



# The UN Sustainable Development Goals Report 2023



# Table of Contents

A Message from the President of KTH Royal Institute of Technology.....	3	9. Industry, Innovation and Infrastructure.....	33
Students have the floor.....	4	10. Reduced Inequalities.....	37
This is KTH.....	5	11. Sustainable Cities and Communities.....	40
1. No Poverty.....	9	12. Responsible Consumption and Production.....	43
2. Zero Hunger.....	11	13. Climate Action.....	47
3. Good Health and Well-Being.....	14	14. Life Below Water.....	51
4. Quality Education.....	17	15. Life on Land.....	54
5. Gender Equality.....	20	16. Peace, Justice and Strong Institutions.....	57
6. Clean Water and Sanitation.....	23	17. Partnerships for the Goals.....	60
7. Affordable and Clean Energy.....	26	KTH and Sustainability Rankings.....	63
8. Decent Work and Economic Growth.....	30	About This Report.....	63



# A Message from the President of KTH Royal Institute of Technology



“We take the lead for a sustainable society.” This is the bold beginning of our new vision, adopted by the University Board last year. It is a vision that gives direction, inspires dedication and reinforces our commitment to contributing to a more sustainable world. With a strategic focus on sustainable development and digital transformation, we intensify our efforts to integrate sustainability into all disciplines and preparing students as future leaders in sustainable innovation.

The vision is not just fine words but goes hand in hand with our daily activities in research, education and innovation on our campuses.

KTH’s continued focus on climate action is also driven by the latest IPCC report, published in March 2023, which underlines the urgent need for rapid action.

Almost every day we are reminded of how quickly things are moving in the wrong direction when it comes to sustainable development, and at the same time how important KTH’s role as a leading technical university is. In relation to ongoing energy challenges, the University’s comprehensive approach addresses the complex energy landscape, contributing solutions to help mitigate energy concerns and advance the transition to a more sustainable energy future. Cybersecurity is another topical area, crucial for an increasingly digital and vulnerable society, that is researched and taught at KTH on a daily basis.

Other important research areas include climate-resilient

urban planning, food systems and sustainable materials, to name but a few.

Complex problems and challenges often require complex solutions. These are made possible through collaboration with the surrounding society, its businesses and institutions, and within the University, through collaboration across disciplines within the research community, both nationally and internationally. Researchers, educators, students and partners working together to shape the future through the present.

It is also important for us at KTH to ensure that good intentions are translated into practice and have real impact and tangible benefits for society and its necessary sustainable transformation.

The UN Sustainable Development Goals (SDGs) facilitate and strengthen KTH’s ability to work strategically and systematically with sustainable development in education, research, collaboration and with our own impact on all KTH campuses.

I will conclude by quoting the end of KTH’s vision: “We are bold, creative and responsible, driven by our purpose to enable sustainable and equitable societies.”

This report provides different examples of how KTH is working towards and in line with the 17 Sustainable Development Goals.

Anders Söderholm  
President, KTH Royal Institute of Technology



# Students have the floor

During 2022 and 2023, a lot has happened that affects students when it comes to sustainability. One of several changes that have been made has happened in the union building, where a number of resource sorting bins have been placed out on all floors, covering it's everything from combustible to glass recycling.

When it comes to the changes that the chapters have made, the list is long, including everything from food waste sorting in the chapter halls which has been carried out in collaboration with KTH to a general forum where old items that the chapters themselves have bought are donated so that they are not thrown away and can be reused by another chapter or person.

During the large relocation work from both Campus Södertälje and Campus Kista, the students have fought to be able to bring and reuse as much as possible so that the chapter does not have to buy new things.

The chapters have also continued their work in creating and updating their governing documents in the form of sustainability policies regarding how chapter members should think about various activities.

During 2022 and 2023, a lot has happened that affects students when it comes to sustainability. One of the recent changes is in the union building with the installation of resource sorting bins on every floor. These bins are

designated for various types of recycling, including combustible materials and glass, making it easier for everyone to contribute to sustainable waste management.

The chapters have implemented numerous changes to promote sustainability. These initiatives range from food waste sorting in chapter halls, implemented in collaboration with KTH, to the creation of a general forum where chapters can donate previously purchased items. This forum prevents unnecessary waste by allowing other chapters or individuals to reuse these items, fostering a culture of sustainability and resource efficiency within the KTH community.

During the extensive relocation efforts from both Campus Södertälje and Campus Kista, students have actively worked to salvage and reuse as many items as possible. This initiative aims to minimise the need for new purchases by the chapter, promoting sustainability and resource efficiency.

The chapters have also made significant progress in developing and updating their governing documents, specifically sustainability policies. These policies guide chapter members on how to approach various activities with a focus on sustainability.

Oskar Dubeck, THS Head of Student Social Activities



# From basic research to societal benefits

Since 1827, KTH has grown to become an international leading technical university. As the largest institution in Sweden for technical education and research, we bring together students, researchers, and educators worldwide. Our activities are grounded in a strong tradition of advancing science and innovation, focusing on contributing to sustainable societal development.





### **Versatile solutions to global challenges**

KTH works with industry and society in the pursuit of sustainable solutions to some of humanity's greatest challenges: climate change, future energy supply, urbanisation and quality of life for the rapidly growing elderly population. We are addressing these with world leading, high impact research and education in natural sciences and all branches of engineering, as well as in architecture, industrial management, urban planning, history and philosophy. Almost two-thirds of the 4 billion SEK turnover relate to research.

Basic and applied research are performed side by-side at KTH and interdisciplinary research is conducted in parallel with work in specific fields. This approach encourages versatile solutions, and the innovative climate creates many opportunities to realise great ideas. Our educational programmes foster a new generation of engineers, architects, teachers and undergraduate engineers.

KTH embraces academia and the public and private sectors working together. We are part of extensive international research collaborations and participate in a large number of educational exchange or joint programmes with universities and colleges in Europe, the U.S., Australia, Asia and Africa.

Sweden is considered to be one of the most

technologically innovative countries in the world and Stockholm is consistently ranked as one of the world's most entrepreneurial, innovative and attractive cities. KTH maintains close relationships with an expanding network of international companies and the industrial community in a number of fields, and working and studying here provides access to this network. The five KTH campuses in Greater Stockholm gather more than 13,000 full-time students, over 1,700 PhD students and approximately 3,600 full-time employees.

The campuses are strategically located close to their areas of research and study. For example, KTH Kista is situated in the middle of the Kista ICT hub, with some of the world's leading Information and Communications Technology companies. One of our other campuses, KTH Flemingsberg, is located in one of Northern Europe's leading medical technology centres for research and industrial activity.

KTH continues to focus on research and education for a sustainable tomorrow. We will continuously assess the impact of our efforts in society and contribute with the intellectual resources of our students and researchers to create new approaches to some of the most critical challenges of our times.

### **Sustainability at KTH**

KTH remains dedicated to [Vision 2024–2028](#), [Policy for sustainable development for KTH](#), [Sustainability Objectives](#), and [Management Plan](#). The KTH Sustainability Office, consisting of eight specialists, works to integrate sustainability across education, research, and collaboration, while maintaining and improving KTH's ISO 14001:2015 certified environmental management system. The office collaborates both internally with KTH's Management, School Management, University Administration (UA) Management, and externally to drive and develop sustainability in accordance with KTH's university-wide sustainability and climate objectives, as well as national and international rules and regulations. By focusing on these priorities and leveraging its strengths in education, research, and innovation, KTH aims to prepare future professionals, contribute sustainable solutions to societal challenges, and lead by example.

### **University-wide Objectives**

KTH has established [Sustainability Objectives for 2021–2025 and climate objectives extending to 2045](#). These objectives focus on six critical areas: Education, Research, Collaboration, Integration and working methods, Resource management, and Climate.



### Progress and Initiatives

Overall, KTH is making progress in its sustainability objectives, with ongoing efforts to address challenges and enhance its impact in education, research, collaboration, and resource management.

- Education: KTH has integrated sustainable development into all educational programmes, achieving partial success in two sub-goals and full success in one. The number of courses related to sustainability has increased with circa 300 courses over the past five years.
- Research: KTH incorporates sustainability into research across all schools, with publications addressing most UN Sustainable Development Goals. Funding for interdisciplinary projects has supported innovative research initiatives, although external funding remains a challenge.
- Collaboration: KTH fosters partnerships and enhancing visibility. The university has improved its rankings in sustainability-related assessments and has engaged in national and international networks to promote sustainable development.
- Resource Management: KTH is working towards integrating sustainability into governance and operational processes. Online Staff training on sustainability issues has been prioritised, and the university has established new governance structures to support these initiatives.

### Challenges and Priorities

Assessment shows progress towards KTH's Sustainability Objectives of education, research, collaboration, and integration efforts. However, there are areas that need significant improvement and where additional efforts are necessary to fully meet sustainability objectives and maintain a position as a leading institution in sustainable development.

While the importance of sustainability is recognised, impactful resource management and climate goals requiring immediate and targeted actions are not fully embraced in practice. In terms of resource management, emissions from business travel continue to be a concern, and waste management practices require optimisation. Additionally, the current trajectory indicates difficulty in meeting quantitative climate targets, necessitating a focused action plan. This misalignment between our understanding and actions presents a critical opportunity for improvement.

Furthermore, external funding for sustainability-related research from key agencies has not significantly increased. The university has not seen a substantial rise in faculty positions explicitly focused on environmental and sustainable development. Despite overall improvements in sustainability rankings, KTH's position in the THE Impact Ranking is slightly declining due to the increased number of participating institutions. While research integration is



improving, there's still room for growth in incorporating sustainability across all research disciplines at KTH. These areas highlight where KTH needs to focus additional efforts and resources to fully achieve its sustainability goals and maintain its position as a leading institution in sustainable development.

To address these challenges, the following measures are proposed, focusing on:

- Developing and implementing a carbon budget and climate fund
- Promoting climate-efficient meeting alternatives
- Enhancing data collection and analysis capabilities for more accurate monitoring.
- Placing resource management and climate-related indicators on par with financial KPIs on all levels of the organisation.

There is a need to further integrate sustainability and the management of own resources across KTH's organisation structure and refine systematic working methods for tracking the institution's climate impacts. It is also important to consider the challenges and potential obstacles that may arise during this process. Balancing the need for international collaboration with emission reduction goals, addressing potential resistance to changes in travel policies, and ensuring that sustainability efforts do not compromise academic, or research quality are all critical factors to navigate. By adopting this multifaceted approach, KTH could tackle current shortcomings while building on existing successes. Regular reassessment and stakeholder engagement will be crucial to ensure continued progress towards all sustainability objectives.

For a complete follow-up of KTH's Sustainability Objectives, see KTH's reports to [the Swedish Environmental Protection Agency](#), and [the Report on KTH's Sustainability Objectives 2023](#). Gender equality is integrated into the sustainability objectives but is reported separately in another report.

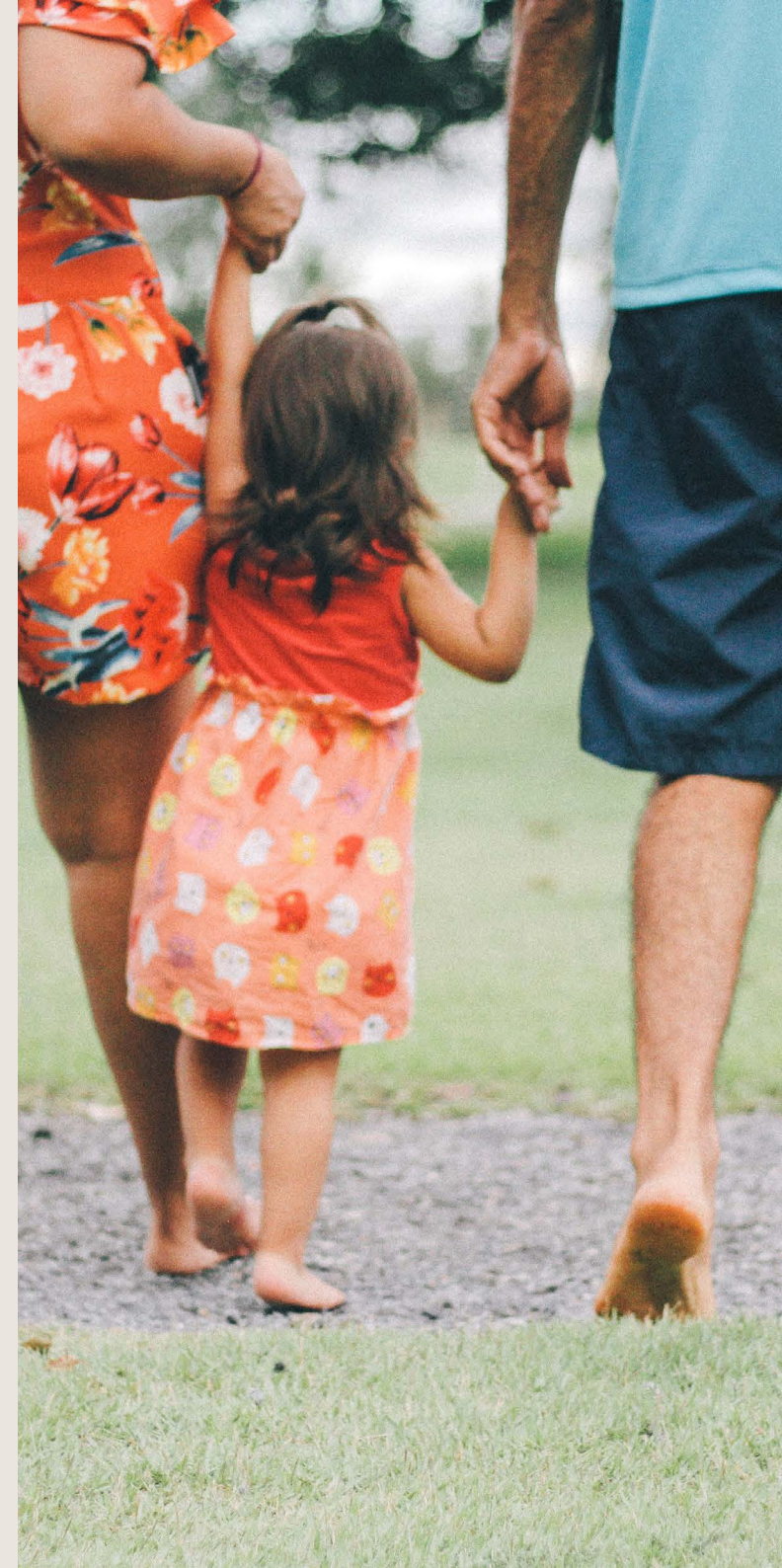




## 1. No Poverty

# End poverty in all its forms everywhere

The right to education is recognised as a human right in several international conventions including the International Covenant on Economic, Social and Cultural Rights, which includes an obligation to develop equitable access to higher education. KTH supports equitable access to education and encourages project initiatives and innovation through financing and programmes.





