International Sustainable Campus Network



2024 Best Practices Report



ABOUT ISCN

The International Sustainable Campus Network (ISCN) is a non-profit association of higher education institutions. Our mission is to provide an international forum to support higher education institutions in exchanging information, ideas, and best practices for achieving sustainable campus operations and integrating sustainability in research and teaching. As of August 2024, over 100 universities from 36 countries across six continents are represented in the network.

ISCN initiatives include:

<u>Communities of Practice</u> – a forum where members discuss common challenges, find opportunities to collaborate, and share ideas for improvement on specific themes:

- ISCN Latin American Chapter
- Campus as a Living Lab
- Sustainability Reporting
- Biodiversity
- Scope 3 Emissions
- Sustainability Leadership and Governance

<u>Fellows</u> – member-sponsored individuals who support ISCN's strategic priorities by guiding and convening communities of practice and spearheading other ISCN initiatives.

<u>ISCN at UN Climate and Biodiversity Conferences</u> – member outreach and coordination for engagement at Conference of the Parties (COP) events.

<u>ISCN Conference</u> – members convene at a host institution to exchange best practices and foster collaborative opportunities with peers worldwide.

TABLE OF CONTENTS

- 3 Foreword
- 4 Case Study Summaries
- **9** Teaching, Learning, and Research
- 26 Campus Management
- 41 Biodiversity
- 48 Engagement, Culture, Behaviour-Change
- 57 Climate
- 76 Campus as a Living Lab
- 89 Governance and Leadership
- 106 Index

FOREWORD

This report is a testament to the dedication of our International Sustainable Campus Network (ISCN) members, who are committed to fostering a sustainable and resilient future.

The year 2024 has been characterized by the complexity of multiple global challenges. From the destabilization of environmental and geopolitical systems to increasing evidence of the climate emergency and biodiversity crisis, all while navigating an increasingly polarized world.

Universities can and are playing a critically important role in helping to solve these grand challenges. We are proud of our members' achievements and commend their leadership on these important issues.

Highlighting the breadth and depth of efforts across diverse university contexts, the 2024 ISCN Best Practices Report showcases advancements in sustainability within university leadership and governance, teaching and learning, research, campus management, community engagement and culture. These initiatives explore multiple themes in higher education and sustainability, from leveraging campuses and communities as test beds for innovation and research, to demonstrating leadership in climate action.

Our goal as a network is to enable transformative peer exchange and learning. As we look to the future, we are committed to acting with urgency in supporting our members to amplify their efforts and learn from each other to effect tangible change. Our collective future depends upon it.

Micharia M

Victoria Smith, Executive Director

CASE STUDY SUMMARIES

TEACHING, LEARNING, AND RESEARCH

Through active involvement in local school sustainability education, the **University of Genoa** conceived the "Sustainability Mural" project as part of a school-to-work program with the main goal of making sustainability part of young students' learning. *Pg.* 10

EPFL redefines sustainability education by pairing faculty and students to co-create course content, integrating sustainable practices across disciplines and fostering a collaborative educational environment. *Pg. 12*

The **University of Tasmania's** Curious Climate Schools project engages students to formulate questions about climate change that are then answered by experts, enhancing climate literacy and supporting student-led inquiry. *Pg.* 14

Partnering with Frontiers for Young Minds and the United Nations Development Programme (UNDP) office of Saudi Arabia, the Office of Sustainability at **KAUST** launched "The SDG Collection," a pioneering youth-oriented article series cultivating scientific literacy among children and inspiring action towards the SDGs. *Pg.* 16

Utilizing a living lab approach, the **University of Southern Denmark's** course "Sustainable Development for the Built Environment" allows students to apply their learning towards increasing sustainability on campus, thereby contributing to the university's sustainability goals. *Pg. 18*

At **Chulalongkorn University**, the Witsawapat Engineering Camp acts as an academic incubator, developing and disseminating crucial water management and irrigation expertise. This program equips students with practical skills to tackle real-world water challenges, cultivating future leaders who are deeply aware of their social and environmental responsibilities. *Pg. 20*

Connecting researchers interested in sustainability is a focus at the Sustainability Office at **VU Amsterdam**, where they have developed

an app that helps VU employees find peers and potential research partners with similar interests, promoting greater sustainabilitydriven collaboration. *Pg. 22*

With a mission to enhance scholarship and teaching related to the environment, the **University of Pennsylvania's** Environmental Innovations Initiative (EII) revamped the university's course inventory and turned it into an easy-to-use and regularly updated digital tool for discovering course offerings related to climate, energy, and sustainability. *Pg. 24*

CAMPUS MANAGEMENT

Using a systems-thinking approach at **The Hong Kong University** of **Science and Technology**, felled trees from construction sites are innovatively upcycled, reducing the university's embodied carbon by approximately 75 tons while meaningfully reconnecting the campus community to the natural world. *Pg. 27*

From pioneering negative emissions pathways to developing innovative CO_2 storage technologies, decarbonization projects at **ETH Zürich** underscore the university's commitment to meeting netzero targets and driving sustainability transformations through interand transdisciplinary collaboration. *Pg. 29*

Amid an energy crisis, **Freie Universität Berlin** achieved an almost 11% reduction in their winter energy consumption through several technical interventions combined with cross-departmental, administrative, and community coordination efforts. *Pg. 31*

With over 10,000 university suppliers, the Supply Chain division's Sustainable Procurement initiative at **Tecnológico de Monterrey** aims to integrate sustainability into procurement operations and culture by promoting environmentally friendly products and delivering comprehensive training programs. *Pg. 33*

Using behavioural campaigns and new technologies, **The Hong Kong University of Science and Technology's** revolutionary Lunchbox Lending Program system leverages AI with the aim of reducing single-use disposable food and beverage containers by 50% over three years. *Pg. 35*

Waste management plans at Unicamp emphasize proper disposal techniques and ongoing education for each of the units of **Unicamp**, advancing waste management across the university community. *Pg.* 37

At the **University of Vaasa**, several on-campus renovation projects seek to improve space and energy efficiency, cutting energy-related emissions by half and significantly reducing the university's carbon footprint over time. *Pg. 39*

BIODIVERSITY

Responding to pre-existing biodiversity commitments, **McGill University's** action-oriented Biodiversity Plan 2030 aims to monitor, protect, and enhance biodiversity, while raising awareness and engaging community members both on and beyond McGill's campuses. *Pg. 42*

At **Unicamp**, ecological corridors connect preservation sites across multiple campuses and vegetational areas beyond the campus, allowing for the safe and natural flow of fauna and flora while reducing environmental degradation and accidents involving fauna. *Pg.* 44

Emphasizing activities in research, teaching, and on-campus, **Freie Universität Berlin** is cultivating vibrant campuses through its Blühender Campus (Blooming Campus) initiative, managing its campus grounds according to biodiversity-focused green space standards. *Pg. 46*

ENGAGEMENT, CULTURE, AND BEHAVIOUR-CHANGE

By combining energy savings knowledge with just a few behavioural adjustments, five of the **Technical University of Denmark's** campus canteens reduced their energy consumption considerably. A behaviour change campaign aimed at kitchen staff resulted in an average energy consumption reduction of 13% in canteens. *Pg.* 49

At **Concordia University**, the Sustainable Event Certification Program serves as a free service available to all university members interested in making their events more sustainable, advancing the university's commitment to creating a more sustainable, equitable, and inclusive future. *Pg. 51*

Highlighted by efforts to eliminate single-use plastics and promote sustainable consumption and production via student engagement, **King Mongkut's University of Technology Thonburi** has dedicated itself to becoming a sustainable university aligned with the 2030 UN SDGs, spanning campus operations, teaching, and research. *Pg. 53*

Embarking on a transformative journey towards global justice and sustainable development, **TU Braunschweig** introduced the SDG Ambassadors Program to anchor the Sustainable Development Goals at the university and to generate attention for them. *Pg. 55*

CLIMATE

To support its objective of achieving a 50% reduction in CO_2 emissions by 2030, the **University of Gothenburg** developed a Carbon Intelligence System (CIS) to view its emissions by category, taking an evidence-based approach to inform the actions and activities needed to effectively reduce emissions. *Pg. 58* The Climate Action Strategy at **UC Chile (Pontificia Universidad Católica de Chile)** encapsulates the university's commitment to achieving carbon neutrality by 2038. Achievement entails a participatory process that includes detailed pathways emphasizing climate resilience and adaptation, emissions reduction, and carbon sequestration. *Pg. 60*

As part of its ambition to be zero carbon by 2040, **The University of Edinburgh** embarked on a long-term, multi-million-pound project involving land acquisition, woodland creation, and peatland restoration to sequester the university's carbon emissions produced by essential air travel. *Pg. 62*

CAP2030 is **The University of British Columbia's** most ambitious climate action plan yet, aiming for net zero emissions by 2035 and a 45% reduction in extended scope 3 emissions. To meet these targets, the university established a CAP accountability framework that outlines responsibilities for action implementation, progress monitoring, and governance. *Pg. 64*

Committed to supporting the UN SDGs, **Universiti Kebangsaan Malaysia's** Sustainability Plan works to promote sustainability within its operations by advancing energy-saving programs, adopting new energy sources, improving waste management, and developing databases and policies that support universal efforts on the SDGs. *Pg. 66*

Massachusetts Institute of Technology has been tracking its scope 3 emissions since 2017 and now seeks to reduce these emissions via its Climate Action Plan. A cross-functional team has expanded the university's greenhouse gas portfolio accounting to include significant scope 3 sources like air travel and construction. *Pg. 68*

Highlighting three prominent projects that advance sustainability in research, teaching, and operations, the **University of Zürich** displays its commitment to sustainable development with the goal of achieving climate neutrality by 2030. *Pg. 70* **UC Chile (Pontificia Universidad Católica de Chile's)** Seed Fund aims to enhance responsible internationalization and offset travel emissions by investing in sustainability projects that prioritize environmental education and capacity building, underscoring the importance of successful collaborations with community partners. *Pg. 72*

Introduced in 2023 at the **University of Twente**, the Climate Centre Seed Funding Initiative aims to foster interdisciplinary projects that span research, education, and community engagement, supporting innovative climate solutions across academia and society. *Pg.* 74

CAMPUS AS A LIVING LAB

Through co-creation and community-driven development, the Bang Pho Living Lab project at **Chulalongkorn University** seeks to revitalize the Bang Pho community by transforming it into a creative learning hub, adapting wood products for urban lifestyles and encouraging collaborative research with students and local entrepreneurs across various design disciplines. *Pg.* 77

Massachusetts Institute of Technology's collaborative Porosity Hunt tests emerging methods to study the potential impacts of climate change—specifically future storm scenarios—on campus infrastructure. With the goal of enhancing climate change resilience, MIT provides valuable insight on how similar research efforts could inform practice and research elsewhere. *Pg. 79*

At the **Universiti Kebangsaan Malaysia**, sustainable living lab programmes in various ecosystems offer spaces for education, research, community engagement, and sustainable tourism, fostering a sense of responsibility for environmental conservation among participants and promoting a more ecologically conscious society. *Pg. 81* At the **University of Cape Town**, the Khusela Ikamva project is a catalytic transdisciplinary research project that aims to find pathways to transition the university to a sustainable campus. The initiative focuses on energy, water, waste, wildlife, and social responsiveness, integrating stakeholder-informed research, community engagement, and Living Lab interventions to test sustainable solutions on campus. *Pg. 83*

By treating the campus as a test bed and involving students in the process of learning and innovation, the **University of Toronto's** CLL approach promises more meaningful, co-developed sustainability solutions and implementation, helping make sustainability a core part of the university's identity. *Pg. 85*

Through a Living Lab framework, the **National Taiwan University** supports their Smart Campus Plus (SC+) project by developing a microclimate sensing network for environmental data analysis and community engagement, enhancing local environmental communication and climate action. *Pg.* 87

GOVERNANCE AND LEADERSHIP

The **National University of Singapore** received Singapore's highest accolade for environmental sustainability, demonstrating its whole-of-university approach and commitment to advancing sustainable development. *Pg. 90*

Partnering with Feed BC and locally sourcing its food, **Simon Fraser University** is working towards reducing the distance food travels from farm to table and decreasing its carbon footprint, while fostering a resilient local food system on campus and throughout British Columbia. *Pg. 92*

True to its commitment as a living laboratory, the **University of Lausanne** established an innovative, participatory process to mobilize its community to transform the universities' activities and ensure that its impact respects ecological and planetary boundaries. *Pg. 94* Novel application of the Doughnut economics model to a university context enabled the **University of Lausanne** to successfully and rigorously quantify its ecological impacts on planetary boundaries, revealing gaps in monitoring and stimulating the production of new data, particularly on well-being. *Pg. 96*

In 2020, **IE University** embarked on a visionary mission called the 10-Year Challenge, in which a new overarching theme in sustainability is presented each year. Through awareness-raising and investments in innovations and improvements, IE University is fostering a culture of sustainability whereby the entire university community works towards meeting the yearly goals. *Pg. 98*

By conducting the world's first Voluntary University Review of the SDGs in 2020, **Carnegie Mellon University** reinforced its commitment to evaluating its impact across education, research, and practices. With the support of dedicated university members and the Sustainability Initiative, the university publishes annual updates and sets future priorities. *Pg. 100*

At the **University of Twente**, Faculty Green Hubs drive grassroots sustainability transformation across disciplines and departments, bringing together students and faculty members to assess faculty sustainability, suggest tailored initiatives, and empower sustainable transformation. *Pg. 102*

Leveraging insights from a Positive Impact Rating and a materiality analysis, **EHL Hospitality Business School** is building its sustainability strategy through several participatory processes, co-creating a sustainable future with its students, staff, faculty, and Board of Directors. *Pg. 104* TEACHING, LEARNING, AND RESEARCH

UNIVERSITY OF GENOA

Sustainability Mural: The SDGs Reinterpreted by Teenagers

Through teaching, research and the so-called "third mission," universities have the responsibility to equip young people with the knowledge, skills, and values they need to create a better and more sustainable future. Since 2017, the University of Genoa (UniGe) has been actively involved in offering different activities to local primary and secondary schools with the common objective of providing students with awareness about environmental protection and social inclusion.

UniGe conceived the Sustainability Mural project as part of a school-towork program with the main aim of making sustainability part of young students' learning. Thanks to the collaboration with the Chiabrera Martini High School of Arts located in the city of Savona, it was possible to depict the Sustainable Development Goals (SDGs) concepts over a 60 m long and 2.4 m high wall inside the UniGe Savona Campus with the direct involvement of students.

Implementation

In 2022, UniGe staff gave lectures to about 50 teenagers belonging to the Chiabrera Martini High School of Arts. These moments provided them with an in-depth analysis of the concept of Sustainability and the 17 SDGs in the 2030 Agenda. Moreover, the students had the opportunity to learn how these topics were applied to the Savona Campus as best practices. All this information allowed the students to learn and deepen the area of design required by the project. Afterwards, the class started a brainstorming phase to select the most effective ideas and techniques to employ for simply communicating the 2030 Agenda goals. Teachers supervised the students throughout the design phase and allowed them to unify their ideas in a single mural painting easily understandable for any kind of viewer.

To make the design clear, the themes were represented using positive and original iconography that could immediately communicate the SDG messages. For example, the planet being stitched symbolizes the desire to safeguard the environment and rectify the mistakes made by mankind towards the Earth; the scales depict the struggle for gender equality; the kneeling men picking up books from the ground figuratively represents the cultivation of culture as a tool of freedom and growth for man and society. After the ideation phase, the class began creating sketches. It was decided to use primary color tones (magenta, cyan, and yellow) to make the educational function of the work more intuitive. This process allowed us to obtain the final hand-drawn sketch on paper and then reproduce it on digital media with the valuable help of professors.







The students at the high school previewed their final design during the 2022 Italian Sustainable Development Festival as part of the workshop Rotta verso un futuro sostenibile (Route to a Sustainable Future). The festival was organized by the University of Genoa together with the Municipality of Savona and Costa Crociere company with the intention of sharing with the local community the results and lessons learned during the first part of this project.

In 2023, the artistic representation began. The first activity involved sketching the outlines of the drawings by projecting the full-size digital version on the long wall. Subsequently, the high school students and some UniGe representatives completed the artwork by coloring the figures with paint and brush, contributing to the realization of shared work. The inauguration ceremony of the mural took place in May 2023 in the presence of many local authorities and stakeholders. The high school students gave a deep explanation of the mural project phases by sharing how each figure is related to each SDG.

Results and Reflection

The Sustainability Mural project allowed for the spread of sustainability culture among teenagers through the logic of learning-by-doing, giving young people the opportunity to learn from an academic institution the different features of sustainability and how to communicate them to society using art techniques. These activities enabled the renovation of an interior portion of the boundary wall of the Savona Campus by creating a permanent work demonstrating the commitment to promote the 2030 Agenda with a local partnership and emphasizing the importance of collaboration in achieving the global SDGs. The wall will always be visible to all campus visitors as an example of a fruitful collaboration for the dissemination of the sustainability culture.

It was not so easy to engage the students' attention mainly because sustainability was an unexplored topic for them. However, UniGe provided them the opportunity to develop ownership over the project by involving them in public presentations of the work to the local community. In this way, students were very eager to develop their skills and knowledge in an artwork-based setting: this was the success of the project and was really appreciated by the citizens who took part in the events.



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ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE



Teacher-Student Tandems for Sustainability Education

Universities are training the next generations of professionals and leaders, leveraging education to produce a concrete impact on society. Sustainability education requires the creation of new content and the implementation of new pedagogical approaches, allowing the transfer of explicit knowledge and skills to tackle global issues. At the same time, it is necessary to modify existing course material to integrate the sustainability aspects that are relevant to each discipline.

These efforts are not always easy to implement. Within the EPFL context, we have identified, through workshops with teachers, that the main barriers are a lack of time (the main limiting factor), courses that are already too packed with content, and a lack of (perceived) legitimacy. These findings led to the development of a support mechanism: the teacher-student tandem. A tandem brings students and teachers together to work on the transformation or creation of a course. The **goal** of the initiative is twofold: teachers receive dedicated student assistance and at the same time students are actively engaged in the process and paid for their engagement. The system is extremely flexible and tailored to specific needs: students can provide feedback, create course content or exercises, or even directly intervene in the classroom.

Implementation

The Sustainability Office recruits students via an online form. Interested candidates are individually interviewed to assess their expertise, interest, and motivation. A list of potential valid candidates is kept up to date.

At the same time, the initiative is advertised to the teachers; when a teacher needs the service, the EPFL Sustainability Office proposes suitable candidates (the final choice is agreed upon by the teacher) and handles all the necessary administrative aspects including employment paperwork, tracking of working hours, and payments. Alternatively, teachers can suggest interested students. This support mechanism has been active since the second half of 2022.

Apart from the focussed support for the teachers, the **truly innovative** element of this project is the redefinition of the roles and responsibilities of student assistants. Employing undergraduate students for assistantships is a common practice at EPFL and other universities. However, their role is typically limited to executing and supporting an existing course (exam proctoring, exercise sessions). With a tandem, they become active stakeholders in the co-creation of the course.

Outcomes and Future Directions

From August 2022 to January 2024, 15 teacher-student tandems worked together. The total support provided equalled about 500 hours of work. There was large heterogeneity in the workload due to varying needs. The shortest tandem took around 10 hours and consisted of helping a new professor adapt a new sustainability-related course to the EPFL syllabus, whilst avoiding redundancies. The longest one took around 90 hours and included the co-creation of course materials as well as feedback on each course session as the course was rolled out for the first time.

Examples of work developed with a tandem include: the adaptation of an ethics course for a population of computer science students, the creation of sustainability-related examples for an algebra course, the creation of

sustainability content in a thermodynamics course, co-development of a course on sustainability in materials science, and creation and betatesting of unusual pedagogical formats for a course on climate change and energy. The type of input that students provide to the teachers can be classified into three categories: (i) development of exercises and activities, (ii) introduction to student perspectives on course content, (iii) adaptation of the course to the specificities of the curriculum (which, it's important to stress, is not always known to the professors).

The feedback received indicates that the initiative is highly appreciated, emphasizing both the tangible relief provided by the student workforce as well as praising their creativity, and recognizing the importance of including the student perspective in course design. The number of interested students still far exceeds the availability of interested teachers. Despite positive feedback and tangible results, participation in a tandem requires trust to involve the students in course design, which is not yet part of the teaching culture. This requires some specific management skills as students need to be involved in the process, but the decisionmaking should remain with the teachers, and finding this balance is not always straightforward. In fact, we observed that word-of-mouth among teachers generates requests for this service, while teachers presented with these options individually may be initially skeptical. Priority should be given now to showcase success stories and, more generally, to promote effective student engagement in educational activities.

More information: <u>Sustainability in education - Sustainability -</u> <u>EPFL</u> and <u>"It's such a great way to design a class" - EPFL</u>



Results of a survey on the barriers to including sustainability in existing courses.

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UNIVERSITY OF TASMANIA

UNIVERSITY of TASMANIA

Curious Climate Schools

Children and young people growing up today face climate impacts on a scale never before experienced. Many children feel overwhelmed and frightened by the enormity of climate change and are frustrated by their limited agency and power to influence effective climate action. At the University of Tasmania, we believe that there is an ethical imperative to support and equip children with the knowledge, hope, and agency they need to understand the challenges of and to participate in climate action. Given the rise in climate distress in young people, there is a growing need for active dialogue-based learning on climate that is accurate, realistic, and optimistic. Existing approaches to climate education in many national curricula (including in Australia) tend to focus on climate change as a scientific phenomenon. Research suggests that young people need more holistic and participatory models of learning and engagement on climate change to engage and empower them as emerging political citizens.

The Curious Climate Schools project is an engagement and research project that aims to address children's unanswered questions and concerns about climate change. The Curious Climate pedagogical approach is unique in that it is student-driven, flipping the usual oneway science-communication model on its head. We start by asking children what they want to know and then find the best experts to answer their questions. This innovative approach includes climate ethics, politics, science, law, Indigenous knowledge, and place-based impacts and action, recognising the interdisciplinary nature of climate change learning. Over the last four years, almost 100 primary and high school classes from around Tasmania have submitted questions to



Curious Climate Schools, and our experts have answered more than 600 questions and visited 80 schools.

Curious Climate Schools has five guiding principles:

- **1. Student-led inquiry**, responding to what students themselves tell us they want to know.
- 1. Holistic approach to climate literacy, teaching about all aspects of climate change, and not restricting information to certain subjects or disciplines.
- 2. Acknowledging feelings about climate change and how they affect

us. Talking about these feelings, and getting support from others, is important and should be encouraged in schools.

- **3. Empowering individual and system change** by helping students to think about what they can do to act on climate, in a way that celebrates the things they can do, acknowledges the structural changes that are also necessary, and avoids blaming individuals for not doing all the things, all the time.
- 4. Being part of a global conversation between students in a class, between classes across Tasmania, between children and experts, and between conversations happening in Tasmanian schools and those occurring at a global level.

