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THE SUSTAINABILITY CORE TEAM
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TU/e

SUSTAINABILITY

Sustainability at TU/e

Report on 2022 & 2023

#SustainableTUe

COLOPHON

PHOTOGRAPHY

Bart van Overbeeke
Vincent van den Hoogen
Angeline Swinkels

DESIGN AND LAYOUT

Grefo Prepress, Eindhoven

TU/e EINDHOVEN
UNIVERSITY OF
TECHNOLOGY

P.O. Box 513 - 5600 MB Eindhoven
The Netherlands
www.tue.nl
www.tue.nl/sustainability

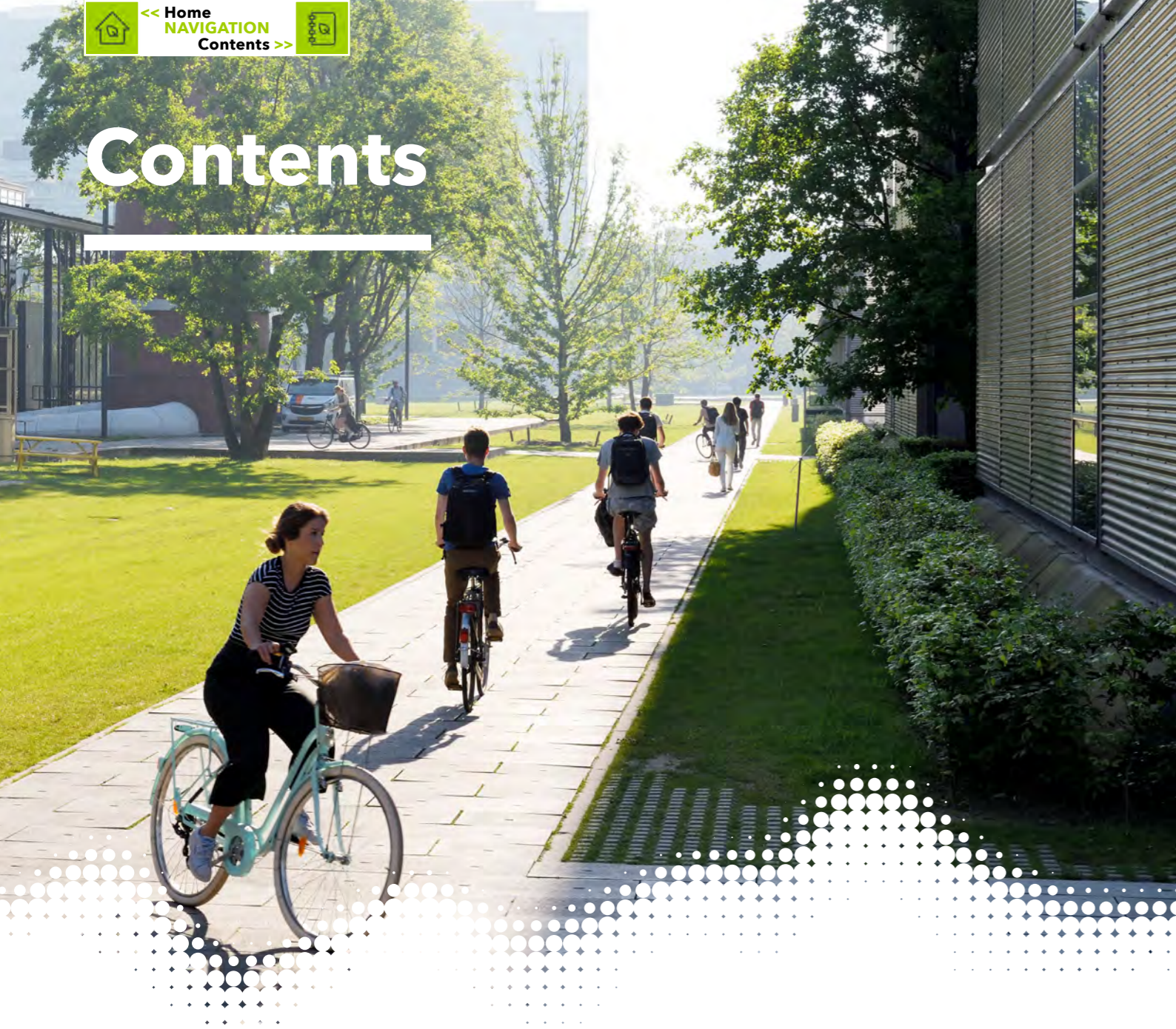
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“TU/e educates engineers of the future who are ready to face today’s and tomorrow’s highly complex societal challenges and can lead the change in Sustainability Transitions.”

Contents



- 6 | **Reader's Note**
- 8 | **Introduction**
- 10 | **The Embedding of Sustainability @TU/e**
- 24 | **Research**
- 38 | **Education**
- 48 | **Campus Operations**
- 54 | Vitality & Social Sustainability
- 64 | Clean & Renewable Energy
- 78 | Smart & Green Mobility
- 90 | Circular & Restorative Resources
- 104 | Green Environment
- 110 | **Governance**
- 122 | **GO Green Office**
- 136 | **Implementation of Sustainability - Sneak Preview 2024**
- 138 | The Embedding of Sustainability @ TU/e
- 140 | Research
- 142 | Education
- 144 | Campus Operations
- 146 | Governance
- 148 | GO Green Office
- 152 | **Acknowledgements**
- 153 | **Disclaimer**
- 154 | **Overview of Abbreviations**
- 155 | **Overview of Definitions**

Reader's Note

This report provides a comprehensive overview of Sustainability at TU Eindhoven, with a specific focus on the advances in the years 2022 and 2023.

The report is structured around four key domains of the university: research, education, campus operations, and governance. The campus operations section is further divided into five key domains: Vitality & Social Sustainability, Clean & Renewable Energy, Smart & Green Mobility, Circular & Restorative Resources and Green Environment.

In this report you will find specific data and figures along with a detailed analysis, as well as key points and background information. To explore further details or find additional information, links have been embedded for the readers' convenience.

Should you identify any areas where additional topics or numbers are necessary, the Sustainability Core Team invites you to reach out via sustainability@tue.nl. We also welcome everyone to join an ongoing dialogue about how to best promote the university's Sustainability initiatives.



Introduction

The strive for a sustainable world is presented in the [TU/e Institutional Plan](#) as the number one societal challenge. This ambition goes beyond making the TU/e campus and business operations more sustainable. It also involves a joint, deeply felt wish among students and staff to contribute to a more sustainable world. This shared feeling of responsibility for a more sustainable world is the driving force behind embedding Sustainability also in TU/e's research, education and governance.

Through the inclusion of Sustainability in the Institutional Plan, TU/e has made a commitment to setting up a functioning unit (Sustainability Core Team) with a mandate to: coordinate Sustainability, develop a Sustainability vision, define a roadmap, and start its implementation in line with the [Sustainable Development Goals](#).

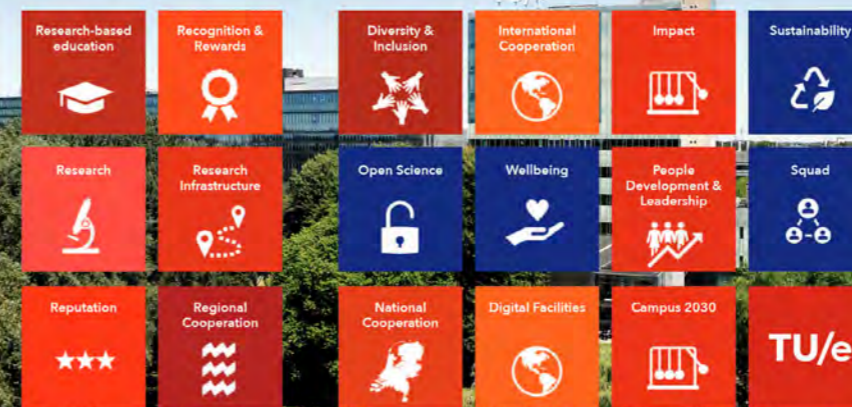


Following this commitment, Sustainability has been increasingly integrated in TU/e activities and policies, culminating with the Opening of the Academic Year 2023/24, where the major societal transitions that we face, were the center point of attention and the ["Chair of the Future"](#) was presented to the Executive Board by our students.

This report documents the route we have already travelled in delivering our promise of the Institutional Plan. In this first TU/e Sustainability Report, we look back with pride and forward with optimism.

prof. dr. ir. Anna J. Wieczorek,
TU/e Sustainability Ambassador

17 Strategic Priorities

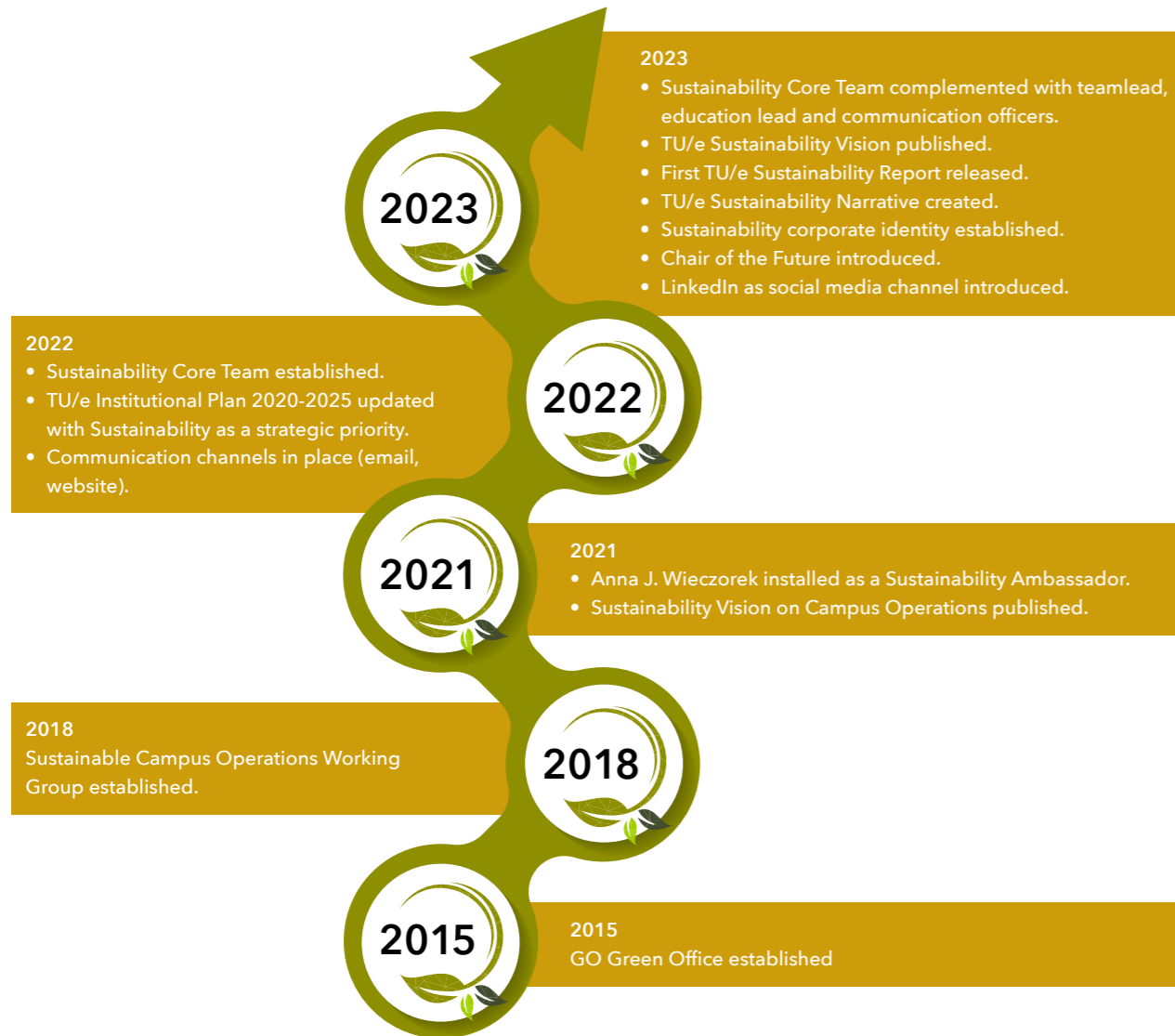




The Embedding of Sustainability @TU/e



THE EMBEDDING OF SUSTAINABILITY @TU/E



Source/ know more:
 TU/e Sustainability Vision:
[Our Sustainability Vision \(tue.nl\)](#)

TU/e Sustainability Narrative:
[#SustainableTUe](#)

Introduction Sustainability Core Team:
[#SustainableTUe](#)
[How to make TU/e a more sustainable university \(tue.nl\)](#)

TU/e Strategy 2030 and Institutional Plan:
[Where does sustainability fit into the curriculum? \(tue.nl\)](#)
[TU/e Strategy 2030 \(tue.nl\)](#)

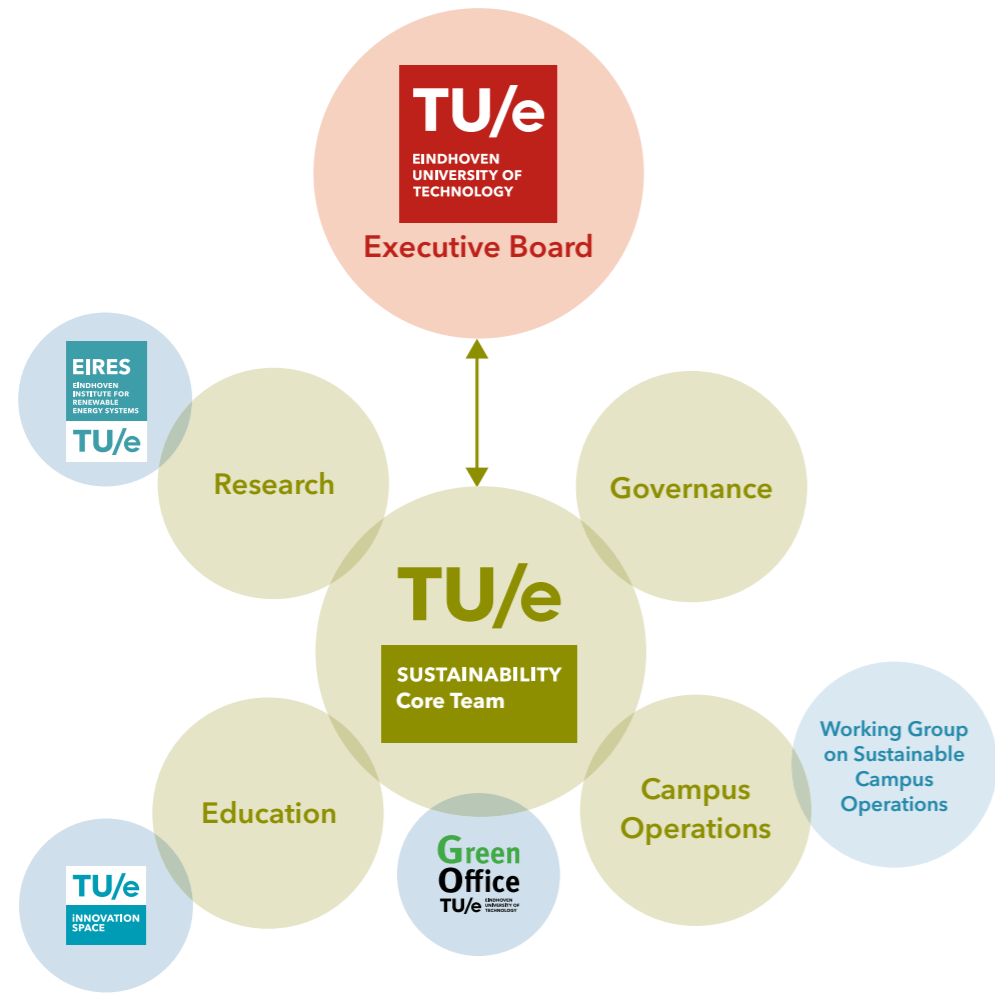
Appointment Sustainability Ambassador:
[Sustainability: fulfilling the good intentions \(tue.nl\)](#)

Sustainability Vision for Campus Operations:
[Operations \(tue.nl\)](#)

Funding GO Green Office:
[GO Green Office: nieuwe TU/e-community met duurzame ambities \(tue.nl\)](#)



THE ORGANISATION



Source: [Meet the team \(tue.nl\)](#)

In 2022 the Sustainability Core Team (SCT) has been established with a mandate to coordinate integration of Sustainability in 4 domains of the university (research, education, campus operations and governance). The SCT serves as a Sustainability catalyst and a connector between GO Green Office, the Sustainable Campus Operations Working Group, Innovation Space and a broader TU/e community.

By bringing science and implementation together, the SCT aims to ensure a speedy execution of new and ongoing initiatives,

based on recent scientific insights. The SCT also offers best practise guidance and Sustainability expertise.

A Sustainability Advisory Board consisting of Richard van de Sanden, Isabelle Reymen, Ingrid Heynderickx, Guus Pemen, Dorine Peters, Maarten Steinbuch, Heleen de Coninck and led by Martin Schuurmans is giving the Sustainability Ambassador and the SCT advice and guidance on key Sustainability matters.

SCT and the Ambassador advise the Executive Board on all Sustainability matters.



