC Mentor) brought two of his energy learning tools: "What's a Watt" and the "Smooth Bike." The Human Power Station offers unique, CO2-neutral events where cycling generates electricity for anything up to 500 watts, from a human-powered cinema to a fun human-powered karaoke session. "What's a Watt" is a single-bicycle system that displays real-time energy output, allowing participants to compare their power to everyday demands. This fosters understanding of energy efficiency. The "Smooth

Bike" is a fun, human-powered smoothie maker, linking energy awareness with physical activity and healthy food choices. Both tools provide engaging, memorable experiences for learning about energy and were a big hit with students who participated in the Energy Hack.



#### 2.2 Poster presentations

Energy Hack featured poster presentations from researchers across a wide range of departments, including the Schools of Business, Computer Science, Politics and International Relations, Economics, Chemical and Bioprocess Engineering, Mechanical and Manufacturing Engineering, Social Policy, Social Work and Social Justice, Civil Engineering, Electrical and Electronic Engineering, and Architecture, Planning, and Environmental Policy.

The gathering of researchers from such diverse backgrounds provided an opportunity to highlight a wide range of sustainable energy practices, including **electric vehicles** 

(e.g., routing, charging station locations, and adoption by small and medium enterprises), energy markets (e.g., market dynamics and stochastic equilibrium), energy policies (e.g., transitioning away from fossil fuels and the extent to which published research is policy-related), hydrogen technology (e.g., establishing a green hydrogen framework and long-term assessments for large-scale power production), wind energy (e.g., wind curtailment and offshore energy development in Ireland), thermal energy and heat pumps.

Participants also had the opportunity to learn about the activities of UCD SEC, including research on lab energy efficiency, a parking lot survey project, and the development of a sustainable energy network. Additionally, they were introduced to Supporting Energy Communities - Operational Research and Energy Analytics (SEC-OREA), which empowers local energy communities (LECs) to contribute to the decarbonization of the energy sector through advanced algorithms and analytics technologies.

# 3 Insights and Observations

#### 3.1 Achievements and impact

The Energy Hack took place between 10:00 and 12:00 in the foyer of UCD Village, a vibrant facility at the centre of activities within the premises of UCD. This event served as a dynamic platform that strengthened the connections between students, the academic community, local sustainable energy communities, and industry professionals. With exhibitors such as the Irish Solar Energy Association (ISEA), the Wind Energy Association of Ireland (WEAI), the Sustainable Energy Authority of Ireland (SEAI), and Next Generation Energy Systems (NexSys), as well as participation from local SECs, including the SEC of Dún Laoghaire-Rathdown and attendees from Dalkey SEC, the event fostered collaboration across multiple sectors.

By featuring poster presentations on wind energy, solar power, hydrogen technology, electric vehicles, energy markets, and policies, the event encouraged knowledge-sharing and innovation across disciplines. Students and academic researchers had the opportunity to engage directly with industry leaders and local communities, exchanging ideas and solutions for advancing sustainable energy practices in Ireland.

This integration of diverse stakeholders created a foundation for discussing <u>Ireland's</u> <u>energy targets</u>, including reducing greenhouse gas emissions, enhancing energy efficiency, and increasing renewable energy adoption. It also explored future opportunities to help achieve these goals. Since these targets require collaborative efforts from local to national levels, the event served as a valuable forum for discussions, offering insights into opportunities for comprehensive cooperation.

The event empowered all participants to contribute to Ireland's energy transition, showcasing UCD's leadership in fostering partnerships that bridge academia, industry, and local communities for a more sustainable future.

#### 3.2 Challenges and lessons learned

The Energy Hack successfully brought together diverse stakeholders, but it also faced challenges due to its limited timeframe and space restrictions within the UCD Village foyer. With just two hours for a packed agenda of poster presentations, exhibitions, and discussions, there was limited opportunity for deeper engagement on certain topics. The space constraints also made it difficult to accommodate larger crowds or extended interactions between participants. Despite these challenges, the event highlighted the importance of aligning different sectors and showcased the value of collaboration in addressing Ireland's energy challenges. Moving forward, there is a clear opportunity to expand the scope of future events by including more universities, engaging additional SECs, and inviting a broader range of industry professionals. Larger, more inclusive events could provide greater opportunities for in-depth discussions and long-term collaboration, ensuring that the collective efforts of all stakeholders can contribute more effectively to Ireland's energy transition goals.

### 4 Stay tuned

In future, we aim to work on the following themes:

(i) Campus Drone Survey: to assess the feasibility of installing solar panels in campus parking areas by conducting a thorough survey and drone-based mapping to identify optimal locations for solar installations,

(ii) Lab Energy Efficiency: as research laboratories are significant energy consumers. This project focuses on optimising energy usage in UCD labs by analysing consumption patterns and implementing power management solutions, and

(iii) Connecting with other Sustainable Energy Communities: this initiative focuses on sharing best practices, resources, and strategies to enhance energy sustainability with other SECs including those in higher educational institutions to discuss opportunities and leading sustainable energy transitions locally.

# 5 Acknowledgments

We happily acknowledge with thanks the all-out support from UCD Estates and NexSys team in organizing this event as part of the Green Week celebrations. We would also like to take this opportunity to acknowledge the participation and support from representatives of heat pump, bike, solar and wind associations of Ireland. We also convey our thanks to members from other SEC from south Dublin. Our special thanks are due to all volunteers -for sparing their time, helping with printing, display and background work associated with poster presentations and helping with photographs during the event. Finally, we would like to thank one and all who participated in this event to make it a big success and hope to build upon it in the future.

# 6 Disclaimer

This report is intended to provide general information only and should not be considered as a substitute for advice covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in any part of this report.



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