



# The UN Sustainable Development Goals Report 2022



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



The latest report of the IPCC, released in March 2023, underscores the urgent need for rapid action to ensure a viable and sustainable future for all. The report emphasizes that the window of opportunity to limit global warming to 1.5°C is closing and that the negative impacts of climate change on nature and human systems are widespread and increasingly irreversible.

The report also notes that current climate measures are insufficient to prevent further risk and damage, and that viable options for a more ambitious climate approach, both mitigation and adaptation, must be implemented.

As one of the leading technical universities in Europe, KTH has a great responsibility to contribute new knowledge, innovations and solutions for the necessary sustainable transformation of society. KTH aims to provide cutting-edge research in materials and energy, smart and useful innovations for sustainable consumption, urban planning and sustainable production for heavy industry to name just a few.

By integrating sustainable development at all levels of our education, we ensure that our students are exposed

to and prepared for these issues as they enter the workforce or choose careers in research. The lifelong learning opportunities at KTH are essential for innovative organisations, initiatives, and individuals to achieve positive social and environmental impact.

The United Nations 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 at all of KTH's campuses.

In this report, we provide an overview of, or perhaps a smorgasbord of, how KTH is working toward and aligned with the 17 Sustainable Development Goals. The goals are closely interrelated and, in many cases, cross-boundary – just as multidisciplinary research and education inherently are. There is not one solution or one answer that is the path to a sustainable future, but it requires work on many fronts. I invite you to read how KTH is working with the SDGs in practice.

Anders Söderholm  
President, KTH Royal Institute of Technology



## This is KTH

Since its founding in 1827, KTH Royal Institute of Technology in Stockholm has grown to become one of Europe's leading technical and engineering universities, as well as a key centre of intellectual talent and innovation. We are Sweden's largest technical research and learning institution and home to students, researchers and faculty from around the world dedicated to advancing knowledge.





### **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 relates 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**

Sustainable, equal and climate neutral. These are KTH's sustainability and climate objectives summed up in three words.

[KTH has university-wide sustainability objectives \(2021-2025\) and climate objectives for 2021-2045](#) which are broken down into sub-objectives with measures to achieve the goals. KTH's sustainability objectives are based on the UN Sustainable Development Goals and are focused in the areas of education, research, collaboration, integration and working methods, resource management, and climate:

- All undergraduate programmes integrate sustainable development in some form. Many programmes at the higher education levels lack compulsory courses or other such elements. Continual development of these programmes is needed.



- KTH has taken new strategic initiatives to increase the contribution from research, to address equality, justice, climate and sustainable development.
- KTH has arranged over 200 events, workshops, seminars, and other activities in connection with sustainable development.
- KTH Campus has been used for various research and educational activities in collaboration with the property owner Akademiska Hus. For example, projects investigated the effect of nudging, a tool for changing people's behavior by making it easier to make certain choices, linked to resource use. Another project tests sensor boxes with a feedback function for connection between measured indoor environment and subjective experience. A third project investigates the system effects of connecting sewage heat exchangers and geothermal heating systems.
- KTH's climate impact (CO<sub>2</sub>e) from energy use has decreased by 24 percent per annual workforce compared to 2015.

KTH will continue to work with measures in accordance with our management plan, which includes measures for energy savings, better resource management and travel. For a complete follow-up of KTH's sustainability goals, see [KTH's report to the Swedish Environmental Protection Agency](#).

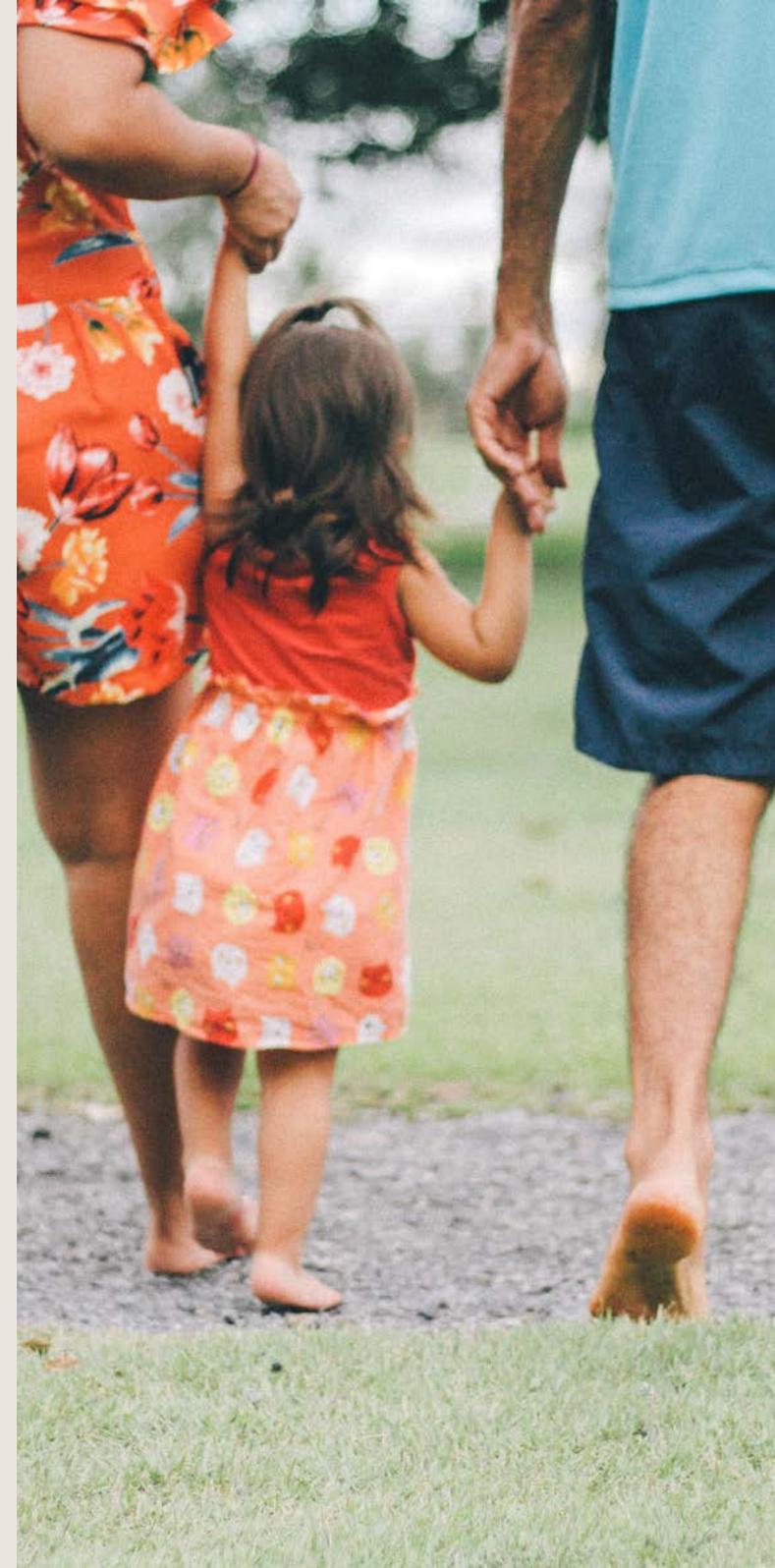
KTH Sustainability Office works with the systematic integration of environment and sustainable development in education, research and collaboration, and progression of KTH's ISO 14001:2015 certified environmental management system. During 2022, KTH Sustainability Office consisted of nine people: The Vice President of Sustainability, the Sustainability Manager, four Sustainability Strategists, a Chemical Coordinator, and two Project Leaders for research and education. 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.



