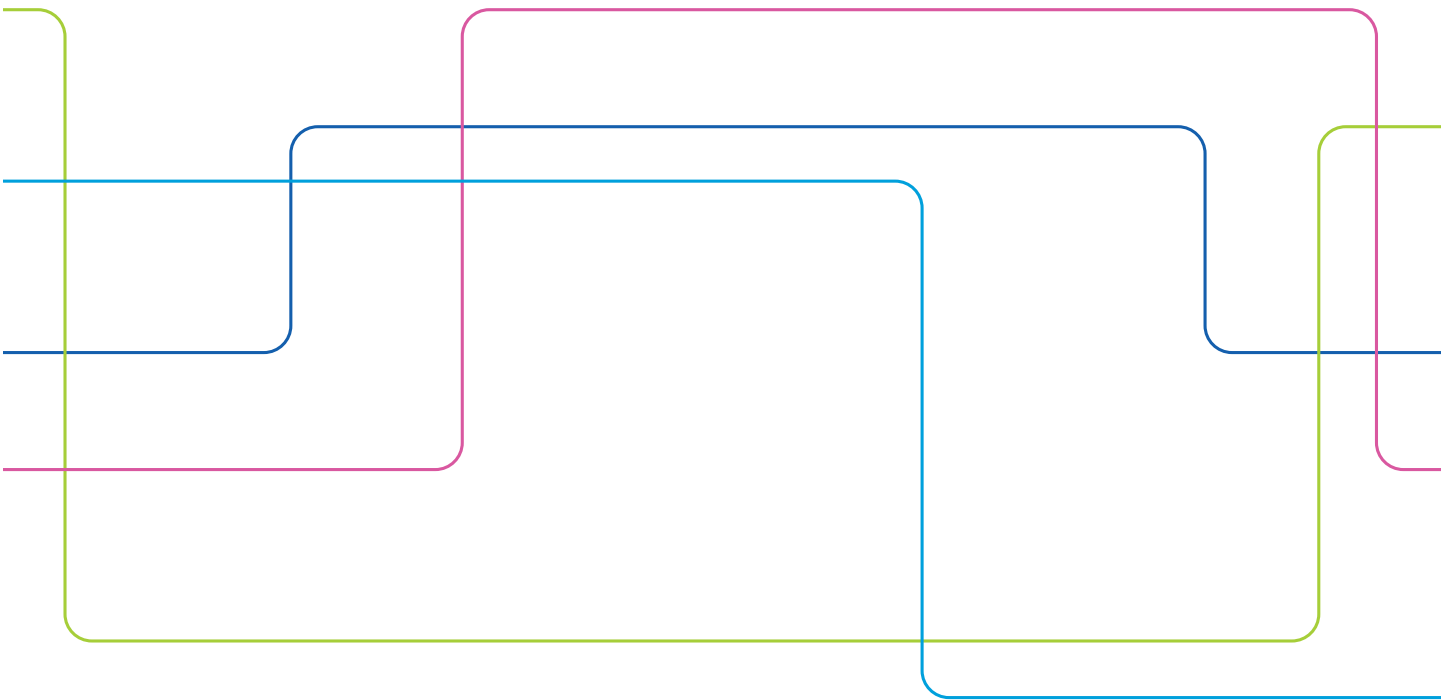




# Annual report 2022





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# About the annual report

The annual report of KTH Royal Institute of Technology is governed by the Ordinance on annual accounts and budget documentation (2000:605). The annual report shall provide a true and fair view of the organisation's results.

The contents of the annual report comprise not only information that KTH is required to report by law and government assignments, but also other information that KTH has chosen to present about its activities, and happenings in 2022 in particular.

The annual report contains reporting and monitoring of a large number of parameters that follow from the reporting requirements in the Higher Education Act, the public service agreement for KTH and universities and higher education institutions for the 2022 financial year, and the Ordinance on

annual accounts and budget documentation (2000:605).

Quantitative data on volume and development are mainly obtained from KTH's operations system. Quantitative data in the text is often expressed as x (y), where x is the data for 2022 and y is the corresponding data for 2021.

Qualitative data on activities and developments are mainly obtained from decisions, minutes, information on the KTH website, etc.

The annual report has been compiled within KTH's University Administration.

A large number of abbreviations are used in the KTH annual report. The most important ones are listed here to avoid having to explain them all in the running text.

## KTH internal

<b>ABE</b>	School of Architecture and the Built Environment
<b>CBH</b>	School of Engineering Sciences in Chemistry, Biotechnology and Health
<b>EECS</b>	School of Electrical Engineering and Computer Science
<b>ITM</b>	School of Industrial Engineering and Management
<b>SCI</b>	School of Engineering Sciences
<b>JML</b>	Gender equality, diversity and equal opportunities
<b>JMLA</b>	Gender equality, diversity and equal opportunities officer
<b>SCILIFELAB</b>	Science for Life Laboratory

## Authorities, organisations and miscellaneous

<b>EIT</b>	European Institute of Innovation and Technology
<b>HPR</b>	Annual performance equivalent
<b>HST</b>	Full time equivalent student (FTE)
<b>KIC</b>	Knowledge and Innovation Communities (within the EIT)
<b>RISE</b>	RISE Research Institutes of Sweden AB
<b>SSF</b>	Swedish Foundation for Strategic Research
<b>SUHF</b>	Association of Swedish Higher Education Institutions
<b>THS</b>	Student Union at the Royal Institute of Technology
<b>UKÄ</b>	Swedish Higher Education Authority
<b>VINNOVA</b>	Swedish Governmental Agency for Innovation Systems

# This is KTH

Since it was founded in 1827, the Royal Institute of Technology (KTH) has developed into one of Europe's leading technical universities and an important arena for knowledge development. As Sweden's largest provider of technical courses, study programmes and research, KTH brings together students, teachers and researchers from all over the world.