### **The Right to Education and Student Financial Support**

KTH attracts students from many different backgrounds, and coming from a disadvantaged background should not be an obstacle to receiving an education at KTH. Students from Sweden and the EU are not required to pay tuition fees. For students required to pay tuition fees, there is a range of KTH and external scholarships available.

Students from Sweden can receive grants and loans while they study. The Swedish Board of Student Finance (CSN) is the government agency that manages Swedish student finance. For non-Swedish students there are different types of Scholarships:

### **KTH Scholarships and Funds**

The [KTH Scholarship](#) covers the full tuition fee of a one or two year Master's Programme. In order to receive a scholarship the applicants are required to describe how an education at KTH will help them contribute to sustainable development. 23 students received a KTH Scholarship in 2023. In addition, 11 students received [KTH One-Year Scholarships](#), two students received [KTH Joint Programmes scholarships](#) and two students received a [KTH India scholarship](#).

All of the students are enrolled in programmes with

the regular tuition fee (155,000 SEK/year) except for Architectural students (260,000SEK/year) and the Molecular Techniques and Life Sciences (200,000SEK/year).

### **Student Field Study: How coffee beans can lift farmers out of poverty**

Two KTH students spent two months in Thailand as part of their [degree project in Industrial Economics](#). They discovered that Robusta coffee beans, which thrive under forest canopies, could significantly improve farmers' incomes despite the global market's perception of Robusta as lower quality. The students found that some Thai farms are adopting sustainable practices, such as creating diverse ecosystems by planting banana trees to revitalise the soil and combining coffee cultivation with other crops like rice, cacao, and durian while reducing reliance on harmful chemicals. They observed that farms knowledgeable about proper coffee processing and refinement techniques could significantly increase their income, contrasting with the low prices that average Thai farmers receive for their beans due to a lack of knowledge. Additionally, the study highlighted environmental considerations, noting that cultivating Robusta could help combat deforestation in Thailand, as it is resilient

to climate change and can grow at lower altitudes. The students emphasised the value of their immersive experience, which provided them with deeper insights into rural life in Thailand and the warm reception from locals, illustrating the complexities of these issues beyond what traditional tourism can offer.

### **The Kymmendö Model – A new housing model to overcome structural homelessness**

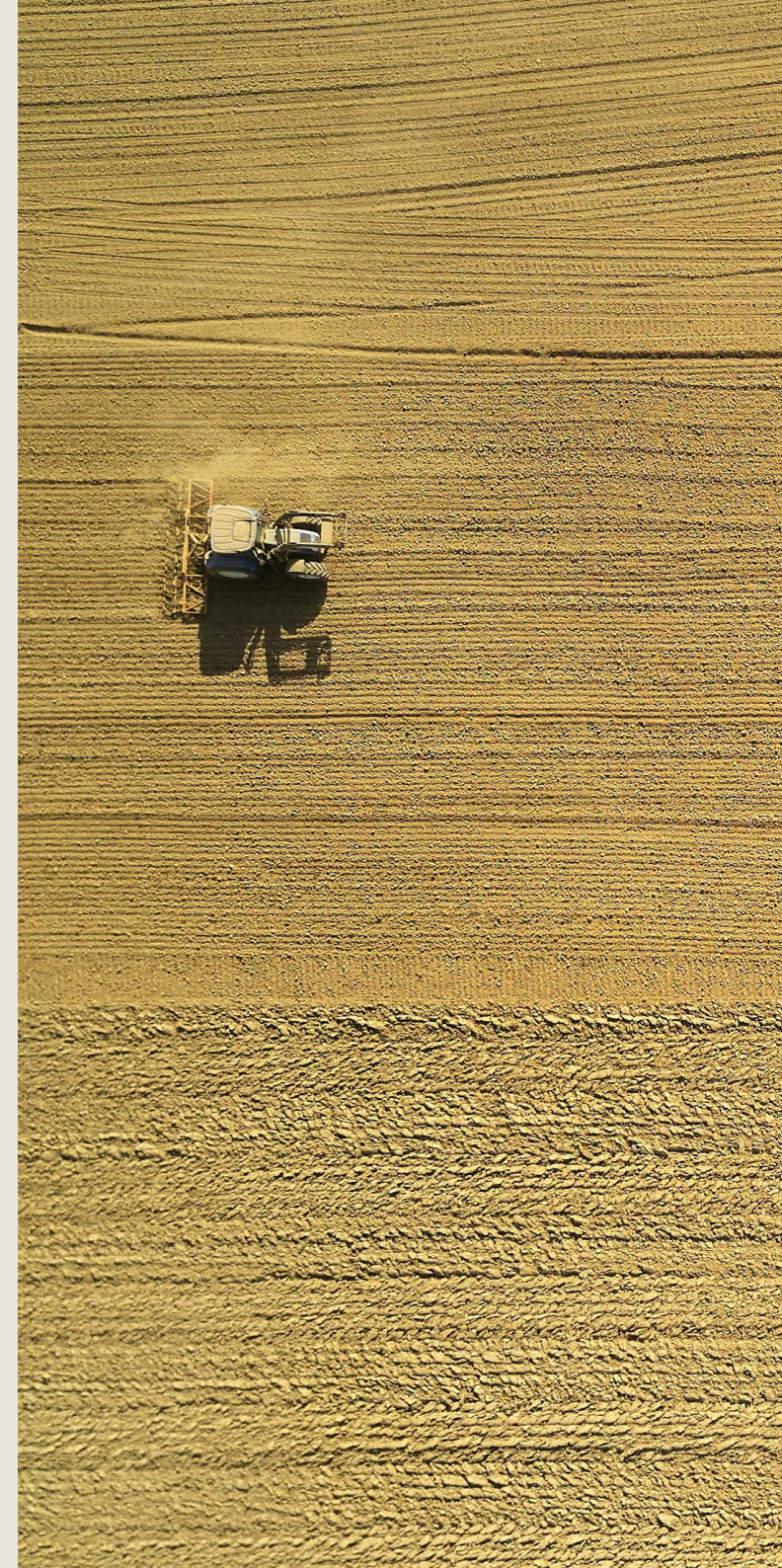
Today, large groups of households have difficulties entering the regular Swedish housing market, not least in the big cities. High housing prices, a reduced number of rental properties and difficulties in meeting the costs of new production are some of the factors that are singled out as complicating. These factors particularly affect socio-economically weak households and people without sufficient queue time. Stockholm City Mission has recently acquired a property – Kymmendö 4 – with the aim of developing a scalable model for affordable housing in new construction. The plan is to apply differentiated rent and needs-oriented selection criteria. [The aim of this project](#) will set a good example and inspire other actors to contribute to a more socially sustainable housing supply.



## 2. Zero Hunger

# End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Through research, operations and on-campus food services, KTH works with students, staff and food providers to support a fair and sustainable food system.





### **KTH FOOD Centre**

[KTH FOOD](#) is an arena for collaboration, innovation, and transformation offering a leading research environment striving for a sustainable, resource-efficient, and fair food system that includes the entire value chain. This is something that results in food products with a positive impact on health and well-being. KTH FOOD has strengths and unique competencies in research and educational activities focused on food systems. From farm to fork: production, processing, distribution, consumption and circular flows, KTH FOOD aims to contribute to research in the food science field in Sweden.

### **Centre for Future Seafood, Blue Food**

[Blue Food](#) is a national seafood centre with the aim of developing Swedish sustainable production of seafood and increasing accessibility for people throughout the country. A primary task is to utilise the wild fish catch more efficiently and to develop a modern aquaculture for fish, shellfish and algae in collaboration with about 70 partners.

### **Biotechnology Master's Programme**

Biotechnology is a rapidly growing subject area that combines knowledge of organisms with technology to use cells in new ways. It is used, for example, for research on diseases, to create new materials and to develop crops that can withstand a changing climate. [The biotechnology Master's Programme](#) at KTH gives you knowledge that can revolutionise areas such as medicine, materials and food. The combination of biology and technology means new opportunities to solve challenges in health, the environment and how we can use nature's own processes for sustainable production of various products.

### **Sustainable Food Production**

The course [Sustainable food production and Consumption](#) describes alternative food systems and their complexity in connection with the assessment of their sustainability, and demonstrates the "trade-offs" of sustainability between contrasting systems (i.e., local vs. global, extensive vs. intensive). Topics covered are agroecology, food and agriculture systems, nutritional cycles, effects on sustainability, life cycle analysis, climate

change, ecosystem services, biodiversity, effects of land and water use, food security and sovereignty, trade, and GMOs.

### **Procurement of Food and Food Services**

KTH has a [procedure for environmental requirements in purchasing and procurement](#). The routine states that the environmental impact of goods and services should be taken into account from a life cycle perspective, from the purchase of goods and services to the removal of returned products and waste.

To support colleagues in creating sustainable meetings and catering, KTH has [Guidelines for Sustainable events and catering](#) which include sustainable food choices.

### **One Planet Plate by Default at KTH**

In 2023, the decision was made to implement [WWF Världsnaturfonden One Planet Plate standard for food ordered for meetings, events, and representation](#). This initiative aims to significantly reduce the university's climate footprint per meal, aligning with its sustainability goals.

The standard specifies that meals should generate



a maximum of 0.5 kg of CO2 equivalent emissions and require organic certification for certain ingredients. The initiative responds to requests from staff and students for more plant-based options and will lead to meals featuring increased vegetables, fruits, and legumes while allowing flexibility for individual dietary choices. The project focuses on changing current practices and procurement procedures while collaborating with suppliers of catering and WWF Sweden.

### **Sustainable, Healthy and Affordable Food Choices on campus**

THS (Tekniska Högskolans Studentkår) restaurants run by the Student Union offer affordable food for students and are not driven by profits. The ambition is to provide healthy and balanced meals where large portions of the ingredients are locally and sustainably sourced.

### **SUSTAIN: Sustainable Approaches for Controlling Saprolegnia Infections in Aquaculture**

This project, funded by the Swedish Research Council Formas (2020–2023), focused on finding new ways to control disease in farmed fish. New FDA-approved drugs

were identified and tested against the fish pathogen *Saprolegnia parasitica*. Better control of the disease will result in higher productivity for fish farmers and potentially reduced costs for the consumer.

### **NoPEST – No toxic pesticides**

In the FetOpen project NoPEST, novel pesticides for a sustainable agriculture were developed and evaluated for targeting plant pathogens in crop production. The consortium consists of KTH, four universities from Europe and Israel and the company Sipcam Oxon. We developed non-invasive disease monitoring technologies to apply precise amounts of novel peptide aptamers specific to oomycetes pathogens. NoPEST contributes to providing sustainable production of agricultural products with higher yields.



### 3. Good Health and Well-Being

## Ensure healthy lives and promote well-being for all at all ages

KTH research and education within Life Science focuses on enhancing the scientific and technological progress in life science, health and care.





### **KTH Life Science Technology Platform**

The [Life Science Technology Platform](#) connects seven thematic research areas that mostly concern human health and the healthcare system, but also adjacent areas, e.g. environment and sustainability. The common denominator of all research is the contribution to human well-being. Research areas include Bioimaging, Biomolecular Tools and Biomaterials, Infrastructure in Health, Mathematical and Computational Sciences, Medical devices, MicroNanoBio, and Fundamental Research in Life Science.

### **Education for Good Health and Well-Being at KTH**

KTH offers a strong constellation of education that covers global challenges in the broader areas of health, environment, and materials. Among them are courses and programmes that address health and aging populations, sustainable production and working life, food production, and clean water. Undergraduate programmes that contribute to good health and well-being include: [Biotechnology and Medical technology](#).

Master's Programmes at KTH include: [Macromolecular Materials](#), [Medical Biotechnology](#), [Medical Engineering](#),

[Molecular Science and Engineering](#), [Molecular Techniques in Life Science](#), [Polymer Technology](#), [Sports Technology](#), [Work and Health](#).