TU/E SUSTAINABILITY NARRATIVE



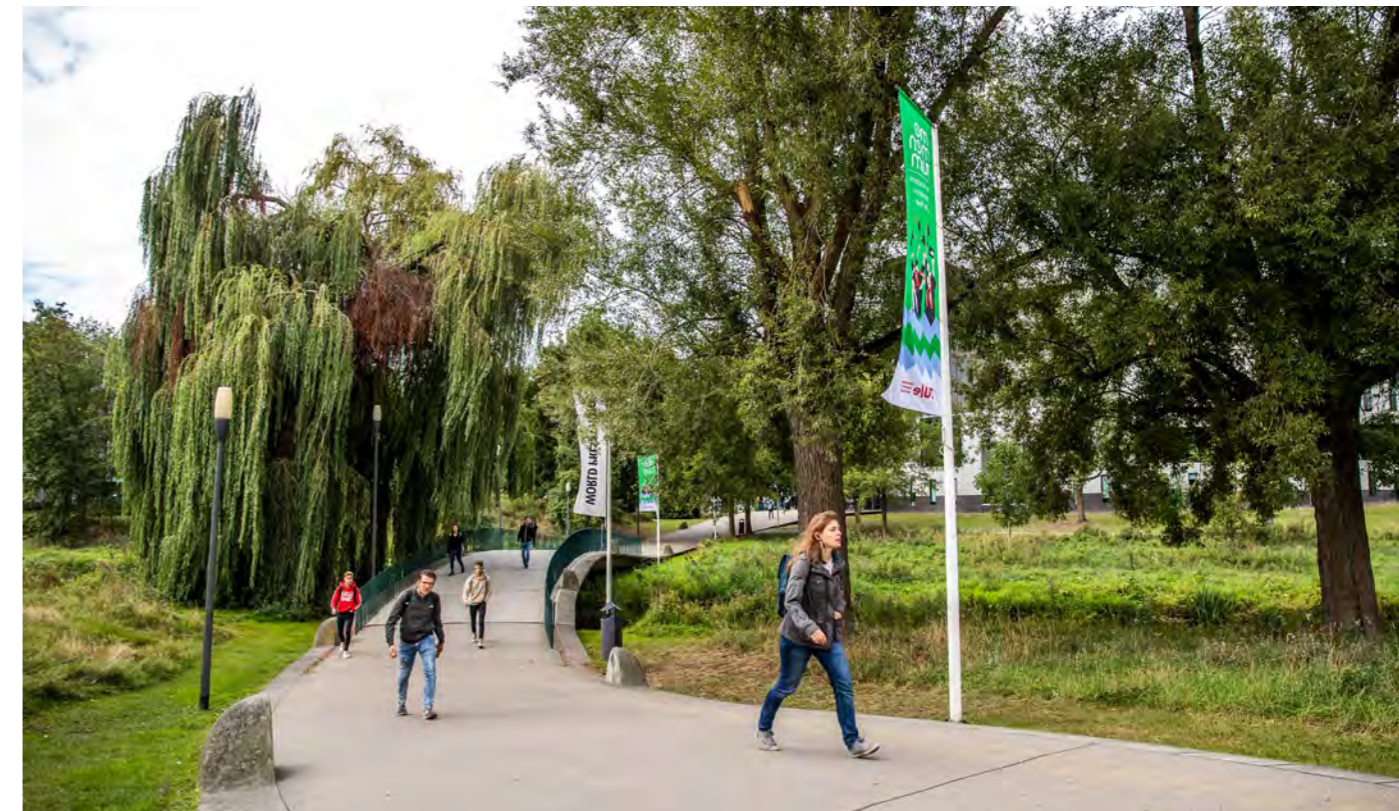
We recognize that as a society, we have surpassed planetary and social boundaries (1). It is important to restore the balance of a thriving economy within its ecological and social limits (2). Such a process implies a transformation - a radical change in how we fulfill our societal needs. It means both technical and social innovation and each of us taking responsibility and contributing (3).

For a university that seeks societal relevance and aims to address societal challenges, it means that it has to transform itself (4). This transformation implies a radical rethinking of the dominant ways of doing research and education, running our campus operations, and our governance (5).

Taking Responsibility. Enabling Transformation.

Sources: Sachs, 2019; Raworth, 2017; Jackson, 2009; EU, 2023; Tilbury, 2011

Numerous societal and environmental challenges require our attention; hard work is needed to tackle these challenges. To give guidance to our Sustainability activities, we've developed an accessible and comprehensive narrative summarized by five icons. These icons visualize our approach towards achieving a Sustainability Transition.



VISIONING REPORT TU/E

Our desired future

By 2050, TU/e fully embodies Sustainability and proactively engages with grand societal challenges. TU/e has pioneered transformative education and research for Sustainability, created a thriving campus implementing the best regenerative practices, and has successfully mobilized its partners, students, and staff to work jointly in these endeavors. TU/e strives to help society transform towards Sustainability by inspiring others and by supporting future generations of change agents. TU/e applies

Sustainability principles reflexively across each domain with all members and partners, and does not shy away from making tough decisions.

As a reliable sustainable transformations partner, working ethically and responsibly, TU/e has built a proven track record of co-creating sustainable solutions to society's most pressing issues. TU/e has strong participatory partnership with the public, the City of Eindhoven and society. TU/e's contributes to aiding countries in the Global South by sharing knowledge both locally and internationally.

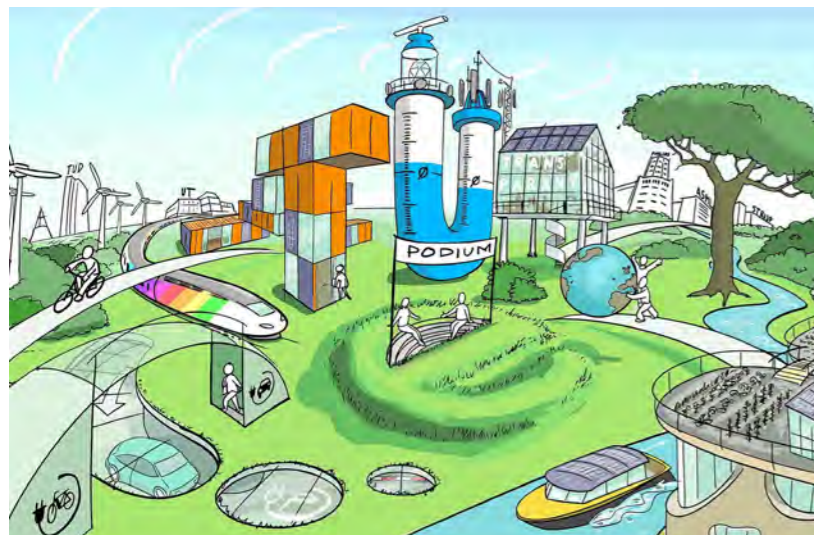


Illustration 1: TU/e Sustainability Vision, by Helmich Jousma.

Source: TU/e Sustainability
 Visioning Report 2023
[Our Sustainability Vision \(tue.nl\)](https://www.tue.nl/sustainability)

For universities to be a driver of change, to lead the transition and embed Sustainability across all facets of the organization, a collective vision is crucial to chart our course forward.

In 2023, a robust Sustainability Vision was developed, with contributions from a diverse ensemble of researchers, staff, and students. They actively participated in several workshops and discussions aimed at envisioning the desirable future for TU/e.

The outcome of this process was captured in an extensive report, presenting the TU/e Sustainability Vision for Research, Education, Campus and Operations and Governance along with a set of Guiding Principles to lead the change.



VISIONING REPORT TU/E

Visions per domain

Research

TU/e's research is farsighted and transformative¹. In exploring novel solutions to the pressing Sustainability challenges, it connects fundamental and normative research. Together with its partners, TU/e forms a vibrant research ecosystem.

Education

TU/e offers inter- and transdisciplinary, engineering education that is transformative², holistic, and socially engaged. TU/e trains student to become future change agents.

Campus Operations

The innovative and accessible TU/e Campus fosters regenerative practices in a sustainably thriving, people-centered and experimental environment.

Governance

TU/e champions change in a self-reflective and transparent manner, it mobilizes partners around Sustainability to transform industry, government and civil society by offering a safe podium for open and critical discussion.

1. Transformative research means working with society in a co-creative, transdisciplinary way. It means focus on societal challenges and broad partnerships that go beyond Tripple Helix of industry, government and knowledge institutes. Transformative research is driven by the need to balance socio-environmental and economic aspects of development and by a systemic approach to change. For researchers it means broadening of the scope of excellent science by recognition of impacts we make with our research on society.
2. Transformative education enables students to reflect on and foster change in established practices and institutions from the perspective of environmental and social responsibility. It enables them to become agents of change and acquire competences necessary to tackle complex societal challenges.

Source: TU/e Sustainability Visioning Report 2023
[Our Sustainability Vision \(tue.nl\)](https://www.tue.nl/sustainability/vision)

To give specific guidance per domain, underlying visions were developed, providing specifies phrases and images around what the University is aiming to build.



Illustration 2: An alternative vision of research at the TU/e, illustrated by Helmich Jousma.

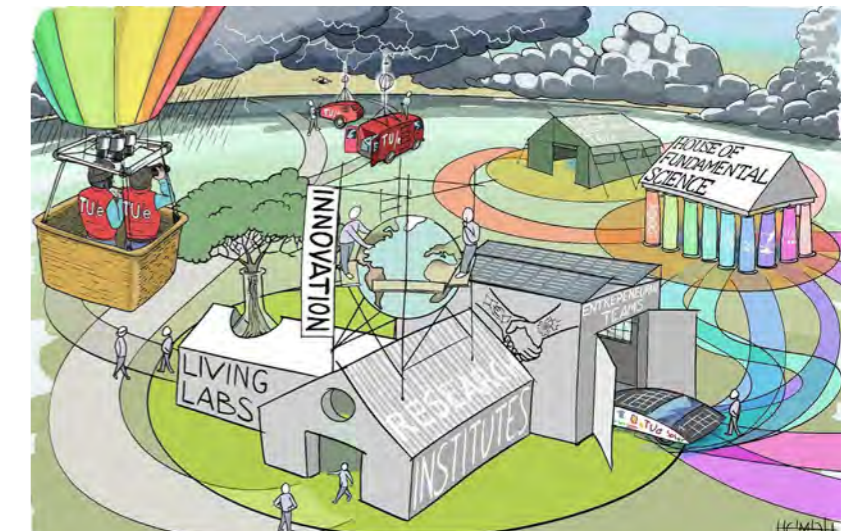


Illustration 3: An alternative vision for education at the TU/e, illustrated by Helmich Jousma.

VISIONING REPORT TU/E

Generic Guiding Principles

Embracing Responsibility

TU/e commits to Sustainability as a priority and communicates its achievements transparently.

Standing up for Challenges

TU/e proactively recognizes, anticipates, and acts on urgent environmental and grand societal challenges.

Consistent & Deliberate

TU/e considers social, economic, and environmental aspects of Sustainability in all its efforts and decision-making to have a positive impact.

Socially Aware

TU/e treats technological development as inseparable from society, considering its impacts systemically.

Mitigating Inequalities

TU/e strives to mitigate social inequalities and their effects within and beyond the university's boundaries.

Source: TU/e Sustainability Visioning Report 2023
[Our Sustainability Vision \(tue.nl\)](https://www.tue.nl/en/sustainability/our-sustainability-vision)

Mobilising Resources

TU/e mobilizes the resources, support and collaborations needed to realize transformations towards Sustainability.

Community-Driven

TU/e fosters safe, vibrant, and diverse communities and collaborative environments where multiple perspectives are welcome and valued.

Pioneering & Inspiring

TU/e uses its innovations to pioneer regenerative and sustainable futures and inspire others.

Integrating Priorities

TU/e combines entrepreneurship, diversity, and Sustainability efforts to accelerate just and sustainable transformations.

Hopeful & Realistic

TU/e fosters a collective sense of hope and realism, supporting its communities in navigating the unprecedented.

Along with the Sustainability Vision, Guiding Principles were developed. These Principles guide integration of Sustainability in the University's decision-making and act as our compass. They offer TU/e and its partners pathways to the Sustainable future in line with the Sustainable Development Goals.



Illustration 4: An alternative vision of campus and operations at the TU/e, illustrated by Helmich Jousma.

The Vision and Principles provide a backbone in defining base indicators to monitor the transformation TU/e is undergoing.

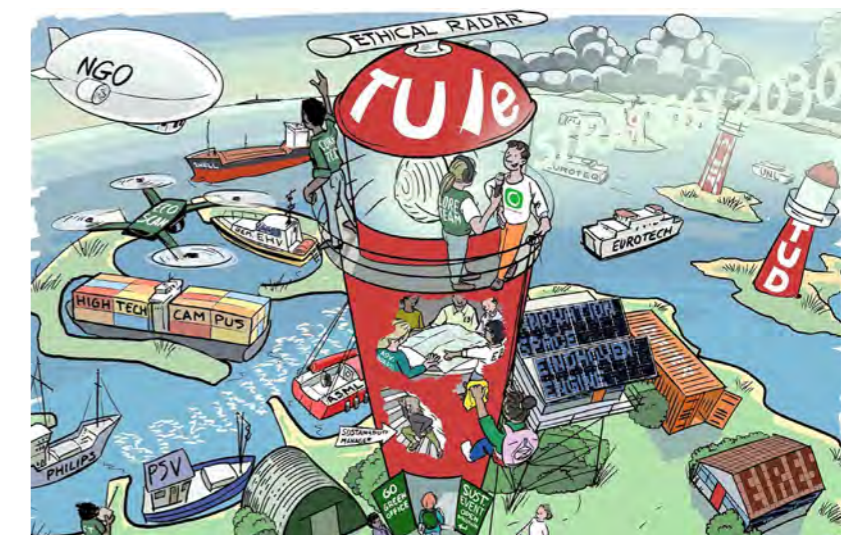


Illustration 5: An alternative vision of governance at TU/e illustrated by Helmich Jousma.



Research

OVERVIEW OF RESEARCH GROUPS' CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS (SDG'S)



Researchers in all departments of TU/e conduct research that in various ways contribute to the transition to a more sustainable society.

In 2022 all faculties, departments and research groups within the TU/e were mapped and connected with the Sustainable Development Goals.

Source: Research group overview [Research \(tue.nl\)](https://www.research.tue.nl)



In an interactive and comprehensive overview, you can select a research group and get insight into the SDGs they contribute to, or you can select an SDG and find out which research

groups are doing research related with this SDG. Curious how it works? Check out the Tool: [Research \(tue.nl\)](https://www.research.tue.nl)

SUSTAINABILITY RESEARCH ASSESSMENT

12% of TU/e scientific articles are visibly connected with one or more SDG's during the period of 2000-2020

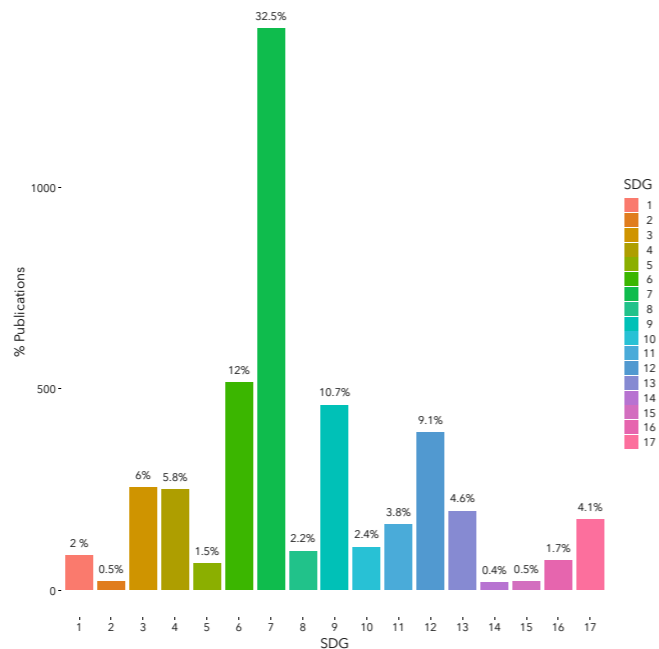


Figure 1: Research related to each SDG at TU/e within the periode 2000-2020 (share of publications).

TU/e in collaboration with Utrecht University has assessed the extent to which our research reported links with specific SDGs in our publications in years 2000-2020. The overall

aim of this study was to take the first step in exploring how the TU/e's research can actively shape the changes needed for a Sustainability Transition.

Source: [report 'Transformative Research for Sustainability @TU/e December 2022](#)

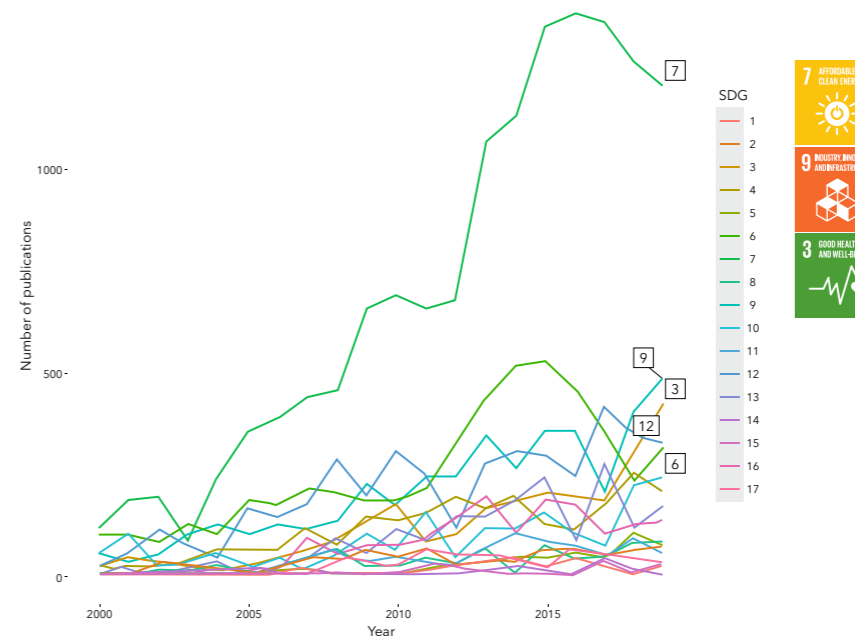


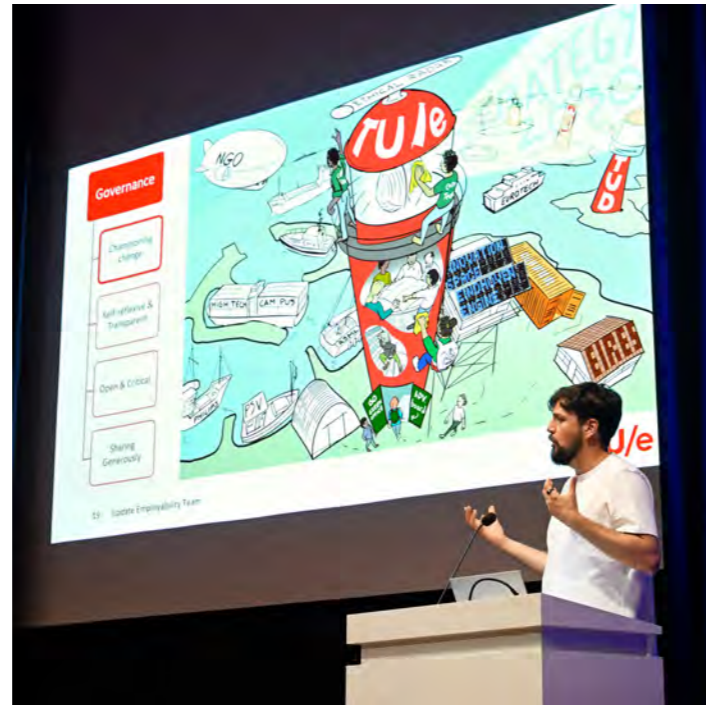
Figure 2: Annual number of publications per SDG at TU/e out of a total of 3655 items within the period 2000-2020.