## 1. No Poverty

# End poverty in all its forms everywhere

The right to education is recognized 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 are 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**

[KTH Scholarship](#) covers the full tuition fee of a one- or two-year master's programme. In order to get a scholarship, the applicants are required to describe how they will use their education at KTH to contribute to sustainable development. 37 students were awarded KTH Scholarships in 2022. In addition, 13 students received the [KTH One Year Scholarship](#). All of the

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

### **KTH Opportunities Fund**

Supported by dedicated alumni and friends, [KTH Opportunities Fund](#) offers funding for students at undergraduate, master's and PhD levels. Students may apply for funding towards projects, internships or research connected to their studies. Applications are reviewed with KTH's four pillars of equality, sustainability, digitalisation and internationalisation in mind, as well as the grade of innovation, interdisciplinary cooperation, impact and potential spin-off effects. The KTH Alumni Advisory Board reviews the applications and makes a recommendation to the President, who makes the final decision. Twelve projects received a total of 302,000 SEK in 2022. A decision was made to close the Fund in 2022, so this was the last year for students to apply for funding through KTH Opportunities Fund.

### **Engagement in Erasmus+ projects for higher education**

Erasmus+ International Credit Mobility (ICM) enables students with fewer opportunities to study at KTH for one semester. Studying abroad provides students with life-changing experiences and will often lead to professional and societal engagement later in life. In 2022, KTH was awarded ICM funds for mobility actions towards India, Botswana, Kenya and Tanzania.

One aim of the Erasmus+ capacity building projects for higher education (CBHE) is to reform educational systems. In the long run, modernizing higher education to meet the challenges of the 21st century is supporting the UN goal of No Poverty.

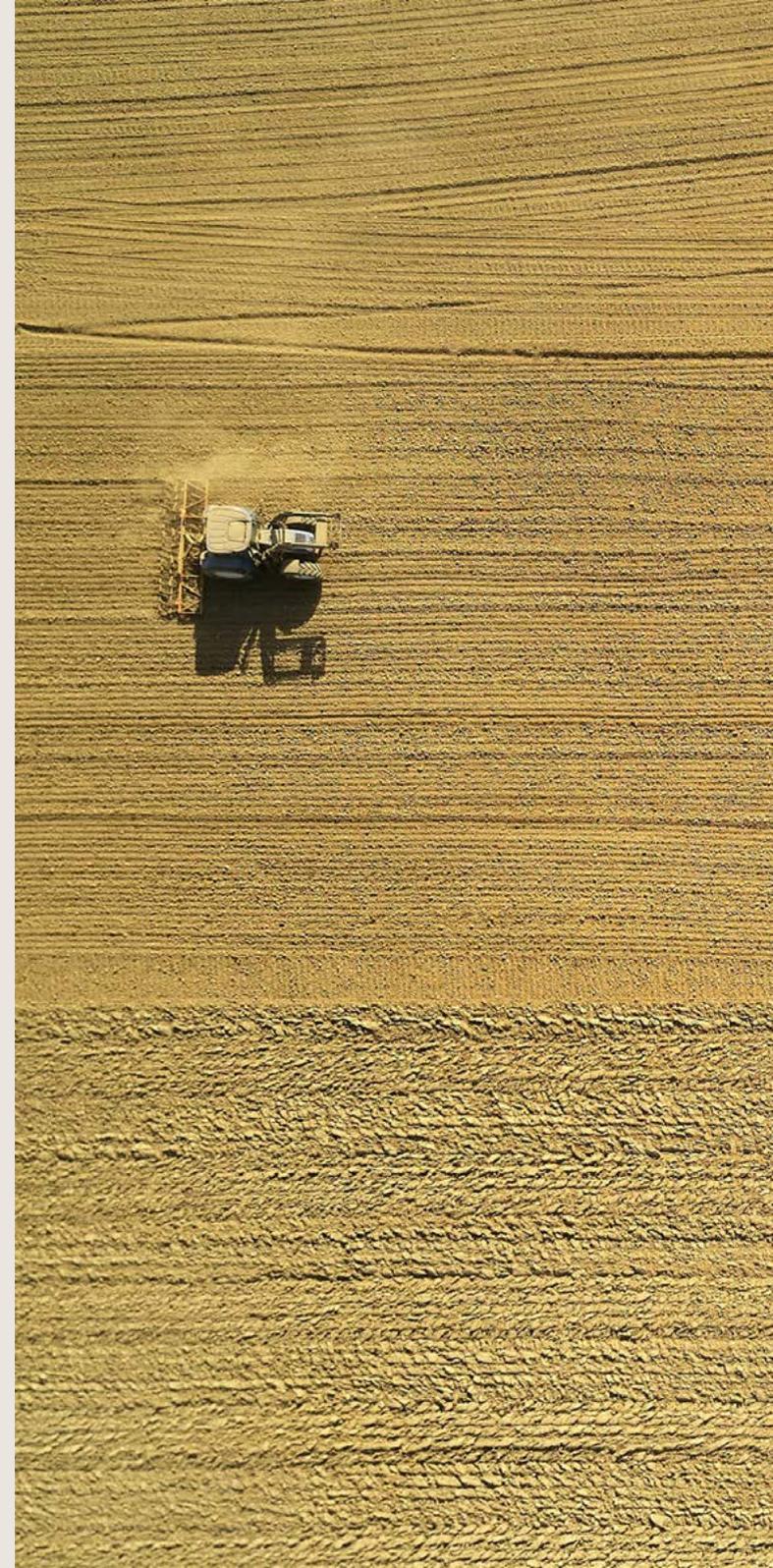
The KTH CBHE projects awarded in 2022 focus on sustainability, global economic improvement, energy, climate, and entrepreneurship in Ukraine, Azerbajdzjan and several African countries.