Implementation

Tasmanian teachers are invited to register their classes and are then provided with guidelines to facilitate brainstorming sessions with their students. Each class brainstorms as many climate questions as they can think of, and then votes on up to ten questions they most want answered. These are submitted to the <u>Curious Climate Schools</u> website. The Curious Climate Schools team harnesses the collective knowledge of 80 experts from the University of Tasmania, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and other research organisations who volunteer to answer student questions

These experts include climate scientists, geographers, conservation biologists, fire scientists, chemists, lawyers, engineers, ecologists, psychologists, oceanographers, Indigenous knowledge holders, and health scientists. Each question is answered either in video or webpage format. As an enduring resource, the website provides information for children and teachers on how to handle feelings about climate change, what people of all ages can do to be part of the solution, and how young people's questions are part of a larger global conversation about climate action, including work led by the UN and the Intergovernmental Panel on Climate Change (IPCC). Our experts also visit schools around the state, sharing inspiring examples of how they got involved in climate action, and talking about climate impacts, adaptation and solutions and how young people can take action themselves.



Outcomes and Recommendations

The most significant positive impact of the Curious Climate Schools project is that it takes children's concerns seriously and provides them with credible and personal expert responses to their questions. By connecting them with researchers working in diverse fields of climate research, the project offers students agency over their own learning about climate change. It supports climate literacy by providing a body of knowledge conveyed accessibly for school students facing varied climate risks and socio-economic challenges. In the absence of state-mandated climate learning in school curricula, a project like Curious Climate Schools could fruitfully be implemented in almost any jurisdiction. There is also an unmet need for professional development in climate literacy learning for new and practicing teachers. The success of the project in Tasmania has been three-fold, inspiring understanding, action, and optimism through real connections between students, teachers, and experts.

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KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY



Empowering Scientific Literacy for Sustainability: A Collaborative Model Between Universities, Schools, NGOs, and IGOs

King Abdullah University of Science and Technology (KAUST) is a young and vibrant graduate university in Saudi Arabia increasingly recognized for its research and innovation in pressing sustainability topics such as sustainable water management, renewable and clean energy, food security, and environmental conservation, thus embodying the essence of science that serves humanity and the planet.

Aligning with its mission to enhance literacy for sustainable development, the KAUST Office of Sustainability (OS) is driving a meaningful collaborative effort with non-profit Frontiers for Young Minds (FYM) and the United Nations Development Programme (UNDP) to deliver new and engaging educational materials to promote the importance of science for humanity while raising awareness about the UN Sustainable Development Goals (SDGs). The "SDG Collection: How Science Can Help Us To Achieve The Sustainable Development Goals" is a collection of articles about research being carried out at KAUST and hosted in the journal FYM, a pioneering open-access scientific journal edited for, and reviewed by, children.

The journal aims to democratize scientific literacy by involving young readers in the review process of scientific articles written for them, making complex science accessible and engaging to children worldwide. The Collection counts on the endorsement and support of the UNDP, one of the leading UN agencies working to fulfill the SDGs. The project combines the strengths of academic research and educational outreach, aiming to cultivate scientific literacy with a focus on sustainable development among children. By doing so, The SDG Collection seeks not only to inform but also inspire the next generation to act for a sustainable future.

Implementation

The FYM journal aims to simplify complex scientific research for young learners, effectively narrowing current scientific literacy gaps. Utilizing a dedicated platform, articles undergo review by children aged 8 to 15 under the guidance of researchers, ensuring content is both accessible and engaging. The journal partners with esteemed organizations and features collections authored by Nobel Laureates, showcasing distinguished research in a format understandable to children.

KAUST has a history of engagement with FYM, editing collections, and sponsoring the journal's Arabic translation. To leverage such engagement, the OS proposed a new SDG Collection in a collaboration agreement with the UNDP office in Saudi Arabia, aimed at enhancing sustainability education. The project began with KAUST's OS and the KAUST Enrichment for Youth (KEY) team securing 17 manuscript submissions, one for each SDG. This involved recruiting guest editors from KAUST's diverse pool of experts and arranging stakeholder meetings to secure article authors.

Diverging from FYM's virtual review process, KEY and OS worked with The KAUST School (TKS) to set up an afterschool club where students



actively engage in person in the peer review process. Moreover, students expand their participation through SDG-related research and by preparing interviews with the article authors in KAUST's recording studios, lending a professional touch to their role as interviewers. The sessions allow for interactive and accessible discussions on scientific research.

This direct interaction between researchers and children demystifies the figure of the scientist, presenting them as contemporary and relatable people who are sources of knowledge and inspiration rather than distant experts in seemingly unachievable roles. It also ignites students' interest in science by exposing them to real-world problem solvers of sustainable development challenges, fostering a sense of proximity and action that textbooks alone cannot achieve. Secondly, it enables researchers to refine their communication skills, translating complex ideas into engaging stories that resonate with broader audiences.

The traditional FYM model transforms students from passive recipients to active participants in scientific discourse and contributors to a global educational resource. Through The SDG Collection, KAUST aims to expand the model with extra audiovisual resources, broadening both scientific literacy and SDG awareness while instilling a sense of achievement in the students, as they become contributors to the dissemination of the global sustainable development agenda among their peers worldwide.

Outcomes and Future Directions

Since launching, The SDG Collection has seen significant engagement from students, highlighting its success in making sustainability science engaging and relevant. Through review sessions and author interviews, it has already enhanced scientific understanding and spurred conversations on sustainability at a local level. As more manuscripts are submitted, we plan to broaden the collection's impact by hosting live review events with multiple schools and creating a national dialogue platform on the SDGs, promoting community and responsibility among youth. Additionally, the contemplation of a Volume 2 of The SDG Collection opens up possibilities for global collaboration, inviting contributions from researchers worldwide to enrich the collection and further its reach. The initiative showcases how higher education institutions can extend their influence beyond academia by participating in educational collaborations that bridge scientific research with sustainable development, acting as a model for other university-driven efforts to influence broader societal change.

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UNIVERSITY OF SOUTHERN DENMARK

SDU 🎸

SDU BSc Course: Sustainable Development for the Built Environment

Sustainable Development for the Built Environment is a firstsemester course for bachelor students at SDU Odense campus that aims to provide students with the fundamental theories and concepts of sustainable development (SD), specifically applied to the built environment. Since 2019, it has been offered by Civil and Architectural Engineering in the Faculty of Engineering and the Department of Technology and Innovation to support and enhance SDU's overall initiatives in its work towards the Sustainable Development Goals (SDGs), contributing to the goal of a sustainable campus by 2030. To realize this long-term goal, this course provides a unique opportunity for students to utilize the SDU campus as a living laboratory for proposing specific solutions to increase the sustainability of the campus and thereby contribute to the university's work on sustainability.

What do students learn in this course?

This course offers a comprehensive study of sustainable development (SD) within the context of the built environment and civil engineering. Through a structured curriculum, students delve into the fundamental principles of SD, exploring its historical development and application in the built environment. Key topics include an in-depth examination of the structure and development pathway of the SDGs. Emphasis is placed on the importance of transdisciplinary approaches and active participation in addressing sustainability challenges, fostering an appreciation for the interconnectedness of socio-economic, environmental, and technical factors within the built environment. Through case studies and course projects, students critically identify and analyze physical, environmental,



Example of an analysis of SDU University Campus. Student team: Isak Thomas Lund Hansen, Lukas Gotfredsen-Birkebæk, Magnus Blomberg, Serkan Kerim Bagci.

and socio-cultural factors at play, as well as legal, economic, and policy considerations. Overall, the course strives to empower students with the knowledge, skills, and competencies needed to contribute meaningfully to SD efforts within the built environment. By fostering a deep understanding of SD principles and their application, students are prepared to tackle the challenges of designing and managing built environments that are environmentally responsible, socially equitable, and economically viable.

How do students learn in this course?

This course employs interactive lectures, case study discussions, and group projects as primary teaching methods, ensuring a dynamic learning experience for students. The overarching challenge presented to students is the transformation of the campus into one of the world's most sustainable by 2050. The course structure centers on a group project that tasks students with analyzing challenges and responses, SDG assessments, and creating a vision, strategy, and action plan for the SDU Odense Campus. The students work in groups, utilizing the SDU campus as a living laboratory to collect data to inform their analyses and proposals.

What do students develop?

In the 2023-24 semester, four groups tackled campus challenges: greenhouse gas emissions, biodiversity loss, and waste management. Group 1 saw SDU Odense as a sustainable leader, targeting carbon neutrality via strategies such as sustainable transportation, renewable energy adoption, and cafeteria CO₂ reduction. Initiatives included promoting cycling, installing electric vehicle chargers, transitioning to renewables, and offering a plant-based menu to set a sustainability benchmark. Group 2 explored opportunities at SDU that would result in a net-negative environmental impact, focusing on sustainable construction, renewable energy, water conservation, and biodiversity. This involved modular buildings, geothermal and solar energy integration, rainwater collection, green roofs, and wildlife corridors. Group 3 focused on enhancing campus biodiversity through habitat creation and developing resting spaces, managing rainwater for the development of ponds and supporting animals, developing ecological walls and green roofs, and educating on sustainable agriculture. Group 4 envisioned SDU 2050 as a place where students thrive mentally and physically, with strategies like enhancing outdoor spaces, promoting physical activity, integrating treetop canopies with solar panels, and implementing rainwater reuse systems for environmental stewardship.

This course at SDU Odense is exemplary in sustainability education and impactful for several reasons. It integrates theory with real-world application by using the campus as a living laboratory, fostering a deeper understanding of sustainability complexities. Group projects focusing on tackling campus challenges engage students in developing innovative



Transition to renewable energy

By 2050, SDU will be complete energy self-sufficienct, generating the majority of its energy internally. This involves reducing reliance on non-green energy corporations and fostering partnerships with sustainable electricity providers. Implementing energy-saving measures will complement these efforts, ensuring a greener, more self-reliant campus committed to sustainable practices.

Lower CO₂ emissions in the cafeteria

3 SDU will have a sustainable shift in its canteens, aiming to significantly reduce CO₂ emissions by introducing a plant-based menu. Establishing an on-campus greenhouse ensures locally sourced produce, minimizing emissions. Embracing a menu sourced primarily from our greenhouse and occasionally from local suppliers signifies our commitment to a sustainable and eco-friendly approach to dining.

VISION

By 2050 the SDU campus in Odense will be the leading university for sustainable development. The campus will demonstrate the possibilities of being CO_2 neutral, both direct and indirect. The SDU campus will be self-sufficient, proving to be sustainable by implementing transportation initiatives, having a transition to renewable energy and lower the CO_2 emissions in the cafeteria, and therefore set a benchmark for future development.



Example of a vision of SDU Campus Odense for 2050. Student team: Ahmad Mahmoud Tabesh, Ellen Klarskov Lyngholm, Gustav Jens Ellegaard, Katrine Ellehage Arentoft, Mille Agerskov Kofoed.

solutions, contributing to the university's sustainability goals. The outputs are shared with the SDU SDG Hub, inspiring future sustainability initiatives and instilling sustainable practices in students, thereby enhancing university stewardship and care. This collaborative approach ensures that the course generates meaningful impacts, both within the campus community and beyond.

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CHULALONGKORN UNIVERSITY



Witsawapat Engineering Camp: Academic Incubator to Address Water Management in Remote Thai Communities

The Faculty of Engineering at Chulalongkorn University comprises 12 departments, including the departments of Environmental Engineering, Civil Engineering, Survey Engineering, and Water Resources Engineering. With expert faculty members, this academic incubator serves as a crucial source for nurturing expertise in irrigation and water management, which is readily imparted to students for realworld application in addressing challenges related to water management in remote communities.

This knowledge transfer takes place through the Witsawapat Engineering Camp, a volunteer rural development engineering camp program. The primary objective of this camp is to foster future leadership in students, emphasizing their social and environmental responsibilities. It addresses the water scarcity and agricultural challenges faced by the residents of Chetawan Village, Santa Sub-district, Na Noi District, Nan Province. The village, consisting of 264 households and a total population of 1,067 people, relies predominantly on highland agriculture, primarily for corn farming to feed animals, with minimal water usage. However, their main crop of low-priced maize results in low incomes and negatively affects the quality of life for community members. Therefore, the Chetawan Village area requires specialized knowledge in irrigation and water system management. The village has been transformed into a living lab for students participating in the Witsawapat Engineering Camp, which, over seven generations, has involved up to 1,000 students. This initiative has facilitated the co-creation and exchange of knowledge between student volunteers and the community, benefiting both parties.





The volunteer camp initiative commenced in the year 2018 with surveys and the implementation of water resource development projects in collaboration with local communities and sub-district administrative organizations. This collaboration resulted in the creation of water resources and systems, including the Huai Nam Phia weir in 2019, which covered an area of approximately 200 rai with water. In 2021, the camp established the Ta Nam weir and distribution system for consumption. In 2022, the Huai Tang Ho weir was created, generating water for an expanded area of approximately 200 rai. These efforts ensured year-round water utilization for 43 households. Moreover, community members are able to cultivate high-value fruit trees such as durian, cocoa, and date palm, as well as various vegetables, resulting in annual household savings of 35,813 baht per rai.

These initiatives have significantly improved the quality of life for the residents, fostering trust and confidence in the Chetawan Village community. In 2023, in addition to solar-powered water pumping systems and a check dam, the community allocated land to Chulalongkorn University for the establishment of the Dintanian Pracha Ruam Jai center. This center serves as a hub for knowledge exchange with local community members and external visitors, including other organizations. It also serves as a model for sharing water resource development strategies with other communities in drought-prone highland areas.



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VRIJE UNIVERSITEIT (VU) AMSTERDAM



A Match Made in Science: An App to Foster Cross-Faculty Collaboration

At the Sustainability Office of VU Amsterdam, we're passionate about connecting researchers interested in sustainability. Many people work on similar topics in different departments or faculties without being aware of the overlap in research topics. Interdisciplinary research can be rewarding as well as challenging. The first step is to become aware of others' interests. To this end, we developed an app that helps VU employees find peers with similar research interests across faculties. <u>Our app</u> provides insights into the employee's profile based on texts that illustrate their interests and identifies potential research partners within VU who share these research interests.

The profiles are partially based on the Sustainable Developmental Goals (SDGs) and text-based topics using Natural Language Processing (NLP). The SDGs are designed to outline the primary global priorities for the coming years to enhance sustainability. These goals, while focused on sustainability, encompass a broad spectrum of objectives that extend beyond environmental concerns. As a result, the SDGs hold significance for individuals and organisations beyond those directly engaged in sustainability efforts. Next to the SDGs, we include content themes abstracted from the texts.

Individual profiles based on the SDGs and themes are a practical way to categorise the interests and expertise of different individuals. When two individuals share common themes and/or SDGs, it is likely that they share interests or expertise even though they do not know each other's work yet. The app will connect them and illustrate these connections visually.



Implementation

We fine-tuned OpenAI's language model on texts labelled by the OSDG <u>community</u>. By selecting only those texts in this public repository that are highly likely to reflect an SDG, we ensured that the model would be able to find patterns in the data that distinguish these texts from the others. The fine-tuned models predicted the SDGs well, with an overall F1 score of 0.93 (multi-label model) and 0.95 (single-label model). These models are used to predict the SDGs of 763 texts (e.g., masters thesis topic descriptions, study guides and personally submitted texts). Next to the SDGs, we estimated content themes using a Non-Negative Matrix Factorization (NNMF), which is closely related to multinomial principal component analysis. NNMF is a powerful technique for discovering hidden patterns within a corpus of text. When words are frequently found together in documents, NNMF can group words into themes, also called topics. Before applying NNMF, we cleaned the texts and removed a set of almost 400 common words (e.g., research, thesis). The best model (based on our interpretation of the results) contained 18 themes. For each model, we assigned a label based on the most frequent words observed in the themes.

In the app, 344 people can search for themselves and others. The first page shows a list of people with similar names, and for each person, the related SDGs and themes are shown. We call this information the profile. As each person might have more than one text, we show for each theme how many of their texts are related to this theme. Above the profile information for each person, a button appears that allows for visualisation of the network of that person. The networks are based on both SDGs and themes. If two people share two or more SDGs or themes, they are linked in the network. This network shows all immediate connections to the VU employee and the connections among the people in the network. It could be that some people in this network are unrelated even though they share similar topics with the VU employees.

We invited everyone who is currently in our database to an on-campus event. Those attending the event were matched with someone in their network. Thanks to the VU library data team that shared with us the existing connections based on published articles, we avoided matches among people who are co-authors.



Future Directions

Future iterations of our approach could be more sophisticated by considering the strength of ties in the network. This might involve quantifying the degree of shared interest or expertise and assessing the depth of the connection. Another improvement could involve taking into consideration existing relationships based on co-authorship in published articles in the app. We also plan to extend the database with the Scopus profiles.

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UNIVERSITY OF PENNSYLVANIA



Fostering Cohesive Sustainability Education: Creating and Maintaining a Robust Course Inventory

The University of Pennsylvania (Penn) is a private Ivy League institution in Philadelphia, and home to 12 schools on a 300-acre urban campus that serves roughly 11,000 undergraduate and 17,000 graduate students. About 5,200 standing and associated faculty, plus additional instructional staff, offer courses across disciplines.

Education in areas related to climate, sustainability, and the environment have long been institutional priorities, a status cemented in 2009 when the university released its first Climate Action Plan. Now in its third iteration, the plan has a stated goal to increase opportunities for cohesive sustainability education. As part of that effort, in 2012 the Penn Sustainability Office created the first comprehensive list of sustainabilityfocused and sustainability-related courses.

In 2020, Penn launched the Environmental Innovations Initiative (EII), based in the university's Office of the Provost, with a mission to support and enhance scholarship and teaching related to the environment. In 2022, the Initiative took ownership of the course inventory and set about revamping it and turning it into an easy-to-use digital tool. It now exists as a robust, regularly updated, searchable inventory on the Initiative's website.

Implementation

Penn students register for courses using Path@Penn, a database that enables searching by course type (e.g., fieldwork, research, online, inperson, etc.) as well as subject, school, and other variables. But, prior to



2012, there was not a single place for students to go to explore diverse disciplinary interests in environment, climate, and sustainability courses.

In that same year, the Penn Sustainability Office used the Registrar's Office resources to develop a list, in PDF form, cataloging sustainability-focused and sustainability-related courses. The resulting Sustainability Course Inventory helped Penn to obtain its first STARS certification with the Association for the Advancement of Sustainability in Higher Education in 2014. That inventory was updated every year through 2021.

Desiring to provide an even more robust—and digitized—resource, in 2022 EII developed a curated list of keywords and conducted a search of the university's full course catalog. Reviewing course descriptions enabled EII staff to select only those courses that had clear connections to target areas. To further validate these results, EII contacted each of the 53 academic units on campus to confirm that the offered courses had environmental, climate, energy, or sustainability content.

The <u>course inventory</u> went live in December 2022 on the EII website. Searchable by keyword, topic, and academic unit, it allows students to find environment-related offerings across disciplines. Users can also sort the inventory by the Initiative's priorities of stewardship of nature, climate action, and societal resilience. Courses with content that connects to multiple priorities have been assigned to one priority area to streamline the search process.

Language on the course inventory webpage encourages users to contact EII to add courses and to visit Path@Penn to confirm course availability and eligibility.

Outcome and Future Directions

To promote the resource, EII staff and faculty leaders have shared it in presentations across campus, including to undergraduate education deans and at new student orientations, and have taken out paid ads in the student newspaper. The site averages 300 visits a month and has the highest views per user and engagement time of any page on the EII website.

To increase engagement and use of the inventory, we asked academic units to consider including a link to the inventory from their course pages. We are also hoping to explore a way to integrate the inventory into Path@Penn to give students a one-stop shopping experience for courses that relate to climate, the environment, and sustainability.

Beyond its primary aim of ensuring that every student has an opportunity to graduate with a sense of environmental ethics, the course inventory has also proved instrumental for other institutional tasks, such as discerning curricular gaps, fostering campus-wide connections, and facilitating the development of new programs. The inventory has also spurred greater awareness on the availability of introductory courses for undergraduate students and has received positive feedback for improving the visibility of existing courses.

Twice a year, prior to the start of each semester, EII staff repeat the outreach to each academic unit to update the inventory. We are considering ways to automate this to cut down on the onerous task of sending out more than 50 emails. Yet this process offers a valuable opportunity to engage with academic departments and foster relationships with faculty members across disciplines, from political science to design.

Furthermore, the course inventory has enabled EII to identify and label courses that offer immersive education. Anticipating that interest in and demand for such experiential learning will only increase over time, we expect the course inventory will support efforts to give students more hands-on learning opportunities in climate, energy, sustainability, and the environment.

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CAMPUS MANAGEMENT

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY



Campus Trees to Reduce Embodied Carbon in New Construction

The much-loved mature Acacia tree grove across from Shaw Auditorium made way for the construction of the new Martin Ka Shing Lee Innovation Building in late 2022. These trees are not native to Hong Kong, but the year-round greenery and wide, inviting leaf canopy had created a beautiful natural oasis for the campus.

Typically, felled trees from construction sites are ground into wood chips or mulch and used as landscape amendments. While this makes use of the material, it represents a low-value-added solution. For this new Innovation Building, HKUST was determined to find a better and longerterm solution. The project management team learned that the lumber from Acacia trees has a mix of deep brownish and reddish hues and is dense enough for woodworking. The challenge is that Acacia trees do not grow straight; they meander and curve in ways that make them less attractive for harvesting. This is why the majority of Acacia trees in Hong Kong go straight to the chippers. The team also recognized that harvesting trees was not in the Innovation Building's capital budget, and harvesting and preserving the wood from these trees would be expensive, especially since one of the last remaining sawmills in Hong Kong had just gone out of business.

However, the project team persisted in investigating how to gain the most value from the Acacia grove. They recognized that utilizing the wood from the mature trees would trap carbon dioxide, effectively



removing it from the atmosphere and reducing our embodied greenhouse gas emissions from the construction site by around 75 tons. Further, since carbon is stored in the waste wood and raw materials are harvested and manufactured locally in a less energy-intensive way, making furniture and other products would result in a lower life cycle environmental impact. Finally, in a city that is designed for typhoons and extreme weather, the local community is accustomed to buildings that are concrete and steel-intensive. Utilizing locally harvested wood in our buildings represented an opportunity to reconnect our campus community to the natural world in a meaningful way.

Outcomes

After making the case to senior leadership, the project team was able to secure additional funding to carefully remove these trees in ways that preserved the value of the wood so they could be dried, milled into planks, and brought back to campus in the form of new tabletops, furniture, panelling, and other value-added resources for the interiors of new construction. Even the small branches and sawdust from the trees were used for compost on campus so that we could retain the full cycle of value from these resources. Of the 97 trees on the original site, 34% were retained on site, and 64% of the remaining trees with broader diameters were collected to produce usable lumber.

Campus users can appreciate the beauty and heritage of these beautiful trees in their new forms on campus at the newly renovated Student Center, as furniture at the HKUST offices, as acknowledgment plaques around campus, and other installations. When the Innovation Building is completed in 2025, visitors will be able to see lots of interior amenities and furniture from the trees while learning about the value of the trees and their contribution to regulating carbon emissions.