This study shows that the number of SDG related publications grew steadily over the past 20 years. The number of publications related to Clean and Affordable Energy (SDG7) grew exponentially over the last 5 years to 32% of total SDG publications. Other top research areas include Clean water and Sanitation (SDG6) and Industry and Infrastructure (SDG9). The research

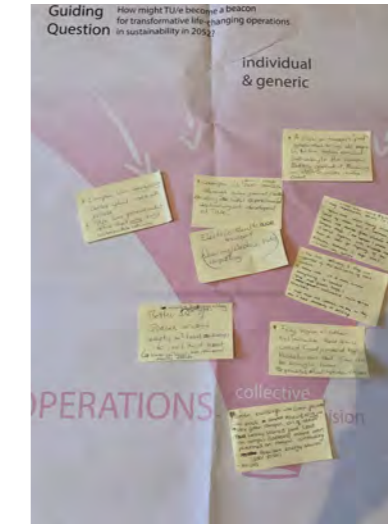
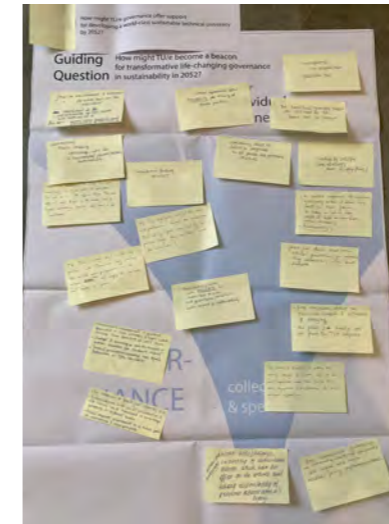
area Health and Wellbeing (SDG 3) has also been growing in importance.

This study furthermore concluded, that single SDGs are insufficient to consider research as 'Sustainability-related'. Instead, it is the interaction between the SDGs that matters.

3 Master theses were finalised in 2023 on the subject of university transformation



Sources:
[Leveraging Collaboration to Transform TU/e Into a University Sustainability Change Agent – Eindhoven University of Technology research portal \(tue.nl\)](#)
[Transformative Education for Sustainability at Universities of Technology – Eindhoven University of Technology research portal \(tue.nl\)](#)
[Searching for alternative sociotechnical imaginaries for transformative research towards Sustainability – Eindhoven University of Technology research portal \(tue.nl\)](#)
[Transformative Education for Sustainability at TU/e \(4tu.nl\)](#)



In 2023 several Master Theses were supervised and finalised, all related to the specific subject of integration of Sustainability at TU/e. In these theses, we have mainly studied ourselves in the identity of a Technical University and addressed topics such as: how TU/e can become a change agent, how sustainable education can flourish in a technical environment and what transformative research for Sustainability is. Next to that we contribute to research of the Centre for Engineering Education for 'Transformative Education for Sustainability at TU/e' to find

out what tools are necessary to integrate and evaluate Sustainability in engineering education at TU/e and how they can be implemented.

Researching and analysing Sustainability from an actionable, transformative and responsible perspectives gives insight into possible ways to accelerate the transformation to Sustainability.

This research has contributed to creating the TU/e Sustainability Vision and provides important input for developing a roadmap.

EXAMPLES OF SEEDS OF SUSTAINABLE AND TRANSFORMATIVE RESEARCH

Community Based Virtual Powerplant (cVPP):

a novel model of radical decarbonisation based on empowerment of low-carbon community driven energy initiatives. This project has won the European Citizens Award.



New Energy and mobility Outlook for the Netherlands

The Eindhoven University of Technology (TU/e) and four other universities in the Netherlands will develop new methods and techniques to give the transition a major boost. They work within the framework of NEON, a multidisciplinary research program in which engineers cooperate closely with social scientists, NGOs and companies.

The Neon project

Accelerating the Transition to Sustainable Energy and Mobility

Sources:

- [New Energy Outlook for the Netherlands \(tue.nl\)](https://www.tue.nl)
- [cVPP - Community-based Virtual Power Plant | Interreg NWE \(nweurope.eu\)](https://www.nweurope.eu)
- [EIRES \(tue.nl\)](https://www.eires.tue.nl)
- [eindhovenengine.nl](https://www.eindhovenengine.nl)

Eindhoven Institute for Renewable Energy Systems (EIRES)

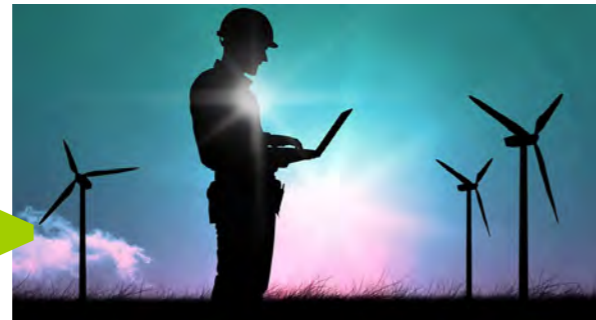
enables a CO2-neutral energy system by developing solutions that deliver the energy transition to people's homes in a manufacturable, scalable, and affordable way.



Urgent societal challenges need agile solutions.

Eindhoven Engine

connects bright minds to accelerate innovations and unleash their full potential.



Institutes set at TU/e can serve as good examples of how Transformative Research for Sustainability can be stimulated at a technical university. These institutes focus on crosscutting questions that cannot be addressed in a disciplinary way. There are also several research

projects initiated by researchers operating on transdisciplinary principles and focus on addressing grand societal challenges. These are only a few examples, use the links to get a full and updated overview.



SYMPOSIUM ON TRANSFORMATIVE RESEARCH



In June 2023, a first Symposium on Transformative Research¹ was organized at the initiative of Anna J. Wieczorek and the TU/e Sustainability Core Team.

This event brought together a diverse group of academics and researchers aiming to explore the power of Transformative Research in addressing Sustainability challenges head-on, through bringing social and natural sciences together and questioning some of the traditional structures within universities.



1. Transformative Research means working with society in a co-creative, transdisciplinary way. It means focus on societal challenges and broad partnerships that go beyond Tripple Helix of industry, government and knowledge institutes. Transformative research is driven by the need to balance socio- environmental and economic aspects of development and by a systemic approach to change. For researchers it means broadening of the scope of excellent science by recognition of impacts we make with our research on society.

Sources:

[1. Post | LinkedIn](#)

[2. Post | LinkedIn](#)

TRANSFORMATIVE TU/E - UNIVERSITY OF THE FUTURE THE 4TH GENERATION UNIVERSITY



Sources:
[University of the Future \(tue.nl\)](https://tue.nl)
eindhovenengine.nl
[Towards the 4th Generation University | Steinbuch \(maartensteinbuch.com\)](https://maartensteinbuch.com)

Given the challenges we face as society and the new role universities must consider because of them, we take a long-term perspective at TU/e, and think about the type of university we want to be in the future.

University of the Future is a TU/e Innovation Space Project where the TU/e in 2050 is envisioned. The TU/e Sustainability Core Team participates in this project to ensure that the future holds a transformative and sustainable TU/e.

4th Generation University is a vibrant open innovation hub featuring active participation from industrial, societal, and governmental contributors. It fosters interdisciplinary collaboration and co-creation to tackle global challenges, seamlessly integrating academia, industry, government, and society within its innovation ecosystem. Emphasizing both global and local impact, the university serves as a facilitator and motivator, aiming to enable its network to generate sustainable value through a shared commitment to open collaboration and knowledge exchange.

The Sustainability Core Team regularly meets up with **The Eindhoven Engine**, a technology research and prototyping center. Eindhoven Engine connects bright minds to accelerate innovation and developing breakthrough technologies stimulating a global shift and addressing urgent societal challenges.



Transformative University is an initiative of the Sustainability Core Team. We believe that the future university has to seek societal relevance, addresses Sustainability challenges and radically reimagine the dominant ways of teaching, operating, governing itself, and doing research. It must aspire to be a 4th generation university by being both sustainable and entrepreneurial and creating value for all people and the environment.



Education



CURRICULUM ASSESSMENT

73 bachelor courses
 and
56 master courses are
 more or less connected
 to Sustainability which
 adds up to
5% of all offered
 courses

Sources:
 4TU.CEE project TU/e Education for
 Sustainability December 2022
[Sustainability in Education \(4tu.nl\)](https://www.4tu.nl/en/education/sustainability-in-education)
[Education \(tue.nl\)](https://www.tue.nl/en/education/education)
[Edu Final \(tue.nl\)](https://www.tue.nl/en/education/edu-final)

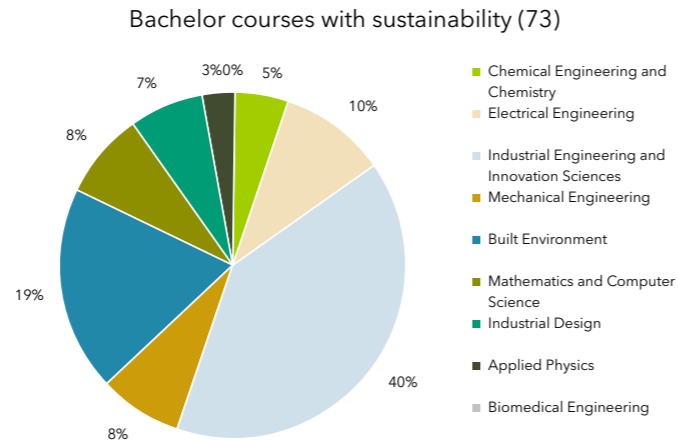


Figure 3: Amount of bachelor courses.

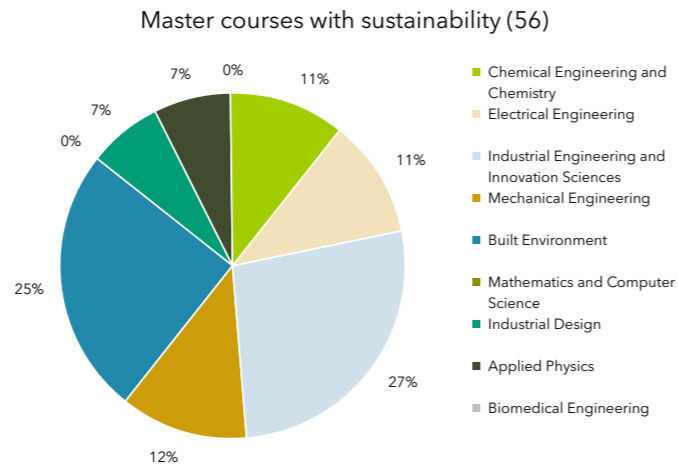


Figure 4: Amount of master courses.

In 2021/2022 a study was done by the TU/e Sustainability Core Team and GO Green Office as part of the 4TU.CEE project, investigating the current state of Sustainability in education.

All Bachelor and Master courses offered by TU/e have been screened for their relationship to Sustainability. This analysis shows more courses related to Sustainability in the Bachelor studies

than the Master courses, and that the faculties IE&IS and Built Environment account for almost 60% of the Bachelor and 52% of the Master courses related to Sustainability.

A total of 5% of all courses offered at TU/e is related to Sustainability. Based on this outcome, Sustainability was given a more prominent position in the redesign of the Bachelor College.





67 bachelor and master courses are linked to one or more of the Sustainable Development Goals



Figure 5: SDGs that are mostly incorporated in our current curriculum.

Figure 6: SDGs that are the least or not incorporated in our current curriculum.

Sources:
 4TU.CEE project TU/e Education for Sustainability December 2022
[Education \(tue.nl\)](#)
[webinar 'Sustainability in Engineering Education' \(4tu.nl\)](#)
[Where does Sustainability fit into the curriculum? \(tue.nl\)](#)

All identified courses on Sustainability were classified into three levels: 1 - mentioning Sustainability, 2 - partially related to Sustainability, and 3 - teaching about Sustainability.

From the total of 129 courses related to Sustainability, 67 courses are at the level 3. Every faculty has at least 1 course that relates to one or more of the SDGs, with a maximum of up to 22 courses at IE&IS.

The SDG's that are mostly incorporated in the current TU/e curriculum are Affordable and Clean Energy (SDG7), Industry, Innovation and Infrastructure (SDG9), Sustainable Cities and Communities (SDG11), Responsible Consumption and Production (SDG12) and Climate Action (SDG13)

In collaboration with 4TU, a webinar was organised and hosted in the beginning of 2023, where these results have been shared and discussed with other 4TU universities.



SUSTAINABILITY CORE TEAM AND ALT (ACADEMY FOR LEARNING AND TEACHING)



Redefining education: Let's talk sustainability!

What are the nuances of integrating sustainability into TU/e education?

04 December 2023 12:30-13:30
MetaForum 1.092 (Energy Forum)



Sources:

[ALT conducts lunch roundtable on Sustainability in TU/e education \(sharepoint.com\)](#)

[TU/e Academy for Learning and Teaching: Overview | LinkedIn](#)



Educator roles are evolving towards being coaches who guide students in their path to become change agents actively shaping the future.

The Academy for Learning and Teaching (ALT) actively supports this education innovation in TU/e and orchestrates several meetings annually in pursuit of this objective. The Sustainability

Core Team collaborates closely with ALT to more deeply embed Sustainability in education by reaching out to teachers.

In 2023, a roundtable lunch meeting was jointly organised, convening staff members to exchange insights and experiences in elevating Sustainability as a central focus in courses and projects.

EUROTECH POSTER PRESENTATION



Transformative Education for Sustainability at Eindhoven University of Technology Empowering the students of today to create the world of tomorrow

Zahar Koretsky

Problematisation
Technical universities have a major responsibility to contribute to sustainability transitions as co-creators for sustainability solutions via offering space for critical reflection and nuance about technology's role.

Currently, TU/e's sustainability research is highly oriented to collaborating with powerful societal actors, particularly industry. And valorisation models see societal actors as recipients rather than co-creators of knowledge. This falls at the expense of research that prioritises learning with, from and for the general public alongside their local expertise and lived experiences. Likewise, SDGs are criticized too.

TU/e has funded a two-year study to explore existing and new possibilities for changing its research infrastructure in order to move in more transformative directions in support of its 2030 strategy (TU/e Strategy 2030).

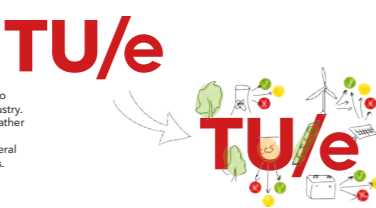
What is transformative education for sustainability?
At TU/e this means looking beyond only technology's impact on society and only SDGs, but also nurturing relationships with the university's partners together with and for society.

Research question
What tools are necessary to integrate and evaluate sustainability in engineering education at TU/e and how can they be implemented?

Objectives
Guiding principles
SDGs are increasingly criticized for:
- not providing the best guidance for sustainability, especially at technical universities
- being formulated in an unclear way
- being difficult to operationalize because of being defined at a high level (Swain, 2018; Biermann et al., 2022).
At TU/e we will explore whether SDGs provide a suitable guide to link the university's education to sustainability.

If not SDGs then what?
Literature knows other, more productive ways to guide the practical work on sustainability at universities, such as by using the notion of challenges, missions or other. These could provide a set of alternative guiding principles especially at technical universities. After a literature study and interviews with other universities, a choice can be made at TU/e as to how we want to assess sustainability in education.

Assessment framework
Most universities, including TU/e, make their assessment of sustainability based on self-reporting. We will explore whether we can develop a framework which operates on more systematic and objective criteria.
We will base it in:
- literature,
- interviews with other universities worldwide,
- interviews with professional bodies, including accreditation ones.
We will discuss and validate the findings in a workshop together with other (Dutch) universities and universities of applied sciences.






Partnership assessment tool
TU/e adopts a challenge-based learning (CBL) approach that incentivizes collaborative and hands-on teaching and learning.

What is CBL?
CBL prompts students to work with peers, teachers, and experts in their communities and around the world to ask good questions, develop deeper subject area knowledge, accept and solve challenges, and share their experience.

In CBL, companies or institutions can bring in challenges that students can work on. However, the question arises as to the extent to which TU/e and its students should engage in specific challenges that cater to the needs of specific companies. There is currently no screening of the offered challenges from sustainability perspective. Such a screening tool can help assess and guide the partnerships and collaborations based on sustainability criteria. We will develop such a partnership assessment tool based on:
- systematic academic and grey literature reviews,
- interviews with relevant organisations.