## 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 wellbeing. 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 center with the aim of developing Swedish sustainable production of seafood and increasing accessibility for people throughout the country. A primary task is to utilize the wild fish catch more efficiently and to develop a modern aquaculture for fish, shellfish and algae in collaboration with about 70 partners.

### **MatLust**

In the five-year EU project MatLust, KTH Lean Centre is responsible for the 'lean programme', where companies receive both knowledge and tools to develop their activities to become more sustainable, efficient, learning and profitable. The purpose of MatLust is to strengthen growth and sustainability in the food industry in the Stockholm region. MatLust offers free development programmes, activities, networks and other forms of support to small- and medium-sized companies. Through the investment in Södertälje Science Park, of which MatLust is a part, Södertälje becomes a knowledge centre and a creative meeting place for food and sustainability.

### **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 revolutionize 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.

Since 2020, the School of Electrical Engineering and Computer Science adopted a decision about sustainable catering. The decision means, among other things, that the meal options will be labelled with a recommendation on which option on the menu is expected to have the lowest climate impact and that disposable plastic items must be avoided.

### **Sustainable, healthy and affordable food choices on campus**

THS 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.

### **Christmas Community Meal**

Sharing meals is a simple act that builds relationships and supports communities. For the [Christmas Community Meal](#), [KTH FoodTech](#) students collected surplus food from restaurants and businesses which were used to cook and serve meals to those in need. Everyone was welcome, especially those financially challenged in need of a warm meal and company. The meal was free and organized by volunteers, and 100% of donations and gifts went to food and supplies.



### 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 wellbeing. Research areas include Bioimaging, Biomolecular Tools and Biomaterials, Infrastructure in Health, Mathematical and Computational Sciences, Medical devices, MicroNanoBio, and Fundamental Research in Life Science.

### **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 (DDL S)**

The Data-Driven Life Science (DDL S) 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.

### **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 population, sustainable production and working life, food production,

and clean water. Undergraduate programmes that contribute to good health and wellbeing 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 organized 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.



### **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 both 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. Employee 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, crisis support and stress management. As an employer, KTH is legally required to supply aids to vision, such as glasses if an employee has trouble

with their vision. Further, all employees are given a health-care allowance of maximum 3,000 SEK per calendar year as well as the right to exercise during paid working hours through 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 educational programmes, including doctoral programmes. The number of first-cycle and second-cycle study programmes with a focus on the environment and sustainable development is the same as in recent years, with two Masters of Science in Engineering programmes, ten master's programmes and one doctoral programme. The number of courses marked as related to the fields of the environment or sustainability has increased from 947 to 990 between 2021 and 2022.

### **Educational investment in sustainable development**

In 2022, an educational investment in sustainable development was announced with funds from grants for education at basic and advanced level, 700,000 SEK, and from grants for research and education at postgraduate level, 300,000 SEK. The investment will also be made in 2023. 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, openness, and collaboration with the outside world. KTH's quality work is characterized 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 competence centre [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 program directors. KTH uses the [CDIO framework](#) with particular focus on enhancing the integration of sustainable development.

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

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 programmes 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.

### **Information Support for Quality Higher Education and Research in Uganda**

In 2022, the project 'Information Support for Quality Higher Education and Research in Uganda', funded by the Swedish International Development Cooperation Agency, was completed. KTH participated in the project which was part of a Swedish-Ugandan research collaboration to strengthen the research capacity and postgraduate education at Makerere University, Uganda. The aim was also to reduce poverty and increase sustainable development.

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

To ensure quality education for our students, KTH develops teachers' skills for teaching sustainable development. The pedagogical development course [Learning for Sustainable Development](#) (4.5 credits) is offered annually for teachers at KTH. 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 2022, 44 percent of the announced teaching positions were linked to sustainable development, which is an increase of 24 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 a 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 opportunities (JML) is led by a Vice President who has support from an Equality Office. [KTH's Equality Office](#) is a permanent unit whose function is to coordinate and support KTH's overall work with Gender equality, diversity, and equal conditions. KTH Equality Office works with programmes, and training related to diversity, equity, inclusion and human rights on campus. KTH has two main assignments regarding gender equality, diversity and equal conditions at the university. The first is the assignment based on the Discrimination Act and the seven grounds of discrimination. The second is Gender Equality Integration, where universities and colleagues must develop a plan for how the higher education institution intends to develop the work with gender equality integration. The Gender Equality Policy goals thus constitute the external framework for this assignment, to which KTH must contribute to its organized work for increased gender equality. The goal of the gender equality policy is that women and men should have the same power to shape society and their own lives.