### **Medical Technology for a sustainable world**

The [Medical technology programme](#) focuses on learning to promote understanding and solutions for several of the SDGs, especially the goal of Health and Well-being. Students also learn about economic and social aspects of technology, as well as ethical issues around technology and healthcare, so that they can ensure that care is organised in an economically and socially sustainable way. Upon completion, students have the necessary tools to begin a career that will contribute to the development of sustainable healthcare, both in Sweden and in other countries where the need is potentially even greater.

### **Science for Life Laboratory, SciLifeLab**

SciLifeLab, Science for Life Laboratory, is an institution for the advancement of molecular biosciences in Sweden. Life science is a field of high strategic importance for Sweden, as it impacts the development of healthcare, industry, agriculture and our environment globally.

SciLifeLab began in 2010 as a joint effort between four universities: KTH Royal Institute of Technology, Karolinska Institutet, Stockholm University and Uppsala University. Today, SciLifeLab supports research activities at all major Swedish universities. In addition to the academic projects, the research infrastructure has also provided services to health and medical care, and to industry.

### **Data-Driven Life Science (DDLs)**

In data-driven life sciences, the [DDLs initiative](#) spans basic research in a variety of areas such as new drugs, spread of infection and infection biology, precision medicine and diagnostics, and cell and molecular biology. As a whole, the initiative will contribute to improving human quality of life and well-being, protecting biodiversity and creating a sustainable society. The initiative is coordinated by SciLifeLab, a collaboration between the four host universities Karolinska Institutet, KTH, Stockholm University and Uppsala University, of which KTH is principal.



### **Air Epistemologies: Practices of Eco-poetry in Ibero American Atmospheres**

The [“Air Epistemologies: Practices of Eco-poetry in Ibero American Atmospheres”](#) project explores the interconnectedness of air and human health. Through the lens of eco-poetry, the project emphasises how air serves as a medium that links humans with each other and other organisms, particularly in the context of airborne health risks highlighted by the SARS Covid-19 pandemic. By raising awareness of aerial communities and the significance of breathing as a form of knowledge, the project fosters public consciousness about air quality and its impact on health.

### **EIT Health**

[EIT Health](#), a Master’s Programme in innovative technology for a healthy living environment, started in the autumn of 2020. The programme is led by KTH in collaboration with five other universities. Within EIT Health, KTH has continued to coordinate the Behealsy doctoral programme.

### **Working Environment and Wellness at KTH**

KTH takes a holistic perspective on the work environment. At KTH, the term “work environment” means the physical, organisational and psychosocial work environment, as well as factors that actively contribute to the sustainable development of society. KTH regards [healthcare and wellness](#) as important issues since good employee health means they are better prepared to meet the demands of working life. Your health is not only a personal affair, but also a shared resource, which is decisive for the organisation’s performance. KTH offers all employees among other things: occupational healthcare, rehabilitation support, and crisis support and stress management. As an employer, KTH is legally required to supply vision aids, such as glasses if an employee has trouble with their vision. Furthermore, all employees are given a healthcare allowance of a maximum of 3,000 SEK per calendar year as well as the right to exercise during paid working hours through the use of a weekly health and wellness hour.





## 4. Quality Education

# Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

KTH's objective is that education in technology should be upheld as a natural choice for young people who want to contribute constructively to sustainable societal development.





KTH's objective is that education in technology should be upheld as a natural choice for young people who want to contribute constructively to sustainable societal development. KTH's steering documents determine that sustainable development must permeate all study programmes. KTH's overall sustainability objectives include [specific objectives](#) for education. Education is directly linked to the global target 4.7, which states that all students should receive sufficient knowledge of sustainable development, but above all, the teaching at KTH affects every one of the sustainable development goals. At KTH, our aim is to integrate sustainable development into all of our educational programmes, including doctoral programmes. The number of first cycle and second cycle study programmes focusing on the environment and sustainable development is the same as in recent years, with two Masters of Science in Engineering programmes, 10 Master's Programmes and one doctoral programme. The number of courses marked as related to the fields of the environment or sustainability has remained the same at over 980 courses. KTH uses the [CDIO framework](#) with particular focus on enhancing the integration of sustainable development.

### **Educational Investment in Sustainable Development**

In 2023, an educational investment in sustainable development was announced with funds from grants for education at basic and advanced level, of 700,000 SEK, and from grants for research and education at postgraduate level, of 300,000 SEK. Five projects were granted funds in this call. Among these was a mathematics related project called 'A Mathematical Approach to Complex Systems and Sustainability' and a doctoral course focusing on energy systems for sustainable development.

### **KTH Quality System**

[KTH's Quality system](#) promotes democratic values such as academic integrity and freedom, gender equality, sustainable development, and openness and collaboration with the outside world. KTH's quality work is characterised by efficiency and a system in which education, research and collaboration are followed up, reviewed and developed continuously.

### **Raising Visibility of Education and Sustainable Development at KTH**

All students shall possess the knowledge and skills to drive sustainable societal development and contribute to the transition to an equal and climate neutral society. Above all, the teaching at KTH shall address all of the Sustainable Development Goals. To highlight how programme content is connected to the SDGs, information has been included in all programme descriptions regarding how the programmes relate to the Sustainable Development Goals. There are also some programmes that have specific focus on sustainable development.

### **Sustainable Leadership with Lean – Life-long learning**

The [KTH Leancentrum](#) is a competence center for sustainable business development offering training, seminars and coaching for both business and the public sector. Courses include [Lean & Green](#), [Sustainable Leadership with Lean](#), [Sustainability in Practice](#) and [Sustainable Transport Systems](#).



### **KTH Global Development Hub**

KTH Global Development Hub, GDH, supports the development of challenge driven education within KTH and partner universities in Eastern and Southern Africa. Challenge driven education is mainly used in project courses where students work with solutions to locally formulated societal challenges related to the UN's sustainability goals.

### **STEM and Education for Sustainable Development**

The KTH Department of Learning in STEM works with various aspects of education for sustainable development and education leadership, for example through research and development, and by educating, supporting and collaborating with teachers and education programme directors.

### **Vetenskapens Hus / The House of Science**

Each year, about 80,000 school students and teachers pass through the [House of Science](#) each year, which has the purpose of inspiring and creating interest and knowledge in an environment that demonstrates science, technology and mathematics. Within the theme of environment and sustainability, there are several different

school programs for different ages, where both biology and chemistry as well as technology are used. Supervised activities for students include building and measuring Grätzel solar cells, working with wind turbine models and thinking about raw materials and products and how to reuse and recycle these. Other activities also address the issue of how food choices affect the environment. The House of Science is a centre jointly owned by KTH and Stockholm University.

### **Pedagogical Development – Developing skills for teaching sustainable development**

To ensure quality education for our students, KTH train the teachers for teaching sustainable development. The pedagogical development course [Learning for Sustainable Development](#) (4.5 credits) has the aim of giving the teachers tools to, based on their own subject area, integrate ideas and issues around sustainable development. In addition to this course, sustainable development is covered in the following higher education pedagogical courses:

- [Leading Educational Development](#) (3 credits)
- [Gender and Gender Equality in Higher Technical Education](#) (4.5 credits)

- [Teaching and Learning for Challenge Driven Education in a Global Context](#) (3 credits)
- [Global Competence for Teachers in Higher Education](#) (3 credits).
- [Basic Communication and Teaching](#) (3 credits) (for PhD students)

In 2023, 28% of the announced teaching positions were linked to sustainable development, which is a decrease of 16 percentage points from the year before.

### **Environmental Courses and Study Programmes for employees**

KTH's employees, and people who work on assignment for KTH, must have adequate knowledge to perform their work duties in a manner consistent with KTH's work with environment and sustainable development. KTH offers environment and sustainability related courses and study programmes for employees and contractors, such as basic online training on sustainability for employees, workshops during leadership training as well as lab and chemical training.



## 5. Gender Equality

# Achieve gender equality and empower all women and girls

KTH values are based on democracy, equal value of persons, human rights and freedoms and a free and open discussion. Equality between women and men and distancing oneself from all forms of discrimination are both an issue of quality and an obvious part of KTH's values. Gender equality and diversity among employees and students are also important resources for KTH.





### **Governance at KTH – KTH Equality Office**

KTH's work for gender equality, diversity and equal conditions (JML) is led by the President with support from KTH Equality Office, which is a permanent unit whose function is to coordinate and support KTH's overall work with gender equality, diversity, and equal conditions.

KTH, like all Swedish universities, has two main assignments regarding gender equality, diversity and equal conditions. The first is based on the Discrimination Act and the seven protected grounds for discrimination. The second is a government mission on gender mainstreaming in institutions of higher education, where universities and colleges must integrate gender equality in their organisation and activities. The government's Gender Equality Policy goals also constitute an external framework for this assignment, to which KTH must contribute its organised work for increased gender equality. The goal of gender equality policy is that women and men should have the same power to shape society and their own lives.

KTH organises its work with gender equality, diversity and equal conditions through a JML plan with four prioritised areas: collective organisation, knowledge and awareness, equal opportunities, and inclusive cultures.

### **Integration of JML into the SDGs**

Since 2021, JML has been integrated into KTH's Sustainability Objectives. The plan makes it clear that gender equality, diversity and equal conditions are integrated into sustainability work at KTH.

### **Gender Equality in Education at KTH**

Gender equality, diversity and equal conditions (JML) are to be integrated into all educational programs at KTH in three aspects: content, design and implementation. All programs need to have a plan for when and how the mandatory JML content is to be integrated. Support through workshops and coaching has been offered by the KTH Equality Office. KTH Equality Office also produced materials that can be used in educational activities, both introductory academic texts and films on several topics that were added to the [Necessity Bag](#), an online resource for JML integration.

### **The Research and Collaboration Programme on Gender-based Violence**

KTH, alongside Karolinska Institutet and Malmö University, initiated a research and collaboration programme

intended to combat sexual harassment and gender-based violence. The goal was to establish research-based knowledge about inclusive working and study environments as well as a sustainable organisation for the prevention of sexual harassment and gender-based vulnerability in the academic world. The programme helped strengthen and intensify the work on the university's organisational culture, with a focus on quality, sustainable development, working environment, leadership, gender equality and equal conditions. The programme included a national study regarding the prevalence of sexual harassment throughout the Swedish higher education sector, the development of new research-based knowledge about sexual harassment, as well as the development of common platforms for research collaborations and the process of change.

A report on the results for KTH from the national study was written during 2023 and published at the beginning of 2024. The report includes, besides KTH's results, a short overview of research on sexual harassment and incivility, as well as group work material to process the results in smaller groups.



### **Equal opportunities at KTH**

This project includes various initiatives intended to create equal opportunities in terms of salary, power and career. One example is the continued work on faculty development from a gender equality and diversity perspective. KTH needs to have equal processes with respect to recruitment, assessment and employment, as well as the conditions for equal resource allocation. The FFA group (responsible for future faculty) has worked from an early stage on faculty regeneration with a focus on gender mainstreaming. The members of the group comprise of Deputy Heads of Schools or Heads of Schools from all the Schools and are headed by the Dean.

### **Leading Educational Development**

The course [Leading Educational Development](#), which is gender integrated, is offered each year. A course in higher education teaching, [Theory, and Gender quality in Higher Technical Education](#), has been conducted yearly since 2019. This course is important in the development work for increased gender awareness in all of KTH's courses. The participating teachers acquire knowledge in the field of gender and education, as well as theoretical scientific knowledge that will help them in their own work regarding course arrangements. Gender research from various parts of KTH has also been included in the course. The

examination contains elements where the teachers have to apply the new knowledge in analyses of their own courses.

### **Course in Gender and Technology**

Since 2018, the [Gender and technology](#) course has been offered by the department of philosophy and history. The course is a social, cultural, philosophical, and historical investigation of gender and technology. Drawing on feminist Science and Technology Studies (STS) and feminist media studies, the course provides critical perspectives on connections between gender and technology.

### **Student Recruitment**

KTH works proactively with increasing the quota of female and nonbinary students in the first-cycle educational programmes currently dominated by male students. KTH has been working with this since 2014, at that time with a project called KTH Giants, and now with Fill the Gap. A variety of activities are carried out every year, from digital marketing campaigns and social media posts to inspirational events with speakers, workshops and an educational fair. The meeting between prospective and current KTH students is essential for Fill the Gap, the core message focusing on more diversity among our engineers in order to build a more sustainable future for all.



## 6. Clean Water and Sanitation

# Ensure availability and sustainable management of water and sanitation for all

Through research and education in engineering, environmental science and public health, KTH supports the development of knowledge and skills to achieve clean water and sanitation for all.





### **WaterCentre@KTH**

The WaterCentre@KTH is a wide cross-disciplinary collaborative effort based at KTH Royal Institute of Technology. The centre's mission is to bring about water innovations for a sustainable future. The centre believes in the meeting of experts, practitioners, and policymakers. It connects scientists and offers an arena for joint knowledge creation with industry, government and civil society. Several researchers and research projects are related to climate adaptation and climate risks, including rising sea levels and flood risk management, working together with municipalities in Sweden and abroad. One example is the project "Robust decisions for managing climate risk in Sweden", which is done in cooperation with several municipalities and counties and is funded by the Swedish Civil Contingencies Agency.