Validation and experimentation
A debate and a critical reflection needs to take place with relevant stakeholders on the soundness of the developed approach and how to implement it at TU/e.
For this purpose, three workshops will be organized to discuss and legitimise the use of the developed approaches.
Tests are also planned for the implementation of the assessment framework, the guiding principles, and the partnership assessment tool.

References:
Biermann, F., et al. (2022). Scientific evidence on the political impact of the Sustainable Development Goals. *Nature Sustainability*, 5(9), 776-800.
Swain, R. E. (2018). A critical analysis of the sustainable development goals. *Handbook of sustainability science and research*, 343-352.
TU/e Strategy 2030: <https://www.tue.nl/en/our-university/about-the-university/tue-strategy-2030/>, conducted at 26-11-2022

During the Eurotech Symposium in France, in 2023, a poster was presented, aiming to empower the students of today to create the world of tomorrow.

This poster presentation was set up to share the way of working in TU/e on Transformative Education, explaining Challenge Based Learning and the way we use the SDG's.



Sources:
[poster_v2.pdf \(tue.nl\)](#)
[Transformative Education for Sustainability at TU/e \(4tu.nl\)](#)

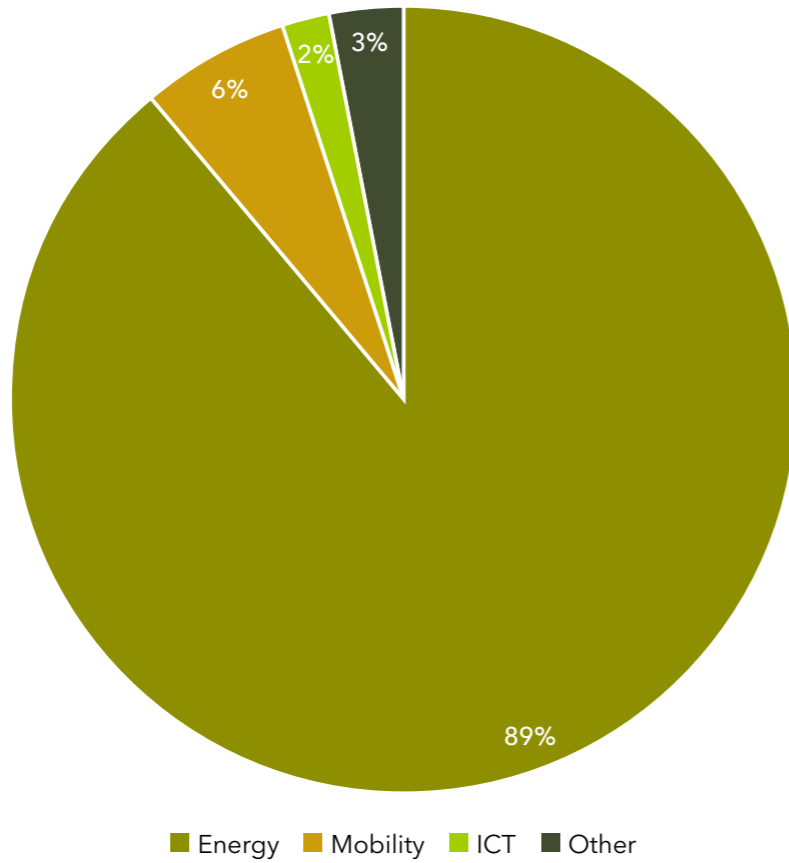


Campus Operations



CO₂ FOOTPRINT

26,975
 tons is the total
 measured CO₂
 footprint of the TU/e



* Note: only data that was readily available and reliable was used to calculate this footprint. Some topics aren't part of this footprint due to the unavailability of data.

Source: TU/e organisatiescan 2022, Maart 2023

An updated CO₂ Footprint was calculated in 2023, utilizing data from the year 2022.

This scan underscored the primary contributors to CO₂ emissions and the significance of data

and measurement. It provides us with direction for the upcoming years to further decrease our CO₂ footprint, while emphasizing the need to gather and enhance our data collection efforts.



SUSTAINABLE PROCUREMENT

18 tenders were awarded, using sustainable criteria to select new contractors.

- Coffeemachines (FMC)
- Waste disposal (FMC)
- Student Notebook (LIS)
- Interior planting (FMC)
- Office supplies (FMC)
- Electricity (RE)
- Furniture (FMC)
- Catering, food outlets and banqueting (FMC)
- Reception Services (FMC)
- Cleaning (FMC)
- Site, electrical and technical Maintenance (RE)
- Printing Services and AV resources (LIS)
- Industrial Clothing (FMC)
- Car Rental (Finance)

Sources:

[Operations \(tue.nl\)](https://www.tue.nl/en/operations)

[How coffee is getting greener at TU/e | tue.nl/stories | Sustainability](https://www.tue.nl/en/stories/sustainability)

In 2023, a Sustainable Procurement Policy was approved and put into effect. The influence of sustainable and socially responsible public procurement is considerable, accounting for 18% of the Dutch climate footprint.

The 'TU/e procurement with Sustainability impact' policy focusses on climate control, circularity, environmental impact, chain responsibility, social responsibility, and innovative strength as its primary themes.

Sustainability criteria comprised 20% to 40% of the tender evaluation, thereby serving as a pivotal factor in the selection of new contractors.

Additionally, all these contracting parties are mandated to incorporate a Sustainability roadmap in contract, and to provide data for the TU/e CO₂ footprint and other Sustainability reporting in the future.

Outside view of Spectrum building.

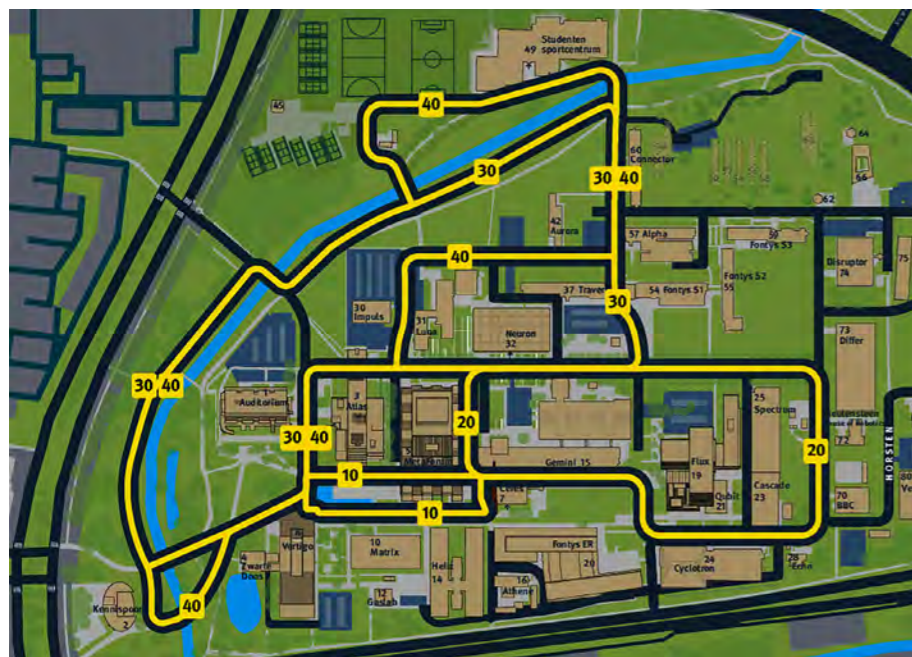




Vitality and Social Sustainability

TU/e consists first and foremost of the people who work, learn and live here. Together they form the TU/e community: a diverse and international community of students, employees, alumni and cooperation partners. We want to enable and encourage students and employees to adopt a healthy lifestyle. We want to create a buoyant culture of compassion, well-being, equality and social engagement for everybody, within and outside our campus.

7 starting points facilitating 4 different WorkWalks, crossing the TU/e Campus



Sources:
[Workwalk \(tue.nl\)](https://www.tue.nl/workwalk)
[Dit zijn de genomineerden van de LoopAward 2023! | Nationaal Voetgangerscongres](https://www.loopaward.nl/)

In early 2023, four distinct TU/e WorkWalks¹ were introduced at the TU/e Campus, ranging from 10 to 40 minutes each. The predetermined routes ensure time efficiency and prevent loss of track.

Rather than gathering in a confined space, these WorkWalks offer the opportunity to exercise and

engage in meetings simultaneously, promoting a healthier and more active lifestyle. WorkWalks start at the reception of every large TU/e building on Campus.

The TU/e WorkWalks received a nomination for the Loopaward 2023, recognizing outstanding walking initiatives in the Netherlands.

1. A WorkWalk is a predetermined route on the TU/e Campus, stimulating working while walking.





In both 2022 and 2023, a Vitality week was organised at the TU/e Campus, uniting students and staff by engaging in various workshops and activities covering a spectrum of topics including nutrition, mental health, sleep habits and exercise.

[Vitality Week 2024 \(tue.nl\)](https://tue.nl/vitalityweek2024)

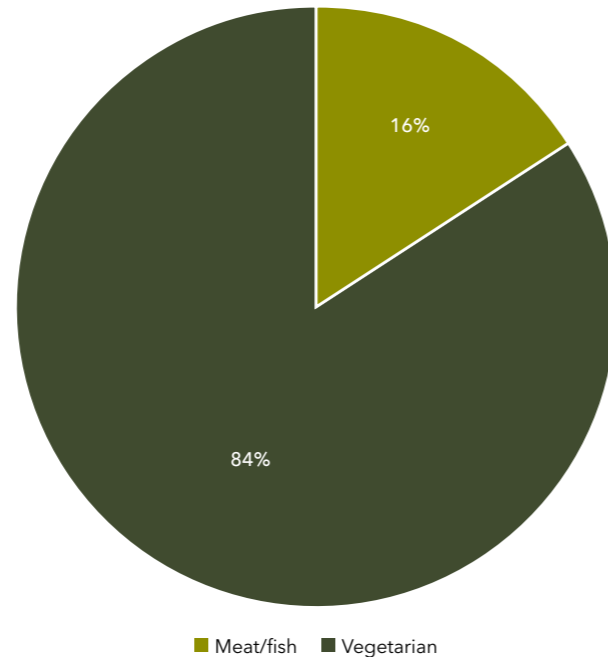


VEGETARIAN AND VEGAN FOOD

11 dairy free coffee machines, using oatmilk instead, leading to **47,342** coffee consumptions with oatmilk in 2023 which is close to 7% of total coffee consumptions

3 vegan vending machines, leading to **4,877** vegan consumptions in 2023

Ratio meat/fish and vegetarian (banqueting 2023)



Sources:
[Catering \(tue.nl\)](#)
[A vegan sandwich instead of an almond cookie \(tue.nl\)](#)
[How coffee is getting greener at TU/e | tue.nl/stories | Sustainability](#)
[New coffee machines good news for tea lovers too \(tue.nl\)](#)

TU/e caterers provide vegetarian and vegan options across all company restaurants, prominently showcasing these products to ensure they receive maximum visibility and attention.

Since the beginning of 2023, banqueting defaults to vegetarian selection, requiring specific request for non-vegan options. This shift resulted in a 62% adoption of vegan choices and 22% utilization of vegetarian alternatives.

Vegan vending machines are available in Metaforum, Flux and Auditorium, and since 2023 TU/e has 11 coffee machines that only offer dairy free products, using vegan oat milk.

TU/e is introducing vegetarian and vegan catering due to their lower carbon footprint compared to meals containing meaty, dairy or fish.



FAIRTRADE UNIVERSITY SOCIAL SUSTAINABILITY



Source: [Catering \(tue.nl\)](https://www.catering.tue.nl)

In 2016, the TU/e received the title of being a Fairtrade University and up to 2023 we still live up to this standard.

Being a Fairtrade University means TU/e propagates the principles of Fairtrade and incorporates them in its purchasing policy and sustainable business operations.

By means of social return, the TU/e caterer helps people with a limitation to the labour market to find a job. The most visible example is our Brownies & Downies café, situated on the ground Floor of the Atlas Building.





Clean and Renewable Energy

With many buildings and complex processes, our energy demand is high. We have already taken significant steps to reduce the amount of energy consumed. We are making use of innovative techniques, to save even more energy while making a greater contribution to the generation of clean energy.

ENERGY LABELS FOR ALL TU/E BUILDINGS

65% of TU/e buildings have a low or very low use of energy



Atlas - the world's most sustainable education building*

* According to [BREEAM.NL](https://www.breeam.nl) certification standards.

Sources:
Management review 2023, March 6th, 2024
[Atlas building \(sharepoint.com\)](https://sharepoint.com)

In 2022/3 TU/e labelled all buildings in use with an energy certificate. To obtain this certificate, an extensive report is drawn up, describing not only the current energy efficiency per building, but also describing which improvements can be made to gain a higher energy efficiency.

65% of TU/e Buildings have an energy label of B or higher, indicating a low or very low use

of energy. Atlas, our main building is the most energy efficient building on Campus with an energy label A++++.

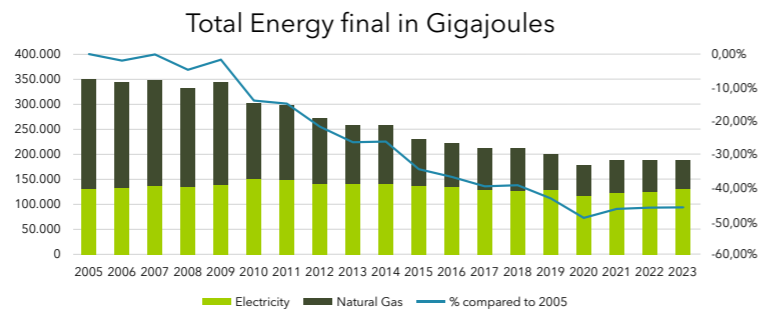
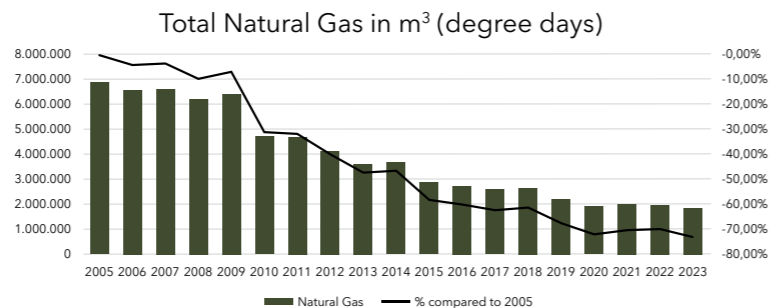
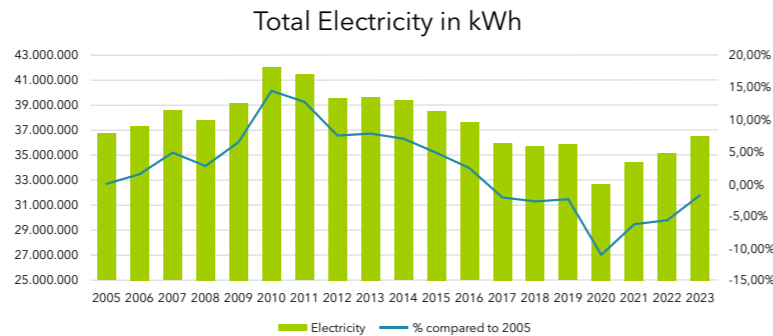
The buildings with a lower energy efficiency are awaiting renovation. When renovating a building we follow the renovation standard, leading to an energy efficiency label of B or higher.



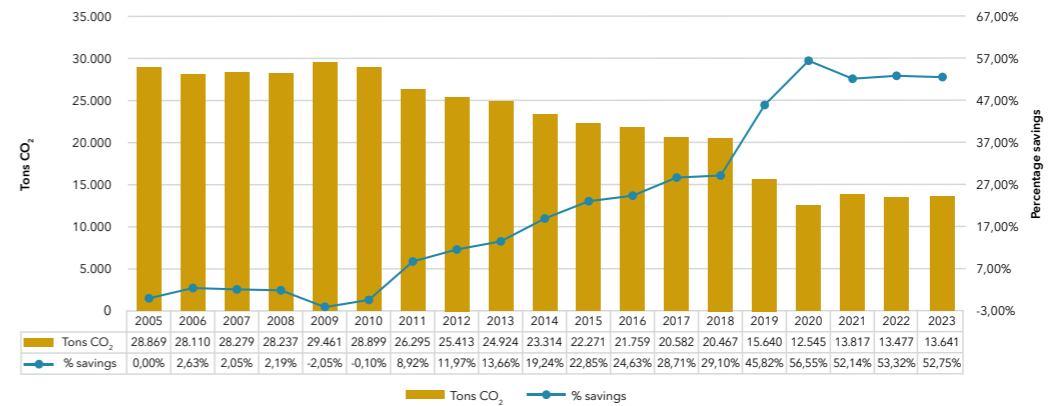
ENERGY USE AND CO₂ EMISSION

70% less use of gas since 2005
45% less use of energy since 2005
52% less CO₂ emissions since 2005

Sources:
 Management review 2023, March 6th, 2024
[Energy \(tue.nl\)](https://www.tue.nl/energy)



Tons CO₂ total Electricity + Natural gas and savings compared to 2005, ref KEV 2019



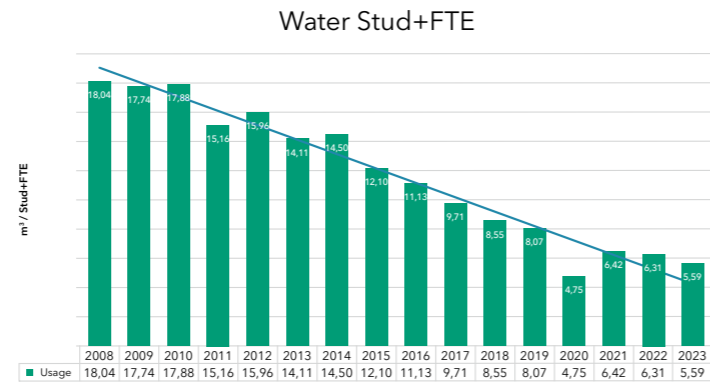
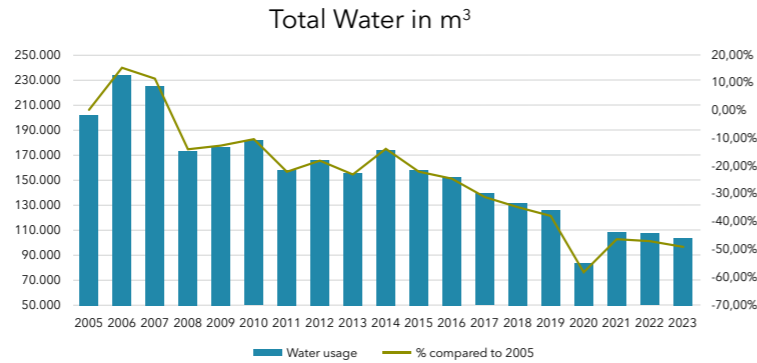
Since 2010, the use of electricity decreases on a yearly basis. This is due to changes in buildings such as renovation and demolition and actively monitoring and steering our use of energy. In 2023 we reached the level of 2019 again because of the renovation of the Neuron building (free of gas) and the addition of the new Qubit building.