Key Takeaways for Other Institutions

A key lesson from this project is how systems thinking approaches can help guide project and design teams. While a development team might take a narrow view—seeing trees within a site boundary as an impediment—the design method can include conversations about seeing the entirety of the process from different angles. How many items that seem like waste are actually valuable? How can building materials come from the site itself? How can we utilize the design process to emphasize a circular economy view of where materials come from?

For future tree felling on our campus, HKUST has embraced the lessons learned from this project and developed a new Tree Felling and Planting Policy to maximize the value of trees at the end of their lifespan. Before trees are felled, they should be examined for health and amenity value. Some may be useful for products (for example, the Aquilaria is a local tree that produces a fragrant oil that is used for incense and perfumes, and the Cinnamomum Camphora produces an oil that is an excellent mosquito repellent). Those trees with valuable hardwood shall be cut and sorted for maximum reuse. Wood logs that are kept shall be more than 200 mm in diameter, and not less than 1.5 meters long, preferably over 2 m. Where available, existing saplings of native species and exotic species with value shall be transplanted to a suitable site in HKUST.



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ETH ZURICH

ETH zürich

Driving Decarbonization Through On-Campus Projects

With 2023 being marked as the hottest year on record, the imperative for technological solutions to mitigate climate change has never been more urgent. Recognizing this pressing need, ETH Zürich, as a higher education and research institution committed to sustainability, has set net-zero targets and is actively working towards driving change from within. Recognizing the critical role universities play in leading by example, ETH has embarked on various on-campus projects. This living labs approach aims not only to demonstrate research outcomes, but also to foster continuous development and evaluation of technologies in partnership with industry. The large-scale <u>Anergy Grid</u> on campus Hönggerberg marked an early start in 2013.

We present some of the recent on-campus decarbonization projects at ETH Zürich and our learnings with them.

CO₂ Capture Initiative with UniSieve: Towards Cleaner Chimneys

One of our primary initiatives for on-campus decarbonization is the CO_2 capture pilot initiated in partnership with UniSieve, a cleantech company originating from ETH Zürich. By leveraging innovative membrane technologies, we aim to capture CO_2 emissions from on-campus chimney exhausts. Initial testing, which commenced in December 2023, has yielded promising results, with membranes demonstrating compatibility and stability over extended periods. As a next step, the pilot will focus on further optimizing membrane surfaces to achieve even higher purity levels as well as work on the technical setup for extracting the gas.



DemoUpCARMA: Pioneering Negative Emissions and Storage Solutions

Building on our efforts in CO₂ capture, <u>DemoUpCARMA</u> (Demonstration and Upscaling of CARbon dioxide MAnagement solutions for a net-zero Switzerland) represents a significant stride towards negative emissions and storage solutions. Led by ETH Zürich and commissioned by the Swiss confederation this multi-stakeholder initiative demonstrates the implementation and scale-up of two pathways for carbon utilization and permanent storage: mineralisation in recycled demolition concrete manufactured in Switzerland together with the ETH spin-off Neustark; and mineralisation in a geological reservoir in Iceland.

DemoUpCARMA investigated the optimum design of these pathways and how to scale them in the medium to long term, considering

technological, economic, regulatory, political, and societal factors. Comprehensive life cycle analyses have proven the technical feasibility and positive impact of both pathways, with 90% and 80% efficiency, respectively. The project was completed in December 2023, however, both research and development around the pathways as well as the created platform for national stakeholders will be continued.

Seasonal Energy Storage: Enabling Renewable Integration

Connecting our initiatives in carbon capture and storage, ETH Zürich is also actively exploring solutions for <u>seasonal energy storage</u>. Existing storage technologies are expensive, use scarce minerals (e.g., lithium), and often require special conditions (e.g., high pressure).

Researchers of the ETH Functional Materials Laboratory have developed a cheap, reliable, and scalable demonstrator of seasonal storage using the redox pair iron/iron oxide. Two pilot facilities (250 kWh and 10 MWh) have already been built on campus to prove the technology and allow for testing and further development. In the next step, an even larger facility is planned to be built to store as much as 20% of the required energy on ETH's Hönggerberg campus. This innovative approach not only facilitates the integration of renewables, it also enhances the flexibility and resilience of the campus energy system.

Coalition for Green Energy Storage (CGES): Collaborative Innovation

In collaboration with EPFL and partners from politics, science, and industry, ETH Zürich launched the <u>Coalition for Green Energy Storage</u> in 2023. This initiative aims to push the boundaries of innovation in storage and transport solutions for renewable energy carriers, with the overarching goal of creating a climate-neutral and flexible energy system for Switzerland. Around 20 partners and industrial companies have already voiced their interest in a collaboration.

CGES represents a bold and collaborative effort to accelerate the transition to a sustainable energy future. In partnership between academia, industry, and government, and by joint research, development, and deployment efforts, ETH contributes to creating a climate-neutral and flexible energy system that can meet the challenges of the twenty-first century.



Reflection: Lessons Learned and Future Directions

These decarbonization projects at ETH Zürich underscore the university's commitment to driving sustainability transformations. From pioneering negative emissions pathways to developing innovative CO₂ storage technologies and advancing green energy storage solutions, these endeavors hold significant promise in combating climate change. The inter- and transdisciplinary set-up of our projects highlight the need for holistic approaches to sustainability, where innovations in one area complement and reinforce those in others. Close collaboration between administrative units and researchers has been paramount in making living labs a reality while navigating regulatory frameworks has highlighted the need for clear guidelines to expedite project timelines. By leveraging our expertise and partnerships, we are not only advancing decarbonization on campus, we are also laying the foundation for broader societal change toward a more sustainable present and future.

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FREIE UNIVERSITÄT BERLIN



Overcoming the Energy Crisis at Freie Universität Berlin

Freie Universität Berlin has succeeded in reducing the university's annual energy consumption by a total of 30.5% or 49.2 million kilowatt hours between 2001 and 2022. During the same period, the amount of floor space increased by a total of 9.5% and the student enrollment by more than 7%. If the new buildings added since 2010 are excluded from the balance sheet, the university can even report a 35.5% drop in consumption. This was particularly visible in the heating sector, which has fallen by almost 42% (on a like-for-like basis) since 2000/01, while electricity consumption has fallen by 20%.

The energy controlling system in conjunction with annual energy efficiency programs (2003-2011) and the bonus system for energy savings, which has enabled the departments to generate additional funding since 2007, played a key role in reducing the university's energy consumption. Without the energy efficiency activities outlined, the university's energy costs would have been a total of €9.3 million higher in 2022.

In this respect, the measures have significantly strengthened the university's resilience in terms of its energy costs during the 2022/23 energy crisis. On the other hand, the university was particularly challenged in this situation, precisely because it had already achieved such significant savings. The energy crisis was the result of the Russian war of aggression on Ukraine, which posed an acute threat to energy security in Germany, particularly the supply of oil and natural gas. The prices formed on the energy markets for natural gas and other energy sources multiplied, in some cases within a few months. On June 23, 2022, the Federal Ministry of Economics and Climate Protection (BMWK) declared a gas emergency plan for Germany. In order to be prepared for this, the entire population as well as all businesses and public institutions were urged to save energy. The state of Berlin called on universities to save at least 10% of energy in the winter of 2022/23. This presented the university with a huge challenge given the savings it had already achieved. How did it overcome it?

The Executive Board of Freie Universität set up an Energy Efficiency Working Group to develop an immediate energy-savings program as well as graduated emergency scenarios in the case of supply restrictions and interruptions. The latter included measures in the event that more than 25% (level 1) or 40% (level 2) of energy had to be saved. Fortunately, there were no such consequences. However, the university has developed and implemented the aforementioned immediate energysaving program. It includes the following core elements:

1. Awareness raising and transparency

There were numerous discussions with departments and central administration on the structures of their energy consumption and concrete energy-saving options on site, such as running times of HVAC systems, setting thermostat controls in the different types of rooms, cooling and office equipment, organizational adjustments to research work in laboratories, phytochambers, and greenhouses.

2. Communication

A project website and regular communication through the university media and social media provided the university community with background information, recommendations for action, and regular updates on the development of energy consumption.

3. On-site energy checks

Another working group performed technical and organizational on-site energy checks to examine the following options:

- Reducing the running times of ventilation and air conditioning systems by 1 to 3 hours
- Adjusting the night and weekend temperature reductions (e.g., 1 to 2 hours earlier reduction)
- Lowering the temperature in lecture halls, seminar rooms, and functional areas
- Shortening the switch-on times of outdoor lighting

As a first step, the staff responsible for operational management drew up recommendations for the on-site energy checks. As a second step, these recommendations were discussed with the scientists and administrative staff in the buildings concerned. This contributed to a set of measures approved by all stakeholders, which was successively implemented over the winter. With these measures, the university succeeded overall in reducing electricity consumption in winter 2022/23 by 10.7% and heat

consumption by 9.6% compared to 2019. The year 2019 was chosen as a reliable comparison period, as it was before the COVID-19 pandemic. The graph shows an example of the effects on the daily electricity load profile of the earlier reduction in operation compared to the previous annual period at the university's main campus.

The successes were the result of a combination of intensive technical energy checks and coordination of them with local scientists and administrations. It should be highlighted that many proactive impulses to organize research processes more efficiently also came from scientists. Overall, the savings demonstrate the potential of combining technical and discursive interventions. Many of these positive learnings can also be transferred to everyday operations. The working group is to be permanently installed and further energy-saving potential will continue to be identified at the university.



Load profile (10kV) of the Dahlem main campus in blue compared to the same period of the previous year in red.

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TECNOLÓGICO DE MONTERREY



Tecnológico de Monterrey's Path Towards Sustainable Procurement: Efforts and Actions to Achieve It

The Supply Chain team at Tecnológico de Monterrey is responsible for supplying products and services to the university's campuses and institutions that are part of it. It is committed to promoting sustainability among its more than 10,000 suppliers with the goal of increasing awareness of the importance of ensuring a sustainable future by developing a proactive culture in the face of the climate emergency.

To achieve this, the Sustainable Procurement initiative emerged upon the creation of the Sustainable Code for Value Partners (suppliers) as a first step. It promotes the development of a sustainability plan that establishes objectives, measures, and actions to integrate sustainability into the company's strategy, operations, and culture, ranging from resource conservation to innovation. For this reason, suppliers were given seminars that, with the support of experts, addressed sustainable procurement from different perspectives, highlighting the unmistakable and undeniable nature of climate change and how it is becoming increasingly complex.

These seminars also addressed how to make sustainability a priority in decision-making, the increasing importance of supply chains to reduce their environmental impacts, and how concrete and collective action will promote a future that will continue to bear fruit for the benefit of society. For this purpose, Tecnológico de Monterrey offers training in various continuing education programs specialized in sustainable procurement through the Life-Long Learning Green Academy, providing an opportunity for future students to continue expanding their knowledge in this area.



In that sense and in addition, the Sustainable Procurement initiative, in collaboration with some of its suppliers aligned to that aspiration, has established joint efforts of innovation, research, and development that integrate environmentally friendly products into internal supply catalogues, enabling users to make environmentally conscious purchases for items such as drinking fountains, consumables, cleaning chemicals, garbage cans, textiles, and disposables. By mid-2024, the initiative aims to also include compostable garbage bags for organic waste, waterefficient devices and fixtures for sanitation spaces, furniture made from recycled materials, and energy-efficient lighting in the list of items.

Furthermore, the Supply Chain team has actively participated in the development and implementation of institutional strategies that contribute to reducing the university's environmental impacts through multidisciplinary efforts. The following stand out as examples of these efforts:

- Eliminating PET water bottles for campus operations and events
- Supplying and installing drinking fountains to encourage reusable water bottle usage
- Replacing disposable food containers in internal cafeterias with reusable ones
- Utilizing compostable disposables in take-out restaurants
- Correctly sorting and disposing of different types of waste
- Transitioning to hybrid and electric vehicles
- Piloting electric modes of school transportation

Additionally, the Supply Chain team is working towards reusing demolition materials from institutional infrastructure projects in other ways to achieve resource circularity. Lastly, in partnership with a construction materials supplier, 80% of the waste will be transformed into raw materials to produce cement or concrete for new building construction, while also ensuring proper disposal of the remaining 20% of waste.

The progress made over the past two years is remarkable, however, it is only a tiny step, and there are still great things to be done.

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THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY



Al-driven Smart Reusable Meal Container Lending and Returning System

One-time-use disposables are a significant contributor to the overall amount of waste going to landfills, with disposable takeaway containers representing a big proportion. This project aims to cut single-use disposable food and beverage containers by 50% over a three-year period through a series of behavioural campaigns and the use of new technologies. The cornerstone of the campaign is the Lunchbox Lending Program (LLP) system, developed by the Sustainability/Net-Zero Office of HKUST on behalf of the Hong Kong Sustainable Campus Consortium.

The system comprises a combination of distribution and reverse vending machines for lending and returning meal containers. Each machine can provide 120 reusable lunchboxes and operate 24/7. The machines are equipped with internal cameras and AI Object Recognition software, allowing users to borrow a lunchbox by paying a HK\$20 deposit which can be fully refunded upon returning the used container. Users do not need to clean the containers before dropping them off, as the used containers will be cleaned by a professional dishwashing partner to guarantee they are clean and sterilized. Campus caterers also offer discounts to encourage the use of bring-your-own (BYO) meal containers, resulting in personal savings.

The project has provided the university community with a sustainable alternative for takeaway single-use disposables and has also created an ecosystem whereby users and operators are invited to share feedback to



co-develop and continuously improve the user experience of the system. Through promotional campaigns, the project has introduced human elements to the machines through decorations and gifting during exam periods to make them more approachable and user-friendly.

Implementation

Supported by a generous grant from the Hong Kong Jockey Club Charitable Trust, the program was jointly crafted by the members of the Consortium and went through several development iterations of prototypes and designs. The first prototype was installed on the HKUST campus in the spring of 2023, and eight improved sets were installed on the other Consortium campuses later in the year. The project team consulted the Environmental Protection Department to learn from their experience in deploying plastic bottle reverse vending machines in the community and engaged the industry to find best practices in AI and identification technologies. The development team considered a variety of options to encourage participation such as using the honour system, charging a small fee, and requiring a deposit, and collaborated with local organisations like Muuse, Foodpanda, and WWF Hong Kong to learn from their experiences. In the end, the team decided that a small refundable deposit would be inexpensive enough not to discourage participation, but high enough to dissuade users from keeping the containers. The project team partnered with Octopus Cards Limited, one of the widely used electronic payment gateways in Hong Kong.

Outcomes and Future Directions

The project team installed nine sets of machines on the eight campuses of the Consortium. The feedback from the community has been positive, but the utilization rate has been lower than expected. Three lessons learned so far are:

- 1. When people understand the system, they appreciate it and use it regularly. The largest user groups are staff and graduate students who tend to pick up food and bring it to their desks. Undergraduate students are more likely to eat in the restaurants.
- 2. While the machines seem intuitive, they still require a strong campaign to introduce them to the campus communities and demonstrate how they work. For example, some users admitted that they originally avoided the machines because they mistakenly thought the \$20 was a charge, not a refundable deposit.
- 3. To be most effective, a program like this needs to be combined with disposable fees in the restaurants. On campuses where restaurants charge \$2 to \$4 for disposables, the utilization rate of borrowed meal containers is higher.

Moving forward, we expect the utilization rates to continue growing each month as awareness campaigns familiarize the campus communities with the benefits of participating. The project team is integrating a reward scheme called Carbon Wallet whereby users can earn points every time they borrow and return a container. Points can be redeemed for ecofriendly products, university-branded water bottles, and other attractive items.

Because of the high visibility of the machines, members of the broader Hong Kong community have noticed and are interested in exploring how the system can be further implemented beyond the university campuses into the external community. The system is also of note to campus researchers who see them as interesting targets for social science interventions and for student opportunities to practice Life Cycle Analysis project work to further lower the system's footprint.



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UNIVERSITY OF CAMPINAS (UNICAMP)



Waste Management Plans Reduce Waste and Optimise Purchasing Practices

In 2003, UNICAMP started pioneering work in Brazil on hazardous waste management on its campuses, drastically changing how its community deals with waste over the years. This work has broadened the scope of activities, from waste to environmental management and, finally, to sustainability.

The first action started in 2004 with the incineration of passive hazardous chemical waste. This was followed by the treatment of formaldehyde, treatment of residue generated in the analysis of chemical oxygen demand, disposal of material containing asbestos, disposal of inorganic salts, recovery of used lubricant oil, collection of general purpose and lead-acid batteries, and disposal of aerosols. The incineration of 134 tons of passive hazardous chemical waste was carried out in 2004 and 2007. While proper disposal of hazardous waste held significant environmental importance, its execution was crucial, reflecting the accountability and expertise of the waste generator. This process commenced with the Waste Management Group (GGR) nominating waste management representatives for each unit. The representatives were responsible for obtaining information on managing hazardous waste and disseminating it within the unit.

After 17 years of running these programs, we noticed that the representatives needed a tool for reviewing the waste management and prevention practices for their improvement. Therefore, since 2020, we have been updating or creating Waste Management Plans for each of the units of UNICAMP through courses where the representatives are updated on the policies and practices of waste management at the university.



Implementation

To update or create the Waste Management Plans for each unit of UNICAMP, we initially wrote a technical procedure describing all the items a Waste Management Plan should include and developed a model together with representatives from one of the units.

Once we had the technical procedure and model, personnel responsible for representing the Waste Management Group at each unit enrolled in a course at the UNICAMP School of Corporate Education (EDUCORP). This course, entitled "Waste Management Plan," presents the principles applied to handling and disposing of biological, chemical, and domestic waste according to the policies adopted by the university. As a concluding task, the representatives received our assistance in presenting the management plan of their unit. The plan had to be presented to and approved by the board of directors of each unit to become official and be known by all in the internal community.

Throughout the course, we present opportunities to reduce the waste generated, protocols for handling each type of waste, a model for an action plan to improve the critical, semi-critical, and noncritical issues, as well as an inventory of all the waste generated. We also emphasized the importance of optimizing the materials bought, reusing materials, and avoiding single-use utensils as a way of reducing the amount of waste generated.

With this approach, not only have we involved the community in handling waste according to university policy, we have also taken a step forward in trying to reduce the amount of waste generated throughout campus operations. The approach also involved meetings that were held regularly with the group of representatives from the Waste Management Group of each unit/organisation to disseminate knowledge and best practices for waste management. In this way, these groups can help to improve the waste management practices at UNICAMP and create a community of waste handling personnel that can exchange experiences. We have held 3 to 4 meetings with these representatives to exchange ideas and best practices, with weekly publishing.



Results and Reflection

Using this approach, we have already trained five different groups for 6 months each involving a total of 218 people from 51 units of which 44 units have presented their Waste Management Plan. We noticed that these people are much more actively involved in improving the waste management plans and reducing the quantity of waste generated after they have been trained. In addition to the 44 updated plans, having regular meetings is key to building resilience in waste management practices and helping to sensitize the community. Therefore, it is our view that sharing knowledge and offering assistance might be a great way to involve the campus community in handling waste properly and start implementing initiatives to reduce the amount of waste generated.

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UNIVERSITY OF VAASA



Increased Energy Efficiency of Campus Buildings

In 2019, the University of Vaasa began a large-scale campus development project. The project's goal was to transform the university campus into a vibrant and beautiful meeting place that adheres to sustainable development principles. The first phase of the project focuses on renovating buildings and facilities. The second phase includes the development and modification of campus processes. We intend to explore the future demands and opportunities for studying and working, resulting in innovative and comfortable environments for all. The project is expected to be completed in 2024.

The key objectives of the University of Vaasa campus development project are as follows:

- 1. Create a compelling and competitive campus that draws new students and faculty members.
- 2. Renovate the campus with sustainable development in mind.
- 3. Consider the future needs of learning and working with new facilities that will accelerate the transition to a more communal work environment.

As the final step in the campus development project, one of the university buildings, Fabriikki, will be abandoned. The functions currently housed in the Fabriikki building will be relocated to other buildings in such a way that persons who need to collaborate can be as close to one another as possible. The Science Library, located in the Tritonia building (the current Ankkuri building), will be relocated to the Luotsi building. The Ankkuri building will have offices for staff, and the Tervahovi building will mostly be used for studying.



Tervahovi's third floor will serve as the new home for student organisations. Our goal is to provide a comfortable and adaptable atmosphere for student organisations, where everyone is treated equally and interdisciplinary activities are possible.

Fortum, a Nordic energy company, will provide the University of Vaasa with a local energy solution. The new energy system will generate carbon-neutral energy, lowering emissions and helping the university reach its goal of becoming carbon-neutral by 2030. The solution makes innovative use of clean electricity for heat generation and storage. It enables the University of Vaasa to maximise its own energy output while minimising the system's life cycle expenses. The university's buildings will be heated and cooled using industrial-scale air-to-water heat pumps. The energy solution also includes an electric boiler, power and heat storage, and a demand response, which lets the system adapt to changes in market prices and the need for flexibility.

Implementation

Initially, the University of Vaasa purchased the campus properties for its own use. As a result, we were able to save money on rent while still having complete freedom to expand our facilities.

The university chose the alliance model to implement the campus project. This concept is built on a joint agreement among the project's primary stakeholders and is largely dependent on teamwork. The university's goal with the alliance model is to make economic and scheduling progress.

The construction work is carried out one building at a time to ensure that the campus stays operational despite the renovation activity. Emissions from the manufacturing of the materials used in the renovation equal the annual carbon footprint of the university. By selecting low-carbon products and materials, minimising material waste and effectively scaling building services, material-related emissions are decreased.

Results and Reflection

Significant renovations include the Luotsi building's complete refurbishment and updates to both the Tritonia (now Ankkuri) and Tervahovi buildings. This includes an expansion of the Mathilda restaurant in Tervahovi, alongside the construction of new classrooms



and the renovation of existing ones. The majority of the Ankkuri building's changes have affected staff workspaces and the lobby's Café Oskar.

The University of Vaasa established a carbon footprint baseline in 2019. In that year, the university's carbon footprint was equivalent to the annual emissions of 290 Vaasa residents. Buildings accounted for roughly onesixth of the university's carbon footprint in 2019.

The campus development project aims to increase space efficiency by reducing heated square metres by up to 40%. The carbon footprint of the university's facilities will be significantly reduced over time due to improved space and energy efficiency. Energy-related emissions will be cut in half compared to the baseline level.

The pandemic scenario and the changes it brought have proved that we are on the right track. Working patterns will change in the future, demanding new kinds of space requirements.

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MCGILL UNIVERSITY



McGill Biodiversity Plan 2030

The McGill Biodiversity Plan 2030 is an action-oriented framework that was created to protect biodiversity and its contributions to people at McGill University from now to 2030. It was launched in September 2023 during the first edition of a cross-campus Biodiversity Festival and BioBlitz.