### **Decision-making in Critical Societal Infrastructures**

The [Decision-making in Critical Societal Infrastructures \(DEMOCRITUS\)](#) project develops methods for monitoring and controlling large-scale infrastructures with the help of digitalisation. The project designs new methods for learning over large datasets, proposes networking solutions that support monitoring, learning and control, and constructs data-driven models of the monitored physical processes. As an application, Democritus focuses on

water distribution systems, which exhibit many unsolved challenges for future societal systems. We study real-time leak detection, detection and mitigation of possible contamination or attacks, global decision-making while observing local data privacy, and the efficient utilisation of smart meters.

### **PUDDLE JUMP: Promoting Upstream-Downstream Directed Linkages in the Environment: "Joined-Up" Management Perspectives**

The [PuddleJump project](#) tackles water-related challenges by developing hydrological models that help municipalities manage water sustainably. For SDG 6, it improves water storage, quality, and flood management. SDG 13 equips stakeholders to mitigate climate impacts like floods and droughts. SDG 11 is addressed by supporting sustainable urban planning. SDG 17 is reflected in the collaboration between researchers, local governments, and citizens for co-created water solutions.

### **Cavitating microbubbles as a next-generation water cleaning technology for PFAS removal**

The removal of micropollutants, such as polyfluoroalkyl substances (PFAS), commonly known as 'forever chemicals,' from water is a critical and challenging issue that remains unresolved globally. [This case](#), which has received

support from KTH Innovation, provides a chemical-free solution with low energy consumption and CO2 emissions, relying solely on the energy released by the collapse of cavitating microbubbles.

### **Environmental Engineering and Sustainable Infrastructure Master's Programme**

Our society has major challenges in managing a changing climate and developing and securing good water quality. The Master's Programme in [Environmental Engineering and Sustainable Infrastructure](#) offers seven different competence profiles, including: Water Technology; Environmental Geotechnology and Hydrogeology; Water and Wastewater Technology; Environmental Information Analysis and Management; Sustainable Infrastructure and Environmental Systems Analysis; Sustainable Societies. There are individual courses within the programme focusing on water technology and wastewater engineering such as "Water and Wastewater Handling" which describe different systems for the handling and distribution of water and wastewater, criteria for evaluation, and principles and fundamentals of biological, chemical and separation methods. Study visits at plants for wastewater treatment and water treatment are included in this course.





### **Industrial and Environmental Biotechnology Programme**

The biotechnology sector is considered to be one of the main players in the development of a sustainable society, and able to tackle current and future societal challenges. The Master's Programme in [Industrial and Environmental Biotechnology](#) prepares students for careers focusing on the development of more effective and environmentally friendly production of commodities. The programme provides knowledge and understanding about how biological processes and cellular components are used to create new technologies, industrial processes, and biotechnological products. Knowledge is acquired on how microorganisms are orchestrated to remove contaminants from water and soil or to produce biomolecules that can serve as raw materials. Microorganisms are used to design and create effective and sustainable production of products from food ingredients to detergents, paper, and textiles. Sustainability is a key aspect that features in all areas of biotechnology and that continuously combines science and technology to improve, simplify, or streamline industrial manufacturing of products or services.

### **Albano Campus – Water Systems**

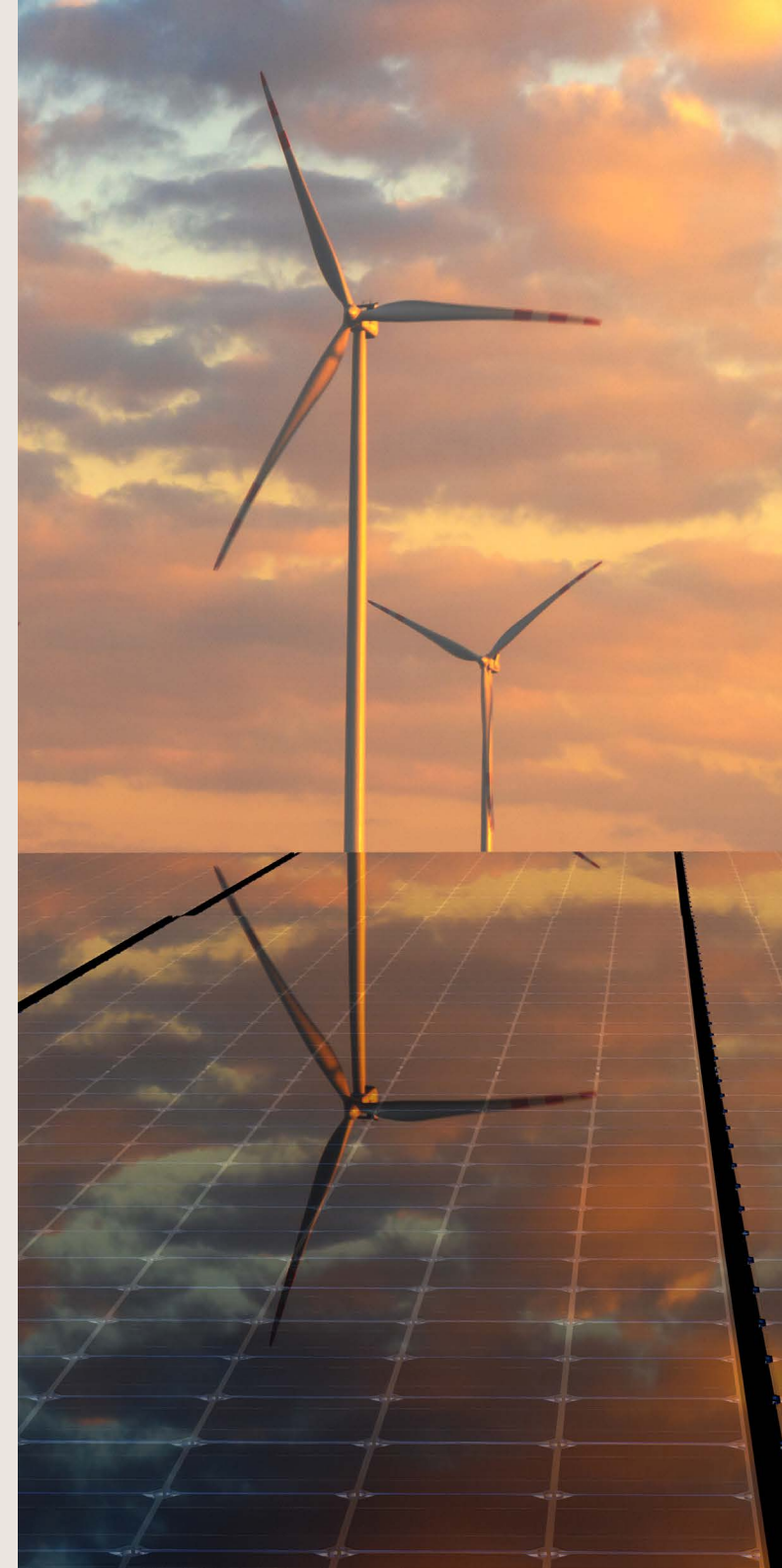
In Stockholm, a cohesive university area extends from Stockholm University in the north, via KTH over to Hagastaden with Karolinska Institutet in the west. [Albano campus](#) is a modern and competitive university environment in harmony with nature and with the goal of being a role model in sustainable urban development. Several sustainability efforts include the creation of new water systems to utilise stormwater and improve the microclimate, and outdoor environments that are designed to strengthen the distribution routes for plants and animals. The project is a collaboration between Akademiska Hus, Stockholm University, KTH, Svenska Bostäder and the City of Stockholm.



## 7. Affordable and Clean Energy

# Ensure access to affordable, reliable, sustainable and modern energy

Research and education at KTH in the field of Energy Science and Engineering aim to gain new knowledge, and to develop technologies and systems that will allow the implementation of a sustainable global energy system with respect to both natural resources and environment. KTH offers 23 energy programmes with energy including three master's programmes. Energy research is conducted in a number of KTH schools, programmes and specialised research centres.





### **KTH's Energy Platform**

KTH's [platform for research in energy](#) was created to support and catalyse interdisciplinary research in the energy field. An important goal is to facilitate interaction between expertise at KTH and external partners within academia, public organisations, and companies with an interest in energy research. Students and researchers are engaged in the global innovation effort to bring forward new solutions that mitigate the threat of climate change and resource scarcity. KTH energy research and innovation is embedded in various disciplines from nanotechnology to economy. Research and innovation ranges:

- from new nuclear reactors to more efficient solar cells,
- from smart grids to efficient heat pumps,
- from biofuels to batteries,
- from turbo machinery to fusion reactors.

The long-term vision is to develop energy systems that eliminate the contribution to climate change while at the same time safeguarding ecosystem functions and providing people around the world with energy for their basic needs.

### **Electric Power Engineering Master's Programme**

The Master's programme [Electric Power Engineering](#) addresses the global demand for affordable and sustainable resources that has created a large need for electrical engineers and researchers to provide electricity and to build new smart solutions that enable a more sustainable energy management. Electric power is one of the key areas for achieving our sustainability goals. One illustration of this is that a reduction in emissions and energy consumption often results in more demands and more utilisation of electric power, typically when changing from fossil to electric power. The first year of the programme includes technology complementary courses that provide environmental, societal, and philosophical perspectives to electric power engineering. The Master's programme in Electric Power Engineering covers the following areas: modelling of electrotechnical equipment, power electronics, electrical machines, power system operation and control, power system planning and electricity markets, and management in power systems.

### **Sustainable Energy Engineering Master's Programme**

The Master's programme in [Sustainable Energy Engineering](#) provides state-of-the-art education in the fields of solar energy, power generation, energy utilisation, and transformation of energy systems. Also, crosscutting and interdisciplinary challenges address multiple impacts such as land use and climate change in an integrated, holistic approach. After completion of the programme, students will have a broad knowledge of energy engineering, and have acquired skills in managing complex problems, taking into account lifecycle perspective. The aim is to educate leaders and developers for future innovation in energy.

### **Open-access course on clean cooking access modelling**

OnStove, the revolutionary geospatial clean cooking tool developed by the division of Energy Systems (dES) at KTH, has released an open-access course. The course, "[Geospatial Clean Cooking Access Modelling using OnStove](#)" is set to empower ministries, non-governmental organisations, academia, and individuals with the knowledge and skills to drive clean cooking access in their regions.



### **The Sustainable Power Laboratory**

The Sustainable Power Laboratory (SPL) enables world-class research into technologies needed for the transition to a decarbonised energy system with radically reduced environmental impact. Research is carried out on all levels, from materials characterisation to power system dynamics. The lab consists of nine different facilities.

### **KTH Energy Dialogue**

The [KTH Energy Dialogue 2023](#) focused on the theme “Sustainable Energy Transition – Challenges and Opportunities,” bringing together experts, researchers, and industry professionals to discuss critical issues in the energy sector. The event featured diverse perspectives through presentations and discussions on renewable energy technologies, energy storage solutions, grid integration, and supportive policy frameworks. By facilitating knowledge sharing and encouraging collaboration between academia, industry and government, the dialogue promotes innovation and accelerates the transition to clean energy systems. Additionally, discussions on regulatory measures provided valuable insights for policymakers, influencing energy policies aligned with

Sustainable Development Goal 7 (SDG 7), which aims to ensure access to affordable, reliable, sustainable, and modern energy for all. Overall, the KTH Energy Dialogue 2023 raised awareness about the importance of sustainable energy transition, inspiring action and commitment from various stakeholders toward achieving SDG 7 targets.

### **Semi-transparent photovoltaics as “solar windows”**

In [this project](#) we develop a new concept for a smart solar cell window. It is a semi-transparent photovoltaic layer, which dynamically regulates transmittance of visible and near-infrared light with a photochromic coating. Thus, it saves energy for cooling and produces electricity in buildings towards the goal of “zero-energy” buildings. The technology can be used as a window or facade and is in demand by the construction, real estate, architectural and glass industries.

### **SUNRISE**

[The Sustainable Nuclear Energy Research in Sweden, SUNRISE](#) is the first step towards building a lead cooled research and demonstration reactor in Sweden.

Together with Uppsala University and Luleå University of Technology, among others, the research within the SUNRISE centre focuses on reactor physics and design, materials science and process technology, combined experimental and modelling programmes to work towards establishing a lead cooled research and demonstration reactor in Sweden.

### **Wisdom**

At the Tekniska Museet, Wisdom aims to display science and innovation in new ways. Here, researchers from KTH are redefining the future of heating and cooling systems. [The Wisdom project](#) serves a dual purpose as both a showcase for clean energy technologies and an educational platform. Visitors can learn about energy usage and system performance, combining education and public engagement in sustainability issues. Furthermore, KTH's participation in a European research initiative aimed at creating more efficient geothermal solutions underscores the importance of international collaboration in addressing global challenges that contributes to reducing dependence on fossil fuels and promoting clean energy technologies.



### **Renewable Energy and Energy Efficiency in facilities on Campus**

Reduced energy consumption is important in order to ensure efficiency and to contribute to a climate neutral society, in accordance with KTH's sustainability policy and KTH's [sustainability and climate goals for sustainable buildings](#).

In 2023, KTH's energy use decreased by 10 percent per annual workforce (from 17,970 kWh to 15,950 kWh), 10 percent per full-year student (from 5,327 kWh to 4,579 kWh) and 4 percent (from 249 kWh to 227 kWh) per square metre (base year 2015). Actions that have contributed to reductions are: Solar panels, heat recovery, windows with energy glass, energy savings transition from desktop to laptop computers, and continual operational optimisation and closure of buildings during breaks.