The use of gas shows a continuous decrease because more and more buildings are free of gas and use our ATES system for heating and cooling. We have already decreased 70% of our gas usage, and are expecting to reach up to 90% decrease by 2030, compared to our reference year 2005.

Despite the expansion in square metres, our energy consumption in the year 2023 compared to 2022, remained the same.

USE OF DRINKING WATER

49% less
 drinking water usage
 since 2005



Sources:
 Management review 2023, March 6th, 2024

Although not obligatory yet, TU/e also monitors the use of drinking water and actively decreases the consumption where possible.

Drinking water now is only used for basic human needs and, by exception, for levelling the ponds. The use of drinking water for cooling buildings and laboratories, is completely phased out and replaced by coolers that recirculate the water or by making use of our Aquifer Thermal Energy Storage System.

In 2023, we reached an all-time low water usage per person on Campus due to all measures taken over the years.

In the renovated Neuron building, water-saving toilet-facilities are being used, as in all renovated buildings to be from now on.





2854 solar panels are installed on the roofs of TU/e Buildings, generating **743,575 kWh** of solar energy in 2022 and **599,781 kWh** of solar energy in 2023. **2.5-3%** of the energy used by TU/e was generated by solar energy

Solar panels on top of the Spectrum Building.



Since 2017 TU/e has been progressively installing solar panels on the roofs of its buildings, gradually expanding the number of

solar panels across the Campus, making a total of 7 buildings with solar panels in 2023.

Sources:
Management review 2023, March 6th, 2024

AQUIFER THERMAL ENERGY STORAGE (ATES)

11,290 MWh
of cooling was delivered by our
ATES in 2023 and
10,125 MWh
of heat was delivered by our ATES
in 2023, leading to a total avoided
CO₂ emission of
1,636 tons CO₂

Sources:
Management review 2023, March 6th, 2024
<https://www.youtube.com/watch?v=1nTzHK-YoDY&feature=youtu.be>

The Neuron Building upon completion.



Since 2002, we have employed an ATES system on our campus, supplying heating and cooling to all newly constructed and renovated buildings. This initiative facilitates an improvement in our energy transition efforts and allows for a gradual reduction on our reliance on gas for heating purposes. The system comprises 16 hot and 16 cold sources, interconnected via a dual ring, one dedicated to providing cooling and the other for heating purposes.

In 2023, alongside integrating the Neuron Building into the ATES system, a significant technical enhancement was implemented to optimize its efficiency. This adjustment effectively eliminates the need to circulate approximately 800,000 m³ of water to maintain pressure within the system's rings and is saving 250,000 kWh of energy per year.

DUMAVA FUNDING



€ 2,387,799.90 of DUMAVA funding was granted

Helix Building.



Photos: Bart van Overbeeke

DUMAVA stands for 'Duurzaam Maatschappelijk Vastgoed', which translates to 'Sustainable Community Real Estate'. It is a funding program of the Dutch government, in which the cost of enhancing the energy efficiency of buildings is partly subsidised.

TU/e entered the first round in 2022 with the Helix Building (installing heat pumps) and the Auditorium Building (improvement of energy

label E to A, diverse measures). It was possible to apply for this funding because of the extensive energy labelling of our buildings, detecting good opportunities to improve the energy efficiency.

Both projects were approved and we now have up to 3 years to realise the desired improvements.

Auditorium Building.





Smart & Green Mobility

The TU/e campus is being transformed into a designated area where walking, cycling and public transport are stimulated. Automobile use is discouraged as much as possible wherever this can be realized. Important elements regarding mobility are the reduction of CO₂ emissions, the realization of fewer traffic movements (automobile traffic), the promotion of alternative transport, flexibility in the choice of transport modalities and the integration of traffic flows.

ELECTRIC VEHICLE CHARGING POINTS

38 charging points for electric vehicles on TU/e Campus



Source: Beleid laadvoorzieningen TU/e Campus, 10 October 2022



Until 2022, the TU/e Campus had only 14 charging points for electric vehicles (EV). Due to the rising use of electric vehicles, a considerable expansion became imperative. To accommodate this expansion, an additional transformer station had to be established beforehand.

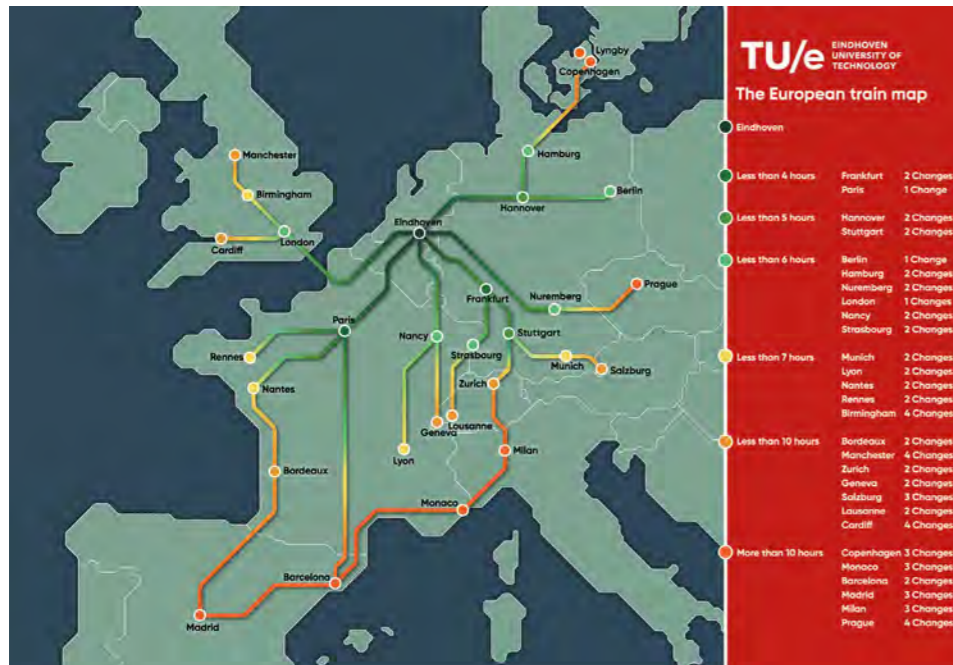
In 2023, an additional 24 charging points were installed near the Auditorium Building at the main Entrance of the Campus, resulting in a total of EV charging points amounting 2% of the overall parking spaces (excluding spaces designated for third parties). This aligns with the anticipated average usage of electric cars.

Notably, this provision also encompasses EV charging facilities for disabled parking spaces. Concurrently, the existing charging points underwent renewal. All EV charging points have the option for load-balancing, contributing to a manageable and stable use of energy.

Simultaneously, the EV charging policy underwent an update, outlining a comprehensive development plan for the expansion and management of EV charging points.

TRAIN MAPS

28 train routes to European cities and 30 train routes to Benelux cities are mapped

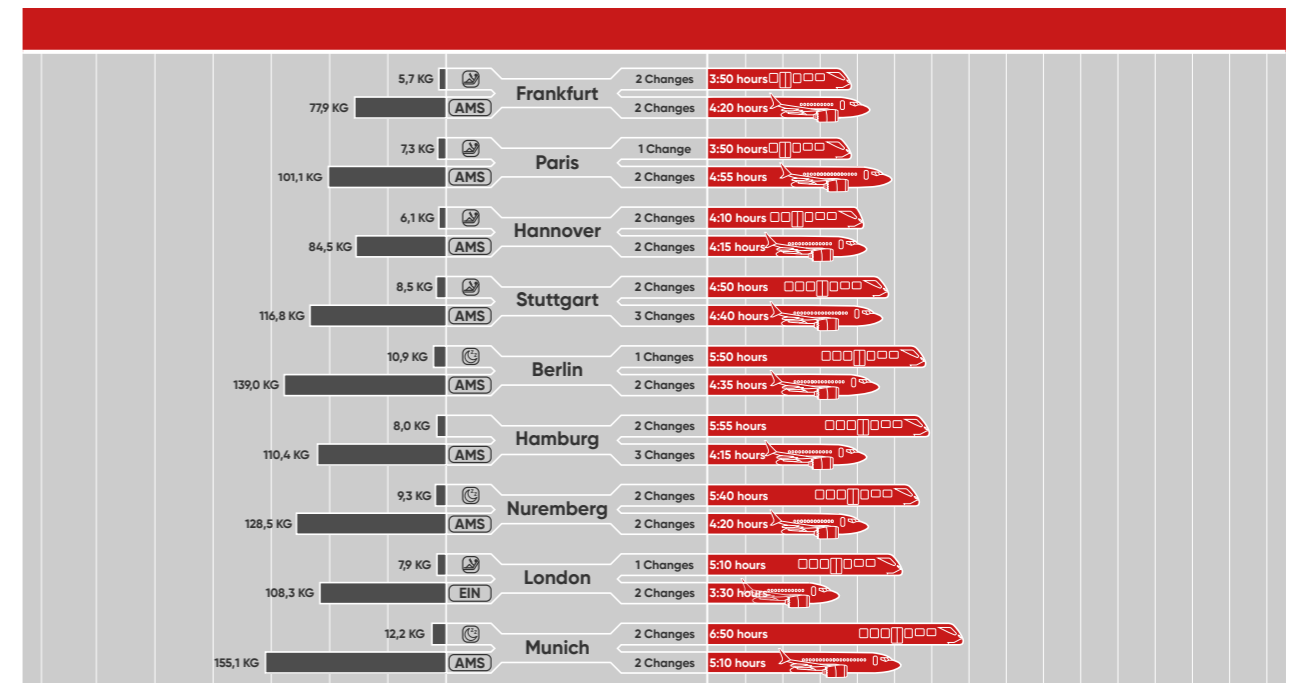


Sources:
[Mobility map English version modified text Europe only.pdf \(tue.nl\)](#)
[Mobility map English version NL modified text.pdf \(tue.nl\)](#)
[Train Plane Eng.pdf \(tue.nl\)](#)

In 2023 a European train map was created, displaying 28 frequently visited European cities as well as 30 Benelux cities, that are conveniently accessible by train. The map delineates the number of transfers required, the estimated travel duration and the quantity of CO₂ emission saved when opting for train travel. By utilizing trains for all business trips, a significant reduction of up to 80% of CO₂ emission can be achieved.

This provides valuable insights and serves as a helpful resource when determining the most suitable mode of transport for travel to relatively nearby locations.

In anticipation of a new sustainable business travelling policy, the Technology, Innovation and Society Group (part of the Faculty IE&IS), supported by the Low Carbon Travel Initiative already started a pilot on sustainable business travelling, using train as the predominant way of travelling.



INSIGHT IN STUDENT AND STAFF MOBILITY

96% of all students come to campus by bike, public transport or walking
68% of employees come to campus by bike, public transport or walking



Sources:
Mobiliteitsplan 15 mei 2023
Mobiliteitsplan TU/e-campus 6 november 2017
Discussienota mobiliteit 20 juni 2021

Periodically, the commuting habits of both staff and students are analysed to monitor travel patterns, aligning with our goal to promote sustainable travel practices and reduce our overall CO₂ emissions. The results obtained in 2023 were compared to those from 2017, revealing a slight increase in the adoption of sustainable travel options among the community.

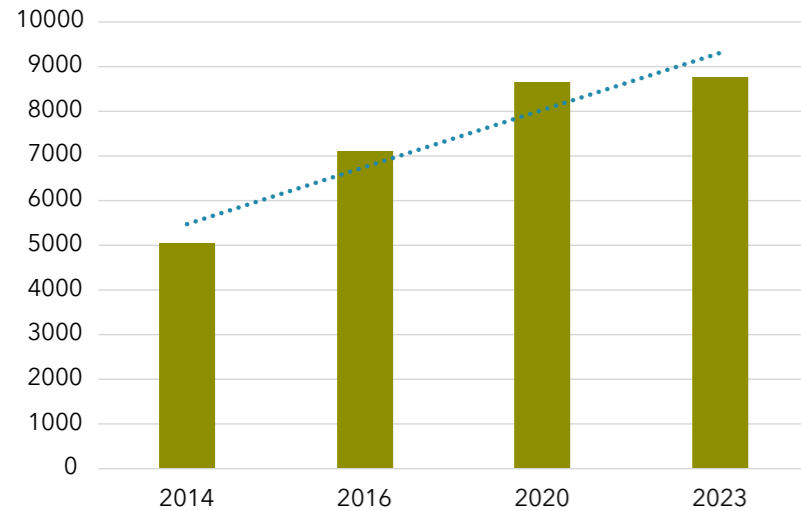
The most effective approach to minimize CO₂ emission is to avoid travel altogether. Nearly 75% of staff works remotely for at least one day a week. Additionally, around 40% of staff commute by bicycle. Interestingly, another 14% of staff express the willingness and ability to commute by bike, indicating an untapped potential. Moreover, 16% of the staff regularly utilize public transportation for their commute.



BICYCLE FACILITIES

8,778 bicycle parking places are currently available at the TU/e Campus

Number of bicycle parking places



To stimulate bicycle use when travelling to and from the TU/e Campus, facilities were expanded in 2022/23.

Bicycle parking spaces have gradually increased over the years, leading to a maximum of 8.778 parking spots in 2023.

The 5 current bicycle repair stations have been replaced and expanded with a 6th repair station in the new Neuron building.

A new bicycle policy has been approved, which supports the use of electric bicycles and includes provisions for changing facilities and showers in all major new or renovated buildings.



SUSTAINABLE MOBILITY INITIATIVES



Brainport Bereikbaar Student Campaign.



Source: People@work, May 2023

Coming from a joint research project, the Sustainable e-bike Hopper was tested in the third quarter of 2023. Because the Hopper is a covered e-vehicle suitable for 2 person-use, it is considered an addition of the current e-bike assortment (especially in specific weather conditions).

Together with Fontys, Summa and Brainport Bereikbaar, a big campaign was launched in October 2023 to gain insight into the travel behaviour of students. Aim of this research project is to learn the enablers for more sustainable student travelling.

Hopper.





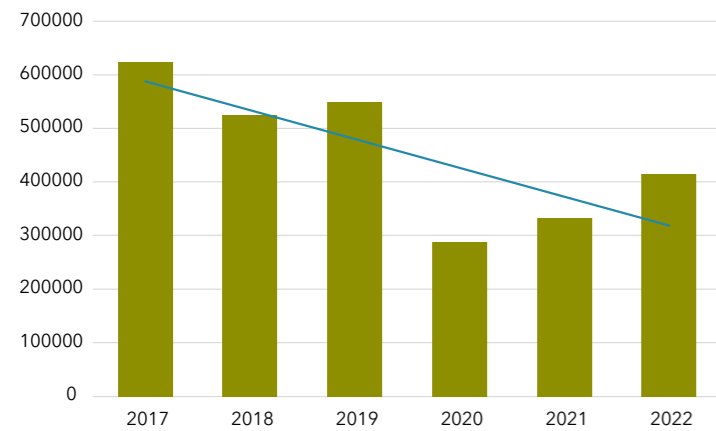
Circular & Restorative Resources

Raw materials are not a matter of course in the future. That is why we aim at non-toxic materials and reusable materials which we can reuse endlessly within a circular process and which have a small CO₂ footprint in the various stages of their lifecycle.

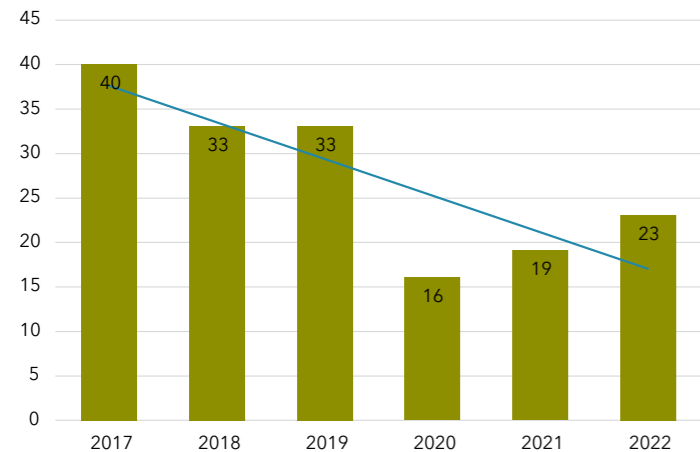
LET'S GO ZERO CAMPAIGN



Residual waste overview (kilos)



Waste per student/employee (kilos)



Sources:
[DIZ 2020-1830907 Roadmap afvalinzameling- en verwerking 2020-2024.pdf \(tue.nl\)](#)
[Campaign Let's go zero \(tue.nl\)](#)
 Waste overview 2017-2022:
[Wastestream20172022 \(2\).xlsx \(live.com\)](#)

TU/e strives to become a waste free university by 2030, and continuously seeks for opportunities to contribute to this goal. On a yearly basis new initiatives are implemented with the aim to steadily reduce the amount of waste we produce. We focus on decreasing the amount of residual waste since this type of waste has no circular use.