The Biodiversity Plan responds to existing commitments at McGill to protect biodiversity. In its Climate & Sustainability Strategy 2020–2025, McGill committed to increasing biodiversity by 2025 and creating a plan for campus biodiversity that emphasizes native, adaptive, and edible species. Ahead of the UN Biodiversity Conference in December 2022, McGill joined hundreds of higher education institutions around the world to sign the Nature Positive Pledge. The pledge states that universities will assess their biodiversity baseline, adopt targets for biodiversity, set actions to achieve those targets, and report annually on progress. To help guide these efforts, the Office of Sustainability led the creation of a Biodiversity Plan for McGill in collaboration with faculty, staff, and students from 15 academic and administrative units.

This group was central in establishing McGill's vision to monitor, protect, and enhance biodiversity via its research, teaching, and operations while raising awareness and engaging community members both on and beyond McGill's campuses. The Biodiversity Plan identifies six objectives and corresponding activities to achieve this vision: (1) Create and maintain inventories of biodiversity across McGill's properties; (2) Analyze and report on McGill's biodiversity impacts; (3) Increase McGillians' engagement in biodiversity-focused educational and research activities; (4) Embed biodiversity best practices in University operations; (5) Increase the quality and quantity of green spaces on McGill's campuses; and (6) Develop strategic partnerships to help meet biodiversity targets. The



plan and its implementation are founded on the principles of being evidence-based, collaborative, climate-relevant, and socially significant.

Process

The McGill Biodiversity Plan was developed from June 2022 to July 2023 through a participatory process led by the Office of Sustainability. This was done in collaboration with a leading expert in biodiversity science based at McGill, Professor Andy Gonzalez, Liber Ero Chair in Conservation Biology and Founding Director of the Quebec Centre for Biodiversity Science.



Stakeholder consultations, including workshops, one-on-one discussions, presentations, and collaborative drafting and revisions, were held with staff, faculty, and students from operational and administrative units, academic departments, and a student club. Based on their areas of expertise, which ranged from biodiversity science to landscape architecture to student outreach, these stakeholders determined the key objectives and goals to orient McGill's biodiversity actions through to 2030 and will be closely involved in implementing the plan.

The project team secured initial funding for two years from the McGill Sustainability Projects Fund (SPF), the largest fund of its kind in Canada. The SPF's goal is to support initiatives, such as the Biodiversity Plan, that create a culture of sustainability at the university.

Reflection

The following factors enabled a successful launch of the Biodiversity Plan and are expected to help lay the foundation for its effective implementation.

Building on research: Developing the plan with faculty, researchers, and students with expertise in biodiversity science allowed the creation of a scientifically robust framework that builds on the rich academic work being carried out at McGill. As a result, the plan not only includes actions to incorporate biodiversity in operations, such as creating sustainable landscaping policies, but also allows for a more ambitious vision to integrate biodiversity actions in research and teaching, data collection, and biodiversity monitoring.

Fostering a participatory process: While the Office of Sustainability convened the development of the plan and will facilitate its implementation, collaborative drafting allowed units across McGill to take ownership of actions in the plan. As such, traditional silos isolating academic and administrative departments were bridged so that biodiversity actions could be aligned between students, staff, and faculty in a shared vision.

Harnessing seed funding: Funding from the McGill Sustainability Projects Fund enabled the team to rapidly kickstart actions in the plan at a moment when there was enthusiasm from consulted stakeholders. These funds will be used to conduct research on McGill's biodiversity footprint, create a public-facing database of biodiversity at McGill, host engagement and awareness activities, and develop a landscape initiative promoting biodiversity on campus, among other actions.

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UNIVERSITY OF CAMPINAS (UNICAMP)

Ecological Corridors at the University of Campinas

The Unicamp Ecological Corridors project is being developed on the Zeferino Vaz and Fazenda Argentina campuses. The Zeferino Vaz campus was planned in the early 1960s with the main objective of integrating academic areas and promoting interaction between students and teachers. This led to the creation of the large circular central square that connects the areas of health, biology, and the exact and human sciences. Despite being integrative in this sense, the territorial planning of this campus did not consider its natural characteristics, isolating fragments of native vegetation and channeling existing streams to make way for roads and buildings.

After decades of occupation and construction of new buildings and roads, the first results of this planning process began to emerge through accidents with local fauna, and flooding. Therefore, since 2009, the university has been seeking to reverse this situation. Flooding is being addressed with sustainable drainage projects, the redevelopment of channelized waterways, and nature-based solutions.

Accidents involving fauna are the justification for <u>Unicamp's Ecological</u> <u>Corridors project</u>. This project was strategically established for the university in 2021 and aims to connect the preservation areas of the Zeferino Vaz and Fazenda Argentina campuses with each other and with vegetation external to the university, allowing the natural flow of fauna and flora through the construction of wildlife crossings, planting and maintaining vegetation in ecological corridors, as well as their fencing and signage. Before this, some actions were developed by the Animal Monitoring Center of the Environment Division to minimize the problem of environmental degradation through community awareness and environmental education; the installation of specific traffic signs and physical barriers in Áreas de Preservação Permanente (APP) meaning Permanent Preservation Areas; and conducting a feasibility study for the implementation of fauna crossings.

Implementation

The work involved the following development stages:

- a survey of previous actions related to the project, which brought forward projects carried out between 2009 and 2016 to raise awareness in the community to minimize the impacts of the presence of animals on campus, including road signage, campus PPA fencing, and a feasibility study for the implementation of ecological corridors;
- conducting a current field survey with photographic documentation to better understand the area as a whole and its ecological diversity;
- conducting a survey of local fauna based on sightings and accident records from the Animal Monitoring Center of the Unicamp Environment Division;
- preparing the project management process by establishing various personnel and teams, acquiring financial resources, preparing technical documentation for project bidding, complying with new bidding laws, and monitoring the bidding process for each phase of the project.

Outcomes and Future Directions

The implementation of Unicamp's ecological corridors will:

- Reduce the degree of isolation of remaining vegetation areas.
- Improve gene flow through seed dispersal and increase the survival rate of animal and plant species.

- Reduce the number of accidents at intersections between wildlife crossings and road systems.
- Improve sustainability indicators for environmental preservation and conservation.
- Implement 217,000 m² of ecological corridors, 92 m of wildlife crossings, 6,500 m of fencing, and 300,000 m² of ecological restoration area.

Until October 2023, alignments were made with internal and external bodies, including the Municipality of Campinas and owners of surrounding properties. Areas for ecological restoration have also been defined. In terms of contracts, the executive projects for aerial and underground wildlife crossings have already been contracted and the ecological restoration project is in the bidding process.

The Unicamp Ecological Corridors project represents the university's concern in ensuring environmental preservation and conservation, as well as the duty to guarantee the safe flow of wildlife between its APPs. The project is aligned with the 2030 Agenda for Sustainable Development and has direct impacts on the Sustainable Development Goals (SDGs), including SDG 13 – Climate Action against global climate change, as it sequesters carbon equivalent to a green area of 300,000 m²; SDG 15 – Life on Land, as the project's objective is to preserve animal species, and; SDG 17 – Partnerships for the Goals as alignment with various bodies and internal and external partnerships is needed to guarantee the successful implementation of the project, although UNICAMP is financing this. This project is pioneering in terms of its facilities and results, and represents an example to be followed by other universities and public bodies that have green areas in their territories.



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FREIE UNIVERSITÄT BERLIN



Let the Campus Bloom: Biodiversity Conscious Green Space Management

Freie Universität Berlin is proclaiming 2024 the Year of Biodiversity and will place a special focus on activities in research, teaching, and on campus. An important cornerstone is the work of the Blühender Campus (Blooming Campus) initiative, which has been campaigning for more biodiversity-focused green space management since 2019. Today, around 10 hectares of campus grounds are managed according to standards developed by our scientists together with the green space management team.

Mowing and Plants: The mowing frequency was reduced, and patchy mowing enables constant food resources for insects. Botanical mapping shows where species diversity is particularly high and where maintenance should be adapted. Spontaneous, time-adapted mowing with insect-friendly equipment is a challenge that we work to improve in the future. The focus is on spontaneous vegetation: where there is little biodiversity, regional seeds of native species are sown.

Community Garden: In the Blätterlaube (green canopy) community garden, which the Blooming Campus shares with the SUSTAIN IT! initiative, rare wild plants as well as vegetables and dye plants are cultivated. Many practices for more biodiversity can take place here in a small space. An installed wildlife camera provides information about the life of nocturnal animals. But the community garden is not always quiet, as it is also a place to learn, meet and, not infrequently, a place to celebrate. Students, employees, and neighbors aged 3 to 93 enjoy being in the garden.



Being Biodiversity Positive: Habitats for insects in their various life stages were created using piles of dead wood, leaves, stones, small bodies of water and compost. Open ground and sand piles offer nesting opportunities for sand bees and others. Some plants are left standing over several winters to provide shelter.

New Projects: There is no scarcity of ideas—whether kestrel nesting boxes with video transmission, wildlife-safe garbage cans, tiny forests, or art on window glass to prevent bird strikes—many new projects are being developed. More green roofs and facades are also among the initiative's goals, including more shrubs and trees for greater structure in the vegetation.

Monitoring and Citizen Science: There is a particular focus on butterflies. For example, a butterfly species that was no longer found in Berlin was rediscovered during the weekly butterfly monitoring on campus. The species was probably able to re-establish itself following a change to a more common host-plant species. In addition to butterfly monitoring, there is a project in the iNaturalist app, a citizen science project from which data is also used for scientific purposes. In addition to species monitoring, plant phenology can be observed on the campus too. In a bed with various wild plant species from the project Pflanze KlimaKultur!, plants that grow over time and produce flowers and fruit can be observed. This makes the Blooming Campus part of a research project on urban-rural gradients and their influence on plant phenology.

Public Relations: There are accompanying public relations projects for all age groups. In a project for kindergarten children, even the youngest learn why spiders sit in the bathtub, or go on a scavenger hunt for early bloomers. Workshops are offered as part of the biannual Schools@ University for Sustainability and Climate Protection on topics such as building nesting boxes, making seed bombs, and edible wild herbs. The initiative contributes to city-wide public relations projects such as the Long Day of Urban Nature, the Long Night of Science and Berlin Science Week. Guided tours take place regularly on campus, ranging from general themes to wild bee tours with external experts. The Blooming Campus is a project that connects different groups of people through nature-based experiences.

Science and Teaching: Increasingly, projects with students are taking place on campus, and final theses deal with campus nature from a natural or social science view. A field experiment on soil and plant ecology and

an observation study on insect diversity is part of the research made possible by the change in use of the green spaces. As a living lab, the Blooming Campus connects science, teaching, and management practices.

Communication: Signs have been put up telling people about insect mortality and the benefits of untidy urban nature. Articles in the campus newspaper Campus Leben informed university staff and students about the project. In the summer of this year, the Blooming Campus won the Berlin Nature Conservation Prize, attracting attention beyond the university and leading to further networking with stakeholders from the city and Berlin's nature conservation community.

Join our initiative "Blühender Campus"! • Sustainability • Freie Universität Berlin (fu-berlin.de)

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ENGAGEMENT, CULTURE, AND BEHAVIOUR-CHANGE

TECHNICAL UNIVERSITY OF DENMARK



New Habits Reduce Energy Consumption in DTU Canteens

With just a few minor adjustments, five of DTU's campus canteens have reduced their energy consumption considerably. A behaviour change campaign aimed at kitchen staff reduced energy consumption in the canteens by an average of 13%. The approach combined knowledge of energy savings with behavioural adjustments.

From Small Adjustments to Big Savings

In 2023, Campus Service decided to expand the existing effort to save energy by initiating a cooperation with the canteen operator to find energy savings in the kitchens. An external consultant assisted Campus Service and the canteen operator in identifying how the work processes could be optimized to save energy. At the time, there had already been a huge focus on energy savings due to the global energy crisis. As an example, the staff was already aware of turning off and lowering the lights and exhaust, and avoiding the use of blast coolers, which freeze food in a few minutes. However, an initial baseline measuring showed that there were still areas with room for improvement. The dishwashers, ovens, fridges, and freezers accounted for the biggest waste of energy because they consume a lot of electricity even when they are not being used. Some of the primary focus areas included postponing turning on the electrical appliances in the mornings and closing the oven doors to prevent heat from escaping to save up to 60-80% of the energy used for reheating. The kitchen staff also postponed turning on the dishwashers and instead gathered dishes in piles and sorted them before running the machine. Furthermore, the temperature in the fridges and freezers was raised as they were often set at a lower temperature than needed. It is possible to save approximately 5% of energy for every degree you increase the temperature.

Involving Staff and Using Humour

According to the energy consultant, the process works best when the entire kitchen staff is included in the process because everyone will then gain a sense of ownership over the project. Also, they need to be reminded of new habits, so they don't forget during busy working days. The campaign concept was 'Catch the Wasters' and the staff were met with humorous black and red stickers on the kitchen appliances displaying the texts "washing waste," "heating waste," or "cooling waste". They served as reminders to use energy with care. Each sticker had a drawing of an "energy glutton" impersonating typical areas where energy is often wasted. They illustrated a set of villains that the kitchen staff should fight together. In this way, the overconsumption



DTU catches energy wasters in the kitchen with nudging in the form of behaviourregulating stickers placed on the kitchen machines. Photo credit: Nasrin Billie from DTU



The canteen staff at DTU Risø Campus achieved 18% energy savings, while across all canteens there was an average energy savings of 13%. Photo credit: Martin Armand Nielsen from Ken storkøkkener

of energy became the common enemy, and the campaign avoided pointing a finger of blame at the staff. Often, we tend to appeal to people's conscience and responsibility when communicating sustainable behaviour, but in this case, the staff was involved as part of the solutionnot the problem.

Habits Are Key

The focus of the campaign was to find solutions which were easy to implement, but which would still save energy. Experience shows that a canteen can typically save 8%-12% of its power consumption by looking at the kitchen staff's daily habits. Often, there is a tendency to just turn everything on when you arrive in the morning. After the end of the two-week test period, the results were clear: the five DTU canteens achieved a combined reduction of 8,490 kg CO_2 per year. They reduced their electricity consumption by 7%-18% (an average of 13%). The kitchen staff were motivated by the project and found the transition easy. Months later, staff still stick to the new routines.

The results of the process and method are very inspiring for Campus Service at DTU. This approach can be transferred to other areas not only at DTU but to other universities as well. It is possible to truly achieve results by changing behaviour without creating obstacles in your everyday working life. In line with this, project managers in Campus Service offer employees at DTU's department's workshops on energy management behaviour in accordance with DTU's goal of reducing the University's total energy consumption by 10% before 2030. The campaign demonstrates that behaviour measurements have a significant impact on energy consumption. Now, DTU's focus is to keep up with and maintain the new habits, and to use the findings and experiences in other corners of the university.

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CONCORDIA UNIVERSITY



Sustainable Event Certification Program

The Sustainable Event Certification Program is a voluntary and free service available to all members of Concordia University who wish to take measurable action to make their events more sustainable. Event organizers get support in selecting and implementing positive actions. The program aims to address aspects of sustainability related to in-person, virtual, and hybrid events. A Sustainable Event Guide serves as the basis for the program and covers best practices related to the following topics: diversity and inclusion, indigenization, accessibility, waste and transportation, purchasing and sponsorship, digital consumption, and sustainability awareness and reporting. Other supporting material for event organizers include email and event code of conduct templates, guidelines for speakers, an accessible document checklist, and a guide to determining the sustainability of sponsors, caterers, and suppliers.

Four levels of certification can be awarded based on the number of actions an event organizer commits to. Events can either be Platinum, Gold, Silver, or Bronze certified. Once certified, event organizers can communicate their achievements to raise awareness and gain recognition for their efforts.

A Sustainable Event Certification Program is of great value and importance to Concordia as it addresses the goals of our Sustainability Action Plan and our Indigenous Directions Action Plan by creating structures, processes, and resources to build long-term mutually respectful and meaningful relationships with Indigenous communities, Elders, and knowledge holders. It also supports our Equity, Diversity, and Inclusion Action Plan by fostering an equitable, diverse, and inclusive campus; and our digital strategy by promoting accessible digital environments.

Implementation

The program was developed by the Office of Sustainability and Hospitality Concordia in collaboration with the Access Center for Students with Disabilities, the Black Perspectives Office, the Office of Community Engagement, the Equity Office, the Office of Indigenous Directions, and Zero Waste Concordia in Facilities Management. The program also received support and contributions from the Concordia Student Union, the Sustainability Action Fund, and Sustainable Concordia.

The Sustainable Event Certification Program was officially launched in September 2022. From the onset, two members of the Office of Sustainability were responsible for certifying events. Our office now has one person working part-time whose mandate is to coordinate the program.



To certify an event as sustainable, event organizers are asked to take the following steps:

Step 1: In the planning stages, the organizers are advised to read the <u>Sustainable Event Guide</u> and consider the actions and timeline in relation to their event.

Step 2: The organizer appoints a lead person on their planning team to coordinate the certification process.

Step 3: At least 3 to 4 weeks prior to the event, the organizer books a meeting with the sustainable events team. The bigger the event, the more in advance we recommend that they reach out. This meeting usually takes a maximum of 1.5 hours and serves to empower the organizer with even more knowledge and understanding of the actions that are applicable to their event.

Step 4: The organizer submits their completed checklist to the Office of Sustainability. Their preliminary score will be calculated along with their level of certification. They will receive the corresponding seal to include in their promotional material and can borrow a standing banner for use in their event.

Step 5: The organizer undertakes and promotes the sustainable actions to which they committed.

Step 6: The organizer reports back and submits the relevant documents to the Office of Sustainability, usually, within three weeks after the event.

After these steps are completed, the organizer receives their final certification level, a performance evaluation, and is celebrated on the program's webpage.

Results and Reflection

Since the start of the program, 30 events have been certified. The events range from small, student-organized events to large international conferences, such as the International Society of the Learning Sciences annual conference. We have received positive feedback from the community on the program and continue to seek and incorporate the event organizers' experiences.

There are several improvements we would like to make to the program in the near future. First, event organizers are awarded their level of



certification based on a points system where every action that applies to their event counts as 1 point. However, not all actions are equal in impact or effort. A criteria-based certification could be a solution to this problem. We have also noticed that event organizers have different levels of capacity depending on their role, the size of the organizing committee, and funding. We would like to explore different options for making the program more accessible and relevant to all event organizers.

Since the start of the program, the guide and supporting material have been updated multiple times to reflect event organizer feedback. Now that the program has been running for over a year and a half, we have decided to keep tabs on any revisions and only update the documents once or twice a year.

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KING MONGKUT'S UNIVERSITY OF TECHNOLOGY THONBURI



The Key Role of Student Engagement in Achieving a Sustainable Campus at KMUTT Thailand

King Mongkut's University of Technology Thonburi (KMUTT) has committed to being a Sustainable University for the 2030 UN SDGs since 2017. This includes incorporating sustainability leadership in all our activities from campus operations and teaching, to conducting research. We aspire to be a green and sustainable campus, acting as a role model in energy, environment, and safety management systems. Additionally, we aim to provide a sustainability platform to promote sustainability leadership that encourages our students and colleagues to become change agents, helping the community and society achieve a better quality of life through the adoption of Thailand's national Sufficiency Economy Philosophy (SEP) for SDGs mission. This complies with SDG 3: Good Health and Well-being; SDG 7: Affordable and Clean Energy; SDG 11: Sustainable Cities and Communities; SDG 12: Responsible Consumption and Production; SDG 13: Climate Action; SDG 15: Life on Land; and SDG 17: Partnerships for the Goals.

Student engagement is key to achieving a sustainable campus and supporting one of our goals focusing on sustainable consumption and production. KMUTT Green Heart is the student sustainability leadership team interested in making the university and its surrounding communities greener, and enabling a better quality of life. According to the results of the single-use plastics investigation, usage in KMUTT totaled 2 million pieces in 2019, which created big problems for university waste



management. This study aims to share our experience on student engagement at KMUTT focused on no single-use plastics usage on campus.

Implementation

To solve the problem of waste management presented by the huge amount of single-use plastic usage and promote sustainable consumption and production on campus, KMUTT Green Heart created their own activities for a "Say No to Single-use Plastics" campaign with nudges to action using the EAST Framework (Easy, Attractive, Social and Timely). The Green Nudges Action Plan was initiated using five steps including 1) brainstorming and setting goals, 2) communicating to all target groups, 3) designing the nudges with an action plan for the pilot site, 4) increasing people's participation, and 5) expanding to all in KMUTT. The KMUTTOneLess campaign was launched in 2019 by KMUTT Green Heart with the objective of having no big 4 single-use plastics (plastic bags, bottles, straws, spoons, and forks) used within KMUTT by the year 2021. The KMUTTOneLess campaign started with the commitment from everyone in KMUTT to reduce the use of one of the big 4 single-use plastics.

Results and Reflection

The results from the 28-month operation (January 2019 to April 2021) showed a 97.6% reduction (1,973,000 fewer pieces) in big 4 single-use plastics usage in KMUTT, with 15,000 students and staff participating in these activities. The results achieved were successful, with a large reduction in both campus waste and greenhouse gas emissions (approximately totaling 500,000 Kg CO₂). This greatly improved KMUTT's campus environment while positively contributing to climate action. Based on the results of this study, KMUTT launched the policy "No single-use plastic in KMUTT" on May 1, 2021, to ensure campus operations met SDG 12 targets for sustainable consumption and production. The learnings from this study showed that student engagement is the key driver behind "No single-use plastics usage in KMUTT" which makes KMUTT a sustainable campus. Moreover, this activity helps expand KMUTT students' leadership and create more KMUTT Green Heart students and social change agents who can help make KMUTT and the surrounding community sustainable.



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TU BRAUNSCHWEIG

SDG Ambassadors Program

Embarking on a transformative journey towards global justice and sustainable development, TU Braunschweig introduced the SDG Ambassadors Program to anchor the Sustainable Development Goals at the university and to generate attention for them. The aim of the program was to present the individual SDGs and translate them into the everyday lives of our university members. We wanted to show how abundant the topic of sustainability is and how many approaches there are to working towards a sustainable future.

We started by looking for 17 employees from teaching and research who are committed to working towards one of the SDGs on a daily basis. To do this, we searched through research projects and courses to find ambassadors for each topic area. Following this, we networked with these employees in order to win them over as ambassadors for our program.

We also looked for student SDG ambassadors by adapting the search criteria to find students who are committed to at least one of the core messages of the SDGs in their studies or volunteer work. We published the student ambassador positions with a call for participation so that interested students could apply independently. At the end of the program, the students were awarded a certificate for their volunteer work so that they could include it in future application processes.

A central component of the program was a public relations campaign to bring the work of the ambassadors to life. This campaign included short interviews and photos that were published on our Instagram channel and website weekly. In short interviews, the ambassadors reported on their motivation to work towards greater sustainability and their specific work on the SDG. In the photographs, which were taken either outdoors or at





their workplaces, the ambassadors can be seen holding a card with their SDG icon.

To bridge the gap between the virtual and real world, meetings with the SDG Ambassadors were organized throughout the year. These meetings provided opportunities for face-to-face interaction and allowed the ambassadors to share their experiences, insights, and challenges with each other and with fellow students and faculty members. We made sure that the formats of the network meetings differed to appeal to as wide an audience as possible. For example, one network meeting was linked to a lecture, one was held in the lunch canteen, and one was organized as a Christmas party.