Relevant new buildings and conversions include requirements regarding renewable energy and energy efficiency. KTH's property owners on all campuses comply with the construction industry's building rules and follow Swedish legislation regarding energy declarations

and energy mapping. KTH works in continual dialogue with employees, students and with property owners to improve energy efficiency. Akademiska Hus also has a sustainability goal of halving the amount of energy purchased between 2000 and 2025. In addition, Akademiska Hus has the following climate targets:

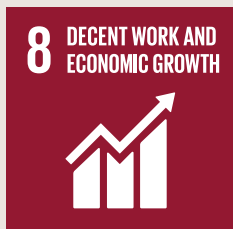
- To be climate neutral by 2035, which is defined as reduction of emissions for scope 1–3 with 85% from base year of 2019 and implementation of carbon removal for remaining emissions.
- Milestones for emissions are reduction by 40% for scope 1–3 by 2025, and by 65% 2030 compared to base year of 2019.



## 8. Decent Work and Economic Growth

# Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

KTH takes a holistic perspective on the work environment. At KTH, the term 'work environment' means both the physical and psycho-social work environment as well as factors that actively contribute to the sustainable development of society. As a government agency, KTH follows the Swedish regulations that exist in the area of working environment. These national rules are translated into steering documents within KTH.





### **The Department of Industrial Economics and Organisation (INDEK)**

The [Department of Industrial Economics and Organisation \(INDEK\)](#) is the intersection of management and economics, technology and science at KTH. INDEK addresses SDG 8 by investigations into the future of work and reskilling approaches as well as policy oriented research related to the policy of innovation and growth.

The department is organised into three units:

- Management & Technology (MT)
- Sustainability, Industrial Dynamics and Entrepreneurship (SIDE)
- Accounting, Finance, Economics and Organisation (AFC)

### **Fordonsdalen**

Climate change and digitalisation are creating changes in our entire transport system; infrastructure, travel behaviour and vehicle types are affected. Improved efficiency and reduced climate impact are positive, they also mean a radical change for the automotive industry both in terms of products and production as well as business models.

In the Fordonsdalen project granted in 2020, KTH works jointly with Region Stockholm to strengthen the regional automotive industry's competitiveness in the transition to the sustainable transport system of the future.

### **Technology, Work and Health Master's Programme**

Functional and well-designed work systems, organisations and work environments are essential for a healthy and productive working life, and professionals with knowledge in proactive occupational safety and health management play a vital role. In the [Programme Technology, Work and Health](#), students learn how to plan, design and analyse work environments, from the perspectives of sustainable work and organisational performance. Work is an integral part of peoples' lives and an essential determinant of health. Thus, the programme also relates to SDG #3: Good health and well-being. Work-related accidents and diseases are common in all countries, and students in this programme gain a broad understanding of workers' health: that of blue and white-collar workers, of all genders, ages and socioeconomic classes.

### **Work Environment at KTH**

[Work environment](#) means all factors, physical, organisational and psychosocial, that affect employees and students at KTH, such as attitudes, leadership, behaviour towards each other, premises, equipment, furnishings, chemical products, working methods, work organisation, cooperation, social interaction and the possibility of recovery and personal development.

### **Trade Unions**

There are [three trade unions](#) at KTH that support KTH staff and faculty to monitor their interests in the workplace and assist with negotiations and contact with the employer. The union representatives elected by the annual meeting also work in general bodies where various issues are discussed. This can apply to the work environment, gender equality, collaboration, local agreements and more.



### **Preventing Discrimination in the Workplace**

Discrimination in the workplace is forbidden according to Swedish law, and KTH follows the Swedish legislation. This area is a very important and prioritised part of KTH's work within work environment. KTH has several steering documents that address working environments:

- [HR policy](#)
- [Guidelines on gender equality, diversity and equal opportunities](#)
- [Code of Conduct for employees and fellow workers](#)
- [Administrative procedure for cases of discrimination harassment sexual harassment and victimisation](#)







## 9. Industry, Innovation and Infrastructure

# Build resilient infrastructure, promote sustainable industrialisation and foster innovation

Investment and the development of infrastructure within transport, irrigation, energy, information and communication are key for the achievement of the Sustainable Development Goals. The development of knowledge and skills within technology and innovation at KTH, often in collaboration with industry, supports sustainable development, including economic growth, social inclusion and environmental balance.





### **AI Sustainability Centre (AISC)**

The [AI Sustainability Centre](#) was established with the purpose of creating a new and just approach to AI. A multidisciplinary and research focused approach that considers both the positive and negative impacts on people and society at the same level as commercial benefits or other efficiency gains. The Centre calls it Sustainable AI. More frequent cases of unintended discrimination, faulty decisions and recommendations, as well as privacy intrusion, increase the demand for explanation models and ability to govern AI in a more responsible way. Today, AI is integrated without prerequisites for identifying, measuring and evaluating the implications from a social, juridical and ethical perspective.

### **Production Angels**

[Production Angels](#) supports startups with sustainable and innovative products to scale up from prototype to production. Production Angels' mission is to promote production in Sweden and is aimed at industrialisation and scaling up of startup companies with hardware products, the phase that is often called the "valley of

death". Through situation-based coaching by production experts, training materials, and matching with manufacturers, Swedish startups with sustainable innovations are supported to approach a production phase with local manufacturers.

### **KTH Industrial Transformation Platform**

KTH's [Industrial Transformation Platform](#) was created to support and catalyse interdisciplinary research in the field of industrial transformation and industrialisation of new products and services for a sustainable society. An important goal is to facilitate interaction between expertise at KTH and external partners within academia, public organisations and companies with an interest in research about Industrial Transformation.

### **Educational and Research Initiative in Södertälje**

Together with Södertälje municipality, Scania and AstraZeneca, KTH is carrying out an educational and research initiative in Södertälje. The purpose of the investment is, among other things, to strengthen the competitiveness of Swedish industry through cutting-edge

education and research. The educational initiative includes the three educational programmes Industrial technology and sustainability, Industrial technology and production maintenance, and Sustainable production development.

### **Industrial Technology and Sustainability Programme**

The programme [Industrial technology and sustainability](#) teaches students to understand and develop solutions for several of the SDGs, including the goals of Sustainable Industry, Innovations and Infrastructure as well as Sustainable Consumption and Production and Decent Working Conditions and Economic Growth. Students learn about sustainability from an industrial perspective, for the environment, work and competitiveness. The students learn and receive instruction in communication, argumentation, debates and negotiation, for example about which sustainability aspects a business should measure or debate about future technology and work in industry. These skills are crucial for collaboration and required for solving complex problems.



### **Entrepreneurship and Innovation Management Master's Programme**

The Master's Programme in [Entrepreneurship and Innovation Management](#) is designed to give students a focused, relevant and useable body of knowledge in this diverse, relevant and modern field. The programme is ideally suited for those with an interest in starting and managing innovative projects or new economic endeavours. The programme helps to improve employment opportunities, particularly for young people who have business ideas, by teaching and coaching students in creativity, innovation, entrepreneurship and how to identify business opportunities. To promote sustainable industrialisation, this programme provides knowledge in the field of industrial dynamics with an emphasis on innovation and entrepreneurship aimed towards technical creativity. Moreover, students will get an opportunity to learn about the responsible consumption of natural resources and production by the application of creative ideas, entrepreneurial approaches and innovative management.

### **Transformation Day 2023**

KTH's Transformation Day 2023, organised by the Industrial Transformation Platform and the Circular Economy initiative, focused on the circular economy and its contribution to sustainable industrial transformation. The event, themed "[Industry transforms – towards circular economy](#)", brought together researchers, students, industry representatives, and organisations to discuss challenges and opportunities in circular economy implementation. This collaborative approach fosters innovation, promotes sustainable industrialisation, and develops resilient infrastructure through knowledge sharing, research, and educational initiatives, directly supporting the goals of SDG 9.

### **KTH Innovation**

In 2023, [KTH Innovation](#) continued supporting a high number of ideas aimed at contributing to sustainable development. Around 85% of all ideas supported by KTH Innovation in 2023 had the ambition of contributing to sustainable development. Sustainability aspects

were implemented in business coaching using the KTH Innovation Readiness Level™ model. The model, which is available under a creative commons licence has now been downloaded by over 2500 organisations. The model enables KTH to spread our process oriented approach to innovation around the globe. Other activities included organising an ideation workshop focusing on innovations for a more sustainable fashion industry and highlighting several KTH startups working to decrease emissions and waste. KTH Innovation also put a special focus on energy innovation in Sustainable Energy Action, a project funded by the Swedish Energy Agency, and in an event facilitating meetings between industry and energy startups.

In 2023, we also continued working with the [Global Change Award](#), the world's largest initiative to create a planet-positive fashion industry.



### **Kitocoat**

Massive amounts of food are wasted every year. Kitocoat is reducing global food waste by prolonging the shelf life of fruits and vegetables. Based on KTH research [Kitocoat](#) develops a biodegradable and edible coating that has antimicrobial properties and acts as a barrier, keeping your produce fresh for longer. Kitocoat is a coating composed of layers of chitin, which creates a barrier against moisture, heat, and other damaging factors. This natural and sustainable solution is effective in preserving the quality, and prolonging the shelf-life, of fruits and vegetables, while also reducing the need for plastics. KTH Holding AB invested in Kitocoat in 2023.

### **Research Initiative on Sustainable Industry and Society (IRIS)**

[IRIS](#) works with digitalisation, innovation and entrepreneurship. The IRIS initiative enables researchers to work together on joint research projects. With a holistic interdisciplinary perspective, the aim is to enhance the impact of KTH's research for a more sustainable industry and society. The initiative focuses on four strategic areas for

research, education and impact: Industrial transformation through sustainable digitalisation, integrated mechanics, components and materials design, including additive manufacturing, sustainable energy systems, infrastructure and business, innovation and entrepreneurship ecosystems and infrastructure.

### **Center for X-Rays in Swedish Material Science (CeXS)**

The transition to sustainable energy and industrial systems requires a greater insight into materials and development. Such material development is also important to the sustained competitiveness of Swedish industry. Sweden's investments in a material science beamline at PETRA III in Hamburg, Germany enables contributions to sustainable development goals via experiments into the behaviour and characteristics of materials as they are being produced and used. Setting the research direction, and governing the Swedish materials beamline, are key duties of the [Center for X-Rays in Swedish Material Science \(CeXS\)](#), which KTH is responsible for.



## 10. Reduced Inequalities

# Reduce inequality within and among countries

Democracy, the equal value of all human beings, human rights and freedom, and free and open discussion are part of KTH's core values. KTH works to reduce discrimination and to promote equality and diversity at KTH and in society through research, education and operations.





### **Scholars at Risk (SAR)**

Scholars at Risk (SAR) is an international network dedicated to promoting and protecting academic freedom. The network gives sanctuary to scholars who are unable to work in their home countries by arranging temporary research and teaching positions at institutions in the network.

KTH is also part of the project InSPIREurope via Gothenburg University. The project is funded by the Horizon 2020 action Marie Skłodowska-Curie and is coordinated by SAR Europe. It aims to forge a coordinated, cross sectoral, Europe-wide alliance for researchers at risk.

### **Real Estate and Construction Management**

The Department of Real Estate and Construction Management has social sustainability as one focus aspect in its research. The main focus areas related to social sustainability are:

- housing owners' strategies for building social sustainability (rental policies, owner incentives, financial viability from a societal point of view)

- conversion of rental apartments to housing cooperatives and private ownership in low-income areas
- including legal aspects, feasibility, integration, prices and neighbourhood effects
- sustainable renovation strategies in 1960s housing areas
- urban development work in a segregated city with filtered housing areas
- municipal housing social programmes; effects of rental policies on discrimination and segregation • gender aspects in real estate management (collaboration with Malmö University).

### **Sustainable Urban Planning and Design**

The Master's Programme in Sustainable Urban Planning and Design focuses on the interrelationship between the built environment and social, economic and institutional forces. The programme develops professionals with a profound and broad understanding of the multiple factors in sustainable urban development. Students are trained to alter planning and design practices to respond to the environmental conditions and societal needs of the future.

Equity and equality are core qualities of sustainable societies, involving, for example, equal access to housing, public services and transport systems. The causes and consequences of inequality are analysed in courses such as Introduction to Urban Economics and Planning Theory and Urban Governance, and students will learn to address equality issues in urban planning and design in project courses.

### **Global Development and Political Ecology**

The course Global Development and Political Ecology develops a critical framework for understanding uneven development including social justice and environmental change, with a special focus on tracing global commodity chains and the rapid urbanisation of the global South. The course is fundamental for further studies in critical environmental research, sustainable development, and development studies.



### Measures against Discrimination

KTH is an administrative authority. As such the basic provisions for the employment of teachers and students are prescribed in the legal regulations for central government sector employment and in general labour law legislation. According to the Instrument of Government (1974:152), administrative authorities shall take into account everyone's equality under the law and shall observe objectivity and impartiality. The law also states that central government sector appointments shall be based on reasonable grounds such as length of service and expertise. Additional provisions are found in the Public Employment Act (1994:260) and in the regulations on application in the Employment Ordinance (1994:373). There are also specific regulations for public higher education in the Higher Education Act (1992:1434) and the Higher Education Ordinance (1993:100). Provisions may also be found in the Discrimination Act (2008:567), the Administration Act (2017:900) and the Language Act (2009:600). Active measures at KTH. In cases of perceived discrimination, employees may make a complaint directly to the Discrimination Ombuds Office. This complaint to the Discrimination Ombuds Office may be made in parallel with a complaint to KTH.