Since 2022 we have been able to gradually decrease the amount of residual waste production compared to 2017 with 34%, while expanding buildings and increasing employee and student numbers. Currently we still dispose of 411 tons of residual waste.



RESIDUAL WASTE ANALYSIS

57% of waste found in the residual bin is equipped for recycling



Source: [Sifting through garbage to improve waste separation \(tue.nl\)](https://www.tue.nl/en/news/2023/02/sifting-through-garbage-to-improve-waste-separation)

To reach a waste free university, all participants' involvement is needed. In 2023, the TU/e initiated a residual waste resource analysis, covering all TU/e buildings.

Every building was visited and during this visit, a 1100-liter roll-off container with residual waste was searched through and analysed, leading to a full and detailed overview of methods and

actions to further improve our waste separation and re-use potential.

First analyses show, that some 57% of the content of the residual waste container is food waste and plastic. If disposed correctly in the currently available bins, it could easily be recycled.



SUSTAINABLE EVENTS POLICY



In 2023, a Sustainable Event Policy was drawn up and approved, to be implemented on the first of January 2024.

With this policy in place, events will be catered with food that has a low environmental impact, is not heavily processed, comes from sustainable agriculture and offers variety, while being balanced and nutritious.

Drinks will be served out of hard cups with a return system and food is offered without using disposable plastics. With the implementation of this policy, there will be no single use of plastic, and waste streams are separated to a maximum.

Sources:

[Sustainable Events \(tue.nl\)](https://www.tue.nl/sustainable-events)

Sustainable Events policy, 13 December 2023

INTRODUCING THE BILLIE CUPS

1.5 million disposable coffee cups are avoided per year, by using reusable cups



Source: [Billie makes 100,000 cups superfluous \(tue.nl\)](https://www.tue.nl/en/news/2022/02/10/billie-makes-100000-cups-superfluous)

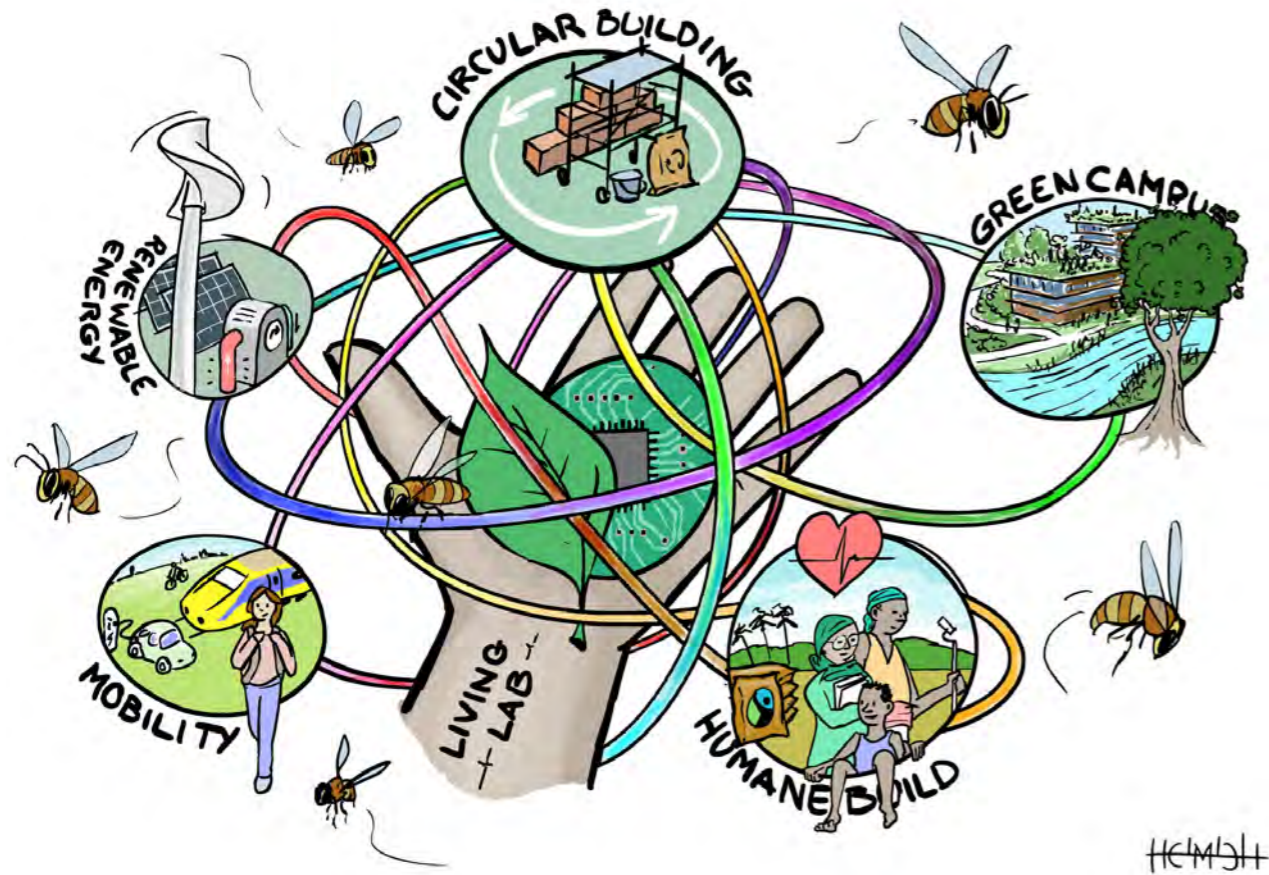
Since the beginning of February 2022, no more disposable cups are being used in the canteens at TU/e. All canteens use the Billie Cup: a re-usable and returnable alternative. You are also welcome to bring your own personal cup.

From May 2023, the coffee machines in pantries are also free from disposable cups, and when ordering catering, re-usable tableware is used.

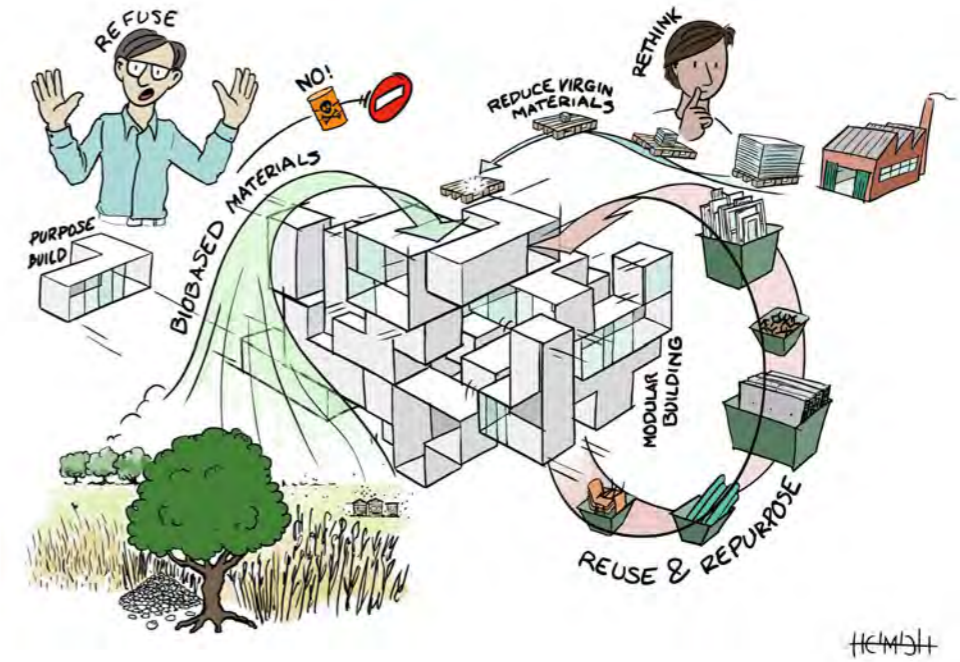
Next to the Billie cup, the use of additional plastic materials in the canteens is being minimised by using paper wrappers for sandwiches and other snacks.



CIRCULAR BUILDING POLICY



Source: [Circular Building One Pager](#)



In 2023, a new circular building policy has been drawn up and improved, building on the 4 themes 're-use residual materials', 'material usage and impact', 'healthy materials' and 'adaptive capacity'. With this policy in place, we want to challenge industry in making the next step in system change.

As a follow-up for this new policy, 7 quickscans¹ were made of renovation projects, demolition projects and maintenance projects, showing possibilities to incorporate circularity in these projects.

1. When making a quick scan, circular experts physically go through a building, detecting building materials that can be re-used.

CIRCULAR BUILDING INSPIRATION DAY



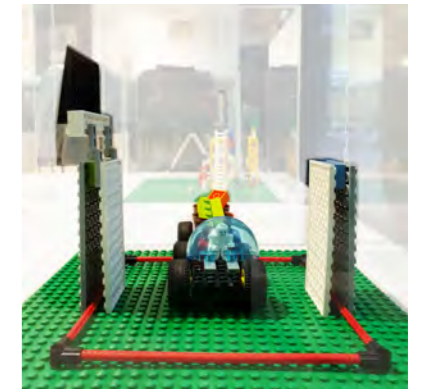
Source: [Circular Building One Pager](#)



Model 1: develop Together.



Model 2: The Web.



Model 3: Zero Energy Garage.



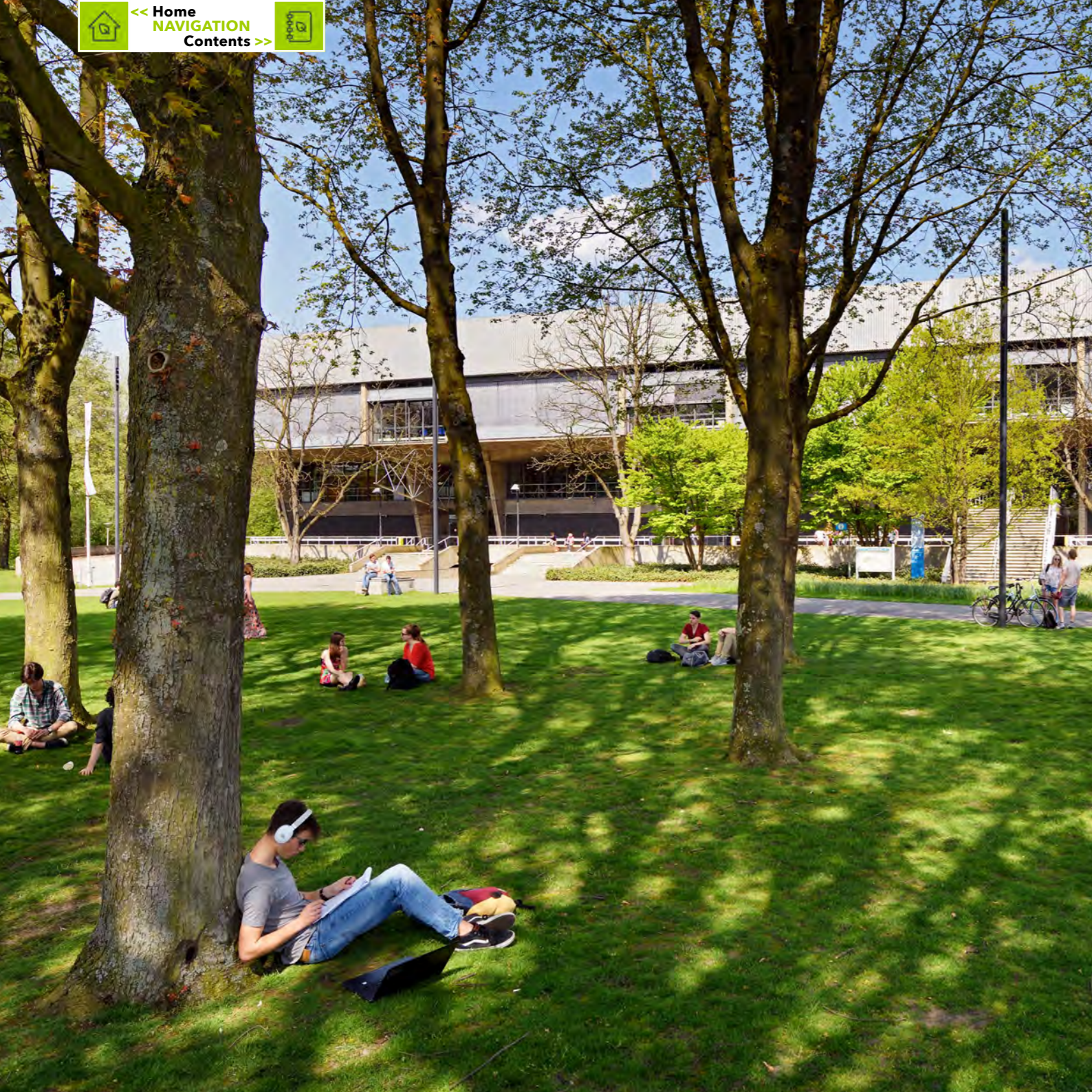
Model 4: Biobased, Reuse and Nature-Inclusive.



Model 5: Reuse, Flexibility and Process.

To get the policy alive and inform all involved in circular building, an inspiration day was organised with 35 participants from the Real Estate and Procurement department, learning all about incorporating circularity in everyday work.

This inspiration day started with several speakers highlighting circular initiatives and sharing knowledge. After that, the participant formed groups to engage in a Lego Serious Play session, thereby developing their own circular future building.



Green Environment

A green environment contributes to the preservation and enhancement of the quality of life for humans and animals. More and more, the green environment emerges as the answer to challenges such as climate change, extreme weather patterns, and combating pests. In addition, it has a beneficial influence on our health and wellbeing.



126-172 out of 280 points on the biodiversity score for the TU/e Campus



Source: Visie op de biodiversiteit Technische Universiteit Eindhoven, 1 maart 2022

In 2022, a comprehensive biodiversity inventory was conducted on TU/e Campus, revealing the presence of more than 25 distinct types of trees and an abundance of over 60 bird species. Additionally, the survey identified various wildlife species including a beaver, foxes, hedgehogs, rabbits, bats, and also several cats inhabiting the campus area.

Based on this inventory, suggestions were made on how to improve biodiversity on Campus. In 2023, invasive exotic plant species are successfully driven out, different field of grass are sown as flower meadows, several wadi's¹

and several bird nesting boxes and bat nesting boxes are added for protection against said cats.

Upon the completion of the latest Qubit building, a green rooftop was incorporated, contributing to a total of four green rooftops across the campus.

To assess the biodiversity on campus, it was evaluated using the 'biodiversiteitsmeetlat van IPC Groen Ruimte', resulting in a total score ranging from 126 to 172 points on a 280-point scale, depending on the area assessed.

1. Wadi is short for 'Water Afvoer Drainage en Infiltratie'; Water Discharge Drainage and Infiltration. A lowering in the land scape to capture and store water.



GREEN-BLUE POLICY

1/3 of the TU/e Campus surface is green
1.421 ton CO₂ is stored on a yearly basis
 by the matured trees on TU/e Campus

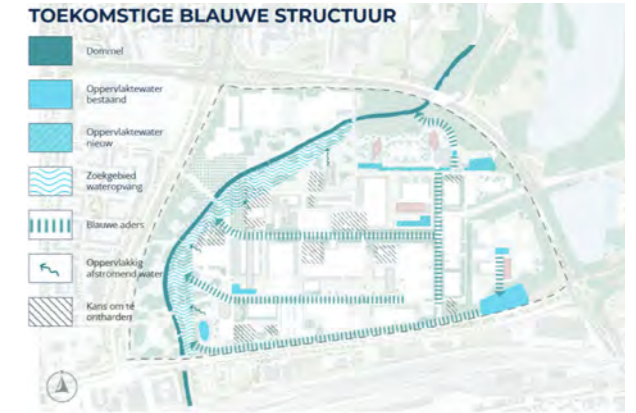
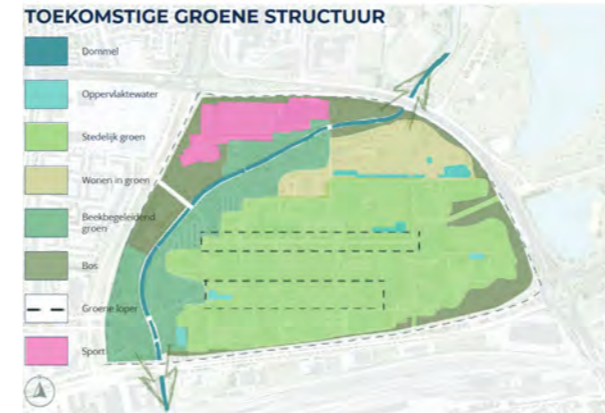


Reflection of green Facade Atlas Building.



Future blue structure surrounding the new student village on TU/e Campus.

Source: Groenblauwe structuren van de TU/e Campus 12 oktober 2023



In 2023, alongside the TU/e Landscaping Vision, a Green-Blue Policy was formulated and subsequently approved. This new policy is designed to tackle environmental concerns such as biodiversity preservation, mitigating heat stress and managing potential flooding issues.

Various analysis were conducted in the formulation of this policy revealing, among other findings, the percentage of green space present on Campus and the quantity of CO₂ stored by mature trees within the Campus area.

The Green-Blue Policy outlines strategic directions pertaining to water retention, biodiversity enhancement, green space quality improvement, retrofitting buildings with green elements and expanding green zones. These guidelines created maps, illustrating the future green and blue elements of the campus.