In addition, a course catalogue for students at the TU Braunschweig was developed to provide an overview of SDG-related courses. It includes suitable courses offered by the SDG ambassadors as well as other courses collected on the topic of SDGs. Since then, the course catalogue has been made available and updated every semester.

Implementation

The program was designed and realized by the Green Office of the TU Braunschweig and provides educational and networking offerings on the topic of sustainable development. The Program was implemented by the Green Office coordinator and a student assistant. Within the program, almost no financial costs were incurred, as all ambassador positions were filled on a voluntary basis. Only printing costs and costs for organizing the network meetings were incurred. This makes the SDG ambassador program easily transferable to other universities.

The SDG Ambassadors Program at TU Braunschweig will return in 2024 with a similar structure, but it will have one new feature: Ambassadors will take part in a new SDG seminar, which they are going to shape and structure together. This seminar will provide a platform for exploration and collaboration.

Results and Reflection

The program is now part of the regular offerings of the Green Office. It has managed to generate publicity for the SDGs at our university and translate the topic into the everyday lives of our university members.



One potential for future implementation is to strengthen the exchange between the SDG ambassadors and the university community. To make this possible, the network meetings should take place more regularly and be advertised more publicly. Student participation can also be expanded. To make this possible, we would like to organize a seminar together with at least 10 of the 17 future SDG ambassadors that students can attend as part of their curriculum and receive credit points for.

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UNIVERSITY OF GOTHENBURG

Reducing Climate Impact with the Support of Objectives and a Carbon Intelligence System (CIS)

Since 2019, the University of Gothenburg (GU) has been a member of the national Climate Framework initiative. The Climate Framework is an agreement among Swedish higher education institutions with the aim of working systematically to reduce climate impact, with the goal of decreasing CO_2 emissions by 50% by 2030 and reaching climate neutrality by 2045.

The Vice-chancellor (Rector) of the University of Gothenburg established an objective for the university to achieve a CO_2 reduction of 25% by 2024, aiming for a 50% reduction by 2030. To support this objective, a Carbon Intelligence System (CIS) has been developed and implemented, together with CO_2 budgets at the faculty level. A steering group, led by the Pro Vice-chancellor, got the commission to coordinate the implementation process. The decision by the Rector makes it clear that each faculty is responsible for achieving the goal, and the dean is expected to report on the progress regularly.

Implementation

With the CO₂ objectives in place, we conducted an inventory to find out the total climate footprint of the university, using a method where economic data from the economic system in combination with emissions data from environmentally adapted multiregional input-output models are combined to create an estimate on greenhouse gas emissions from the purchase of all goods and services. Our calculations included scopes 1, 2 and 3. The calculations are based on Life Cycle Analyses (LCA) so the emissions shown take into account the whole process, from extraction through processing to use in the organization. See diagram for a schematic view of the analysis process using the CIS tool.



Schematic view of the process with the Carbon Intelligence System (CIS)

During 2023 the operational dialogues were formalised, and the CIS tool was further developed providing more data and value to the faculties and institutions. CIS makes it possible for each Dean on the faculty level as well as every Prefect (Head of Department) on the department level, to view their institution's emissions via a drop-down menu, where you can choose to display a certain institution and/or a certain category and visualize the emissions. This is helpful when deciding on what measures to take or which activities to engage in.

In 2023, several informational and training activities, as well as workshops, were carried out to improve understanding of the tool and to increase its use. In December, the Rector's management and strategy meeting was held with all deans and heads of department. The focus of that meeting was to exchange knowledge and experiences about sustainability and climate impact. The overall result for 2023 show that GU increased



its CO_2 emissions by 1% compared to 2019. While some faculties have reached the target of 25% CO_2 emissions reduction, others have increased their emissions.

Outcomes and Future Directions

With the CIS tool, we have very precise measurements of our emissions. We have five years of measuring, with 2019 as our baseline. The figure shows the overall CO_2 emissions and results from the CIS tool for 2023. Emissions are sorted into seven categories.

The development of the CIS tool has started several internal processes that will hopefully lead to emission reductions over time. These initiatives would most likely not have been started if it hadn't been for the CIS emissions calculating tool.

Above all, the tool has created a good understanding of our organisation's challenges with climate work and the difficulties in reaching ambitious goals. Since the introduction of CIS, several seminars have been held where the discussions have sometimes been challenging, but at the same time very instructive.



GU's overall CO_2 emissions (in kilotons) in 2023.

Reflections and Challenges

The process of introducing a CIS tool initially involved a lot of socalled method criticism, which has resulted in the system and its data being further developed. Subsequently the focus has shifted to which measures and actions can reduce a faculty's or department's climate impact.

A challenge lies in initiating and coordinating measures that benefit the entire university in order to avoid suboptimization. Such measures can be about sustainable purchases, coordinated distribution of goods, systems for reusing goods, and a climate fund. At the same time, initiatives from institutions and faculties can be developed such as, for example, local travel guidelines/policies, promotion of train travel, and changing fuel types on research vessels.

As the targets for CO_2 emissions are set in absolute numbers, questions have been raised about how the university should handle, for example, increased research grants or more training places. Likewise, the question of the difficulty (or dilemma) of managing the conflict of goals between increased internationalization and reduced climate impacts.

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UC CHILE (PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE)



Climate Action Strategy: Carbon Neutral by 2038

Concerning sustainability issues, UC Chile declared its first commitment in the UC Development Plan 2010-2015. In this document, the university determined the implementation of a Sustainability Office responsible for promoting a sustainabilitybased culture with an impact on the university's community and processes. Furthermore, UC Chile embarked on the creation of the Institute for Sustainable Development in 2018, which aims to enhance education and research on sustainability issues. Other examples of the university's sustainability endeavors include the declaration of a climate emergency in 2019 and the commitment to make UC Chile carbon neutral by 2038.

UC Chile's activities to help tackle climate change also triggered a participatory process that started in 2020. This process entailed the creation of an institutional Council for Climate Action. The Council, formed by faculty members, staff, and students, oversees the work of several working groups that address varied themes, including energy and buildings, transportation, waste, water, biodiversity, education, research, and culture. The Council also defines the pathways that UC Chile must follow to achieve carbon neutrality. Such pathways include elements of resilience and adaptation, as well as monitoring activities. The aforementioned participatory process then utilized academic knowledge to carry out concrete actions that have benefited the university and its stakeholders.

The 2023 UC Chile Climate Action Strategy summarizes the work of this participatory process, which has involved the collaboration of at least



150 members of the university's community. The launch of the Climate Action Strategy has enabled the university to take various steps towards tackling climate change. However, UC Chile is aware of the challenging tasks regarding the carbon neutrality commitments for Scopes 1, 2 and 3. In this vein, the strategy encompasses 18 major projects, which address 10% of the target emissions (reductions) to be met by 2038. Consequently, UC Chile is continuously working on measures and solutions, and reviews its strategy to meet sustainability targets and achieve climate action objectives. In addition, UC Chile is developing a Carbon Sequestration Plan, which aims to increase the university's carbon sequestration capacity. Acknowledging the complexities of reducing its activities and corresponding impacts to zero, the university's priority is to enhance carbon capture, while implementing projects and other measures to reduce the operational impacts from campus activities and raise awareness on sustainability habits.

UC Chile's commitment to carbon neutrality and climate action has inspired other Chilean higher education institutions to join the efforts. UC Chile is part of a Chilean network of higher education institutions–Red Campus Sustentable (RCS)–which seeks to incorporate sustainability criteria into its activities. As a partner of RCS, UC Chile has contributed to the creation of a working group formed by numerous Chilean universities which aims to provide mutual support on a "Carbon Neutrality Route." This working group also delivers guidance for carbon footprint quantification, mitigation plans, and action development so that the universities' carbon sequestration capacities can be enhanced.

UC Chile is therefore committed to sustainability and climate action issues; its actions seek to motivate stakeholders and the whole of society to find concrete solutions for a better world.

ESTRATEGIA PARA LA ACCIÓN CLIMÁTICA



Carbono Neutral al 2038

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THE UNIVERSITY OF EDINBURGH

Creating Woodland for Everyone: The University of Edinburgh's Journey in Land Management

In an era where environmental action is imperative, The University of Edinburgh has committed to sequestering unavoidable carbon emissions produced by essential travel (research and students' flights to and from Edinburgh, equating to around 10% of emissions) as part of our ambition to be zero carbon by 2040. In 2021, we embarked on a long-term, multimillion-pound project involving land acquisition, woodland creation, and peatland restoration.

In addition to acquiring 887 hectares of owned land, the University will develop long-term (50 to 100 years) partnerships for woodland creation and peatland restoration. Benefits beyond carbon sequestration include enhancing biodiversity and woodland connectivity, recreational and landscape improvement for local communities, and the preservation and celebration of cultural heritage features.

We are acutely aware of the land ownership context in Scotland and the notion of green lairdship: accelerated land purchases for offsetting schemes that are often associated with greenwashing and lack of consideration for local communities. As such, we are committed to investing in and creating long-term partnerships, and ensuring this work brings about social and environmental capital to the local area. We want to exemplify a responsible approach to woodland creation in Scotland.

Implementation

Covering 431 hectares, our first site in Stirling, Drumbrae will be home to native broadleaved woodlands with a diverse coniferous element,

balancing ecological diversity. 45% of the site will remain unplanted to retain open ground habitats, and areas around archaeological sites will have four times more open ground than the minimum required by the UK Forestry Standard.

Community consultation was really important to us, and the Drumbrae community consultation and engagement was multifaceted. Stakeholders were identified by geographical proximity and the relevance of groups/ organisations to the project.

The initial process included an early engagement survey, a formal consultation survey, and an in-person public event. The early engagement survey elucidated existing uses of and relationships to the site. Later, the formal online survey was an opportunity for stakeholders to comment on the woodland design plans. The in-person event drew in over 80 attendees, helping build relationships and offer a deeper understanding of issues important to the local people and community. The event featured an opportunity for stakeholders to provide feedback on the woodland design in paper format and by placing physical notes on enlarged maps.

Stakeholders were also able to learn more about the project directly from the University of Edinburgh staff and the land management, ecology, and archaeology consultants. Feedback was integrated into the project, and we publicly shared <u>key themes</u> that emerged and how we have responded, showcasing a commitment to community involvement and responsiveness.

Rullion Green Wood is the second site that we own, but we plan to change how we manage it. At the Rullion Green Wood consultation, we built on our experience and created a separate youth survey with a



booklet designed to explain the project to a younger audience. We also incorporated geospatial mapping into public surveys to allow people to comment on precise areas of our woodland designs.

Educational and Recreational Opportunities

Our dedicated Community Ranger is playing a pivotal role in integrating creative methods of engagement. Educational and recreational opportunities are a key element of what we want to deliver at our sites, and we know that our partnerships with local schools, colleges, and community groups are integral to the success of sustainable initiatives.

Throughout the summer there will be several biodiversity projects, aiming to re-establish unique plants that support rare butterfly species.

An academic lead for the programme will be joining us this year so we can capitalise on the opportunities this work will bring for research and experiential learning for our students and researchers.

We are also committed to exploring and showcasing the rich cultural heritage at each of the sites. Our Drumbrae Archaeology Report unearthed several historic environment sites dating from the bronze age to the 20th century. It will be great to work alongside local archaeologists to learn more about these sites, and to preserve and celebrate local history.

To ensure that information is presented in a community-driven manner, we will be hosting a community workshop in the summer to collaboratively shape content for some interpretation panels that will be placed at main entrances and key locations. By involving local communities at each step in the process, we hope to create a sense of shared ownership and pride in the project.

Reflections and Future Direction

The insights gained in the last 18 months have not only shaped our initiatives to date, but also provided a roadmap for future developments and enhancements.

We are exploring avenues for outdoor learning opportunities. This involves working with schools, and staff and students at the University to champion and facilitate experiential learning opportunities.



To embed sustainability into local socio-cultural landscapes, we plan to further lean into the arts by producing videos, conducting interviews, and collaborating with local artists.

Long-term projects hinge on their ability to adapt to circumstances and community needs. Regular evaluations, feedback mechanisms, and ongoing community consultations will be integral to our approach.

By weaving together ecological benefits, community involvement, and cultural appreciation into our projects, we hope to create a blueprint for holistic and impactful woodland creation and peatland restoration in Scotland.

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THE UNIVERSITY OF BRITISH COLUMBIA



Establishing UBC's Accountability Framework to Accelerate Its Path to Net Zero Emissions

In 2019, the University of British Columbia (UBC) adopted its most ambitious climate action plan (CAP2030) in its history, setting a course to accelerate toward net zero emissions (without offsets) by 2035 and committing to 45% reductions in scope 3 emission areas, including business air travel, food systems, commuting, materials, and waste. These are referred to as extended emission areas within UBC's CAP2030. The new emission reduction targets are aligned to meet and exceed the IPCC target of 1.5 degrees Celsius.

In order to achieve these ambitious reduction targets, UBC developed a new accountability framework to help guide the implementation of actions that are required to achieve the defined goals and targets established in CAP2030. The breadth and scope of the plan necessitates that it reaches every corner of the institution, requiring a distributed approach to implementation. A CAP Accountability framework was developed that outlines responsibilities for the implementation of actions, monitoring progress, and governance over decisions and processes.

What Are Accountability Frameworks and Why Are They Important?

Accountability frameworks provide a clear pathway that enables organizations to define incremental stepped changes that advance toward achieving long-range targets. They break down long-term greenhouse gas emissions reduction targets into specific, measurable, attainable, realistic and timebound milestones (SMART). They also



outline the governance structures that help align and direct decisions that advance to meeting those targets. The frameworks help to measure the progress being made toward those targets through reporting that is shared publicly and with the governing bodies, so they are aware of the efficacy of the policy that they endorse. Effective reporting tools provide an accurate assessment of how successful the implementation of policies and plans has been in advancing toward defined targets.

UBC's Approach to Developing a Climate Action Accountability Framework

UBC's CAP 2030 requires a whole-of-university approach whereby every unit has a role and responsibility in ensuring it is integrating climate action into its day-to-day decision-making, programming, and business processes. The framework provides a mechanism and process for UBC units to report on their progress and achievements toward UBC's Board-approved Climate Action Plan 2030 targets.

It is similar in concept to the province of British Columbia's Public Sector Climate Change Accountability Reports (CCAR), where provincially funded post-secondary institutions (including UBC) are required to submit their reports to the province annually to chart progress toward carbon neutrality.

Governance Structures That Ensure Accountability for Achieving Targets

UBC has established a sustainability governance structure that provides strategic oversight and direction, and helps guide decisions around funding and resourcing to advance actions in the plan. Individual administrative units and departments are responsible for reporting progress through the Operational Sustainability Steering Committee. The UBC Sustainability Hub facilitates reporting on academic initiatives as part of the UBC Climate Emergency Report and the UBC Annual Sustainability Report. UBC has also dedicated resources to support data collection, analysis, and reporting. Each year, UBC reports high-level progress on the Climate Action Plan to the Board of Governors.

Lessons Learned

UBC has found that accountability frameworks are helpful tools, but they require champions within each administrative unit and department to steward them forward. Faced with many competing priorities for time, with the consequences only being reputational, units often struggle to advance the actions within the defined timeframes.

Reporting success stories of individual units is important as it builds a sense of pride and helps create a positive signal to other units to rise to the challenge. It also helps foster a culture of sustainability and a renewed commitment to taking collective action.

UBC celebrates successes and helps build awareness through annual Sustainability Soirees, which showcase innovation, creative programming, and the impacts that they have made. These events also serve as a space for recruiting new champions to advocate for taking more concerted climate action within the area in which they work.

CAP 2030: A DISTRIBUTED OWNERSHIP MODEL



Accountability frameworks need to be adaptable to the unit's needs and capacity. They need to be simple to understand and efficient to execute. Efforts to be too comprehensive and have too many metrics require a lot of time and data collection effort. It is helpful to identify the biggest areas of impact by assessing the activities of your unit and department. Focusing efforts on those big impact action areas and the 'low-hanging' fruit are best as these are often rewarding and satisfy the need to demonstrate that the activities being undertaken are having a demonstrable impact. This motivates further action to achieve deeper emission reductions.

Despite these challenges, a climate accountability framework can play an important role in keeping your university aligned to advancing climate action as it provides a tailored pathway for different groups within complex university governance structures. Accountability frameworks can also be used to measure progress and help define incremental and achievable steps toward the big goal of net zero emissions.

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UNIVERSITI KEBANGSAAN MALAYSIA



Journey to Net Zero Carbon: Shaping the Sustainable Future of UKM in a Changing World

The National University of Malaysia (UKM) is committed to supporting the United Nations Sustainable Development Goals (SDGs) by promoting environmental, social, and governmental sustainability within UKM's operations. A roadmap that outlines the key elements for achieving decarbonization on campus and good governance has been established in the UKM's sustainability plan for 2030 and 2050 and highlights the best practices for managing key indicators of sustainability.

Launched in 2022, the UKM's Sustainability Plan aims to create a green, sustainable, and prosperous campus through UKM's commitment to implementing energy-saving programs, exploring the latest energy sources, establishing more efficient solid waste management and training modules, and creating databases and policies that support universal efforts on the SDGs. In addition, UKM has taken on a crucial role in achieving the idea of a "green campus," which includes a variety of programmes designed to lessen negative effects on the environment by promoting a culture of sustainability among students, faculty, and staff, measuring carbon emissions on campus, and identifying the potential for using pristine forest and green areas to offset carbon emissions within the campus.

Overview

The UN SDGs have accelerated the worldwide pursuit of sustainable development. To integrate SDGs into UKM's sustainability report, in 2022 UKM initiated a Carbon Tracking Program on campus. This initiative is in line with the university's desire to create a sustainable campus as stated





in the UKM 2030 Sustainability Strategic Plan. This program applies the methodology prescribed by the GHG Standard Protocol for reporting greenhouse gas emission rates. UKM's objective is to progressively decrease the carbon emission rate on campus by 2030, with a broader, long-term aim of achieving carbon neutrality by 2050. To attain this goal, UKM implements a range of initiatives aimed at diversifying sustainability efforts, which encompass activities like tree planting programs and a forest reserve conservation program. These endeavours are considered essential as part of UKM's strategy to offset carbon emissions by the UKM Forest Reserve in Bangi. Moreover, UKM has taken steps to reduce electricity consumption on its campus through two main strategies. These strategies involve the gradual conversion to energy-efficient equipment and the introduction of measures that harness renewable energy sources such as solar power, on campus. All information related to campus sustainability can be obtained from UKM's website, including specific information on campus carbon emissions and campus green spaces that serve as carbon offsets.

Communication

Sustainability projects and best practices are disseminated through a series of meetings and focus group discussions with stakeholders to gain feedback and input for improving our initiatives towards achieving

a net zero emissions target by 2050. A quadruple-helix collaboration (QHC) between the four major sectors of society (industry, government, research institutes, and the public) is engaged throughout the year. UKM's commitment covers a wide range of areas, including partnerships, community participation, campus operations, research, and education. Furthermore, UKM is embracing integrative research projects, sustainability-focused curricula, and cutting-edge technology to address the SDGs' many complex concerns towards promoting community health and well-being inside and outside the campus. This collaboration provides science-based evidence for decision-making processes when creating a strategy for meeting net zero emission targets at UKM. Our expertise and efforts are shared with wider audiences when attending and presenting our initiatives at international conferences and conducting outreach programs in both urban and rural areas in Malaysia.

Conclusion

The tremendous effort and commitment undertaken by UKM demonstrate the potential to create a campus community that is more just, environmentally sensitive, and socially responsible toward addressing urgent sustainability concerns by forming strategic relationships with regional communities, businesses, governments, and non-governmental organisations. This potential will now serve as a milestone on the path to reaching UKM's net zero carbon emissions commitment by 2050. Based on the lessons learned, UKM will soon introduce the UKM Sustainability Ambassador Program, which aims to equip students from a variety of academic backgrounds with the sustainability knowledge, leadership experience, skills, and competencies that support the culture of sustainability on campus to be leaders today and for years to come.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY



The Impact of Institutional Buy-In on Scope 3 Accounting

MIT has been tracking scope 3 data since 2017 via a broad triage process aligned with the World Resources Institute/World Business Council for Sustainable Development Greenhouse Gas (GHG) Protocol. <u>Fast Forward: MIT's Climate Action Plan for the</u> <u>Decade</u> established an institutional goal to formalize scope 3 accounting and begin to mitigate such emissions, beginning with air travel.

MIT's commitment to climate leadership requires a baseline understanding of scopes 1, 2, and 3 in order to initiate reductions. A cross-functional team including MIT Office of Sustainability (MITOS) staff, student researchers, and a research scientist faculty fellow evaluated and expanded MIT's greenhouse gas portfolio accounting to include in 2023 scope 3 emissions of greatest relevance to a higher education institution including commuting, travel, construction materials, waste, and purchased goods and services.

Implementation

Scope 3 accounting work has been conducted by a partnership between a MITOS staff member and a MITOS Faculty Fellow research scientist working through a pipeline of data collection and analysis, reporting, and action (i.e., reduction strategy). Additional support is provided by a co-leadership structure with staff from multiple departments collaborating on eighteen Fast Forward climate action plan campusbased initiatives, as well as a data sharing agreement with MIT's finance office. Additionally, Fast Forward called for the <u>establishment of food</u>, water, and waste impact goals and strategies, all of which have impactful scope 3 emissions components. This brings more partners to the table to focus on this work, understand departmental contributions to scope 3 emissions, and integrate data and findings throughout multiple Fast Forward initiatives, for example, the establishment of a travel offset and reduction program.

Preliminary Findings and Deliverables

Preliminary data analysis affirms the significance of campus-based scope 3 emissions, which surpasses scopes 1 and 2 combined. Purchased goods are likely the largest source of MIT's scope 3 emissions, but this has been the most time-consuming category for data collection, analysis, and prioritization. This fact, combined with high community demand for business travel accounting and a program to reduce these emissions, led the team to first prioritize reporting on business travel data and reduction planning.

Responding to community interest, MIT launched the scope 3 Business Travel Dashboard in the MIT Sustainability DataPool in 2023. This allows MIT community members to assess the scale of travel-related emissions and explore reduction opportunities. Pairing data with action, MIT is piloting a voluntary air travel carbon offset program for MIT business travel.

Over the coming months, MIT is refining community-facing dashboards to be launched that report scope 3 GHG impacts in categories that can be influenced by MIT departments, labs, and centers; and universitywide systems influencing commuting, construction materials, waste and purchased goods and services.

Outcomes and Future Directions



The above image is a snapshot of MIT's Business Travel Emissions Dashboard capturing all MIT travel approved for MIT reimbursement, by MIT students, staff, and faculty. Presenting emissions data by school or department enables each unit to visualize their individual impact, identify opportunities to reduce emissions, and contribute to MIT's overall efforts to reduce climate impacts.

As expected, school areas with larger populations and groups involved in research and education globally generate more emissions via travel. The groups shown do not represent all school areas or departments contributing to travel emissions but do include the larger contributors.