## 11. Sustainable Cities and Communities

# Make cities inclusive, safe, resilient and sustainable

KTH's campuses are situated in the region of Stockholm, Sweden, one of the fastest growing urban centres in Europe. Through education, research, and collaboration with local communities, KTH has the opportunity to help form inclusive, sustainable and smart cities. This supports rural-urban linkages that are socially, environmentally and economically beneficial, and respectful of basic human rights.







### **Research for new transport solutions**

The strategic research area TRENoP has the vision of contributing to the transformation of today's transportation system into a greener, smarter and safer system through the integration of policy and technology with a system perspective. KTH has a leading role in this collaboration with Linköping University and the State Road and Transport Research Institute (VTI).

### **Mistra Sustainable Accessibility and Mobility Services (SAMS)**

The vision of the programme [Mistra SAMS Sustainable Accessibility and Mobility Services research program](#) is that Sweden by 2030 largely has achieved a transition to far-reaching sustainable accessibility and mobility in urban regions through the implementation of disruptive accessibility services that meet the needs and preferences of broad groups of users and significantly contribute to sustainability targets.

### **SSL as a centre at KTH**

[Stockholm Senseable Lab, SSL](#), is a collaboration between KTH, the Massachusetts Institute of Technology, MIT, and the Municipality of Stockholm to jointly pursue research in sustainable urban development. The centre explores, together with the Municipality of Stockholm, new dimensions of a smart city: mobility, energy production and energy efficiency, environmental monitoring, water and waste management, public health and governance models.

### **KTH Live-in Lab**

[KTH LiveIn Lab](#) is a platform for accelerated innovation in the real-estate sector, and for collaboration between academia and business. Most test beds in the KTH Live-In Lab are operated in real environments for testing and researching new technologies and new methods. The purpose of KTH Live-In Lab is to reduce the lead times between test/research results and market introduction. In this way, KTH Live-In Lab aims to facilitate the advent of the sustainable and resource-effective buildings of the future. KTH Live-In Lab also ensures that KTH becomes a sustainable campus and that Stockholm retains its

leadership in sustainable urban development with a focus on digitisation and smart cities. This is done by accelerating the pace of innovation in the construction and real-estate sectors, based on excellence in research, education and collaboration.

### **Science week 2023 – Sustainable Change Management in Development, Production and Urban Development**

[Science Week](#) was organised for the sixth year by Södertälje Science Park, together with KTH, Scania, AstraZeneca, Södertälje municipality and about 40 co-organisers. This year, [KTH hosted Lean Days: Sustainable Change Management](#). During Lean Day 2023, discussions centred on how companies should handle the major contemporary changes that require practical transitions. A closely related theme was the future of workplaces. Much focus was placed on the central role that small and medium-sized enterprises play in the transition – for example, in the automotive industry, where they have a key role in the historic technological shift that the automotive sector is currently undergoing. Seminars and workshops were organised with themes related to sustainable development, sustainable production and sustainable urban development.



### **Albano is Sweden's first campus area to be Citylab certified**

At the [Albano campus](#), 70,000 square metres of new university premises, 1,000 student and research housing as well as landscaped parks, shops and restaurants are being built. The area will be the first campus environment in Sweden to be certified according to Citylab which, unlike other environmental certifications, does not only apply to an individual building but covers an entire urban development project. Albano stands out as an urban development project on the cutting edge of sustainable urban development. The development of the Albano campus into a modern and competitive university environment takes place in harmony with nature and with the goal of becoming a role model in sustainable urban development. Several sustainable efforts are being made, including strengthening the possibility of increased species richness for, for example, pollinators and birds. New water systems are being created to take care of storm water, and improve the microclimate and outdoor environments that are designed to strengthen the distribution routes for plants and animals.

### **KTH Campuses and Public access**

Apart from research and education there are multiple [common facilities at KTH's five campuses](#): Student Health, Library, Info Centre, Sports Centre and Housing Agency. The public and local communities have free access to the university campuses, libraries, buildings of cultural historical value, and concerts by the academic orchestra, open lectures and KTH Campus guided tours in art, architecture and history. Events at the old Nuclear Reactor Hall and other open laboratories occur throughout the year. Art collections can be viewed in buildings open to the public. The campus green spaces are also used by the public, with outdoor seating, an outdoor gym, and access to the National Park, urban gardens and beehives.

### **Research on improved security at train stations**

In a collaboration between KTH and Södertörn University, researchers have begun investigating the risk of being exposed to [crime in station environments](#), as well as the fear of crime in these environments. The work should lead to proposals for changes to improve safety, and the results can be used as guidelines for the entire country.

### **Research on the importance of ethics when working with smart cities**

One key to achieving Stockholm's vision of being the world's smartest city by 2040, is the use of digitalisation, sensors and artificial intelligence (AI), to analyse huge volumes of data that are generated by the inhabitants. But to gain the confidence of people for the surveys that are being done, you need to identify and manage the ethical questions that arise when people come face to face with new technology. [Investigations about ethical aspects of smart cities](#) are being done in various projects within the parameters of the Stockholm Senseable Lab, a collaborative project between KTH and MIT.

### **New research shows the climate impact of buildings**

On behalf of the Swedish National Board of Housing, Building and Planning, KTH researchers, together with the IVL Swedish Environmental Research Institute and the consulting company WSP, have collected data and calculated the climate impact of [68 new buildings in Sweden](#). The work is unique in its kind and is expected to provide the construction sector with new knowledge about what impacts the climate on a large and small scale, as well as how climate impact during the construction of buildings can be gradually reduced.



## 12. Responsible Consumption and Production

# Ensure sustainable consumption and production patterns

At KTH, research and education for responsible consumption and production focuses on areas such as logistics, system knowledge, process development, optimisation, quality improvement, and design and product development. Strong ties to business, industry and civil society leads naturally to excellent conditions to create sustainable manufacturing industries and sustainable consumption practices.





### **MISTRA Sustainable Consumption**

KTH is host to [MISTRA Sustainable Consumption](#), a research programme between academia and partners from business, the public sector and civil society. The aim is to stimulate a transition to sustainable consumption by generating in-depth knowledge on how niche sustainable consumption practices can become mainstream in the areas of food, vacation and furnishing. The programme examines niche sustainable consumption practices and develops roadmaps for how they can be scaled up and mainstreamed by policy makers, business, civil society organisations and citizen consumers.

The vision is that by 2030, sustainable consumption practices have become mainstream in Sweden, to a significant extent catalysed by our programme through knowledge generation and practical change. This transition will have, by 2030, contributed to a better quality of life, and equity, within and across borders, and have made Sweden – its companies, governmental bodies, and civil society – an internationally recognised example showing that sustainable prosperity is possible.

### **KTH's investment in Sustainable Production in Södertälje**

In June 2014, an agreement was presented between KTH, the Swedish Government, the Municipality of Södertälje, Scania, AstraZeneca and the company Acturum regarding an education and research initiative in Södertälje. One of the aims of the initiative is to strengthen the competitiveness of Swedish industry through cutting-edge education and research. The research profile for the Sustainable Production Development department in Södertälje has three different specialisations: production management, industrial reliability and production logistics. The agreement includes an investment in four new educational programmes, with the aim of doubling the number of educational places at [KTH's campus in Södertälje](#) in the long term.

### **Sustainable Production Development Master's Programme**

The Master's Programme in [Sustainable Production Development](#) fosters knowledge and skills of graduates that contribute to a renewal of industrial production.

Advanced knowledge and skills in the design and development of production systems are needed in order to address emerging challenges. Rational and cost-effective production systems have been key to industrialisation and wealth for decades. However, the area is experiencing change and pressure in different dimensions, which are altering the role of production systems. Requirements of more renewable energy use and circular material flow, increased digitalisation and automation, new manufacturing technologies, as well as service integration and the emergence of new business models are among the phenomena shaping production system development and change. Based on a systemic understanding and courses run in close collaboration with manufacturing companies, programme graduates will be prepared for leading the development and design of production systems, as a part of the solution towards a sustainable society, attractive workplaces and competitive industries. This programme is closely linked to the growing research activities at KTH Södertälje and industry in the regions.



### **Sustainable Technology Master's Programme**

The master's programme in [Sustainable Technology](#) covers the concept of Industrial Ecology, focusing on the interaction of technical, economic, social and ecological systems and processes. Students will explore this interdisciplinary framework for designing and operating industrial systems interdependent of natural systems. Graduates will balance environmental and economic performance and lead the development of strategies for a sustainable future.

### **Co-Kitchen**

The vision at [Co-Kitchen](#) is to develop a co-living framework that will be at the forefront in terms of social, economic, and ecological sustainability. Here is an opportunity to think innovatively regarding everything from energy and resource efficiency, coexistence, learning, cooking, and hygiene. The goal is to develop data and knowledge to influence norms, building regulations and future construction.

### **EIT Raw Materials**

KTH is a part of five consortia of the prestigious EU collaboration, European institute of Innovation and Technology (EIT) that aims to make Europe a global leader for innovation within strategic areas. Within the [EIT Raw Materials project](#), the main focus is on courses and study programmes with a particular focus on sustainability issues, such as lifecycle analysis, recycling, and the replacement of critical raw materials.

### **XPRES: Centre of Excellence in Production Research**

The underlying theme of all [XPRES](#) activities is the challenge-driven effort to increase sustainability in manufacturing in terms of economy, human health, and protecting the environment. For this reason, the selected impact cases are aligned to this challenge and refer to a future where the current understanding of "ownership of mass producing facilities relying on endless resources" is redefined along with the concepts of "sharing economy" and "circular economy".

### **Circular Public Procurement**

The overall aim of the [Circular Public Procurement project](#) is to further promote the use of circular and biobased public procurement in order to guide development for criteria and implementation. Often, green public procurement (GPP) is related more to the environmental impact throughout the lifecycle, while sustainable public procurement (SPP) is often related to addressing the three pillars of sustainability. Despite the discrepancy, addressing procurement practices may be an effective approach to motivate greener production methods by orienting production and consumption trends to encourage demand for more sustainable products.



### **KTH Waste Management**

A Cycle Strategy has begun developed in 2023 (Strategy for sustainable waste disposal). This is to expand and refine the measurement method to be able to follow KTH's waste development and placement in the EU's waste hierarchy. It has been decided to introduce a central environmental station and work will be done to complete and adapt the building to be able to collect fractionated waste from the 35 waste rooms that are on campus. This will reduce driving with heavy traffic in the campus area and reduce CO2 emissions.

### **Reuse and Purchasing at KTH – Circular Furnishings**

KTH is working to develop routines to achieve increased circular use of furniture from acquisition to maintenance and disposal of furniture. An agreement with a new supplier for furnishings for university environments will enable, among other things, the repair of furniture, the rental of furniture and the return of furniture.





## 13. Climate Action

# Take urgent action to combat climate change and its impacts

Higher education institutions (HEIs) have a central role in efforts to combat climate change. KTH has an important task to contribute through our education, research and external engagement and collaborations, but we also need to contribute by reducing the impact of our own operations. We work actively to reduce our own climate impact by allocating resources so that we can achieve these targets and conduct follow-ups.





### **KTH Climate Action Centre**

The [KTH Climate Action Centre](#) is a multidisciplinary, collaborative and research focused centre aiming to advance climate mitigation and adaptation in synergy with all the UN Sustainable Development Goals. The aim of the KTH Climate Action Centre is to conduct groundbreaking research in close collaboration with stakeholders in order to speed up the transformation. The centre engages more than 100 researchers from all parts of KTH, and opens up for dialogue, collaboration and action together with everyone who wants to contribute.

### **Energy Efficient Negative Emissions from the Agricultural Sector**

[Energy efficient negative emissions from the agricultural sector](#) is a joint project between the KTH Royal Institute of Technology (KTH), the Swedish University of Agricultural Sciences (SLU) and Uppsala University (UU). The overall goal of the project is to identify and propose a system for the reduction of multiple greenhouse gases through direct air capture, DAC, which from a cost perspective must be able to compete with carbon dioxide storage from biomass, so-called BECCS (bioenergy with carbon capture and storage).

### **The Centre Production, Use and Storage of Hydrogene, PUSH**

The [Centre Production, Use and Storage of Hydrogene, PUSH](#), concerns research to find solutions to fight climate change. The centre conducts research about the production, use and storage of hydrogen together with the parties from Lund University, Chalmers University of Technology, Umeå University and RISE.

### **Electrical Engineering**

The [Department of Electrical Engineering \(EE\)](#) conducts research where climate is central in some research questions, e.g.: How do we adapt the electric power grid so that it can handle 100% renewable energy sources from hydro, wind and solar power? How can we balance the level of automation and control of power systems needed for stability, cost efficiency and reducing climate impact with the costs and risks associated with increased computing and communication? The department also contributes by researching electrification of the transport sector with new core knowledge and innovative solutions from several areas within EE, such as electrical machines, power electronics and electronic systems.