### **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 opportunities 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 programmes at KTH](#) in three aspects: content, design and implementation. By the end of 2022, all programmes had a plan for when and how the mandatory JML content is to be integrated. Support through workshops and coaching has been offered by [Equality Office](#) which has 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 vulnerability. 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 has and will continue to help strengthen and intensify the work on the university's organisational culture, with the focus on quality, sustainable development, working environment, leadership, gender equality and equal opportunities. 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. The program ended in 2022, but seminars related to the study and work against sexual harassment will continue under the direction of The Association of Swedish Higher Education Institutions (SUHF).



### **Workshop on gender equality, diversity & equal conditions in research collaboration**

This practical [workshop on gender equality, diversity and equal conditions & sustainability in research collaboration](#) was given by KTH's Research Support Office. The seminar was primarily aimed at leaders of major research collaboration initiatives, and the outcome of the workshop served as input in the preparation of a competence course accessible for all researchers and staff at KTH.

### **Equality Forums**

The [Equality Forums](#) in 2022 were organized by the KTH Equality Office. The Forums aimed to increase the accessibility of KTH's JML work (gender equality, diversity and equal conditions) for both staff and students. Equality Forums are regularly occurring, themed sessions for information and discussion, based on the needs raised by the organisation itself. The Forums took place approximately once a month and offered possibilities of in-house training and dialogue around JML issues.

### **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 preconditions 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 Deputy Heads of Schools or Heads of Schools from all the Schools and are headed by the Dean.

### **Integration of Gender Equality and Diversity perspectives**

Examples of processes in which gender equality and diversity perspectives have been integrated or developed in 2022 include:

- Continual follow-up and quality dialogue. In the analyses, aspects regarding gender equality and sustainable development are integral parts.
- The Swedish Discrimination Act's requirements regarding active anti-discrimination measures have been integrated into the continual follow-up process

- Handling cases of sexual harassment against students
- Continued development of the local gender equality and diversity groups and other structures for gender equality and diversity work in the schools, within joint operational support and within the Student Union

### **Leading Educational Development**

The course [Leading Educational Development](#), which is gender integrated, is offered every year. A new course in higher education teaching, [Gender Theory and Gender Equality 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 course [Gender and Technology](#) 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.

### **Fill the Gap**

[Fill the Gap](#) is an activity aimed at increasing the quota of female and non-binary students in the first-cycle educational programmes currently dominated by male students. Fill the Gap started in 2014, and every year a variety of activities are carried out reaching 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 amongst our engineers in order to build a more sustainable future for all.

### **Tekla Festival**

The [Tekla Festival](#) is an annual activity that started after KTH awarded world-famous musical artist Robyn its Great Prize in 2013. Robyn wanted to use Tekla to inspire girls to take an interest in technology, a historically male-dominated sector. The festival is targeted at girls and non-binaries aged 11-15. Tekla aims to amass knowledge and experience by inspiring the festival participants to explore technology. It does this by empowering them to build, create, and test in an environment where all roles are open to them. For its first four years, the festival was held at KTH in central Stockholm. To reach a greater number of technology-oriented girls, Tekla moved to KTH Södertälje in 2019. After a two-year break due to the Coronavirus, the Tekla Festival was held at KTH Södertälje in the spring of 2022.

### **Research on hormone-free contraceptives for women**

Researchers at KTH together with colleagues from Karolinska Institutet have come a long way with [testing a completely new method](#) to protect women from unwanted pregnancies, a work that resulted in a scientific publication in the journal Science Translational Medicine.



## 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 that never would have met 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 concerns 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.

### **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 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 – new water systems**

In Stockholm, a cohesive university area has emerged that extends from Stockholm University in the north, via KTH over to Hagastaden with Karolinska Institutet in the west. 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 sustainability efforts have been pursued, including the creation of new water systems to utilize stormwater and improve the microclimate, and outdoor environments that are designed to strengthen the distribution routes for plants and animals. The development 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 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 catalyze 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 nano technology 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.

### **Using the SDGs for shaping holistic energy programmes, projects and policies**

The SDGs provide a comprehensive, and internationally agreed, lens to understand and communicate cross-sectoral implications of energy policies, programmes and projects. The aim of [this research project](#) is to create a framework for using the details of the 169 Targets of the SDGs for shaping holistic energy programmes, projects and policies.

### **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 electro-technical 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, cross-cutting 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 life cycle perspective. The aim is to educate leaders and developers for future innovation in energy.



### **The Sustainable Power Laboratory**

The Sustainable Power Laboratory (SPL) enables world-class research into technologies needed for the transition to a decarbonized 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 2022 focused on collaboration and internationalisation, where invited guest speakers discussed the importance of international collaboration, cooperation between business, politics, and academia, and the use of business models for sustainable growth. A keynote was given on the world's largest fusion experiment.

### **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.

### **Fusion energy is focus of KTH investment**

During 2022, KTH announced a joint [investment in fusion power](#) with Novatron Fusion Group AB and EIT InnoEnergy. The purpose of the work is to evaluate new technology intended to stabilise fusion plasma – a matter that exceeds 100 million degrees Celsius. Handling fusion plasma poses a key challenge before fusion power can be realised as a stable and sustainable energy solution.

### **Competence centers for sustainable energy systems**

During 2021 and 2022, the Swedish Energy Agency issued a call for competence centers for sustainable energy systems. In the call for tenders, three projects where KTH was involved were granted. Of these, two were already established centres: the Swedish Center for Sustainable Hydropower led by Luleå University of Technology and the Swedish Electromobility Center led

by Chalmers Institute of Technology. The Academic-Industrial Nuclear Initiative, which is coordinated by Uppsala University, was established as a new center with the aim of achieving a future sustainable energy supply.

### **KTH research set to halve data center energy consumption**

In 2022, researchers at KTH found a way to improve the [efficiency of the world's internet servers](#). By co-ordinating data traffic, they succeeded in increasing the speed of computations and data transfers. Their software has the potential to halve the energy consumption of data centres. The project was awarded the Community Award at the NSDI 2022 conference, in part for sharing the programme code with the rest of the research community. The research was funded by an ERC Consolidator Grant ULTRA and the Time-Critical Clouds project (TCC) which was funded by the Swedish Foundation for Strategic Research.