Next Steps

The team is also working with other Ivy+ Sustainability Consortium member universities to refine a protocol for prioritizing and tracking scope 3 emissions categories that are actionable for higher education research institutions. The Ivy+ discussions are seeking to leverage collective analytical methods; and explore collective actions for accelerating and scaling scope 3 reductions. Anticipated outcomes include aligned accounting methods as well as shared emissions reduction strategies for optimized impacts from multiple schools.

Lessons Learned

- 1. Include scope 3 accounting in a university climate action plan to heighten awareness and priority for administrative units to support efforts when approached with data requests, data review, and technical support needs.
- 2. Establish a formalized scope 3 accounting team with a co-leadership model for efficient data collection, processing, and analysis.
- 3. Scope 3 accounting is best used to identify potential for individual, department, and institutional influence over some categories.
- 4. Use spend-based analytics for a broad understanding of impact and opportunity, recognizing its limitations compared to unit-based estimates.
- 5. In a preliminary "triage" or hotspot emissions review, prioritize working with available data and identify gaps rather than waiting for perfection.
- 6. Prioritize categories with high emissions totals, but consider tackling hot-button issues, like air travel's GHG impact, for greater immediate community engagement.
- 7. Develop action plans for categories that can be influenced by individual, department, or campus-wide behaviours and strategies.
- 8. Document assumptions and calculations for data sets, enabling updates over time, and providing feedback to data partners for improved analysis and institutional buy-in.

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UNIVERSITY OF ZURICH



Strengthening Sustainability at University of Zürich

The University of Zürich (UZH) is actively and consistently committed to the global goal of sustainable development. The Implementation Strategy 2030 for the Sustainability Policy sets the goal of achieving climate neutrality by 2030. In the following, the UZH Sustainability Team presents three prominent projects that are intended to contribute to sustainable development at UZH in research, teaching, and operations.

Reducing Flight-Related GHG Emissions at UZH



GHG emissions by cause category (in tons of CO₂e) 2018-2022

Graph showing that air travel was the single largest polluting category before the COVID-19 pandemic and how it has since evolved.

Overview: When UZH analyzed its GHG emissions from its operations, employee air travel was the single largest polluting category before the COVID-19 pandemic (see graphic). For this reason, the Executive Board decided to curb GHG emissions by reducing those caused by air travel.

Project Objectives: The goal was to prevent flight-related GHG emissions from reaching more than 60% of the pre-pandemic level (average of 2018 and 2019) in 2022. This goal had to be met on a university-wide level and by all seven faculties. Moreover, from 2023 onwards, emissions must be reduced by 3% annually, resulting in a reduction of 53% in 2030. Every faculty decided on their own which measures to implement.

Outcomes: The university-wide goal was met in 2022 with emissions at only 56% of the pre-pandemic level. The faculties introduced various measures, particularly steering taxes with a high carbon price as well as strict guidelines, which proved to be very effective steps for reducing flight-related emissions.

Lessons Learned: Ultimately, establishing concrete targets that every university division must meet is crucial. Voluntary self-commitments or the like aren't sufficient. Furthermore, the goals on a university level must be considered as the starting point for a paradigm shift: science and research will have to adapt to the ecological crisis, and flying less is one element of it. This becomes clear when one thinks of face-to-face conferences, which are still a central element of science today. In that regard, the Sustainability Team hosted an event called <u>Smarter than</u> flying: How to organize successful virtual conferences.

More information.

UZH as a Real-World Laboratory for Climate Change Mitigation

Overview: In 2023, UZH issued a call for transdisciplinary projects applying a real-world laboratory approach to identify successful measures for climate change mitigation. In doing so, UZH made itself available as a real-world laboratory. Projects could be submitted by teams, which had to include researchers and technical or administrative staff. Students and external cooperation partners could also be included.

Project Objectives: With this call, UZH aimed to test measures that could help reach its climate neutrality target. Funded projects would contribute to climate change mitigation and needed to quantitatively and significantly reduce or remove greenhouse gases (GHG), either directly or by upscaling the solutions found.

Outcomes: Five real-world laboratory projects were funded. Two of them focus on air travel, one is concerned with the greening of campus areas, one aims to reduce pipette tips in laboratories, and one strives to reduce the energy consumption of large medical appliances.

Lessons Learned: Researchers are not used to conducting research alongside administrative or technical staff. The Sustainability Team therefore supported by finding project partners. In addition, it was important to offer support in estimating the GHG reduction potential.

Initial project results are available on the <u>Sustainability website</u> of UZH.

Unique Learning Opportunity – Study Week "Sustainable Development and Transformation"

Overview: The study week teaches interdisciplinary information and the latest findings on sustainable development based on basic knowledge about the historical and ethical content of the normative guiding principle, as well as the resulting implications for science, politics, business, and civil society.

Project Objectives: A particular focus of the study week is on understanding and analyzing far-reaching and comprehensive social transformation processes. One aspect is the extraordinary challenge of acting under time pressure and the resulting challenges and implications for democratic societies. Covered topics and disciplines



Aerial view of the UZH Irchel campus, where a real-world laboratory is trying to promote biodiversity.

are natural and social sciences, philosophical and ethical foundations of sustainability, social change and transformation, ecological economics, multi-stakeholder processes, as well as concepts and strategies of social, political, and economic action. In addition, methods of interand transdisciplinary work are introduced. The students are supported by transdisciplinary co-teaching from academics and practitioners. Excursions to partner organizations enable in-depth learning and networking.

Outcomes: The aim of the course is to enable students to analyze problems and topics from the perspective of sustainable development and to develop and design complex solutions in a transdisciplinary context within a case analysis. Students are supported to become changemakers and to act as such.

Lessons Learned: Project-based learning as well as the collaboration between science and society should be strengthened for the next implementation. The students also mentioned the general need for more inter- and transdisciplinary courses. <u>More information</u>.

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UC CHILE (PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE)

Seed Fund

In July 2019, the UC declared a climate emergency during the COP25 summit, becoming the first educational institution in Chile to do so. The university pledged to achieve carbon neutrality by its 150th anniversary in 2038. To achieve this goal, the UC is taking measures to reduce, capture, and offset greenhouse gas emissions (GHG).

It is worth noting that since 2013, the UC has annually measured its GHG emissions. The yearly calculation of carbon footprint reveals that energy consumption, commuting, and global mobility transportation are the activities that generate the highest emissions. Global mobility is identified as having the most significant impact. To reduce carbon emissions from global mobility, it is suggested that the funds collected by the UC from international travel be reinvested in sustainability-focused projects.

The proposal is supported by UC's new global mobility plan, which aims to enhance the university's global commitment, promote sustainability, and care for the common home. One of the plan's four pillars focuses on sustainability and aims to promote eco-friendly mobility options that prioritize informed and strategic decision-making with a lower carbon footprint. This involves promoting sustainable development education, raising awareness about climate change, and fostering a culture of sustainability.

The Seed Fund aims to enhance responsible internationalization in accordance with the UC Development Plan 2020-2025. It is a collaborative effort between the Office of Global Mobility, the newly



inaugurated Office of Community Engagement in 2023, and the Office of Sustainability at UC Chile. The objective of this fund is to enhance the relationship between the institution and its community partners, especially through environmental education.

Operation of the Fund and Outcomes

UC Chile's Seed Fund was launched in the second half of 2023 to support local organizations in Chile that wish to collaborate with the university community on new sustainability projects.


It was created to support a wide range of activities including environmental education campaigns, environmental certification of educational institutions issued by the Ministry of the Environment of Chile, and workshops, training sessions, or events focused on incorporating environmental management or climate action capabilities in communities. By January 2024, the Seed Fund awarded prizes to three winners: the Communal Environmental Committee from El Bosque, the Julio Barrenechea Primary School, and the Cordova Wetland. Two of these winning projects are located in the Santiago Metropolitan Area, and one is in Valparaíso, in the central region of the country.

They proposed actions to improve spaces dedicated to environmental education, academic training programs, and capacity building in sustainability and education. All projects will be implemented in the first half of 2024. To support the winning projects, the University has established a support structure. This structure comprises the winning organization, a UC member from the Office of Sustainability who oversees the process and ensures its continuity, and a UC student from the 'Committed to Sustainability Students (ECOS)' volunteer program who is available for project implementation throughout the year.

Next Steps

This fund aims to bring the best of global mobility to communities across Chile from a sustainability perspective. Due to the positive reception of this fund by Chilean organizations and the UC Chile community in its first version, it has been decided that the Seed Fund will continue as an annual competition, open in the middle of each year, offering support for application submissions and future implementations.

In upcoming fund versions, as a way to also reach the northern and southern regions of our country, coordination will be strengthened with the Regional Centers and Stations of UC Chile and their Children's Libraries (Future School Library) across Chile. This aims to enhance the work of communities in connection to UC Chile in their territories through the Seed Fund.

Reconciling UC Chile's objectives of internationalization and sustainability requires ongoing joint efforts. More efforts will be devoted to emphasizing collaborative work with communities and raising awareness about the importance of reducing the impact of carbon emissions from global mobility.



FONDO SEMILLA

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UNIVERSITY OF TWENTE

UNIVERSITY OF TWENTE.

Climate Centre Seed Funding Initiative

The University of Twente (UT) Climate Centre was officially launched in 2023 to increase the visibility and impact of the previously disconnected climate-related education and research activities at the UT. The Centre aims to support projects that can contribute (but are not limited) to developing expertise in using a geo-techno-social approach for climate solutions.

As a way to spur interaction and collaboration, and provide a common goal for the numerous climate-related activities developing on and off campus, the UT Climate Centre 2023 Seed Funding call was initiated.

The projects for this funding could be research and education-related and could cover a range of topics related to addressing the climate crisis.

This seed funding is intended to support ideas related to proposal development, research, communication/publication, educational development, symposium organization, and other activities that advance the goals of the UT Climate Centre. Proposals were sought that bridge disciplinary boundaries and engage with stakeholders beyond academia, including policymakers, industry partners, and civil society organizations.

This grant is specifically designed to support innovative initiatives that explore novel approaches to mitigating the impacts of climate change and enhancing adaptive capacities across diverse sectors and communities. By providing funding and resources to pioneering research and education endeavors, the grant aimed to foster experimentation, creativity, and collaboration in developing effective strategies for climate neutrality and resilience.

Projects funded under this grant may range from experimental research on cutting-edge technologies to community-based initiatives aimed at



building local resilience and promoting sustainable practices. Ultimately, the seed funding grant initiative sought to spark transformative change, inspire new insights, and empower stakeholders to proactively respond to the dynamic challenges posed by climate change, thereby fostering a more resilient and sustainable future for all.

Implementation

The seed funding call was communicated via all possible University channels, and it successfully received over 40 different applications, of which 9 were funded. Projects were selected and funded based on their ability to develop insights and experience working across the geo-techno-social boundaries, and their ability to increase the impact of climate mitigation and adaptation research and education at the UT. Applicants had only 6 months to complete their work and at the end their results would be reported openly to the community. The Climate Centre provided support to the various projects through community engagement and communication, as well as by working through some of the challenges associated with transdisciplinary research and education.

Outcomes and Future Directions

The results of the seed funding call led to a number of really interesting results both on and off the campus. Two examples are provided here.

One project combined different expertise related to green infrastructure (GI) to develop a walking workshop where participants were led around the campus to interact with different GI measures and increase their awareness of these measures and their impacts on climate change for different groups of stakeholders. Participants developed ideas with concrete steps on how to improve GI on campus and in the nearby city of Enschede by using maps as visualization tools. It was beneficial for participants to have both the experience of being in the environment that is shown on the maps and being able to alter the maps for their own design. This enabled participants to visualize through the maps what they value the most. The integrated approach helped as climate change is a complex issue and considering the perceptions and values of diverse stakeholders helped develop innovative GI measures. A central goal was to aid participants in considering GI measures at the interface of geotechno-socio factors that can build bridges between community, values, and biodiversity while mitigating climate emissions.

A second project fostered collaboration between the local Herenboeren community farm which is currently undergoing an exciting transition from conventional to climate-smart agriculture. Researchers from the UT worked to support this transition through scientific geo-data, opensource technology as well as a citizen science and stakeholder approach. Drawing on the novel farm concept, they designed and conducted a hands-on educational program to engage pupils from a nearby school. This way, they put the geo-techno-social approach into practice. As a result, they have contributed to improving the water and irrigation management of the farm and developed a sustainable and repeatable concept for the transition to climate-smart agriculture.



Overall, the seed funding led to a great deal of interactions and collaboration across the UT community, both inside and out. The success of the project will be further amplified by repeating the seed funding call in 2024, as well as by adding a consolidation element where previously funded projects can upscale and increase the amount of external support and impact.

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CAMPUS AS A LIVING LAB

CHULALONGKORN UNIVERSITY



Bang Pho Living Lab: Co-Creation Through Wood Handicraft Community Conservation and Development Planning

The Bang Pho Wood Street, situated on Soi Pracha Naruemit, Bang Pho, is a rare hub for woodworking entrepreneurs in the center of Bangkok, with their unique skills being passed down through generations of local craftsmen for over 60 years. However, changing urban lifestyles have resulted in product patterns and access to goods that no longer align with consumer demands.

Consequently, the community's economic and trade activities have declined significantly to 68%, collaboration among community members has dropped to 58%, and the community's physical infrastructure has deteriorated. Additionally, environmental issues have arisen due to burning a substantial amount of unused wood materials, and younger generations are not inheriting woodworking knowledge.

Due to this situation, the community is losing its unique cultural heritage and local wisdom. To address this, the Faculty of Architecture at Chulalongkorn University (CU) is conducting the Bang Pho Living Lab project, which aims to revitalize the community and adapt wood products for contemporary urban lifestyles. This initiative is funded by the CU Social Innovation Hub.

This research project fosters co-creation between the Faculty of Architecture at Chulalongkorn University and the Bang Pho community. It involves community planning, strategy formulation, and the transformation of Bang Pho into a creative learning hub in Bangkok. Collaborating with the Bang Pho community as the Living Lab platform,



the project includes collaborative research and activities across seven courses, including furniture design, landscape, urban planning, community revitalization, architectural design, and more. This Living Lab is an extracurricular laboratory that serves as a real-world learning center for 266 students and engages more than 50 local entrepreneurs from over 200 community businesses. Knowledge is shared between students, faculty members, and the community, leading to the development of products and community spaces. The initiative also focuses on enhancing the identity and brand of the Bang Pho community with 15 participating organizations.

This collaborative effort occurred from 2020 to 2023 during the Covid pandemic, culminating in the Bang Po(ssible) 2 exhibition "Co-Creation Learning Platform with Community" in July 2023, attracting approximately 1,000 individuals and effectively revitalizing the Bang Pho community. The successful outcome of the project lies in its model of co-creation, enabling the Bang Pho community to present their vision and community planning to the governor of Bangkok through a bottom-up process.

The Bang Pho Living Lab research project has increased the recognition of the community and has been selected as one of the 20 leading creative districts in Bangkok. The project has initiated community showcases and woodworking activities, leading to the development of





livelihoods within the community. Activities such as repairing old furniture with modern materials and designing and creating new products have reduced the waste of wood materials, resulting in improved trade and the economy of the community. Younger generations have become interested in woodworking and community management, increasing the community management committee's size from 10 individuals aged 45 to 60 to over 30 members, including a new generation aged 25 to 44. This research project can serve as a model for preserving local knowledge and the unique identity of communities through the Living Lab approach, which can be extended to conserve and develop existing communities among the more than 2,000 communities in Bangkok.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY



Crowdsourcing Building Porosity Data Collection to Support Flood Mapping and Resiliency Planning

In the summer of 2021, over a dozen students, researchers, and faculty armed with altimeters measured the porosity of campus buildings with a focus on entry points, including windows, doors, and vents. This group was part of the MIT Porosity Hunt, a citizen-science effort using the MIT campus to test emerging methods and instruments to study potential impacts of climate change—specifically future storm scenarios—on infrastructure. A collaborative effort between the Urban Risk Lab, led by director and associate professor of architecture and urbanism Miho Mazereeuw, and the Office of Sustainability (where Mazereeuw also serves as a Faculty Fellow), the hunt aimed to enhance MIT's resilience to climate change impacts like flooding and extreme heat events. Over three days, participants cataloged openings in dozens of buildings across campus to support flood mapping and resiliency planning.

<u>Fast Forward: MIT's Climate Action Plan for the Decade</u> commits MIT to develop a campus Climate Resiliency and Adaptation Roadmap. The roadmap is grounded in the science of a campus-based flood risk model developed by a cross-functional team including MIT Office of Sustainability (MITOS), MIT Center for Global Change Science, MIT Urban Risk Lab, and contributions from staff, faculty, and student researchers.

The hunt efforts are integrated with the <u>MIT Climate Resiliency</u> <u>Dashboard</u>, a tool available to the MIT community that visualizes potential flooding impacts of future storm scenarios to inform preparedness and adaptation planning. The dashboard's debut marked a big advancement in MIT's resiliency planning, but with a significant limitation: flood modeling treats buildings as solid blocks, disregarding their varying porosity. Working with Ken Strzepek, a MITOS Faculty Fellow and research scientist at the MIT Center for Global Change Science, the team identified the need for building porosity data to understand how much water may enter a building in these scenarios.

Surveyors often collect and map this information, but the "hunt" approach was able to leverage the MIT community to collect data quickly and engage students, faculty, and researchers as resiliency stewards for the campus. By engaging the community in these efforts, projects like this encourage awareness so that if a piece of infrastructure on campus fails, someone is more likely to notice and help bring to light any vulnerabilities caused by the impacts of climate change.

Implementation

MITOS and the Urban Risk Lab recruited more than a dozen students, who were joined by faculty, staff, and researchers to map the porosity of 31 campus buildings. The buildings were chosen based on connected basements, understanding that water reaching one basement could potentially flow to another. Urban Risk Lab research scientists Aditya Barve and Mayank Ojha created a mapping app and chatbot to support consistency in reporting and ease of use. Students were guided through measuring openings, adjusting for elevation to correlate to the City of Cambridge base datum, and evaluating the materials and quality of the opening. The collected data can inform safety as well as provide an understanding of potential damage to research or disruption to campus operations from future storms.

Preliminary Findings and Deliverables

Over just three days, the team mapped 1,030 porosity points that were used to update the campus surface and sub-surface flood model. The integration of these porosities into the flood model has enabled the research team to test how the campus receives stormwaters during a variety of current and future anticipated rainstorm scenarios. The updated modeling reveals that there are buildings and basements that might flood during rainstorms and that some locations have a higher probability of flooding than others across the range of scenarios. Once the model is validated by professional engineers, MIT's resiliency and adaptation planning team will prioritize next-step studies for recommending specific adaptations to existing buildings that mitigate projected stormwater.

Outcomes and Future Directions

After the first round of data collection was complete, work continued at the basement level. Katarina Boukin, a PhD student in civil and environmental engineering and MITOS PhD Student Researcher, focused on methods of collecting data beneath buildings at MIT to understand how they would be impacted if flood water were to enter. By looking at absolute elevation and porosity data from the outside, this data can be connected to how water may flow inside buildings. With the added data from the Porosity Hunt, a more complete picture of vulnerabilities and resiliency opportunities is being generated and updated through the resiliency dashboard.

The Porosity Hunt and data collected additionally serve as a study in scalability, providing valuable insight on how similar research efforts inspired by the MIT test bed approach could be undertaken and inform practice and research beyond MIT.



PhD student Katarina Boukin and junior Eva Then were instrumental in the Porosity Hunt, capturing data around campus and synthesizing it for future use. Photo credit: Ken Strzepek

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UNIVERSITI KEBANGSAAN MALAYSIA



Building Sustainable Living Lab Programmes

At UKM, we envision and practice a sustainable university living lab programme through multifaceted initiatives that integrate three key components. First, sustainable living labs: The labs serve as research and education hubs, emphasising sustainable practices. They are located in ecologically significant areas such as wetlands, oceans, and forest reserves. Secondly, education and research: The labs facilitate learning opportunities through fieldwork, workshops, and research projects, aligning with UN SDGs 4, 5, 8, 12, 13, 14, and 15. Visitors can immerse themselves in various studies on natural (geology and biology) and cultural heritage resources, as well as environmental sciences, while contributing to conservation efforts and ongoing research. Thirdly, edutourism: The labs are designed to attract tourists and the wider public. The visitors contribute financially to the sustainability of the lab and local communities while gaining an experiential understanding of the issues at hand.

UKM has several diverse living labs that cover various ecosystems. For instance, the Tasik Chini Research Centre is known for its research on wetlands and is heavily involved with the UNESCO Man and Biosphere initiative together with the Pahang state agencies. Additionally, the Langkawi Research Centre makes strides for the Langkawi UNESCO Global Geopark, focusing on island ecosystems and their communities. Another living lab, called the EKOMAR Research Centre, is based in a coastal region of Mersing, Johor and primarily conducts research on marine ecosystems. UKM is also proud to highlight another research centre located in an internationally recognized Important Bird Area (IBA) at a highland ecosystem called Fraser Hill Research Centre. These living labs offer customized and engaging educational programmes and



International Coastal Cleanup Day 2023 is celebrated at the Marine Ecosystem Research Centre (EKOMAR) by having a beach clean-up, joined by staff from various university departments.

modules that allow participants to get exposure to and appreciate the nature and rich biodiversity of the tropical country of Malaysia.

Various educational programmes have been conducted throughout the years in these living labs. For instance, the Tasik Chini Research Centre has conducted the Men and Biosphere 360° Biodiversity Education Programme in collaboration with the Biodiversity Council of Pahang and the TESSA Knowledge Sharing and Exchange Visit Programme. Furthermore, Langkawi Research Centre has conducted various courses, including the Water and Women Camp under UNESCO-IHP Malaysia and a regional course on the UNESCO Global Geopark. Meanwhile, the EKOMAR Research Centre has been spearheading various coastal cleanup and community programmes, while the Fraser Hill Research Centre also contributes to educating local and international students and visitors through various programmes on highland ecosystems.

Project Objectives

- To build sustainable and responsible educational modules and programmes within the UKM living labs.
- To expose participants to the natural and cultural heritage, so that they can understand and appreciate the importance of preserving and conserving the heritage site's resources.
- To engage participants with the local communities and their daily activities and traditions, so that the participants can appreciate how responsible tourism may impact their livelihoods.



International students from Singapore enjoy the scenic hill view while being entertained by the edutourism programme held by the Fraser Hill Research Centre.



Participants of the 6th Regional Course on UNESCO Global Geopark 2023 visited the gallery and labs of Langkawi Research Centre as part of the field trip.

Learning Outcomes

- Participants developed a deep understanding of the natural and cultural heritage and the significance of preserving life underwater and on land.
- Increased awareness about the impact of human activities on marine and terrestrial environments, encouraging participants to make more sustainable choices in their daily lives.
- Understanding the principles of sustainable tourism and the importance of supporting local economies and livelihoods.