### **Sustainable Development, Environmental Science and Engineering (SEED)**

The [Department of Sustainable Development, Environmental Science and Engineering \(SEED\)](#) has developed environmental declarations for building materials for new buildings. SEED has been extensively involved in designing the method that should be used (simplified lifecycle analysis) in a regulation on climate declaration for buildings. The increased political will to introduce regulation to promote the reduction of climate impact from construction of new buildings was largely due to a series of LCA studies of buildings performed by SEED in cooperation with IVL, The Swedish Construction Federation and a large number of construction sector stakeholders. SEED is currently commissioned to write a road map for the development of this regulation in Sweden and collaborate with the Nordic countries to promote Nordic harmonisation on this topic.





### **Civil and Architectural Engineering**

The Master's Programme in [Civil and Architectural Engineering](#) trains students in design and how to build our future homes and infrastructure, as well as roads, bridges, or tunnels, with all the challenges related to sustainability and the real demands of society. The programme also focuses on how a structure performs throughout its entire service life, not just during the building phase. Students work on developing and designing buildings and infrastructure with regard to human conditions and needs, and society's objectives for economically, socially and ecologically sustainable development. Some examples are the use of energy from wastewater to heat houses, the development and usage of vacuum insulation panels for the insulation of houses, and the planning construction process where we take into account all aspects such as technical, environmental, economic, social, and aesthetic.

### **Transport and Geoinformation Technology Master's Programme**

The main focus areas of the Master's Programme [Transport and Geoinformation Technology](#) are crucial infrastructures in the creation of sustainable cities, countries and communities in general. Functional and well developed transport systems are essential in a sustainable and prosperous society. The planning, building and

maintenance of such a system demands knowledge of transport and geoinformation technologies, as well as an understanding of how new technologies and policies are adopted, how they interact, and how they affect our daily activities.

### **The Character of Social Engagement in the Climate Transition: How Arguments Work in a Social Context**

The research project ["The Character of Social Engagement in the Climate Transition: how Arguments Work in a Social Context"](#) is funded by the Marcus & Amalia Wallenberg Foundation to investigate how arguments function in social contexts during climate transition discussions. The researchers are collecting data through a survey (available in Swedish) and invite public participation to contribute to their study of social engagement in climate-related issues.

### **Science for a secure society**

This [research investigates](#) the hotspots, trends and social vulnerabilities associated with droughts, heatwaves, and floods in Sweden. Our innovative frameworks and models can help policy makers to make informed climate adaptation decisions to mitigate impacts and we will promote early warning system improvements for disaster risk reduction related to hydroclimatic hazards.

### **Climate and Economic Research in Organisations project (CERO)**

Within the framework of the Travel free Meetings in Public Authorities project ([REMM](#)), KTH has continued working on the [Climate and Economic Research in Organisations project \(CERO\)](#) in a collaboration between the KTH Sustainability Office and an academic researcher at the School of Architecture and Built Environment. The project includes both financial and environmental analyses of business trips and commuter travel as well as workshops. Through the CERO project, KTH has developed a follow-up tool for managing objectives and measures to reduce KTH's emissions.

### **Horizon Europe project aimed at reducing emissions from the agricultural sector**

Researchers at the Department of Chemical Engineering are collaborating with other European partners to develop and implement technologies that could significantly reduce emissions of methane and nitrous oxide from the agricultural sector. The [project 'REPAIR'](#) has recently been approved by the European Commission under the Horizon Europe framework.



### **Centre for Sustainable Aviation**

As residential areas increasingly approach the country's airports, there is a need to develop aviation to reduce noise and emissions. The Swedish Transport Administration and KTH therefore decided in 2015 to create a [Centre for Sustainable Aviation \(CSA\)](#). The purpose is to create leading Swedish research on the management and operation of aviation with regard to the environment, in particular noise. The hope is that the centre will be able to generate societal benefits both from a short and long perspective, and both from a local and international perspective. The Swedish Transport Administration's ambition is that research for a total of 50 million SEK will be announced through the centre over a 10 year period.

### **The Climate Framework and The Universities' Climate Network**

In 2019, KTH and Chalmers University initiated the internationally acclaimed [Climate Framework](#) for Swedish Higher Education Institutes (HEIs) which 38 HEIs have signed. Since 2021, SUHF's expert group for collaboration has taken over responsibility and The Universities' Climate Network was formed. The Network continues in 2023 to drive and develop the work of the Climate

Framework, and all HEIs that are members of SUHF are involved. Working together with The Higher Education sector in Sweden, a groundbreaking climate framework was created to guide the development of individual climate strategies aiming to bring institutions into line with national and international commitments, including the Paris Agreement's 1.5C warming limit and the Swedish national target to become climate neutral by 2045. This national agenda has the objective to both reduce direct emissions of all Swedish Higher Education Institutions (HEIs) as a collective, and to ensure that Swedish HEIs integrate climate action in education, research, and external collaboration. This is a whole-system approach as well as a whole-nation project.

### **Climate Politics in Action seminars**

During 2023, [Climate Action Lectures](#) led by politicians, journalists and other professionals working with climate policy were organised by students employed at the KTH Climate Action Centre. Furthermore, joint seminars have been arranged with other organisations regarding climate action in the arctics ([New seminar series about the Arctic launched at KTH Climate Action Centre! | KTH](#)), and civil society's role for climate action.

### **KTH's Climate objectives and measures**

In accordance with The Climate Framework, KTH developed [climate objectives for 2021–2045](#). The climate objectives directly affect KTH's employees and students, as well as KTH's property owners, business partners, financiers and other external partners where relevant. The objectives address the areas that have a major impact from a climate strategy perspective and concern KTH activities such as education, research and collaboration, as well as the impact from its own activities through, for example, waste management, LCA and circular procurement.

In addition, many of [KTH's Sustainability Objectives](#) related to the campus have implications for climate change, including energy use, waste management and transport to and within our campuses. The Objective related to [travel and transportation](#) concerns emissions of carbon dioxide from air transport. The target on [procurement](#) includes climate aspects. [The overall environmental management system](#) can therefore be seen as part of the climate action plan for the university.



## 14. Life Below Water

# Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Through education, research and supporting collaborative management and conservation can Universities contribute to protecting and preserving aquatic ecosystems through education, research and supporting collaborative management and conservation. KTH is also active in developing sustainable use of marine resources for food, materials and energy.





### **WaterCentre@KTH – Innovations for the Blue Planet**

The Water Centre at KTH is a broad collaborative effort based at KTH with the mission to bring about water innovations for a sustainable future of the Earth based on meetings between experts, practitioners, and policymakers. The WaterCentre's research focuses on four themes that combine the wide expertise at KTH around society's challenges with water: Circular, Decentralised, Digitalised, and Marine. The centre connects scientists within IT/ ICT, Marine science, Water science and treatment and Water system and management, and offer an arena for joint knowledge creation with industry, government and civil society.

### **Robolguana: Underwater Robot for Ocean Conservation**

Precise seafloor information is required to work toward the goal of protecting marine biodiversity and supporting the SDG 14. The comprehensive 3D visual imagery of the desired seafloor area and the derived measurable environmental parameters like depth, slope, aspect, curvature, and terrain variability are powerful tools for habitat predictions. In this project, the ocean floor close to Gullmarsfjord, a natural reserve and the largest and only true fjord in Sweden, is 3D mapped.

### **Engineered Floating Wetland**

Nature based solutions have proven to be able to successfully tackle eutrophication problems, resulting in increased marine biodiversity, cleaner water, reduced greenhouse gas (GHG) emissions and use of harvested biomass as valuable materials. The objective of the [Engineered Floating Wetland project](#) is to finalise the development and perform onsite tests of a novel floating wetland system at Utö in the Stockholm archipelago, to capture excess nutrients in the Baltic Sea water. In the long term, the overall goal is to provide a successful model for future implementations for eutrophic marine areas as well as freshwater systems around the Nordic region.

### **Horizon Europe project CIRCALGAE**

This EU project, coordinated by KTH, aims at finding ways to create new products from algae waste. The Horizon Europe project [CIRCALGAE](#) – “Circular valorisation of industrial algae waste streams into high value products to foster future sustainable blue biorefineries in Europe”, consists of a consortium of 21 partners from nine different countries and is the biggest EU project coordinated by KTH so far. Through CIRCALGAE, the idea is to develop biorefineries on an industrial scale in order to create products together with industrial partners such as vegan foods, health promoting food ingredients, protein rich feed, and cosmetic formulations.

### **Environmental Genomics study**

The research group of [Environmental Genomics](#) study how complex communities of microorganisms influence human health and play important roles in earth's geochemical cycles. Recent advances in high throughput biology techniques make it possible to study the genetic potential and functional activities of natural microbial communities without the need for culturing.

The major focus is the Baltic Sea, where the work follows two major trajectories:

1. To model the microbial ecological network that underpins the pronounced season dynamics in microbial community composition of surface waters.
2. To reconstruct the genomes of the most abundant microbial players.

### **Kristineberg Center for Marine Research and Innovation**

The research and innovation platform [Kristineberg Center](#) is a collaboration between the University of Gothenburg, Chalmers, KTH Royal Institute of Technology, IVL Swedish Environmental Research Institute, RISE and Municipality of Lysekil. At Kristineberg Center, marine university education and research focusing on ocean acidification, microlitter and innovation is conducted.



### **Robolguana: Underwater Robot for Ocean Conservation**

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### **Djurö Marine Field Station**

[Djurö Marine Field Station](#) in cooperation with Värmdö municipality, is a resource for marine research in the Baltic Sea focused on a sustainable archipelago development, decentralised and individual water and sewage solutions, as well as technology and ecology in the marine environment.

### **SMaRC – Swedish Maritime Robotics Centre**

[SMaRC – Swedish Maritime Robotics Centre](#) is a national crossdisciplinary industrial research centre for maritime robotics. The main task is to perform research on, and

demonstrate, solutions that can contribute to the transition to autonomous intelligent underwater systems. The centre will focus on four research disciplines – autonomy, endurance, perception and communication – with the aim to develop next-generation maritime robotics for ocean production, safeguarding society and environmental sensing.

### **Pacífico Econavipesca Project: KTH Royal Institute of Technology Field Study**

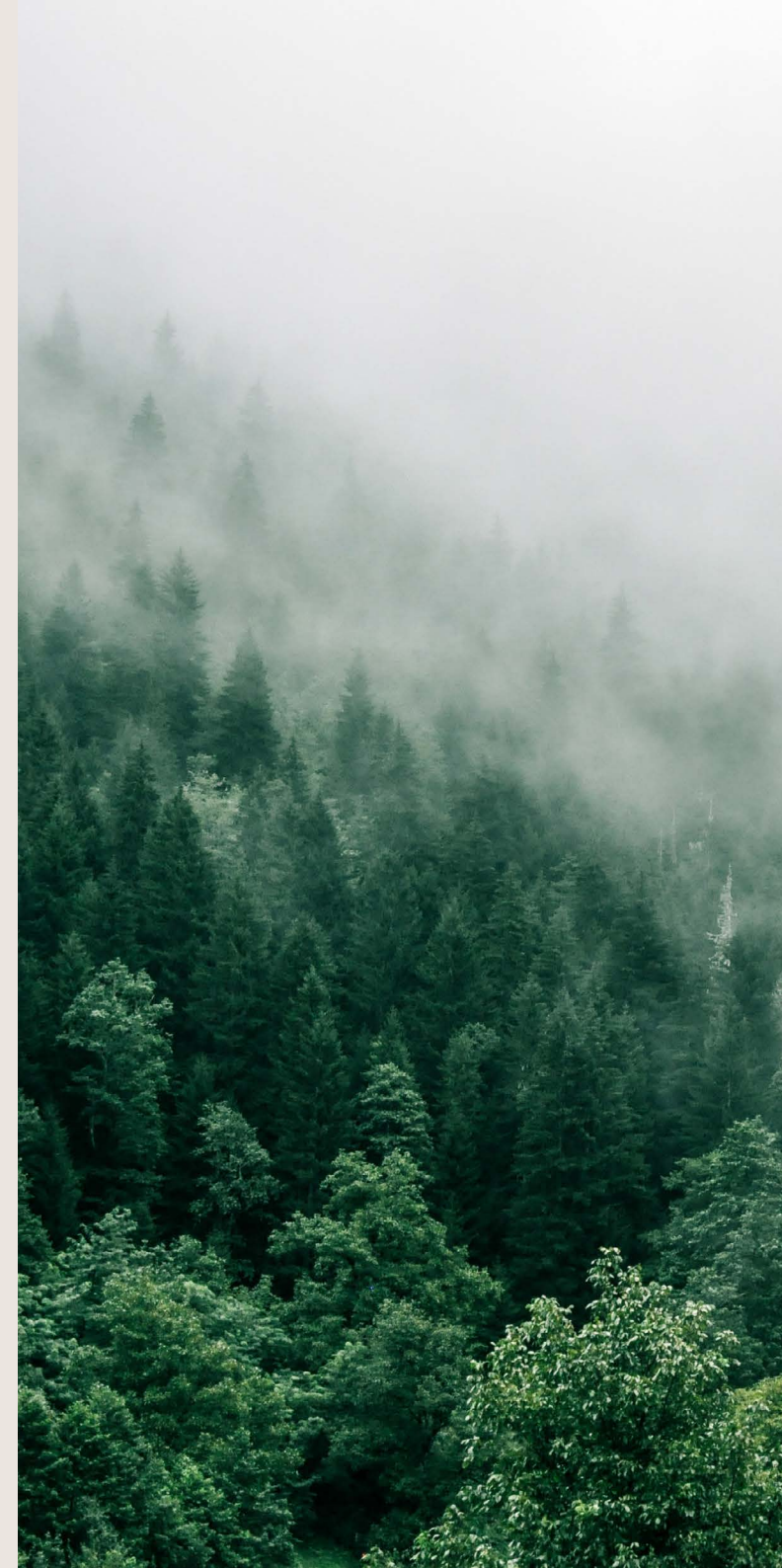
[The objective of the project](#) is to develop a sustainable artisanal fishing model that reduces the environmental, social, and economic impacts on the ecosystem in the municipality of Guapi, Cauca, in Colombia. A major challenge is to reduce dependence on fossil fuels for the fishing boats and engage in dialogues with the local community about ways to create social entrepreneurship opportunities to make fishing activities more sustainable in the long term. This KTH field study produced two reports. The centre will focus on four research disciplines – autonomy, endurance, perception and communication – with the aim to develop next-generation maritime robotics for ocean production, safeguarding society and environmental sensing.