### **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 2022, the amount of energy usage (kWh/workforce) was reduced by 17% compared to 2019, and the need for additional heat was decreased. Actions that have contributed to reductions are: Solar panels installation on roofs, heat recovery, windows supplemented 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 2000-2025. In addition, Akademiska Hus has climate targets:

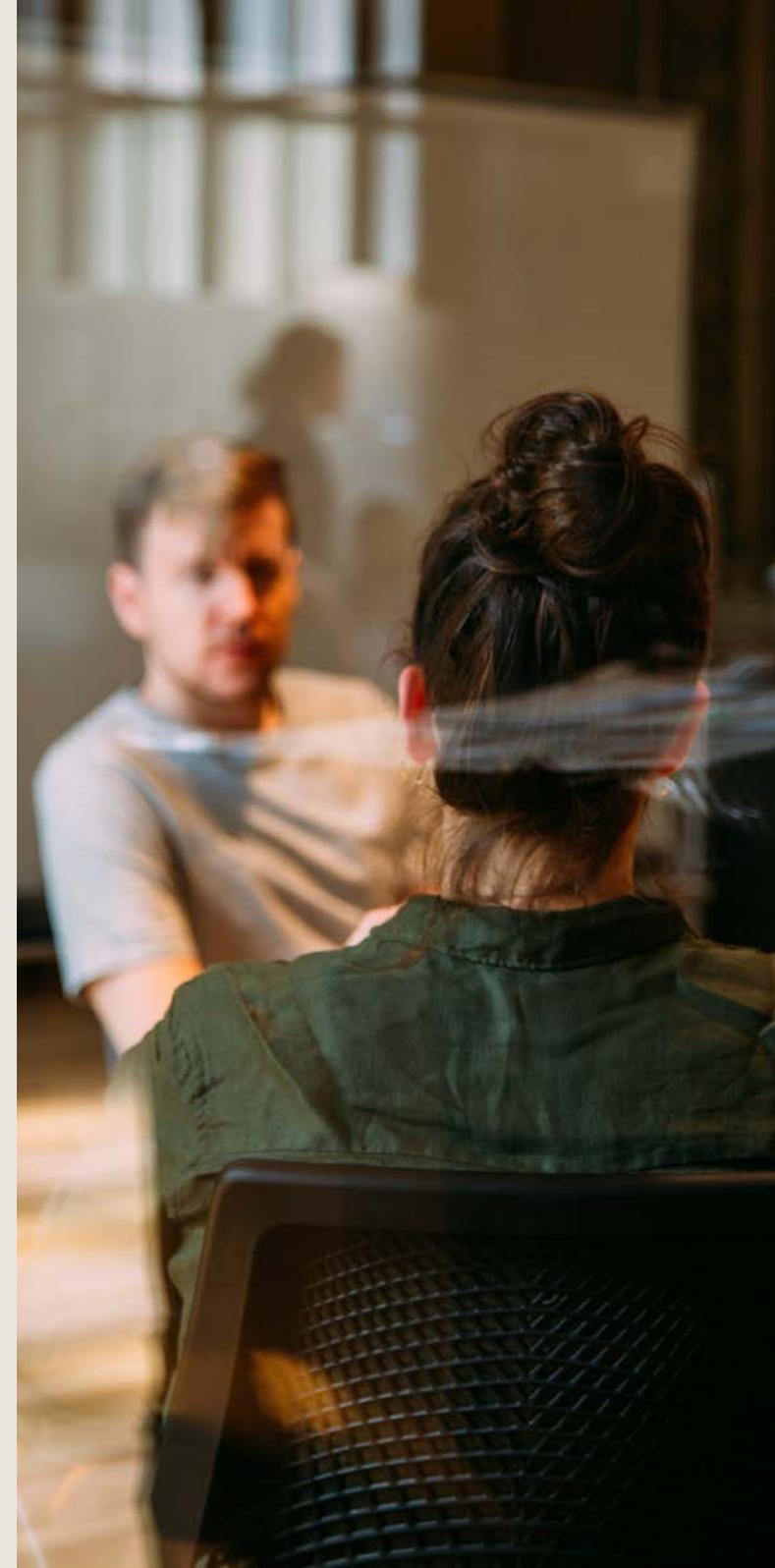
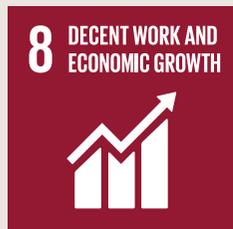
- To be climate-neutral by 2035, which is defined as reduction of emissions for scope 1-3 with 85% from base year of 2019 and implementation of carbon removal for remaining emissions.
- Milestones for emissions are reduction by 40% for scope 1-3 by 2025 and by 65% 2030 compared to base year of 2019.



## 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 of the future of work and re-skilling 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 behavior and vehicle types are affected. Improved efficiency and reduced climate impact are positive, but it also means 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 Technology, Work and Health programme, 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 worker's 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 four trade unions at KTH that support KTH staff and faculty to monitor their interests in the workplace and assist with negotiations and contacts 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 prioritized part of KTH's work within work environment. KTH has several 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 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 to solve 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 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 aiming 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 2022**

KTH wants to create a common image for how we can focus our research and our commitment to offer key competence in the process of transition for a sustainable society. The platform for Industrial Transformation hosts

an annual [Transformation Day](#). More than 140 people from academia and industry gathered at KTH in October 2022 to discuss the transformation of the food industry. The food industry accounts for a quarter of carbon dioxide emissions and is thus facing a gigantic transition, from production, transport to changed eating habits. Many participants reflected on how important it is that KTH now takes the initiative and leads the transition.

### **KTH Innovation**

In 2022, [KTH Innovation](#) continued supporting a high number of ideas aiming to contribute to sustainable development. Around 75% of all ideas supported by KTH Innovation in 2022 had the ambition to contribute to sustainable development. Sustainability aspects were implemented in business coaching using the KTH Innovation Readiness Level TM model, which was also released under a creative commons license. The model enables KTH to spread our process-oriented approach to innovation around the globe. Other activities included organizing a full-day event 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 a Sustainable Energy Action, a project funded by the Swedish Energy Agency.