Governance



SUSTAINABILITY STATEMENT EXECUTIVE BOARD



Statement (extract)

Eindhoven University of Technology (TU/e) is deeply committed to tackling the urgent challenges of Sustainability, driven by alarming IPCC reports on global warming. They prioritize Sustainability as the foremost societal challenge, shaping strategies across education, research, and operations.

In education, TU/e trains engineers to address societal transitions, integrating Sustainability into programs like Sustainable Innovation and Sustainable Energy Technology. The institution plans to embed UN Sustainable Development Goals in its Bachelor College, emphasizing Sustainability in various courses.

Research at TU/e focuses on diverse Sustainability subjects, including climate policy, renewable energy systems, energy storage,

and smart grids. The Eindhoven Institute for Renewable Energy Systems collaborates with external partners to impact public discourse on Sustainability.

TU/e emphasizes sustainable operations, reducing gas consumption by over 70% through initiatives like an underground thermal energy storage system. New buildings prioritize energy efficiency and Sustainability, like Atlas, recognized as the most sustainable education building in 2019.

Collaboration, especially with industry partners, is integral to TU/e's ethos. They have shifted focus from fossil fuel-related projects to renewable energy collaborations, ensuring alignment with Sustainability goals through a stringent review process. Increased transparency is promised in annual reports regarding industry income.

In December 2022, the Executive Board published a Sustainability Statement, stressing the importance to collectively and actively work together on a more Sustainable world.



Source: [Sustainability statement of the TU/e Executive Board \(tue.nl\)](https://www.tue.nl/sustainability)

COLLABORATION WITH INDUSTRY



List of companies with revenue exceeding 100k

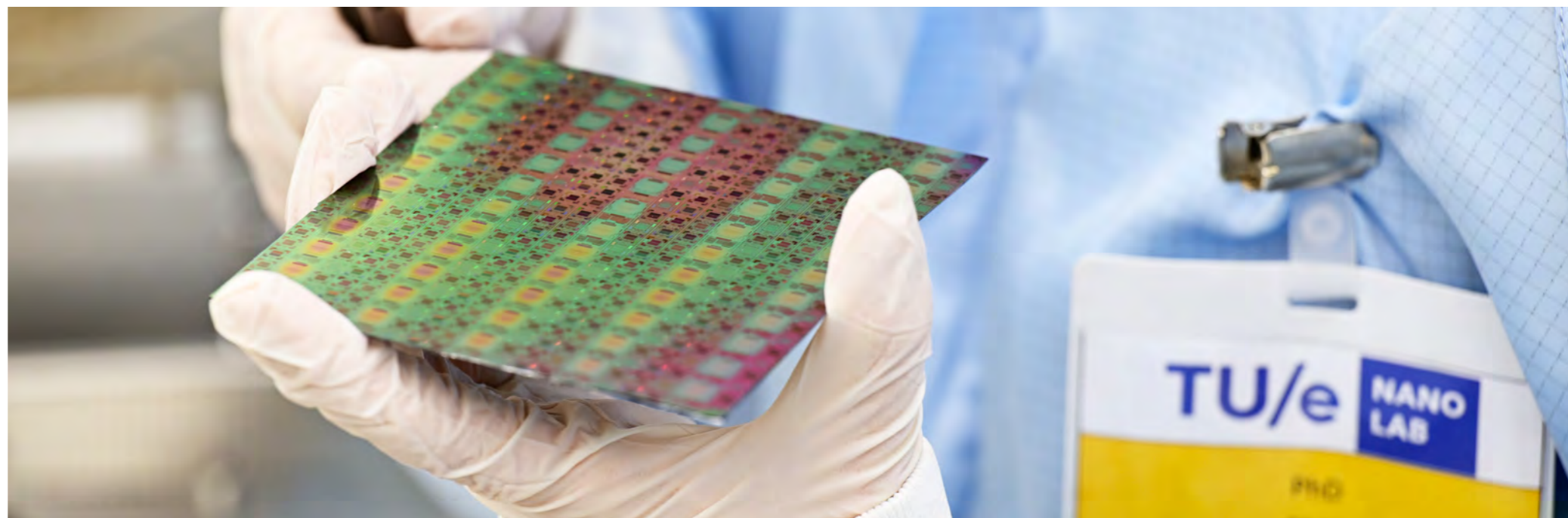
- ASML Netherlands BV
- AccTec BV
- AmbAgon Therapeutics
- ASM
- BASF
- Bosch
- Brainport Development
- Buurauto BV
- Canon
- CITC
- Consolis SAS

- DAF Trucks
- ENGIE
- Janssen R&D
- KPN BV
- OLYMPUS MEDICAL SYSTEMS
- Philips
- Shell
- Signify
- Unilever
- VDL
- VMI Holland BV

In the TU/e annual report for 2022, for the first time, the collaborations between TU/e and the corporate sector have been mapped out and outlined. This initiative aims to transparently show the contributions made by the private sector to TU/e research projects (so called 'vrije projecten'). We were the first university in the Netherlands to present our collaborations in this transparent way because we find it important to

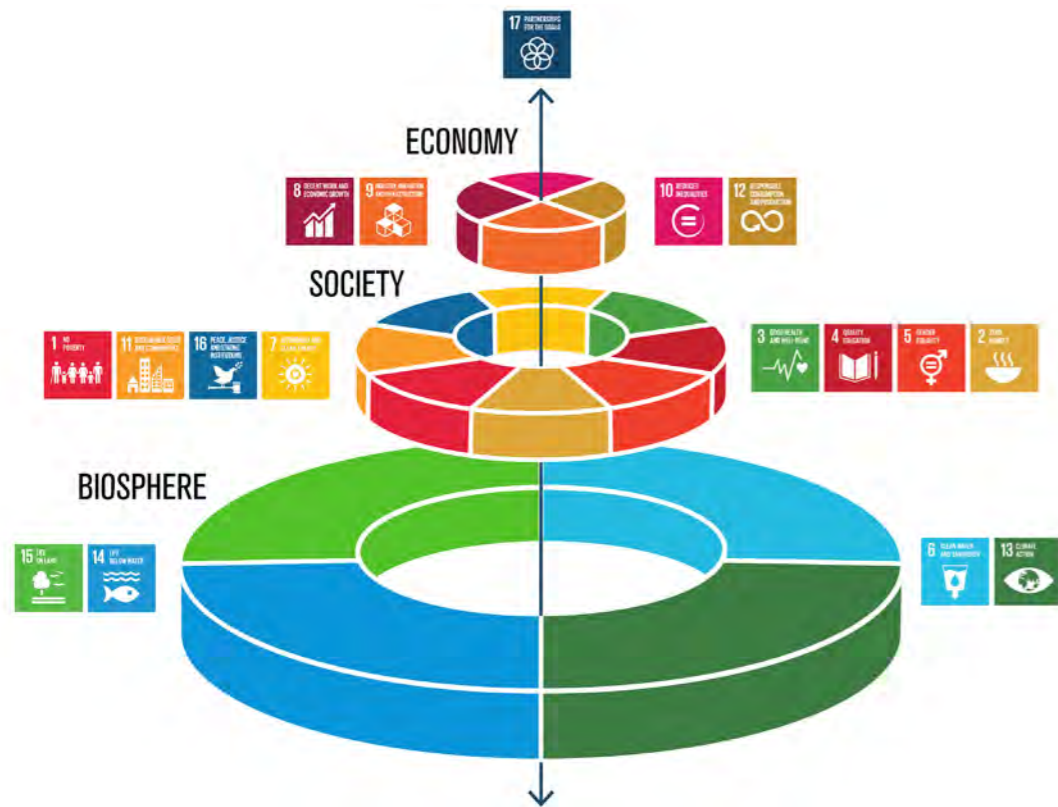
show what our collaboration with industry is, also seen from a Sustainability perspective.

This effort culminated in the publication of an overview detailing the contributions made by 137 companies with which TU/e has established collaborations, categorizing them based on revenue. Companies with a revenue over 100.000 euros are presented here.



Sources:
[Summary ENG](#)
[Jaarverslag NL](#)

COLLABORATION WITH FOSSIL FUEL INDUSTRY



The SDGs can be linked together economically, societally and ecologically.

Illustration: J. Lokrantz/Azote

<https://biospherefutures.net/the-global-goals/>

Link:

[Dialogue Dutch academic community and fossil energy sector - Vrije Universiteit Amsterdam \(vu.nl\)](https://www.vrijeuniversiteit.nl/en/dialogue-dutch-academic-community-and-fossil-energy-sector)

In 2023, at the initiative of the Sustainability Ambassador, a working group started at TU/e to follow up on the Executive Board's statement on investing solely in renewable energy and sustainable projects. During the year this Working Group, consisting of participants from EIRES, General Affairs, Research Support Office, Integrity and other experts, worked on an updated clausula to incorporate in every third-party agreement, ensuring the commitment to renewable and sustainable projects.

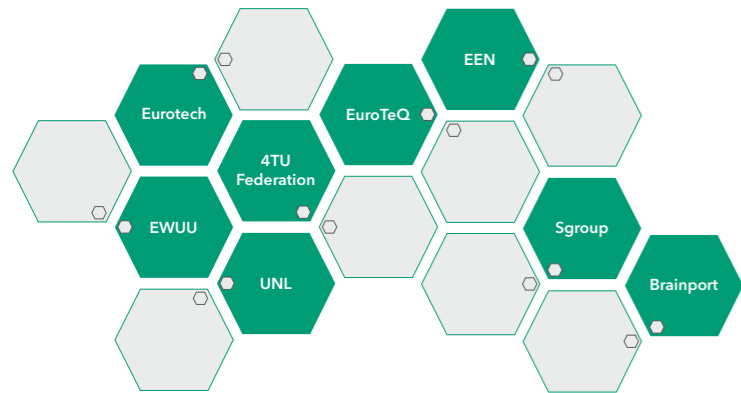
Next to this, the Working Group has developed a Sustainability self-assessment tool to support researchers in their decision-making and to ensure we only work on renewable energy and sustainable projects. This tool aims to assist scientists in transparently evaluating the economic, social, and ecological impacts of their research projects, and proposals, and is accessible to all TU/e employees. The Tool will be voluntary for the period of one year, to explore its utility, after which it will undergo an evaluation.

At the end of 2023, TU/e participated in a series of meetings with other universities that were initiated by the rector of Vrije Universiteit Amsterdam, to discuss the topic of collaboration with fossil fuel industry. A meeting in early

December last year brought together rectors, boards and experts of Dutch universities and knowledge institutes, where participants explored and challenged each other's position and how they could work together on this matter. These meetings will continue in 2024.



ALLIANCES



Declaration for Sustainability

The EuroTech Universities of Science and Technology

1. Are committed to sustainable development, embodied by the 17 Sustainable Development Goals of the United Nations adopted in 2015 as the prime challenge for humanity today.
2. Will integrate the challenges posed by sustainable development in initial education and life-long training as a principal responsibility to train students and professionals to understand and solve key scientific, technological, and societal challenges.
3. Commit to **advancing the frontiers of knowledge**, technology, and innovation as essential tools for **transformation towards absolute Sustainability** and will develop **original technological solutions** needed to address the world's acute problems.
4. Recognize that **technological development and scale-up** must be complemented by behavioural changes to **ensure responsible consumption, to avoid strain on the environment, and to reach a circular economy**.
5. Are **Living Labs** committed to implementing sustainable solutions across their campuses, training, research, and innovation activities.
6. Commit to **mobilizing their entire community** as drivers of transformation through a **collaborative, participative, inclusive and transparent approach**.
7. Will also activate their global partner network to **reach societal wellbeing and global Sustainability**.

Want to know more:

[University alliances & networks \(tue.nl\)](https://tue.nl)

[Sustainable Society · EuroTech Universities Alliance \(eurotech-universities.eu\)](https://eurotech-universities.eu)

[Transformative Education for Sustainability at TU/e \(4tu.nl\)](https://4tu.nl)

TU/e is part of 8 (inter-)national alliance networks with other higher education and knowledge Institutes, with a specific focus on Sustainability. TU/e joins forces with other universities and partners to enhance the impact for science, industry and society.

In the **4TU Alliance** a research project started on mainstreaming Sustainability in engineering education, aiming to close the gap between the desired and needed higher engineering education teacher's competence for sustainable education.

Universiteiten van Nederland (UNL): In 2023, a formal working group was established within the UNL network, comprising strategic Sustainability Managers of all Universities. The objective of this working group is to highlight the significance of Sustainability, and provide advice on issues related to this subject

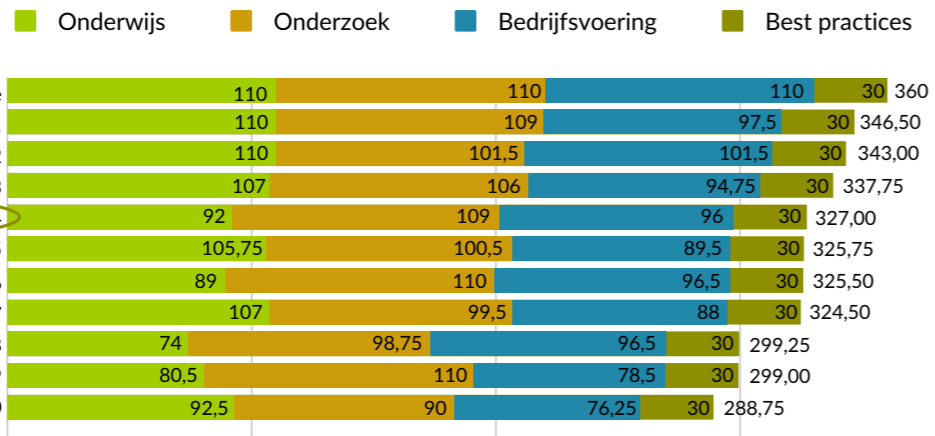
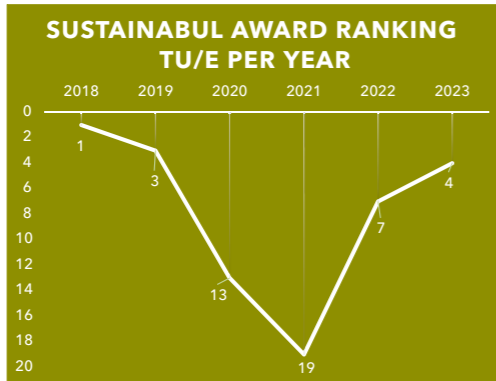
EUROTECH: In April 2023, a symposium was organised by Eurotech and hosted by L'Institut Polytechnique de Paris. TU/e was represented by the Sustainability Core Team, Innovation Space and energy institute EIRES. On recommendation of the TU/e Sustainability Ambassador, this assembly culminated in a joint Sustainability

declaration, demonstrating a dedication to the 17 Sustainable Development Goals (SDGs) and outlining a concise seven-statement overview on actionable steps for Sustainability.

Brainport Sustainability Network: In 2023 all Brainport parties joined forces and discussed their sustainable ambition, best practices and how to work closely together on the Sustainability Agenda for the region. Sustainability directors of the major companies meet regularly. TU/e is represented by the TU/e Sustainability Core Team.



SUSTAINABIL RANKING



Sources:
[SustainaBul - Studenten voor Morgen](#)
[Benchmark Rapport SustainaBul \(studentenvoormorgen.nl\)](#)
[Atlas \(tue.nl\)](#)

Starting in 2018, TU/e actively participates in the Sustainabil Ranking, a ranking among Dutch Higher Educational Institutes, organised by Studenten voor Morgen.

In this ranking, all Dutch higher educational institutes are compared in the domains research, education, campus operations and best

practices. TU/e started with top positions and was even leading the ranking in 2018, which was due to the opening of the renovated Main Building 'Atlas, the world's most sustainable educational building'. After a short down period, we are now regaining our position with a 4th place in 2023, with maximum scores in the domains research and best practices.





Green Office

TU/e EINDHOVEN
UNIVERSITY OF
TECHNOLOGY

Want to know more: [Home - GO Green Office](#)



GO Green Office Team of 2023.

Want to know more: [Home - GO Green Office](#)

The GO Green Office is the go-to place for all students on campus who want to contribute to a more sustainable TU/e. You can meet the members in the Green Room on the ground floor of the Atlas Building during the walk-in hours.

The team behind the TU/e's GO Green Office consist of 11 TU/e students and a team coordinator who is also part of the Sustainability

Core Team. Next to their studies, they work for the GO Green Office to make the TU/e the most sustainable university in the Netherlands.

Since the start in 2015 initiating the first sustainable student projects, the GO Green Office matured into a solid organisation, carrying out many initiatives and with dedicated participation in TU/e's Sustainability Core Team.

Green Office

TU/e EINDHOVEN
UNIVERSITY OF
TECHNOLOGY

CHAIR OF THE FUTURE



Exposition Ground Floor Atlas.

Want to know more and partipate?

[Chair of the Future](#)

[See What's Up & Have Your Say! | Linktree](#)

[Future chair goes on tour \(tue.nl\)](#)

In 2023, the GO Green Office together with multiple students and student-associations, developed and built the TU/e Chair of the Future (CotF), based on the 'Toekomststoel', an idea by Jan Terlouw.

This CotF was presented to the Executive Board during the opening of the academic year on behalf of the TU/e Community. Its purpose is to serve as a reminder to the board and directors

about the importance of providing future generations with a lasting presence in decision-making processes. This initiative aims to include a long-term, inclusive and systemic perspective in the decision-making framework.

The presentation of the CotF was followed by an exposition in Atlas in collaboration with the TU/e Sustainability Core Team, inviting all to actively engage in shaping our future.



Presentation of the Chair of the Future at the Opening of the Academic Year 20203/24.