Success

A sustainable university living lab initiative encompasses a broad range of programmes, from environmental conservation and education to research, community engagement, and advocacy. Various programmes have been conducted at UKM living labs which not only contribute to the achievement of UN SDGs 4, 5, 8, 12, 13, 14, and 15, but also foster personal growth and a sense of responsibility among participants. This ultimately promotes a more sustainable and ecologically conscious society in this country.

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UNIVERSITY OF CAPE TOWN

Khusela Ikamva Sustainable Campus Initiative



UCT launched the Khusela Ikamva "secure the future" sustainable campus project in 2020, as part of its vision 2030 Agenda, of which sustainability is a core concern. The project aims to catalyse the transformation of UCT into a sustainable campus by establishing a community of practice informed by: leading research that incorporates UCT stakeholders from all spheres (students, academic, and PASS staff); extensive and inclusive engagement with the university community; and exemplar Living Lab interventions on campus that serve as a proof-of-concept.

The project will consider environmental, financial, and social impacts associated with five core themes in the UCT campus context, namely energy/carbon, water, waste, wildlife and social responsiveness. The project aims to support and build on UCT's <u>environmental sustainability</u> <u>strategy</u> and will include research to determine the feasibility of particular elements. Certain solutions will be developed into a proof-of-concept to be tested on campus in targeted areas through a <u>Living Lab</u> approach. The project will thereby become a key enabler to transform the institutional fabric of UCT to become a more sustainable campus, not only through the physical fabric of the campus, but also through the social fabric which is the campus community.

The project focuses on these key themes each with a dedicated research leader and team located in a UCT research institution, working in collaboration:

- energy/carbon footprint Harro von Blottnitz (<u>ESRG</u>)
- sustainable water Kirsty Carden (Future Water)

- waste/energy/food nexus Thanos Kotsiopoulos (<u>CeBER</u>)
- wildlife/waste/art nexus Nicoli Nattrass (iCWild)
- establishing a community of practice/social responsiveness Britta Rennkamp (<u>ACDI</u>)



A Living Lab intervention on campus: solar PV shade parking structure with an EV charging point next to one of our busiest campus bus stops.

The work is coordinated by the Director for Environmental Sustainability in the Office of the Vice-Chancellor, with support services from the Research Office, including a governance committee that will track the progress of the project over the course of five years (2021 to 2026).

Implementation

As of February 2024, the project is now three years into its five years and has achieved the following thus far:

- Several postgraduate students have been awarded bursaries through this project to cover the relevant sustainable campus themes of this project
- Various research papers have been published within each of these themes
- Several collaborative workshops were held in the process of the project to extend and incorporate more stakeholders into discussions on how to become a more sustainable campus
- Relationships and bridges formed between academic and administrative/professional staff, as well as with students in support of becoming a more sustainable campus
- Several campus tours have been hosted to help establish the campus as a Living Lab and extend the sustainable campus community of practice
- A sustainable campus online map has been developed that seeks to assist in sharing information about sustainable campus and Living Lab initiatives more easily, even to the point where people can take selfguided tours with signage and QR codes installed at various locations (the signage and QR codes are still in the design and planning stage).

Lessons Learned and Future Directions

- A project such as this has been an excellent way to focus some dedicated researchers' work on our own campus environment across various disciplines
- It has opened the eyes of many academic staff to the complex governance and procurement processes that the administrative/ professional staff are subject to when it comes to implementing infrastructure projects on campus

- It has offered wonderful opportunities to invite other universities and stakeholders to share in the experience, including the campus tour and some of the workshops
- Being a 5-year project has allowed more time and continued funding support for the project to gain real momentum and broader support
- Khusela Ikamva will likely live on beyond the project, in that Living Labs and the community of practice will continue to operate under this banner even beyond the 5-year period of official funding.



UCT Sustainability Map



Screenshot from campus online map (still under development)

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UNIVERSITY OF TORONTO



Co-Production of Sustainability Solutions through U of T's Campus as a Living Lab Theme

In 2017, the University of Toronto (U of T)'s President's Advisory Committee on Environment, Climate Change and Sustainability (CECCS) identified campus as a living lab (CLL) as a foundational theme to support the goal of making sustainability a core part of the identity of the University. By treating the campus as a test bed and involving our community—especially students directly in the process of learning and innovation, this approach promised more meaningful, co-developed sustainability solutions and opportunities for advancing implementation.

A CLL subcommittee was established as part of the CECCS roll-out to support this new priority. Made up of representatives from across the university, this group set out a Charter of Principles to guide CLL project selection and engagement with participants. The subcommittee also identified and facilitated promising interventions in support of the theme. These included the following:

- Identifying major new building and retrofit projects for real-time learning and performance monitoring in collaborations between staff and students
- Working with campus sustainability offices to determine priority operational policies, guidelines and plans that could benefit from student review and input
- Creating CLL opportunities through applied learning courses involving collaborations between students and internal and external ` 'clients'
- Publishing internal and external projects through a joint CLL and Experiential Learning (EL) database to showcase this work and



Photo credit: David Lee from the University of Toronto

encourage further advances on similar topics

- Developing award programs and grant competitions to support and recognise sustainability entrepreneurs and on-campus sustainability change agents
- Soliciting feedback from CLL participants on further development and improvement
- Integrating CLL and, later, engagement and partnerships as cross-cutting themes and priorities for action across all CECCS' subcommittees
- Exchanging our work and CLL experiences with peers to discover synergies, share learnings and collaborate on common challenges

Progress and Future Direction

Steady and positive progress has been achieved over the last five years. In addition to advancing a wide range of sustainability outcomes, U of T's CLL work has led to the following:

- At the time of writing, 197 CLL (on campus) and 248 EL (off campus) projects and reports, mostly available on the CECCS website and public database
- More than 5300 students enrolled in CLL, EL and work-integrated learning across U of T
- More than 20 dedicated CLL courses available to students in different departments
- Close partnership and active support from U of T operational staff in CLL-related activities, courses, and projects each year
- Close partnership and active support from City of Toronto staff members in EL-related activities, courses and projects each year

In 2023, the CECCS worked with CLL students to explore the renewal and expansion of U of T's CLL-related suite of activities. At the time of writing, U of T is considering the following options:

- New opportunities to increase off-campus solution co-production and engagement
- A centralised CLL fund and an annual competition
- New approaches to motivate involvement from a wider group of faculty and staff in CLL-related initiatives
- Student-identified CLL projects guided by student subcommittee
- Participation in the new ISCN CLL community of practice
- Parallel programming to support skills development in engaged

scholarship and co-production for early career researchers

• Opportunities to leverage new data sources (e.g., the new digital twin) for CLL projects

CLL Charter of Principles

Defining Elements

- Integrating core learning and research mission with campus planning and operations,
- Involving responsible use of U of T infrastructure for demonstration of and research on leading edge technical and social solutions
- Engaging students, faculty, staff, and external partners
- Having potential for knowledge transfer within and beyond U of T

Objectives

- Create sustainable solutions that are ecologically and socially sustainable and financially viable in the long term
- Develop research, innovation, and collaboration opportunities through internal or external collaborations
- Seek integrated solutions by employing a campus-wide perspective and focusing on connections between physical and social systems
- Provide learning and engagement opportunities for a diverse range of students, staff, and faculty from different backgrounds and disciplines in

the innovation process

- Advance learning and knowledge of possible solutions for a sustainable future regardless of the outcomes
- Be inclusive and contributory create mutual and lasting benefits for those involved

Success Factors

- High student participation
- Access to resources, as required
- Strong research, teaching and learning outcomes
- Open communication
- Identified operational needs
- Effective project management
- Committed and motivated partners

Student Benefits

- Improved technical and group project skills
- Application of knowledge and education to real-life situations applications
- Networking opportunities with other U of T community members
- Connections to and engagement with prospective industry professionals

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NATIONAL TAIWAN UNIVERSITY



Campus Living Lab Leads to Local Community Climate Action

Recognizing the importance of inspiring local climate action and tackling the complex challenge of climate change requires cooperation across various disciplines. National Taiwan University (NTU) has supported the Smart Campus Plus (SC+) project since 2020 through the Living Lab framework. The SC+ project focuses on establishing a microclimate sensing network in collaboration with local partners and analyzing the gathered data collectively. By emphasizing environmental comfort as a focal point, the project aims to engage stakeholders in discussions about comfort issues, thus fostering local-scale environmental communication and climate action. In 2023, the SC+ team received official funding from the Ministry of Education, becoming one of NTU's five University Social Responsibility projects.

The SC+ project aims to address two main issues during its implementation:

- Bridging interdisciplinary knowledge with real-world field issues in an educational site and trying to fulfill the responsibility of a higher education institution in scientific communication.
- Combining scientific data with local knowledge creates concrete local-level climate actions and establish a paradigm for replication and diffusion.



To achieve this the SC+ project execution is divided into three stages:

1. Development of an integrated system of hardware, software, and data calibration

An initial activity was to deploy IoT (Internet of Things) micro-sensors in-house and integrate them with a calibration station and a cloud database to develop a remote sensor service system. Optimizing the sensors and data systems on this platform served to enhance quality data management capabilities, establish a reasonable indoor and outdoor sensing network, and create a multi-dimensional comfort index.

2. Collaboration with campus teaching, research, and administrative units, and field implementation

Using the Living Lab concept, this project iterated stable operational processes and environmental comfort services within National Taiwan University's campus by combining practical courses in the International Degree Program in Climate Change and Sustainable Development (IPCS) and other teaching resources (e.g., Department of Atmospheric Science and Department of Geography). Moreover, this project also invited teams from various academic fields to address comfort issues together.

Over the past few years, this project has developed indoor sensing strategies in collaboration with the Office of Academic Affairs and discussed indoor air quality improvement plans for large classrooms based on three years of continuous sensing results. It has also collaborated with the Office of General Affairs on outdoor observations of the NTU campus, fine-tuning smart streetlight management systems based on these data. Additionally, this project assisted the Office of Sustainability in constructing an on-campus comfortable environment governance plan.

3. Community field cooperation

The SC+ project expanded community sensing network deployment and data analysis services, based on stable operations and service structures tested within the campus. Through this cooperation, the project assists residents in accessing local comfort information through customized dashboards, which also serve as the basis for conceptualizing local climate actions. Past experiences include helping a temple initiative with air quality improvement actions and figuring out how to address urban heat island issues with local representatives.

Results and Reflection

The SC+ project has achieved positive outcomes within the academic community, including establishing a micro-sensing network both on and off campus, collecting and analyzing small-scale environmental comfort data, and developing an urban environmental database and data dashboard. This system has been patented and has served over 150 students in their practical projects in the past three years. Additionally, this project has facilitated interdisciplinary communication and collaboration between NTU's environmental science team and researchers from various fields, formed several interdisciplinary research teams, and secured external funding.

For the non-academic community, the project has enabled school administrators and community residents to comprehend comfort issues in their living environments through these practices, inspiring subsequent climate actions on a local scale. For instance, it has led to initiatives such as classroom ventilation improvements on campus, which the Office of Academic Affairs led. It also helped the Daxue Village win the carbon reduction competition in 2022 by consulting on the urban heat island effect issues.

However, the SC+ project still faces challenges, including huge outcome uncertainty due to the difficulties integrating analytical results from different disciplines, incomplete data collection due to IoT sensor stability issues, high communication costs in project practice, and more. These challenges decreased the effectiveness of the project team and will require ongoing efforts to overcome them in the future.

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GOVERNANCE AND LEADERSHIP

NATIONAL UNIVERSITY OF SINGAPORE



Scoring Singapore's Highest Accolade for Environmental Sustainability

The National University of Singapore (NUS) has been awarded the President's Award for the Environment, Singapore's highest accolade for environmental sustainability. It is <u>the first</u> <u>university in Singapore</u> to receive this esteemed award under the Educational Institution category. The award affirms NUS's whole-of-university approach to championing sustainability. As Singapore's flagship university, NUS is committed to advancing sustainable development in the areas of <u>education, research</u>, <u>innovation</u>, and <u>campus operations</u>. It strives to be a vibrant living laboratory which drives sustainable solutions and translates research and knowledge into tangible outcomes, shaping the future of sustainability in Singapore.

NUS's leadership commitment to sustainability is demonstrated through the University Sustainability and Climate Action Council (USCAC), chaired by the NUS President, which integrates and advances sustainability across key university functions in education, research, innovation and campus operations.

In contributing to the Singapore Green Plan 2030, NUS has also charted its long-term strategic goals through the <u>Campus Sustainability Roadmap</u> 2030 which guides the university in its transformation towards a carbonneutral, climate resilient, and zero-waste campus. The roadmap outlines NUS's sustainability targets, namely, to reduce its campus Scope 1 and Scope 2 absolute carbon emissions by 30% and purchase quality carbon offsets as a last resort; reduce energy usage intensity by 20%; reduce per capita daily waste disposed by 30%; improve outdoor thermal comfort; and plant 100,000 trees by 2030. All these targets are aligned with, or exceed, our national goals.



The SDE1 and SDE3 buildings, part of Singapore's first net-zero energy building cluster at the National University of Singapore, are among the many contributing factors to our university winning the President's Award for the Environment.

First Building Cluster to Target Net-Zero Energy in Singapore

NUS established <u>Singapore's first net-zero energy building cluster</u> comprising SDE4 and <u>two adaptive reuse buildings</u>, SDE1 and SDE3.

SDE4 was <u>Singapore's first purpose-built net-zero energy building</u>, which is today <u>a net-positive energy building</u>. In 2022, the building generated 565,000 kWh of renewable solar energy while consuming only about 398,000 kWh.

SDE1 and SDE3, two of NUS's oldest buildings built in the 1970s, were retrofitted with modern, net-zero energy and green architectural elements, and have achieved an outstanding ultra-low embodied carbon performance of below 200 kgCO₂e/m².

First Educational Institution in Singapore to Tackle Urban Hotspots

Using the campus as a vibrant living laboratory, NUS is the first educational institution in Singapore to develop a plan to improve outdoor thermal comfort. The university will draw on its expertise in research and campus operations to progressively set up an extensive high-resolution sensor network comprising over 50 sensors across the campus.

These sensors will measure a multitude of environmental factors, such as ambient temperature, for a comprehensive understanding of the micro-climate conditions on campus. Mitigation measures will then be identified and trialled to tackle hotspots on campus.

Building a Biophilic and Greener Campus

To further boost its greening efforts, NUS has pledged to plant 100,000 trees on campus by 2030. These trees will contribute to 10% of the National Parks Board's OneMillionTrees movement. Over 41,000 trees have been planted campus-wide since 2018.

In addition, the university has been expanding green spaces on campus by creating naturalised gardens and curating campus nature ways.

Cultivating a Zero-Waste Culture on Campus

In support of Singapore's Zero Waste Masterplan, NUS launched the Towards a Zero Waste NUS Action Plan 2030 to promote a resource sorting and waste reduction culture on campus, complemented by a network of passionate student advocates who test sustainability projects on campus.

Moving forward, NUS will continue to advance sustainable development in the areas of education, research, innovation, and campus operations, and be a living laboratory to drive sustainable solutions. It will work towards its long-term strategic targets, which will in turn contribute to the larger national and global climate goals.

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SIMON FRASER UNIVERSITY



Strengthening Food Security and the Local Economy

Simon Fraser University's (SFU) commitment to sourcing local food stems from the interconnectedness between local procurement, environmental impact, and community prosperity. By increasing locally sourced food, SFU actively works to reduce food kilometers—the distance food travels from farm to table. This means reduced transportation emissions and a decrease in SFU's carbon footprint within the university's food supply chain.

SFU's commitment to local sourcing goes beyond climate action—it also means supporting local farmers, fishers, processors, businesses, and suppliers, stimulating the local economy, and contributing to the livelihoods of British Columbians. For every dollar that an institution spends on BC-grown and processed foods, it creates up to a 2.2 times impact on the BC economy, including the creation of new jobs

In 2018, the Ministry of Agriculture and Food in British Columbia launched the Feed BC program, which collaborates with public institutions to increase the use of BC-grown and processed foods. By partnering with Feed BC, SFU has been able to scale and reinforce our dedication to fostering a resilient and vibrant local food system, both on campuses and throughout British Columbia.

Prioritizing local procurement with our food service campus partners aligns with SFU's sense of environmental responsibility and commitment to fostering economic growth within British Columbia. Through this, SFU positions itself as a leader in sustainability, shaping a future where higher education institutions play a pivotal role in creating resilient and locally integrated food systems

Implementation

As early as 2012, SFU incorporated local food procurement into its contracts with campus food partners. However, the outcomes were minimal: active promotion of local sourcing was lacking and hampered by the lack of easily measurable requirements.

When a new contract was signed in 2017, SFU stipulated that 25% of produce and 30% of all products must be locally sourced. This empowered SFU to request specific local suppliers and introduced a benchmarking system for local sourcing.

In 2019, a renewed contract further emphasized local procurement by adding quarterly reporting as a crucial component. This underscored SFU's dedication to not only maintaining, but enhancing the quantity and variety of local products in their procurement practices.

Feed BC Implementation

As the Feed BC program rolled out, SFU became a prominent example of how institutions can integrate local procurement into their practices. In July 2019, SFU was invited to be one of the first institutions on the Feed BC PSI advisory committee. This committee aimed to enhance local procurement in Public Sector Institutions (PSIs). SFU played a crucial role, producing guides to improve local sourcing practices across the province and serving as a reference for other institutions.

Feed BC's key strategies involve building awareness and demand for BC food, activating business relationships across the supply chain, and building the capacity of BC food businesses to participate in the institutional market. SFU contributes on all levels.

The establishment of a contract food service working group in 2021 further exemplifies SFU's leadership, bringing together the private

sector, suppliers, other institutions, and the government. The working group addresses common issues around local procurement, presenting a unified voice when engaging with contract food service senior leadership to drive change across institutions. SFU's contract and reporting template became the basis for standardized reporting.

Foodie Engagement

Beyond local food procurement targets, SFU aims to highlight local food through education and events to spark community engagement and drive change. With the launch of the Foodie Program, dedicated resources were hired to build a community around food and support local small and medium-sized entrepreneurs. Initiatives in this program include monthly pop-ups with local food companies and seasonal events featuring local produce. Rooted, an SFU program supported by a Feed BC grant, highlights Indigenous food culture and educates the community about Indigenous dishes through collaboration with an Indigenous chef. Other programs, such as SFU's Food Systems Lab and Embark Sustainability Program, further underscore SFU's multifaceted approach to sustainability through the medium of food.

Outcomes and Future Directions

In line with SFU's commitment to sustainability, the university is actively working towards achieving an average of 30% to 40% locally procured food across its dining services, with a target of at least 50%.

In 2024, SFU secured funding to develop plant-based recipes using local ingredients that will be served in SFU's Dining Commons. This not only aligns with SFU's broader sustainability goals, it also contributes to reducing the carbon footprint associated with meat consumption.

SFU is proud to be a part of a diverse and engaged community that reflects widespread commitment and shared enthusiasm for supporting local food systems.



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UNIVERSITY OF LAUSANNE



Participatory Assembly: A Good Tool for Making Universities More Sustainable?

Since the beginning of its sustainability strategy in 2012, the University of Lausanne (UNIL) has worked in many fields to reduce its environmental impacts. Despite these efforts, UNIL noticed that it is far from fulfilling its commitment to respect planetary boundaries. Major transformative changes were needed to achieve this goal. Thus, it is increasingly known that ecological transformation requires the implementation of participatory processes to mobilise, associate, and coordinate stakeholders (Mormont, 2006), innovative processes or collaborative intelligence (Hofstad, 2016) and, more generally, partnerships or networks between stakeholders (Eweje, 2007). Based on these scientific findings, UNIL decided to experiment with an innovative process to mobilize its community with the aim of transforming its activities so that their impact respects planetary boundaries.

True to its commitment as a living laboratory, UNIL set up a new experiment in participatory democracy. Sixty people representing the community were randomly selected to constitute the Transition Assembly (TA). The university board entrusted the TA with the mission of "elaborating a series of ambitious and transformative measures to bring the impacts of UNIL's activities back within the ecological limits of the planet, while responding to its social mission."

During the academic year 2022-2023, the members of the TA met during 14 half-days of work. The first days were dedicated to preparing the group for working together. Six working sessions then focused on informing the TA members about UNIL's impact sectors allowing the TA



to produce ambitious draft measures for UNIL. Finally, the last sessions were dedicated to finalizing, organizing, and voting on the propositions.

The process design, methodologies, and scientific content of each session were carefully designed by the UNIL Sustainability Competence Center and the team of the Vice-Rector in charge of sustainability. Dedicated human resources were also needed to help facilitate during the working sessions.

Throughout the whole process, three main stakes could be further explored. For each of these, tools and methods have been tested at UNIL that could inform other similar initiatives:

- **Dealing with the human factor** in a group which is heterogeneous in many ways requires methods and tools. To support this we held a half-day session dedicated to identifying the different visions of sustainability held by the members of the TA. In addition, several hours were dedicated to setting, in advance, the rules of behaviour among the TA. Then, working in peer groups to produce the measures helped to create a climate of psychological safety among members.
- Scientific basics to help participants understand why and how much UNIL must change were provided in three ways. First, a movie about the ecological crisis explained by researchers from UNIL was shown. Then, we went over a very detailed ecological impact assessment of UNIL that had been conducted in 2022, based on the conceptual framework of the Doughnut (Raworth, 2012). The main results were presented first, and then results focused on each sector were detailed during thematic working sessions. During these sessions, UNIL's data and information were provided by external experts.
- Finally, the broader challenge was to support the TA in **producing transformative propositions** adapted to respect planetary limits that are sufficiently ambitious to put UNIL on a trajectory to respect planetary limits. Tools for quantifying the impact of proposed measures were crucial in achieving this goal.
- A communication plan was put in place to enable the UNIL community (and the external stakeholders) to follow the process. A website containing all the resources that were developed for the assembly, including a film, a photo exhibition of assembly members' portraits, a report, various articles and public events, was developed.

Results

In July 2023, the TA came out with 28 quantified targets and 146 suggested measures to lower UNIL's impact to fit into the Doughnut (see other UNIL case study). These results have been listed in a public report and presented to the UNIL's board in September 2023. Twelve out of 60 members dedicated additional time to further disseminate the TA's work among the community. The TA's work is now under evaluation to inform the Transition Strategy of UNIL. The report must not be considered as a final point, but rather a starting point.

Key Takeaways for Other Institutions

The TA's results are an excellent tool for discussing with UNIL's chiefs of departments and decision-makers about in-depth sustainability reflection and changes. The random selection of the TA constituents, which differs from the usual consulting processes at UNIL, tested a new way to include more points of view and sensitivities, and to spark deeper dialogue and deliberation. Despite the ambitious mission, the TA's proposals generated a broad consensus among its members. However, some steps of the process could have been improved: the TA suffered from a lack of time for working, debating, and sharing a common vision of what could be UNIL in the future. Also, the team in charge of coordinating the process was undersized compared to the amount of work actually required. Despite some limits, the participatory process conducted at UNIL appears as a valuable tool that could inspire other institutions.