In 2022, we also continued working with the [Global Change Award](#), the world's largest initiative to create a planet positive fashion industry, aiming to relaunch a new and improved concept after the pandemic.

### **IPercept**

[IPercept](#) is a KTH spinoff that has developed a 'fitness tracker' that can increase the efficiency of machine tools and industrial robots by 20-30%. Using their solution, industrial companies can save energy, reduce emissions, and decrease scrap and waste. IPercept's patented technology monitors machine health with sensors and software and can suggest improvements and reduce downtime. IPercept's solution can be installed in less than an hour and is used by the largest and leading industrial companies in Sweden and Europe. IPercept was founded by KTH Professor Andreas Archenti, and researcher Károly Szipka with support from KTH Innovation. They have also received investment from KTH Holding AB.



### **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 the 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.

### **KTH Materials Dialogue 2022**

KTH Materials Dialogue is an annual workshop for materials-related research at the KTH Royal Institute of Technology. This year's workshop, organised by the KTH Materials platform, included scientific presentations under the topic Materials for a Sustainable World. Sustainable materials research is a field of particular strength at KTH, with several groups and constellations working actively towards the understanding, creation, and control of complex materials with a precision down to the single atom level.



## 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 co-ordinated 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 their 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 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 making today's transportation system greener, smarter and safer 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 [Mistra SAMS Sustainable Accessibility and Mobility Services research programme](#) 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 center at KTH**

[Stockholm Senseable Lab](#), SSL, started in 2019 as a collaboration between KTH, the Massachusetts Institute

of Technology, MIT, and the Municipality of Stockholm to jointly pursue research in sustainable urban development. On 1 March 2022, SSL was established as a center at KTH with the aim of exploring, 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 Live-In Lab](#) is a platform for accelerated innovation in the real-estate sector, and for collaboration between academia and business. Most test beds in 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 2022 – Sustainable Development, Production and Urban Development**

[Science Week](#) was organized for the fifth year by Södertälje Science Park together with KTH, Scania, AstraZeneca, Södertälje municipality and about 40 co-organizers. This year, seminars and workshops were organized with themes related to sustainable development, sustainable production and sustainable urban development.

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

On the [Albano Campus](#), 70,000 square meters 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 stormwater, 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 with 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 seatings, 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. The research study will run until 2023.

### **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**

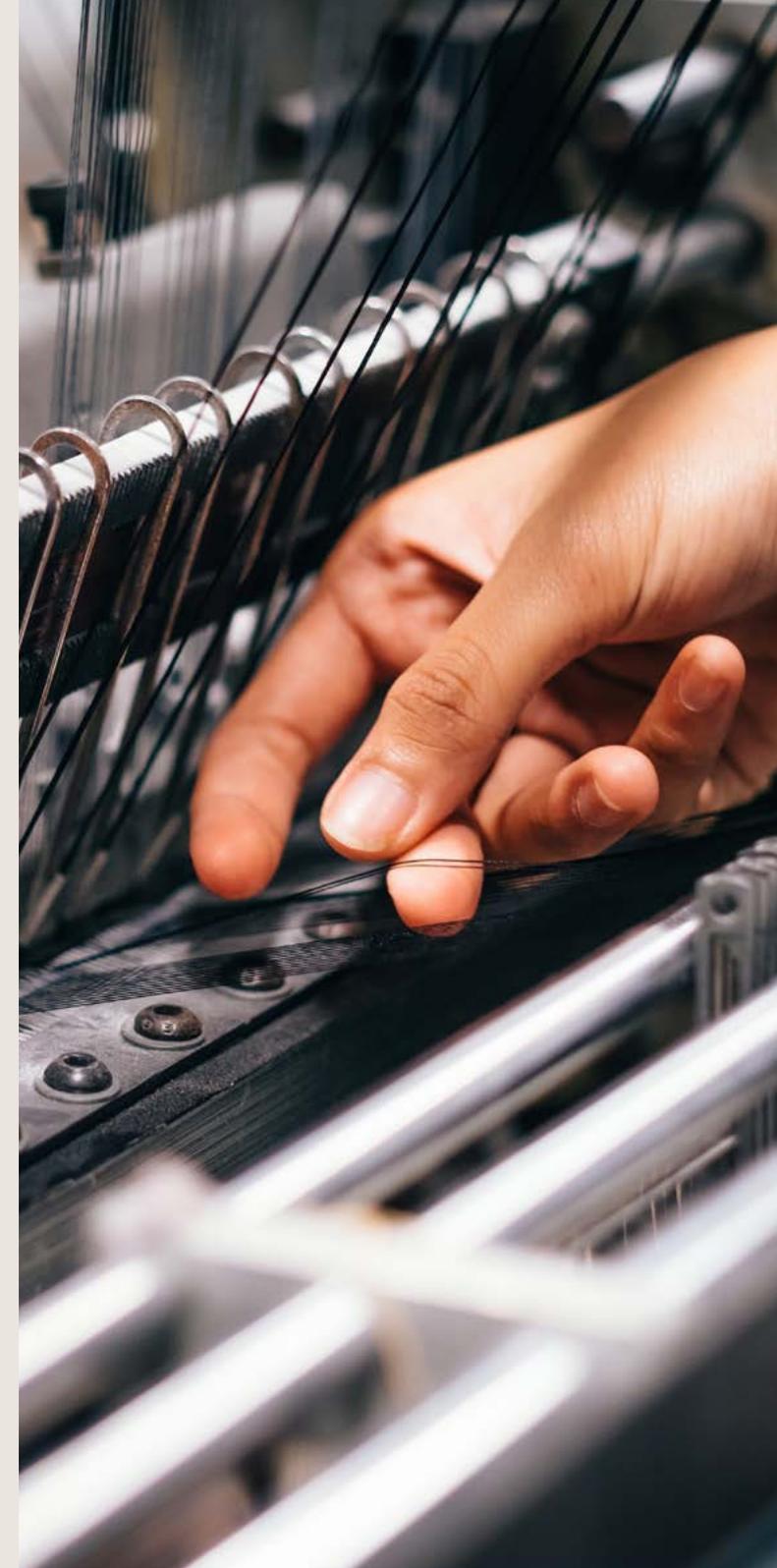
On behalf of the Swedish National Board of Housing, Building and Planning, KTH researchers together with the IVL Swedish Environmental Research Institute and the consulting company WSP have collected data and calculated the [climate impact for 68 new buildings in Sweden](#). The work is unique in its 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 the 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 develop 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 practises have become mainstream in Sweden, to a significant extent catalysed by our programme through knowledge generation and practical change. This transition has 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 recognized 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 department Sustainable Production Development 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 on [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 the 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 project [EIT Raw Materials](#), the main focus is on courses and study programmes with a particular focus on sustainability issues, such as life cycle analysis, recycling, and 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 concept 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 bio-based 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 life cycle, 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 sorting project**