32 study associations participate in the SUMAP project in 2023

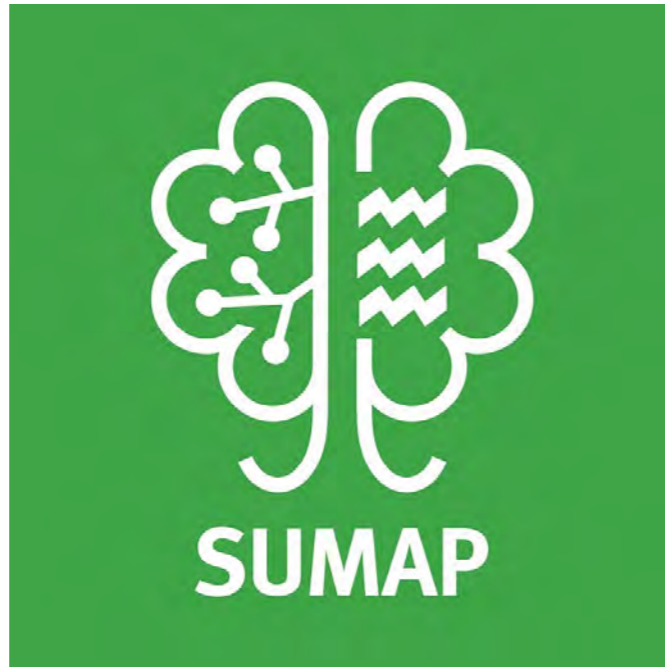
12 meetings were organized, sharing experience en offering support in 2023

16 sustainable and worthwhile projects were established in 2023

Want to know more:

[GO Green Office \(tue.nl\)](https://www.tue.nl/greenoffice)

[GO Green Office wil studentenverenigingen verduurzamen \(tue.nl\)](https://www.tue.nl/greenoffice/wil-studentenverenigingen-verduurzamen)

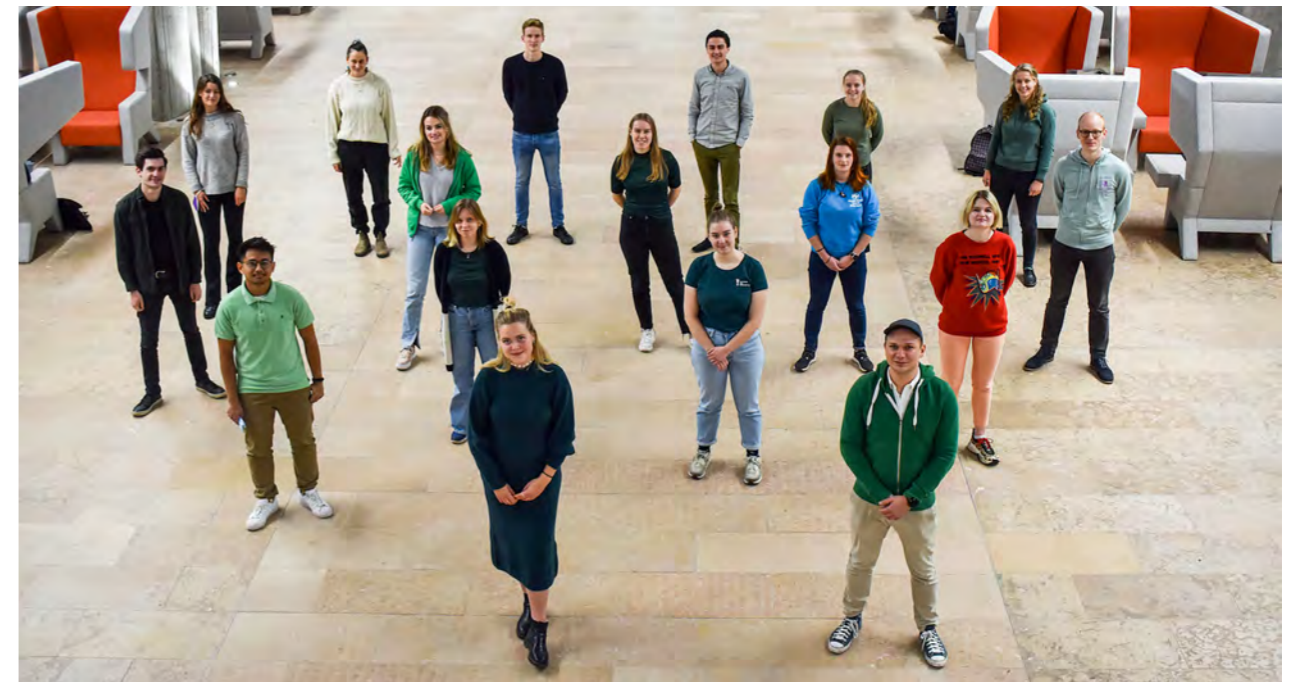


SUMAP stands for 'Sustainability Manager Project' and was initiated in 2021 by the GO Green Office. Aim of the project is to engage all student- and study associations into making more sustainable choices and to support each other. In 2023, we can proudly say that almost all study associations participate!

SUMAP functions as a knowledge platform where good practices are shared. The Sustainability Managers of the associations and the GO Green Office come together several

times per year to share expertise, to activate each other and for inspiration. This comes together with a small yearly competition, rewarding the best Sustainability initiatives with prizes.

If a participating association needs financial support to achieve sustainable impact, a funding request can be sent to the GO Green Office. Requests that are proven sustainable and worthwhile, can be established by the GO Green Office.



RE-USABLE DRINKING CUPS

43 events made use of the Festival Cups in 2023
156 events made use of the Festival Cups in total since the start



Want to know more:

[Op naar een plasticvrije campus met herbruikbare festivalbekers \(tue.nl\)](#)

[TU/e festival cup gets the thumbs up \(tue.nl\)](#)

The GO Green Office introduced the TU/e Festival Cup in 2018 and since then over 150 events used these cups.

The Festival Cup is re-usable and works with a return system. Cups can be borrowed for an event and, upon return, can facilitate another event. Single use of plastics is avoided, and the amount of Festival Cups needed in total is

brought back to a minimum, using this system.

Because of tightened legislation and the new TU/e Sustainable Events Policy, 2023 was the last year the Festival Cups were facilitated by the GO Green Office. From 2024 on, this service will be part of the Facility Management - Event management of TU/e.



SUSTAINABLE EVENTS

18 different workshops, lectures and other activities are organised in the Green Week of 2023



465 kg waste was avoided in 2023 by organising the circular pop-up stores

Sources:
[GreenWeek 2023 - GO](#)
[Green Office](#)
[A sustainable university in the making \(tue.nl\)](#)

In line with recent years, the GO Green Office organised the Green Week at TU/e in collaboration with Technology for Global Development and with the help of multiple volunteers in 2023. The aim of the Green Week is to inspire and motivate the TU/e Community to become more sustainable. The week consist of a variety of activities, workshops, movies and

discussion panels, all contributing in some way to this goal.

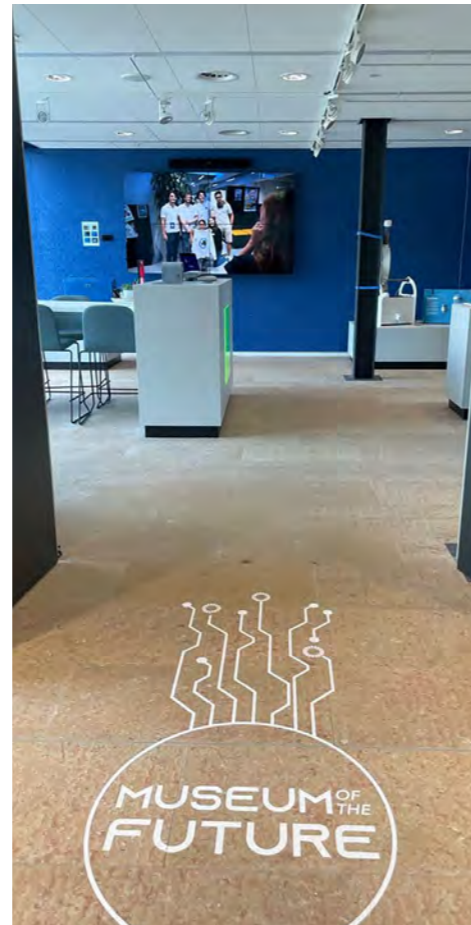
In 2023, the GO Green Office also organised a clothing repair café and 2 circular pop-up store events to prevent fast fashion, waste, and to take a step forward to a circular economy.



GREEN ROOM EXPOSITIONS



Want to know more:
[Green Room - GO Green Office](#)



Since its official opening in June 2021, the Green Room of the TU/e hosted multiple exhibitions, showcasing Sustainability at TU/e.

Parts of exhibitions change every few weeks and at least once a year a big new exhibition is

being organized by the GO Green Office. The 2023 main exhibition took place in March under the title 'Museum of the Future', highlighting interactive and engaging projects and initiatives that address one or more of the Sustainable Development Goals.





Implementation of Sustainability - Sneak preview 2024

A selection of 2024 projects and activities are presented in the following pages. This is a limited overview of all our activities. Want to stay updated? Follow us on [LinkedIn](#) and via the [TU/e-Sustainability Website](#) or contact us via mail: sustainability@tue.nl



Chair of the Future Tour

In 2024, several departments join the conversation and participate in the Chair of the Future Tour, together with the Sustainability Core Team and the GO Green Office. During these visits we bring Sustainability to the decision-making table, supported by the Chair of the Future, and give future generations a chance to speak up.

Roadmap

The input we gather during the Chair of the Future Tour visits, will be analysed and transferred to a roadmap, helping the TU/e community to make choices and implement the most pressing and interesting Sustainability initiatives.

TU/e network, EIRES, Innovation Space, ALT, Brainport, UNL, 4TU, EWUU, Eurotech and many others!

As a Sustainability Core Team, we will continue to build coalitions, connect people and join forces to take the lead in the Sustainability Transition.

Sustainability Symposium

Mark your calendars! On 3 October 2024 we are organising a big Sustainability Festival at TU/e.





4TU.CEE Publication

In our 4TU.CEE alliance we will work on a publication on Sustainability in higher engineering education.

University of the Future/ Eindhoven Engine/Transformative University

In 2024, we will continue our efforts to discuss the shape of the University of the Future by actively joining the conversation and participating in workshops and events together with Innovation Space and Eindhoven Engine.

Source: [Transformative Education for Sustainability at TU/e \(4tu.nl\)](#)



Picture from [Climate TRACE](#).



Collaboration with Innovation Space

At the end of 2023, the Sustainability Core Team started a collaboration with Innovation Space, to advance the developments on Sustainable Education at TU/e from a content-related approach to a didactical one. The objective of this collaboration is to jointly facilitate co-creation sessions aimed at a more Transformative and Sustainable Education within

the TU/e context, by engaging with educational experts, researchers and educators.

Field Study

The Sustainability Core Team in collaboration with the GO Green Office will perform a field study with students to learn how transformative our current educational system is and gain insights for improvement.

Thematic Learning Area Sustainability

The Sustainability Core Team together with Innovation Space is working on the establishment of a Thematic Learning Area (TLA) for Sustainability. This TLA will consist of a set of courses in which different elements of Transformative and Sustainable Education are reflected upon and taught.

Bachelor students will be able to select courses in this learning area to specialize on various aspects of Sustainability. The courses aim to help students contextualize technological developments within the broader set of grand societal challenges.



CAMPUS OPERATIONS

Energy management

In collaboration with EIRES we will introduce a smart grid, peak-shaving and energy storage at the TU/e Campus. In addition, the use and number of Solar Panels on TU/e Rooftops will be optimized.



Business travelling policy

Supported by tightened legislation, the Working Group Mobility will make a fresh start of the year with addressing the TU/e business travelling policy. Other universities precede us in drawing up an up-to-date sustainable business travelling policy and we are going to follow in 2024.

Gathering Data

By drawing up our CO₂ footprint in 2022, we've realised there is data missing. In 2024, we will further focus on receiving adequate data from our suppliers and of the TU/e LIS department specifically.

E-hal (Impuls) under construction approx. 1959.



Source: E-hal Cultuurhistorische verkenning Impuls, October 2023

Circular building

We will continue to make circularity scans on large newbuilt, renovation and maintenance projects and to further develop our circular building policy. Next tot that we will start with preparations for the circular renovation of the Impuls Building, beholding its cultural value as one of van Embden's original buildings.

To support sustainable decision-making during the development process of a building, Life Cycle Vision (LCV) software is introduced at TU/e. When making use of this software, we can easily and directly see the impact of design decisions in the long term. Impuls will be one of the LCV pilots in 2024, supporting circular and Sustainable choices with a long-term added value.

Waste management

Our Sustainable Events Policy will be put into effect on January 1st, 2024, and will be guided thoroughly to ensure a well-balanced and successful implementation. The results of the residual waste analysis will be ready and will be used to take follow up actions to further reduce this waste flow.

Contract management will focus more on gradually improving our waste footprint by exploring new options to re-use waste materials.

GO Green 2023- Renewi VR game.





Self-Assessment project Tool

In 2023 a Sustainability Self-Assessment Tool was designed to support researchers in their decision-making about their research initiatives and to ensure we only work on renewable energy and sustainable projects. This tool aims to assist scientists in transparently evaluating the economic, social, and ecological impacts of their research projects, and proposals. The Tool is voluntary for use for the period of one year to explore its utility, after which it will undergo an evaluation process. The utility of this Tool will be monitored carefully and suggestions for improvement will be part of the evaluation process. Because the set-up of the Tool is generic, in the future, it can also be used to assess the impact of other activities.

CSRD

In 2024 the CSRD¹ is being introduced as part of the European Green Deal. Although this legislation does not apply to the TU/e (yet), we are committed to reporting on our Sustainability efforts. A working group has been formed to investigate the possibilities of using the CSRD framework for monitoring.

1. CSRD is short for Corporate Sustainability Reporting Directive: a European Guideline part of the Green Deal Europe. This directive requires companies to report on Sustainability aspects in their annual report.

Rankings

In 2024, we will again participate in the Sustainability Ranking and possibly the Times Higher Education Ranking for the second time.

Alliances

We will actively engage in our current collaborations, with a focus on the Universiteiten van Nederland (UNL-strategic Sustainability Managers Working Group), 4TU, EWUU, the Eurotech Alliance and Brainport region.



Green Week

In 2024, the Green Week will be organised by the GO Green Office together with many volunteering (student) organizations. The 2024 Green Week will take place in the first week of June (03.06 - 07.06).

Chair of the Future

The Chair of the Future Exposition will be exhibited at Faculties joining the sustainable conversation, acting as a conversation starter for students, staff and boards.

Green Room, Exposition and pop-up store

In 2024 the GO Green Office will continue their regular expositions and events to stimulate a Sustainable TU/e.

SUMAP

The 2024, SUMAP network will continue to enhance the efforts of becoming a more sustainable university by actively managing the SUMAP network and organizing events to share experience and boost enthusiasm.



Green week 2023 - Vegan ice cream.



Acknowledgements

It was possible to compile this report thanks to the continuous efforts and achievements of many students, employees and others connected to TU/e and Sustainability.

With this report we want to honour the hard work of many and greatly thank:

- EIRES
- Facility Management Center
- Innovation Space
- The Academy for Learning and teaching
- The Advisory Board on Sustainability
- The Eindhoven Engine
- The Executive Board TU/e

- The GO Green Office
- The Procurement Department
- The Real Estate Department
- The Regiegroep Duurzaamheid
- The Sustainability Core Team
- The Vitality Core Team
- The Volunteers of the Green Week
- The working group Circular Building
- The working group Collaboration
- The working group Energy
- The working group Mobility
- Various researchers from IE&IS

for their contribution to a #SustainableTU/e.



Disclaimer

We have tried to present a complete and accurate overview of the status of Sustainability at TU/e as of the end of 2023.

Given the shifting dynamics and evolving landscape around Sustainability, it's crucial to acknowledge that this report reflects current realities, which may swiftly become outdated as circumstances

change. We acknowledge the limitations of our foresight and recognize our ongoing learning process. Therefore, it's important to approach the report's insights with a flexible perspective and with the possibility in mind that there are already more current numbers and information available on our website, or - for those with patience, in the new report for 2024/2025.

Overview of Abbreviations

ALT	Academy for Learning and Teaching	NEE	The Entrepreneurial Education Network
ATES	Aquifer Thermal Energy Storage	SCT	Sustainability Core Team
CotF	Chair of the Future	SDG's	Sustainable Development Goals
CSRD	Corporate Sustainability Reporting Directive	SUMAP	Sustainable Managers Project
EIRES	Eindhoven Institutes for Renewable Energy Systems	TIS	Technology, Innovation & Society Group
EV	Electric Vehicle	TU/e	Technical University of Eindhoven
EWUU	Strategic Alliance TU/e, WUR, UU and UMC	UNL	Universiteiten van Nederland
IPCC	Intergovernmental Panel on Climate Change	4TU.Federation	The federation of the four Dutch technical universities, TU/e, TUD, TU, WUR
LCTI	Low Carbon Travel Initiative		
LCV	Life Cycle Vision		



Overview of Definitions

[1] Transformative research means working with society in a co-creative, transdisciplinary way. It means focus on societal challenges and broad partnerships that go beyond Tripple Helix of industry, government and knowledge institutes. Transformative research is driven by the need to balance socio-environmental and economic aspects of development and by a systemic approach to change. For researchers it means broadening of the scope of excellent science by recognition of impacts we make with our research on society.

[2] Transformative education enables students to reflect on and foster change in established practices and institutions from the perspective of environmental and social responsibility. It enables them to become agents of change and acquire competences necessary to tackle complex societal challenges.

[3] A WorkWalk is a predetermined route on the TU/e Campus, stimulating working while walking.

[4] When making a quickscan, circular experts physically go through a building, detecting building materials that can be re-used.

[5] wadi is short for 'Water Afvoer Drainage en Infiltratie'; Water Discharge Drainage and Infiltration. A lowering in the land scape to capture and store water.

[6] CSRD is short for Corporate Sustainability Reporting Directive: a European Guideline part of the Green Deal Europe. This directive requires companies to report on Sustainability aspects in their annual report.



TU/e

SUSTAINABILITY