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UNIVERSITY OF LAUSANNE



The Doughnut Theory: A Compass to Drive the Transition Strategy at the University of Lausanne

In 2023, the University of Lausanne (UNIL) achieved the precise quantification of its ecological impacts. By using the Doughnut economics framework (Raworth, 2012), the local and global impacts of UNIL's activities on the planetary boundaries (Rockström et al. 2009) were assessed. This approach allowed UNIL to identify gaps in monitoring and has stimulated the production of new data, particularly on well-being. As far as we know, this is the first time that the Doughnut model has been downscaled for a scholarly institution providing a holistic assessment of the ecological impacts of a university.

In early 2022, UNIL's Rectorate commissioned its Sustainability Competence Center to lead the downscaling process of the Doughnut model to UNIL. This model, invented by the economist Kate Raworth (2012, 2017), combines the planetary boundaries concept identified by Rockström et al. in 2009, with a social foundation inspired by the SDGs of the United Nations.

The objective was to obtain a quantified inventory of UNIL's impacts as a scientific basis for creating the transition strategy of the university. Two people were dedicated to this assessment for 8 months, with the support of UNIL's technical services to obtain relevant data. Starting with accounting data (travel tickets and other goods purchased by UNIL) and existing monitoring indicators (energy consumption, ecological footprints of food served in UNIL's restaurants, etc.), a complete material flow analysis (MFA) was achieved to quantify the impacts of UNIL on planetary boundaries. This MFA was inspired by a similar effort at Oxford University in 2021 to assess the biodiversity and carbon footprints of its operations



(Bull et al., 2022). As with Oxford, UNIL's assessment categorizes the environmental impacts that are under direct university control or influence as well as those that the university can influence only indirectly, and excludes the downstream (hopefully positive) impacts of education and research conducted at UNIL. To ensure the scientific relevance of the assessment, various consultations with experts were conducted especially on UNIL's impacts on its local ecosystem and the social foundation of its community. The whole method and detailed results were published in a report in 2023 (Gilloots et al., 2023).

Outcomes

A robust diagnostic of the current situation

The results of UNIL's Doughnut approach show that the university overshoots, up to a factor of 30, the planetary boundaries allocated to the university. Three of the four planetary boundaries explored exceeded the threshold: climate change, biodiversity loss, and nitrogen loss. Going deeper into the results, the study shows that the UNIL activities with the most significant impact on climate change are air travel (21%), laboratory equipment and resources (15%), and heating of buildings (13%). With another reading key, such as the biodiversity footprint, two additional areas reach the list of the most impactful activities of UNIL: IT equipment (30% of biodiversity footprint) and meat consumption (10% of carbon and biodiversity footprints).

UNIL's impacts on its local ecosystem, in and around its main campus, are more complex to quantify. The study suggests that UNIL generates pollution in the air, water, and soil of its campus, which in turn has an impact on the health of people and ecosystems in western Lausanne. For example, the daily commuting of the community (in a very small proportion) exposes the local population to atmospheric pollutants in quantities that exceed the thresholds recommended by the WHO in 2021.

A basis for defining the actions to be taken

UNIL's Doughnut framework has been used by the Transition Assembly to establish a series of ambitious and transformative measures to bring the impacts of UNIL's activities back within the ecological limits of the planet while responding to its social mission. This assessment is now being used to finalize the transition strategy and to target priority sectors for intervention. The work on UNIL's Doughnut methodology and the calculation tools developed are also essential to defining measures that are consistent with the scale of the challenges. UNIL's Doughnut model was also adopted as the conceptual framework for a new monitoring system at UNIL that will inform decision-makers about the efficiency of deployed measures.

A better consideration of social impacts

Well-being aspects are an essential part of the Doughnut model. Unfortunately, due to a lack of data, the social impacts of UNIL on both local and global scales are still being identified and quantified. However, work on the UNIL Doughnut framework has already led to greater awareness of the social impacts and co-benefits of the objectives and measures that are considered in the transition strategy.

A useful tool for other institutions

This experiment by UNIL can help other institutions accelerate and strengthen the coherence of their transition strategy. UNIL's Doughnut report contains a detailed methodology that facilitates its reproduction in other institutions. In addition, as the results obtained by UNIL are mostly comparable with Oxford's environmental assessment (Bull et al., 2022), other institutions could also estimate their own global impacts based on the Oxford and Lausanne studies, without the need to achieve a complete quantification and therefore, utilize their resources for action.

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IE UNIVERSITY

The 10-Year Challenge

the university community, giving clarity to this term that is becoming increasingly present in our lexicon. This opportunity allows us to raise awareness about how we each have a role in advancing sustainability and that our individual actions matter as we work together toward a more

Ie

In 2020, IE University embarked on a visionary mission called the 10-Year Challenge in which a new overarching theme in Sustainability is presented each year. The focus of the initiative is to both raise awareness and improve our performance in certain areas of response to specific issues. Some examples of previous years' challenges include Responsible Consumption and Accessibility, Inclusion and Belonging.

This initiative is driven by two primary objectives: reducing our environmental impact (to achieve zero net emissions by 2030), and the cultivation of a sustainable culture and mindset throughout the IE community, aligning ourselves with the UN Sustainable Development Goals targets. Each year, objectives and key results (OKRs) are developed for the specific yearly challenge.

Context

Sustainability was not new to IE University when the Sustainability Office opened in the fall of 2019, but it was also not yet a transversal department with university-wide objectives and implications. At that time, we developed key performance indicators (KPIs) related to sustainability for each unit in the university, resulting in an annual data collection from 54 separate areas with 221 unique KPIs. This allows us to have yearto-year comparative data, and to identify areas of growth and others needing more support as potential candidates for the annual challenge.

Soon after its opening in January 2020, the Sustainability Office launched the 10-Year Challenge, which features a new focus each year and culminates in 2030, aligning (temporally) with the UN 2030 Agenda. Through this campaign, we introduce sustainability as a concept to The first year of the 10-Year Challenge coincided with the first year of a comprehensive, university-wide sustainability strategy and plan. For this reason, our first challenge was Responsible Consumption. We understood the importance of getting the university to begin creating an atmosphere of environmental responsibility and the sustainable use of resources.

Methodology

sustainable world

With each challenge, the first step is to map the current situation using the collected data and conduct meetings with the departments and schools. We can then both promote the challenge for the year and understand the circumstances of each unit as it relates to the focus of the challenge. We listen to each unit as they often have ideas for improvement or encounter related pain points. Through this, we gain a more comprehensive view of the situation from the information we have gathered. What follows is an analysis of the information and a subsequent action plan for the relevant departments or schools. Sometimes the action plan results in a refinement of existing policies or the creation of new ones.

Key Takeaways

Since the launch of the 10-Year Challenge in 2020, we can see that this strategy has been successful in meeting the two primary objectives set out at the beginning: cultivating a mindset and culture of sustainability on campus, and reducing our environmental impact. As we involve each

department and school at the beginning of each new challenge, listen to them, and make suggested action plans, they are amenable to the new ideas and are much more engaged in the process than if we had merely done an informational campaign about the goals of our challenge and asked everyone to be a part.

Ultimately, the achievements or outputs of the yearly challenge are the actions that each area has taken, resulting in continuous advancement in sustainability on campus. As we rely heavily on data for measuring progress, this initiative has underscored for us the importance of having a methodology that everyone understands and is easy to comply with.

This initiative showcases an unwavering university-wide commitment to sustainability. Each challenge is meant to be ongoing and requires the involvement of all departments and schools to be successful. That said, this strategy also requires the Sustainability Office to have a very active role in taking sustainability to the departments, demystifying sustainability, and thereby eliminating any barriers to participation. This facilitates future engagement in the yearly challenges and even inspires creativity on the part of the departments and schools for future ways to be involved.

Outcomes

The IE University Sustainability Office's 10-Year Challenge not only fosters an environment in which sustainability is part of the fabric of the university, it also instills a high level of employee engagement related to sustainability initiatives as the entire community works toward meeting the goals of the yearly challenges. This in turn creates a positive feedback loop as increased employee buy-in further develops a culture of sustainability on campus for our students wherein the university itself is a role model.

IE 10 YEAR CHALLENGE: STAIRWAY TO SUSTAINABILITY



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CARNEGIE MELLON UNIVERSITY



Enhancing Education, Research, and Practices with the UN Sustainable Development Goals

In 2019, the Carnegie Mellon Provost, Jim Garrett, committed the university to the UN Sustainable Development Goals (SDGs), which included conducting the world's first Voluntary University Review (VUR) of the SDGs in 2020. The VUR is a university-wide assessment of how the university contributes to the Sustainable Development Goals across education, research, and practices.

CMU's second VUR in 2021 kickstarted the transition to an interactive, online format and CMU now publishes annual updates, highlights key developments, and identifies priorities for the coming academic year, making the transition from analysis to action in education, research, and practices. Critical to these efforts is the team of undergraduate and graduate Sustainability Initiative interns, who are empowered to drive programming and analysis that are relevant to CMU students, faculty, staff, and community partners.

Education

In 2020, the VUR team manually reviewed courses offered one semester, assigning one goal to each course. It was a significant undertaking so, in 2021, the team developed an open-source automated tool and a set of keywords tailored to academia. However, the terminology used in course descriptions across disciplines does not always align with the keywords, so the analysis is not always accurate and therefore limits the scope of applicability. In 2023, the Sustainability Initiative expanded its efforts from conducting course mapping exercises to incorporating sustainability into a range of educational efforts. This included engaging with the university-wide Core Competencies Initiative (CCI). The core competencies include

Collaboration & Teamwork; Communication & Presentation; Information & Data Literacy; and Intercultural & Global Learning + Diversity, Equity and Inclusion (DEI). While the global goals are relevant to all four competencies, they were formally incorporated into the work of the Intercultural & Global Learning + DEI working group.

Joining forces with partners across campus, the Sustainability Initiative has also begun to explore how the goals can be applied to departments and programs in a way that best suits their unique academic objectives.

Research

Initially, the research activity evaluation was conducted with the aid of an automated bibliographic tool. However, most faculty were unfamiliar with the Sustainable Development Goals, not all faculty research is presented in a publication with text that can be analyzed, and, again, the SDG language is not universally applicable. The initial evaluation was a help-ful starting point for the current phase of research engagement, which consists of working with each department to identify ways for them to apply the goals to their research products, while also encouraging them to update their profile in the central Libraries tool that displays faculty profiles. This way, the faculty can understand what the goals are and can think through how they may be useful to each department.

Potential research grants should also include a component to educate applicants about the goals. The first attempt to create a research grant program resulted in very few applications. Based on an informal assessment, the community was not familiar with the Sustainable Development Goals so there was lots of confusion about how potential applicants might benefit from applying. Most recently, the Sustainability Initiative has partnered with the Office of Undergraduate Research and Scholar Development to supplement the Office's existing grantmaking program with the SDGs. The first fellowships will be offered in summer 2024 and interest is already exponentially higher than the last time a grant was offered.

Practices

The practice category includes activities undertaken by the university or by individuals at the university that are not directly related to coursework or research. The Sustainability Initiative identifies up to three relevant goals per activity and displays them in an interactive Tableau chart so that people can identify potential partners across the university. However, many members are not familiar with the SDGs and are unsure how to employ the tool. Now that the information is available for everyone to use, the Sustainability Initiative has shifted its focus from mapping individual activities to identifying different types of practices and creating partnerships across disciplines to enhance the various ways the CMU community is implementing the goals, paving the way for new collaborations.

Lessons Learned

Engaging with your community to understand how they contribute to the Sustainable Development Goals can be a helpful way to uncover hidden connections and identify potential partnerships across disciplines, whether it be in education, research, or practice. However, it is critical to also ensure that your stakeholders are familiar with the SDGs and to think through how the framework might apply to their context. Student engagement is critical to these efforts. While the SDGs are a global framework, there are unique applications across contexts, and these must be taken into consideration in order for your work to have an impact.



Sustainability Initiative interns together with the Sustainability Director and Dean of Libraries at the grand re-opening of the Sustainability Studio at Carnegie Mellon University's Hunt Library.

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UNIVERSITY OF TWENTE

UNIVERSITY OF TWENTE.

Faculty Green Hubs

In 2019, UTwente (UT) set out to become a sustainable organisation by 2030. Sustainability initiatives were overlapping and disjointed, so in 2020, Green Hub Twente was founded. Nonetheless, UT struggled to make progress in integrating sustainability into education and research, raising awareness for students seeking, for example, courses on climate change and the energy transition.

Learning from best practices in other Green Offices, Green Hub, itself student-driven, introduced Faculty Green Hubs (FGHs) in early 2023, building on a successful 2022 pilot. These hubs consist of students and faculty members who work to assess faculty sustainability and suggest tailored initiatives, bridging disciplinary and faculty divides. Faculty Green Hubs raise awareness, dismantle barriers, and drive change. They empower faculty communities and connect projects, adapting structures and goals as needed. Green Hub Twente offers support and expertise. In a nutshell, Faculty Green Hubs facilitate a decentralised, interconnected, and grassroots approach to sustainability transformation.

As we implemented the Faculty Green Hubs (FGHs), we first set out to start building the network in the faculty. This involved getting acquainted with the faculty board, research groups, project groups, and support staff. This took longer in some faculties than others, but is intended to remain an ongoing process to keep the network of the FGHs up-to-date. Once the network was in place, the teams could start working on projects. Objectives that we wanted to reach through these projects include:



- Mapping of sustainability in education.
- Mapping of sustainability in research.
- Reducing and better sorting of waste.
- Reducing energy usage and other negative climate impacts, like natural gas usage and (short) flights.

The teams are guided and coached by mentors who are staff members in the faculty helping to formulate more faculty-specific goals.

Outcomes

The faculty teams have been a great success. Starting these teams in three faculties proved to be a form of challenge to the other two faculties, who now also want to have their own FGHs. The projects have not only created an impact and built the network, but they have also helped the UT Climate Center and Strategy and Policy department with the mapping of sustainability in education. This information will be uploaded into our Central Sustainability Intelligence Platform (CSIP), where everything related to sustainability comes together. Current and prospective students can find more information like prerequisites for all sustainability-related courses, enhancing their accessibility. Other projects we have launched include:

- Reducing waste and increasing waste separation in the labs.
- Lowering deep freeze temperatures from -80 to -70 degrees, which decreased energy usage by a whopping 30%. After sorting the items stored in deep freezers, we were also able to shut down a deep freezer, saving the equivalent of two average Dutch households worth of energy per year.
- Creating a workshop for the ITC student housing where thermostats were limited to 23 degrees Celsius. With a lot of students coming from warmer climates, thermostats were regularly at 25 or even 28 degrees Celsius. The workshop aims to create awareness and lower complaints.
- Organising the first sustainable internship event where we connect students looking for an internship with companies that face challenges in sustainability. The goal is to build long-term relationships with the companies and have this event every half year.
- Starting a project to turn off the heating in a 12-story building on campus, where we found that after 18:00 there were only 30 to 40 people still in the building, yet the full building was heated. Currently in the data collection phase.
- Started mapping our impact in the faculties in terms of energy and waste saving, to build our business case.

Lessons Learned

The lessons we've learned are:

• Start building the network in the faculty first. You can't start without knowing who your key stakeholders, influencers, and decision-makers are.

- Keep data from day 1. This helps justify the project's value and can possibly help you build a business case for future projects.
- Coordination and facilitation of the teams is essential. The FGH should have been part of our management team from day 1. The coordinators also play a pivotal role in facilitating teams, developing projects, and sharing interfaculty knowledge and best practices.
- Students can be vital resources for helping implement ideas leaders have but that they don't always have the time to put into practice. We make sure that ideas are actually executed.
- Project proposal writing and reporting are key for transferring knowledge and preparing projects for success.

Future Directions

We want to add FGHs to all faculties, ensuring each has 3 to 5 students. We also aim to start the following projects:

- Reduce the impact of study trips.
- Increase the visibility of sustainability in education.
- Increase awareness of individual impacts on the environment.
- Build impactful relationships with companies that have a relationship with the faculty and be their sustainability consultant.
- Organise "speed dating" for students and companies experiencing challenges in sustainability.

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EHL HOSPITALITY BUSINESS SCHOOL

Building a Sustainable Future: EHL's Community-Centric Approach

In response to the evolving sustainability landscape, EHL Hospitality Business School has adopted a pioneering approach to building its sustainability strategy by actively engaging with its community. This report delineates the synthesis of insights derived from the Positive Impact Rating (PIR) and a comprehensive materiality analysis, illuminating the collaborative efforts that underpin EHL's commitment to sustainability. The rationale was clear: to co-create EHL's contribution to a sustainable future. Indeed, it was imperative to not only assess the institution's performance through the lens of its community, primarily students, but also involve internal stakeholders, such as staff, faculty, and the Board in shaping sustainability priorities.

In the spirit of co-creation, the materiality analysis, aligned with the Global Reporting Initiative (GRI) framework, involved 468 participants, comprising students, staff, faculty, and the Board of Directors. This analysis, which focused on economic, governance, environmental, and social dimensions served as complementary insights to the PIR initiative results. The materiality assessment in 2022 offered a nuanced perspective from various stakeholder groups. Among the 26 topics assessed, participants consistently prioritized good employment conditions, occupational health and safety, and waste management. These ratings contributed to pinpointing key priorities to integrate EHL's long-term sustainability strategy.

The PIR surveys conducted in 2021, 2022, and 2023 served as a dynamic feedback loop, and revealed evolving priorities among the student body. In 2021, the inaugural survey underscored the significance of





incorporating sustainability into the organizational fabric. Building on this, subsequent surveys delved deeper into specific concerns such as plastics, food waste, and energy consumption. It was observed that students' concerns resonated with the broader insights from the materiality analysis. While students emphasized data protection and privacy in addition to the core priorities, the Board underscored the importance of energy and institution-led innovation.

The synthesis of PIR and materiality analysis insights has reinforced EHL's commitment to a holistic sustainability strategy. Aligning with the United Nations' Sustainable Development Goals (SDGs), the strategy addresses global challenges and local concerns simultaneously. The materiality assessment, conducted with diverse internal stakeholders, provided granular insights.

EHL has recognized and validated the importance of a dynamic and inclusive sustainability strategy. Insights from PIR, coupled with the materiality analysis, offer a blueprint for institutions seeking to align sustainability goals with community values. Combining student-led initiatives like PIR with formalized materiality assessments facilitates a continuous feedback loop, ensuring that the sustainability strategy evolves in tandem with the evolving concerns and priorities of the community. EHL's commitment to sustainability goes beyond ticking boxes: it is a dynamic, participatory process.

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INDEX

Carnegie Mellon University	
Enhancing Education, Research, and Practices with the UN Sustainable Development Goals Governance and Leadership	100
Chulalongkorn University	
Witsawapat Engineering Camp: Academic Incubator to Address Water Management in Remote Thai Communities Teaching, Learning, and Research	20
Bang Pho Living Lab: Co-Creation Through Wood Handicraft Community Conservation and Development Planning Campus as a Living Lab	77
Concordia University	
Sustainable Event Certification Program Engagement, Culture, and Behaviour-Change	51
EHL Hospitality Business School	
Building a Sustainable Future: EHL's Community-Centric Approach Governance and Leadership	104
EPFL	
Teacher-Student Tandems for Sustainability Education Teaching, Learning, and Research	12
ETH Zürich	
Driving Decarbonization Through On-Campus Projects Campus Management	29
Freie Universität Berlin	
Overcoming the Energy Crisis at Freie Universität Berlin Campus Management	31
Let the Campus Bloom: Biodiversity Conscious Green Space Management Biodiversity	46
IE University	
The 10-Year Challenge Governance and Leadership	98
KAUST	
Empowering Scientific Literacy for Sustainability: A Collaborative Model Between Universities, Schools, NGOs, and IGOs Teaching, Learning, and Resea	arch 16
King Mongkut's University of Technology Thonburi	
The Key Role of Student Engagement in Achieving a Sustainable Campus at KMUTT Thailand Engagement, Culture, and Behaviour-Change	53
Massachusetts Institute of Technology	
The Impact of Institutional Buy-In on Scope 3 Accounting Climate	68
Crowdsourcing Building Porosity Data Collection to Support Flood Mapping and Resiliency Planning Campus as a Living Lab	79
McGill University	
McGill Biodiversity Plan 2030 Biodiversity	42
National Taiwan University	
Campus Living Lab Leads to Local Community Climate Action Campus as a Living Lab	87
National University of Singapore	
Scoring Singapore's Highest Accolade for Environmental Sustainability Governance and Leadership	90

Simon Fraser University	
Strengthening Food Security and the Local Economy Governance and Leadership	
Technical University of Denmark	
New Habits Reduce Energy Consumption in DTU Canteens Engagement, Culture, and Behaviour-Change	
Tecnológico de Monterrey	
Tecnológico de Monterrey's Path Towards Sustainable Procurement: Efforts and Actions to Achieve It Campus Management	
The Hong Kong University of Science and Technology	
Campus Trees to Reduce Embodied Carbon in New Construction Campus Management	
Al-driven Smart Reusable Meal Container Lending and Returning System Campus Management	
The University of British Columbia	
Establishing UBC's Accountability Framework to Accelerate Its Path to Net Zero Emissions Climate	
	(0)
Creating Woodland for Everyone: The University of Edinburgh's Journey in Land Management Climate	
SDG Ambassadors Program Engagement, Culture, and Behaviour-Change	55
UC Chile (Pontificia Universidad Católica de Chile)	(0)
Climate Action Strategy: Carbon Neutral by 2038 Climate	60
Unicamp Waste Management Plans Reduce Waste and Optimics Purchasing Practices Campus Management	27
Ecological Corridors at the University of Campinas Biodiversity	
Universiti Kebangsaan Malaysia	
Journey to Net Zero Carbon: Shaping the Sustainable Future of UKM in a Changing World Climate	66
Building Sustainable Living Lab Programmes Campus as a Living Lab	81
University of Cape Town	
Khusela Ikamva Sustainable Campus Initiative Campus as a Living Lab	
University of Genoa	
The Sustainability Mural: The SDGs Reinterpreted by Teenagers Teaching, Learning, and Research	10
University of Gothenburg	
Reducing Climate Impact with the Support of Objectives and a Carbon Intelligence System (CIS) Climate	
University of Lausanne	
Participatory Assembly: A Good Tool for Making Universities More Sustainable? Governance and Leadership	94
The Doughnut Theory: A Compass to Drive the Transition Strategy at the University of Lausanne Governance and Leadership	96
Fostering Conesive Sustainability Education: Creating and Maintaining a Robust Course Inventory Teaching, Learning, and Research	24

University of Southern Denmark SDU BSc Course: Sustainable Development for the Built Environment Teaching, Learning, and Research	
University of Tasmania Curious Climate Schools Teaching, Learning, and Research	14
University of Toronto Co-Production of Sustainability Solutions through U of T's Campus as a Living Lab Theme Campus as a Living Lab	85
University of Twente Climate Centre Seed Funding Initiative Climate Faculty Green Hubs Governance and Leadership	74
University of Vaasa Increased Energy Efficiency of Campus Buildings Campus Management	
University of Zürich Strengthening Sustainability at University of Zürich Climate	70
VU Amsterdam A Match Made in Science: An App to Foster Cross-Faculty Collaboration Teaching, Learning, and Research	22
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