## 15. Life on Land

**Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss**

KTH contributes to sustainably managed terrestrial ecosystems through education and research but also through collaboration with landowners and Stockholm Region in the management of our Campus environments.





### **Sustainable Urban Planning and Design**

The Master's Programme in Sustainable Urban Planning and Design focuses on the interrelationship between the built environment and social, economic and institutional forces, and is relevant for several SDGs including SDG 15. The programme develops professionals with a profound and broad understanding of the multiple factors in sustainable urban development. Students are trained to alter planning and design practices to respond to the environmental conditions and societal needs of the future. To minimise the environmental impact of urban development, innovative solutions are required. Through exercises and lectures, students will be encouraged to incorporate new technologies, sustainable materials and green solutions, as well as strategies that reduce the need for urban expansion in their proposals to enhance ecosystem services and the sustainable management of natural resources.

### **Earth Observation and Artificial Intelligence for Detection of Global Change – Ecological Assessment (EO-AI-EcA)**

The "Earth Observation for Climate Diplomacy: Ecosystem Conservation in Africa (EO4CD-ECA)" project at KTH focuses on utilising Earth Observation data to monitor and assess ecosystems in Africa, contributing to the conservation and sustainable use of terrestrial and freshwater ecosystems. By leveraging advanced technology, the project aims to support biodiversity monitoring, inform climate diplomacy, and enhance policy decisions related to ecosystem conservation. Through international collaboration, it seeks to address critical environmental challenges and promote sustainable practices

### **REPLAN: Nature-Based Solutions and Green Infrastructure for Sustainable Urban Transformations**

This research project aims to understand and facilitate the interplay of processes, actors, and tools across planning tiers to support Swedish spatial planning in integrating Nature-Based Solutions and Green Infrastructure to achieve human well-being while conserving life-supporting ecosystems in urban regions. The research project is funded by FORMAS and will continue until 2025.



### **KTH Campus plan 2018–2023**

KTH and the main property owners Akademiska Hus have developed a strategy for the development of KTH's various campuses for the period 2018–2023. [The campus plan](#) for KTH is a guideline for continued development of sustainable and inclusive campuses that we can all be proud of. One of the focus areas of the Campus is Ecosystem services and optimised spaces. The aim is to ensure that multifunctional spaces secure ecosystem services, maintaining and/or creating resilience by developing spaces such as parks and green corridors and utilising stormwater. Spaces should preserve and strengthen ecosystem services and climate adaptation and developing ecological values. Based on previous inventories of trees and insects, the KTH campus is developing green spaces for greater biodiversity.

### **Tree recovery, beehives and community gardening**

KTH Sustainability Office, in collaboration with Akademiska Hus, has recovered 20 trees that were taken down at KTH Campus. The stocks have been turned into seating for visitors to KTH Campus, and at the same time, a home for insects and fungi. Branches and smaller parts have been taken care of to become insect nests.

KTH Campus has four beehives which produce honey that is used as representation gifts as well as being used in restaurants and cafés at KTH Campus.

At KTH Campus there are 16 urban gardening boxes that are used both for recreational cultivation and for teaching students and staff.





## 16. Peace, Justice and Strong Institutions

# Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Peaceful, just and inclusive societies are necessary to achieve the UN Sustainable Development Goals. Effective and inclusive public institutions are needed to further Agenda 2030 and the SDGs. Governments, civil society and communities must work together to implement lasting solutions. Universities such as KTH support this work by providing expertise and knowledge as a basis for well-grounded policy and decision making.





### **KTH's organisation**

The University Board is the top executive unit. The chair of the board is, together with other societal representatives, appointed by the government. Other members of the board are the president of KTH, faculty members elected by the faculty and student representatives appointed by the student union. Union representatives can participate and express their opinions. The president's strategic council includes all heads of schools, vice presidents, the deputy president, the university director, the dean and pro dean of the faculty, which are elected by the faculty and student representatives. There are currently six vice presidents appointed by the president for specific tasks including one for sustainable development and one for gender equality and values.

### **KTH working with the government**

KTH's researchers are part of several government councils and delegations with a connection to sustainable development, such as the City of Stockholm scientific advice for sustainable development and the delegation for circular economy.

### **Official remittance and consultation responses**

Before the Swedish government takes a position on a proposal, proposals are sent for consultation to authorities, organisations and other stakeholders. All answers and other remittances in connection with the referral are included in the basis for the decisions that follow the referral. As a public university, KTH is a remittance body to the government when it comes to investigations, legislation, policies and strategies in sustainable development. Remittance and consultative responses are recorded and open to the public.

### **Making Universities Matter: A Knowledge Platform on the Role of Universities in Society**

Making Universities Matter is a knowledge platform that sets out to understand how universities arrange their activities and how they are aligned with different interests in society. The platform studies how the blend of missions and tasks of universities has evolved over time and will relate that mix to institutional specificities such as state governance and how universities interact with students, scientific communities, and stakeholders in industry, government and civil society. It also seeks

to elucidate cross-national differences and similarities in the institutionalisation (and change) of universities: in Sweden and other countries in Europe, and through relevant comparisons with the evolution of university roles in North America and Asia. The platform also aims to engage in policy debates on universities, providing policy relevant briefs and serving as a forum for topical discussion.

### **Master's Programme in ICT Innovation**

This programme includes courses on e-governance and digital democracy, contributing to Target 16.6 on developing effective, accountable, and transparent institutions. The programme equips students with the skills to create innovative solutions for societal challenges.

### **Cybersecurity and Digital Trust**

KTH conducts extensive research on cybersecurity, focusing on protecting digital infrastructure and promoting trust in digital systems. The KTH Cybersecurity Research Center is at the forefront of this effort, addressing various aspects of digital security and resilience aiming to combat cybercrime.



### **Philosophy of Risk**

The [Philosophy of Risk](#) research at KTH examines ethical issues related to risk and uncertainty in decision-making and policy. This research aims to enhance understanding of decision-making under uncertainty, contribute to building effective, accountable institutions and promote just policies. By exploring the philosophical dimensions of risk, it provides insights to support ethical risk management practices and policy development.

### **Open Access Initiatives**

KTH promotes open access to research findings, contributing to ensure public access to information. The university has clear [guidelines for researchers](#) to make their work openly accessible.

### **Technology Ethics**

The university contributes to ethics for emerging technologies through courses in [Technology and ethics](#) as well as professional courses such as [Ethics and Sustainability](#), addressing Target 16. b on promoting non-discriminatory laws and policies.





## 17. Partnerships for the Goals

# Strengthen the means of implementation and revitalise the global partnership for sustainable development

KTH is part of various regional, national and international networks and partnerships that work with sustainability issues through the exchange of knowledge, experiences and resources. These networks span academia, industry and civil society. Multilevel partnerships are key to implementing the goals of Agenda 2030.





KTH demonstrates a strong commitment to SDG 17 (Partnerships for the Goals) through an extensive network of collaborations at local, national, and international levels. The university engages in strategic partnerships with industry, government authorities, and organisations to address major global challenges such as climate change, urbanisation, and sustainable energy. These partnerships provide students and researchers with valuable connections and opportunities to work on real-world sustainability issues. Additionally, KTH participates in international research collaborations and educational programmes, fostering knowledge exchange and capacity building across borders.

KTH's dedication to sustainable development is further evidenced by its involvement in local initiatives like the [Södertälje Science Park](#) and its participation in [Capacity Building for Higher Education](#) projects in various countries. The university's [Policy for Sustainable Development](#) explicitly emphasises collaboration with partners who contribute to sustainability, gender equality, and climate impact reduction. By engaging in diverse partnerships, KTH actively seeks to and contributes to the global effort towards achieving the Sustainable Development Goals.

#### Examples of how we collaborate:

- **National infrastructures** – KTH is a host or partner in several national research infrastructures funded by the Swedish Research Council. Criteria defining a national infrastructure are that it must: enable research of world class quality and thereby contribute to the development of society; be accessible to researchers, industry, and other relevant partners in Sweden, with priority given to scientific quality in case of limited accessibility; be of wide national interest, which means that the research infrastructure is used by research groups and researchers from organisations with a long-term planning horizon for their scientific activities; have a long-term plan for management, governance, funding, competence building and development.
- **Research and Educational Partnerships:** The university engages in strategic alliances with leading international institutions promoting collaboration in education and research. KTH facilitates staff, research and student exchanges through partnerships with over 200 universities worldwide.
- **OpenLab** is a challenge-driven innovation environment for collaboration between the City of Stockholm, Region Stockholm, the County Administrative Board of Stockholm County, Karolinska Institutet, Stockholm University, Södertörn University and KTH. The core of the activities is interdisciplinary and multidisciplinary second cycle courses as part of a collaboration between the participating universities and other institutions of higher education. In addition, OpenLab conducts workshops and other activities where different parties meet, under new forms and ways, in order to develop proposals to deal with the challenges facing the region.
- KTH has a long-standing strategic partnership with [SEI Stockholm Environment Institute](#). SEI is an NGO Think Tank within environmental and sustainable development. SEI is an international research institute focusing on policy and the application of integrated knowledge within environmental and development issues. The institute works to reduce the gap between research and decision-making. KTH's Vice President for Sustainable Development is on the board of SEI and there are researchers from the institute affiliated with KTH.



- [Stockholm Trio for Sustainable Actions](#) – is a collaboration between Karolinska Institutet, the Royal Institute of Technology (KTH) and Stockholm University to combine skills, offer attractive studies within sustainable development and to be a contact hub for partners.
- MLUH – Environmental leaders within universities and colleges (MLUH) is a Swedish network working to strengthen and develop environmental management systems in Sweden. The network meets for annual conferences and works continuously throughout the year on key issues. In 2019, the network was integral to the creation of The Climate Framework for Higher Education Institutes in Sweden.
- The project [Frontrunners for Sustainable Innovation](#) has collaborations taking place along with test and demo environments OpenLab, Kista Science City, Urban ICT Arena and Södertälje Science Park. The project focuses on KTH's research and education, together with SMEs, contributing to solutions to societal challenges through digitalisation, life sciences and environmental and climate technology. The project addresses sustainability issues in line with Stockholm's objective of being a smart sustainable and connected world class city in 2040.
- KTH is a member of the [Sustainable Development Solutions Network Northern Europe \(SDSN NE\)](#) which is a regional SDSN network for Northern Europe and part of the global SDSN. The SDSN NE pools knowledge, experience and capacities of the regions' academic, business and civil society actors and strives to promote the national and regional sustainable development of Northern Europe, as well as the region's efforts for sustainable development worldwide.
- KTH is cohost of [ISCN – International Sustainable Campus Network](#). The mission of the International Sustainable Campus Network is to provide a global forum to support leading colleges, universities, and corporate campuses in the exchange of information, ideas, and best practices for achieving sustainable campus operations and integrating sustainability in research and teaching.



# KTH and Sustainability Rankings

## **Times Higher Education Impact Rankings**

In 2023, KTH Royal Institute of Technology was ranked as number 46 in the world in THE Impact Rankings, which address the UN's 17 global sustainability goals. The ranking was based on extensive documentation of texts related to the sustainability goals, from KTH's website, as well as bibliometric and other quantitative data.

## **QS World University Rankings**

KTH ranks 73rd among 1,500 universities worldwide, in the QS World University Rankings and ranks 58th in QS Sustainability Ranking. The sustainability score reflects a new index for the QS rankings. It measures a number of environmental impact factors, including alumni impact in the corporate sector, a university's sustainability strategy investment, sustainability education and its impact, and equality.

REFERENCE NUMMER: V-2024-0812 Ks-kod 1.3

# About This Report

In this report, we highlight some of the many research, education, outreach and operational activities at KTH that contribute to the achievement of the United Nations Sustainable Development Goals. This report examines the connections between our core business and operations to the Sustainable Development Goals. The report will be further developed in the future. Comments and suggestions are welcome!

The report was developed in collaboration with many engaged colleagues from many different parts of KTH including KTH Schools and University Administration. It is based on KTH's Annual Report, Report to the University Board, KTH's Sustainability Objectives reviews, website review and review of media, publications, articles and other sources.

## **Bibliometrics**

According to a bibliometric method developed by KTH, the share of published peer review articles with a bearing on sustainable development (467 search terms) was 2023, 21% of the total amount of peer review articles (562/2740). This share (and total number) has increased steadily since 2010.

The SDG which has the largest share of publications is SDG 7, Affordable and clean energy, followed by SDG 9 Industry, Innovation and Infrastructure, and SDG 11, Sustainable Cities and Communities.