A [picking analysis of waste](#) on campus was done as part of the 2022 Internal Environmental Audit with the purpose of identifying source sorting and recycling rate in the containers and waste rooms that KTH's operations call-off. The insights gained by this analysis was used as a foundation for a number of propositions on how waste management could be improved across the university. Collaboration with the property owner Akademiska Hus is ongoing within waste management projects.



### **KTH student chapter waste project**

A waste project aimed at improving, increasing and achieving a uniform sorting at source system at KTH continued in 2022 focusing on waste management in the student chapter halls. A review of the waste rooms has been done to improve the space for handling more fractions and has enabled better source sorting on campus. A project plan for a new Environmental Station has been designed to improve and increase source sorting and recycling in the future.

### **Reuse and Purchasing at KTH – circular furnishings**

In 2021, a survey was made of KTH's working methods regarding furniture handling. The mapping has laid the foundation for a project that continued in 2022 with the aim of developing a routine for how KTH should work to achieve a more circular use of furniture from acquisition to maintenance and disposal of furniture.

KTH also signed an agreement with a new supplier for furnishings for university environments. The agreement enables, 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**

KTH Climate Action Centre is a multi-disciplinary, collaborative and research-focused centre aiming to advance climate mitigation and adaptation in synergy with all the UN Sustainable Development Goals. The aim of KTH Climate Action Centre is to conduct ground-breaking research in close collaboration with stakeholders in order to speed up the transformation. The centre engages researchers from all parts of KTH, and opens up for dialogue, collaboration and action together with everyone who wants to contribute.

### **COP27 hub on KTH Campus**

During the UN's annual climate conference COP27 on November 8–17 in 2022, KTH Climate Action Centre hosted a hub in Stockholm together with the organisation We Don't Have Time. A series of seminars and activities were arranged in the hub, involving industry, researchers, students, and the public.

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

Energy efficient negative emissions from the agricultural

sector is a joint project between KTH, the Swedish University of Agricultural Sciences and Uppsala University. 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 (bio-energy 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 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 highly involved in designing the method that should be used (simplified lifecycle analysis) in a new regulation on climate declaration for buildings effective as of 2022. 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 isolation of houses, and 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. Planning, building and maintenance of such a system demand 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.

### **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. During 2022, a travel habits survey will be conducted to follow-up KTH's employees travel to and from work and about their business trips.

### **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 in a short and long perspective, and both in 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 2022 to drive and develop the work of the Climate Framework, and all HEIs that are members of SUHF are involved. A host constellation has been formed and is coordinated by SLU.

Working together with The Higher Education sector in Sweden, a ground-breaking 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 Action Lectures – taking on the climate crisis**

During 2022, [Climate Action Lectures](#) led by researchers were organized by KTH Students for Sustainability och

Klimatstudenterna KTH in collaboration with the KTH Climate Action Centre, with funding from KTH Innovation.

### **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 so is relevant. The objectives address the areas that have a major impact from a climate strategy perspective and concerns KTH activities such as education, research and collaboration, as well as the impact from its own activities through e.g., 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 transports. 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. 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 based on meetings of 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.

### **The mediated ocean: a cross-disciplinary workshop on marine data and policy**

The impacts of processes of mediation on ocean science and governance are manifold, from practices around data collection and processing to the role of environmental data in formulating, monitoring and supporting ocean sustainability outcomes, such as SDG 14 and the objectives of the Ocean Decade.

This workshop on sustainable data for ocean science and governance, included an official 'satellite activity' for the UN Decade of Ocean Science for Sustainable Development. The workshop contributed to research on how data and data practices can be considered sustainable, and how data can contribute to ocean and climate sustainability.

### **Engineered Floating Wetland**

Nature-based solutions have proven to be able to successfully tackle eutrophication problems, resulting in increased marine biodiversity, cleaner water as well as reduced greenhouse gas (GHG) emissions and use of harvested biomass as valuable materials. The objective of Engineered Floating Wetland project is to finalize the development and perform on-site tests of a novel floating wetland system in the Utö, 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 the 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 for 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.

### **Djurö Marine Field Station**

[Djurö Marine Field Station](#) in cooperation with Värmdö municipality, to become a resource for marine research in the Baltic Sea.

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

[SMaRC – Swedish Maritime Robotics Centre](#) is a national cross-disciplinary 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.

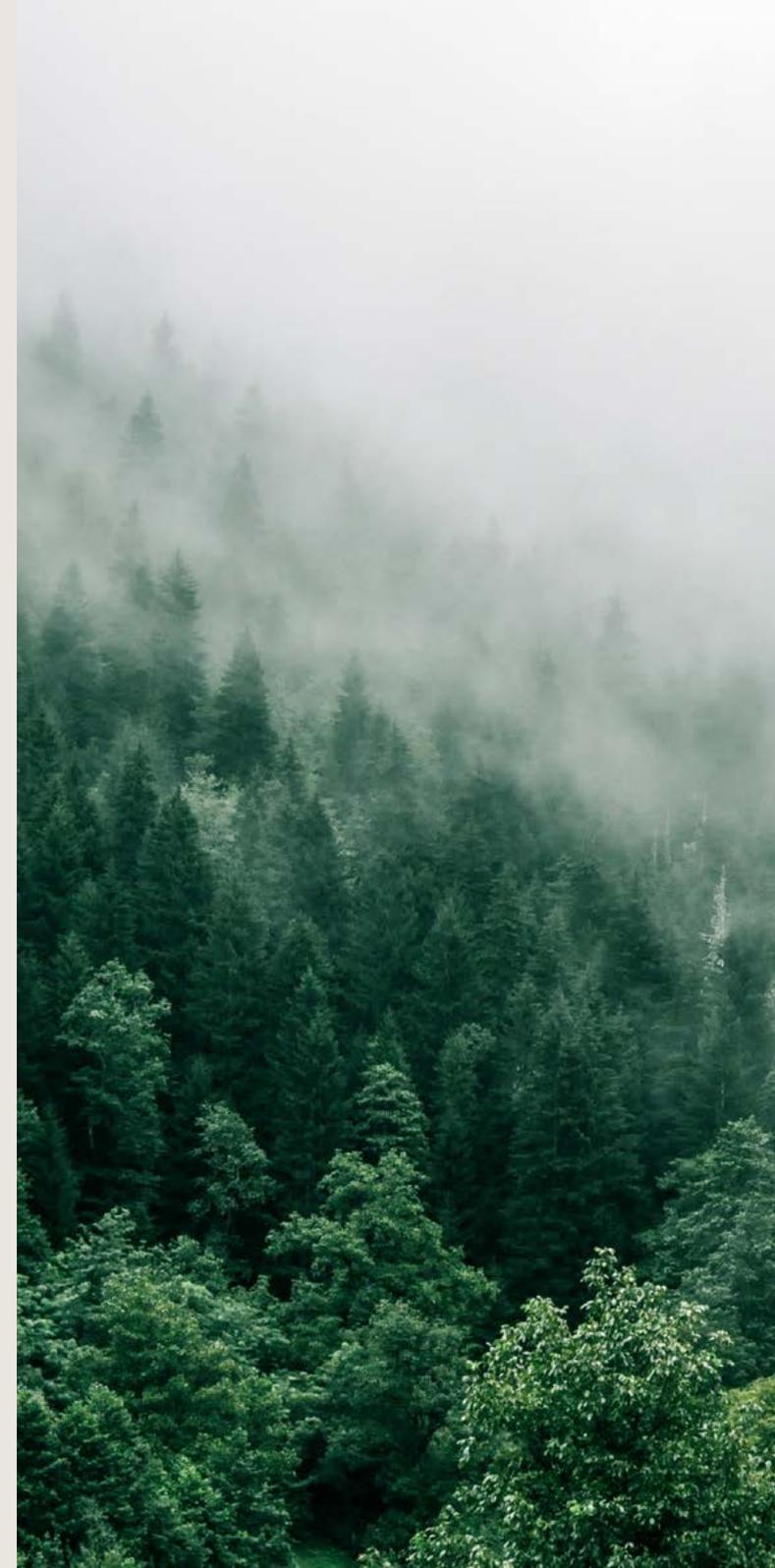
The centre will focus on four research disciplines – autonomy, endurance, perception and communication – with the aim to develop next-generation maritime robotics for ocean production, safeguarding society and environmental sensing.



## 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 sustainable management of natural resources.

### **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 optimized 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 utilizing 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 produced 120 kg of honey during 2022. The honey is used as representation gifts and used in restaurants and cafés

at KTH Campus and is available at KTH Entré.

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

### **KTH research aims to replace palm oil**

In 2022, KTH researchers received 29 million to find substitutes for, among other things, the disputed palm oil. [The project](#) is about developing microbes that will ultimately convert carbon dioxide into food ingredients that have a particularly negative climate impact, such as palm oil. Behind the grant is the Foundation for Strategic Research, SSF.

### **Research on degradation of farmlands in the Mediterranean region**

During 2022, researchers from KTH, Stockholm University and the Navarino Environmental Observatory in Greece showed that the Mediterranean area has the highest rate of soil erosion in Europe. [Their study](#) also showed that the same farmland has the lowest level of organic carbon and severe salinisation problems. The research results were published in the scientific journal Science of the Total Environment.



### **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 wellbeing while conserving life-supporting ecosystems in urban regions. The research project is funded by FORMAS and will continue until 2025.

### **Stockholm Heat Project 2021-2022**

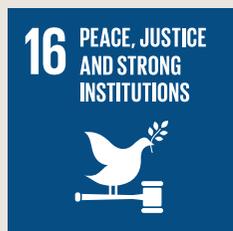
This KTH project combines the deployment of low-cost sensors on vehicles – the City Scanner – with existing data on forest and other tree-cover habitats to measure ambient and ground temperature, and computer vision models to quantify greenery at the street level, in order to assess the hyperlocal benefits of urban greenery at a fine temporal and spatial granularity. This knowledge is important to counter the health impacts of heat events on several spatial scales relevant for urban planning. The Stockholm Heat project collaborates with BZZT, who hosts the City Scanners.



## 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 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 involved in several investigations and delegations that support the government's work. This has included, the Government's Innovation Council, the Government's Scientific Council for Sustainable Development, the Climate Policy Council, and the Collaboration program for Health and Life science.

### **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. Examples include: Transport sector's climate transformation, Opinion on Final report SOU 2022:21 – Right for the climate, and Referral of SOU 2022:13 The Environmental Goals Committee's partial report Sweden's global climate footprint.

### **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 with policy relevant briefs and serving as a forum for topical discussion.



## 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 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.





### Examples of our partnerships include:

- [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.
- [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 longstanding 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, 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 co-host 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. KTH's highest score was awarded for sustainability (96.1). 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 number: V-2023-0611 KS-kod 1.3.

# About This Report

This report highlights 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 by Erica-Dawn Egan, Sustainability Strategist at KTH Sustainability Office 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, The Research Assessment Exercise 2019-2021/2022, website review and review of articles and other sources.

## **Bibliometrics**

According to a bibliometric method developed by KTH, the share of published peer review articles with bearing on sustainable development (467 search terms) was 2022 19% of the total amount of peer review articles (552/2815). 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.