KTH's education and research covers a wide range of fields, mainly in technology, natural sciences, architecture, industrial economics, social planning and learning. Special focus is placed on digitalisation, sustainability, internationalisation and gender equality, which permeate all activities at KTH.

KTH participates in educational and research cooperations with universities and higher education institutions all over the world. KTH's collaboration with strategic partners among companies, public authorities and organisations provides students and researchers with a wide network of contacts.

KTH works in collaboration with the wider community to devise sustainable solutions to some of humanity's greatest challenges, such as energy supply, climate change, urbanisation and quality of life for an ageing population. KTH works to strengthen the quality and relevance of Swedish higher education and research by taking responsibility for the role of technology in societal development and creating impact and societal benefit from education and research.

KTH contributes locally, regionally, nationally and globally through extensive collaboration with industry and public stakeholders, and through partnerships with many universities. The innovative climate at KTH promotes versatile solutions and creates a new generation of researchers, engineers, architects and teachers.

KTH conducts its courses, study programmes and research at five campuses in the Stockholm region.

KTH Campus is situated on Valhallavägen in the centre of Stockholm and covers an area as large as the Old Town.

KTH Kista is situated north of central Stockholm. It provides education and research in the field of IT, in close proximity to companies and research institutes in the ICT sector.

At KTH Södertälje, which is situated south of Stockholm, education and research are conducted with emphasis on sustainable production in an area with strong links to the manufacturing and production industry.

KTH Flemingsberg is situated in Huddinge, south of Stockholm. Activities in Flemingsberg focus on development in the interdisciplinary field of medical technology.

KTH Solna, north of Stockholm, is a national hub for research in various life sciences. This is home to the Science for Life Laboratory, which is run together with the Karolinska Institute, Stockholm University and Uppsala University.

## KTH in figures, 2022

### EDUCATION

- Architecture programme and 17 Masters of Science in Engineering programmes
- Master of Science in Engineering and teacher training
- Nine Bachelor of Science in Engineering programmes
- Master of Arts/Science in Education
- Bridging teacher training programmes
- One and two-year Master's programmes
- Bachelor's programmes and two-year academic education
- Continuing professional development, qualifying programme
- Third cycle education
  
- 13,583 full time equivalent students, 34 per cent women and 66 per cent men (including paying students)
- 11,368 annual performance equivalents (including fee-paying students)
- 1,582 active research students (at least 50 per cent activity), 34 per cent women and 66 per cent men
  
- 2,685 beginners for the Master of Science in Engineering, Architecture and Bachelor of Science in Engineering programmes, 30 per cent women and 70 per cent men
- 776 beginners for qualifying programmes, 29 per cent women and 71 per cent men
- 2,209 beginners for one and two-year Master's programmes, 36 per cent women and 64 per cent men, of whom
- 970 will graduate with a two-year Master of Science in Engineering
- 1,239 are simply studying a one or two-year Master's programme at KTH
- 293 new entrants to third cycle programmes, 34 per cent women and 66 per cent men
  
- 72 Degrees of Master of Architecture, 60 per cent women and 40 per cent men
- 1,134 Degrees of Master of Science in Engineering, 36 per cent women and 64 per cent men
- 292 Degrees of Bachelor of Science in Engineering, 35 per cent women and 65 per cent men
- 1,672 Degrees of Master of Science (one or two years), 37 per cent women and 63 per cent men
- 250 Degrees of Doctor, 28 per cent women and 72 per cent men
- 38 Degrees of Licentiate, 29 per cent women and 71 per cent men

### SITE AREA

- 288,400 sq m

### RESEARCH

Primary responsibility for five national strategic research domains (SFOs):

- E-sciences
- IT and mobile communications
- Transport research
- Production technology
- Molecular biosciences (Science for Life Laboratory)
- Partner in five more areas

Partners in five programmes of the European Institute of Innovation and Technology (EIT)

- EIT InnoEnergy
- EIT Digital
- EIT Health
- EIT Raw Materials
- EIT Urban Mobility

External research funding, revenue from grants, SEK 1,858 million (excluding transfers):

- Swedish Research Council SEK 337 million
- EU SEK 253 million
- Wallenberg Foundations SEK 235 million
- Vinnova SEK 185 million
- Swedish Energy Agency SEK 158 million
- Other government agencies SEK 270 million
- Other external funding, including private funding SEK 420 million

### FINANCES

SEK 6,065 million in total turnover (of which SEK 776 million transfers)

Direct government funding (excluding transfers):

- SEK 1,243 million education at first and second cycle level
- SEK 1,417 million courses, study programmes and research at third cycle level

### STAFF

- 4,026 full time equivalent positions (5,240 employees), 1,675 women and 2,351 men, of whom 339 professors, 72 women and 267 men (including visiting professors and adjunct professors)
- 288 associate professors, 80 women and 208 men

# Organisation

KTH's courses, study programmes and research are organised into five schools. Each school has departments, divisions and research centres. The schools report directly to the President. Each school is led by a head of school.

The University Board oversees all KTH affairs and is responsible for ensuring fulfilment of its assignments. The Board consists of a total of 15 members: the President, eight external members, three teacher members and three student members.

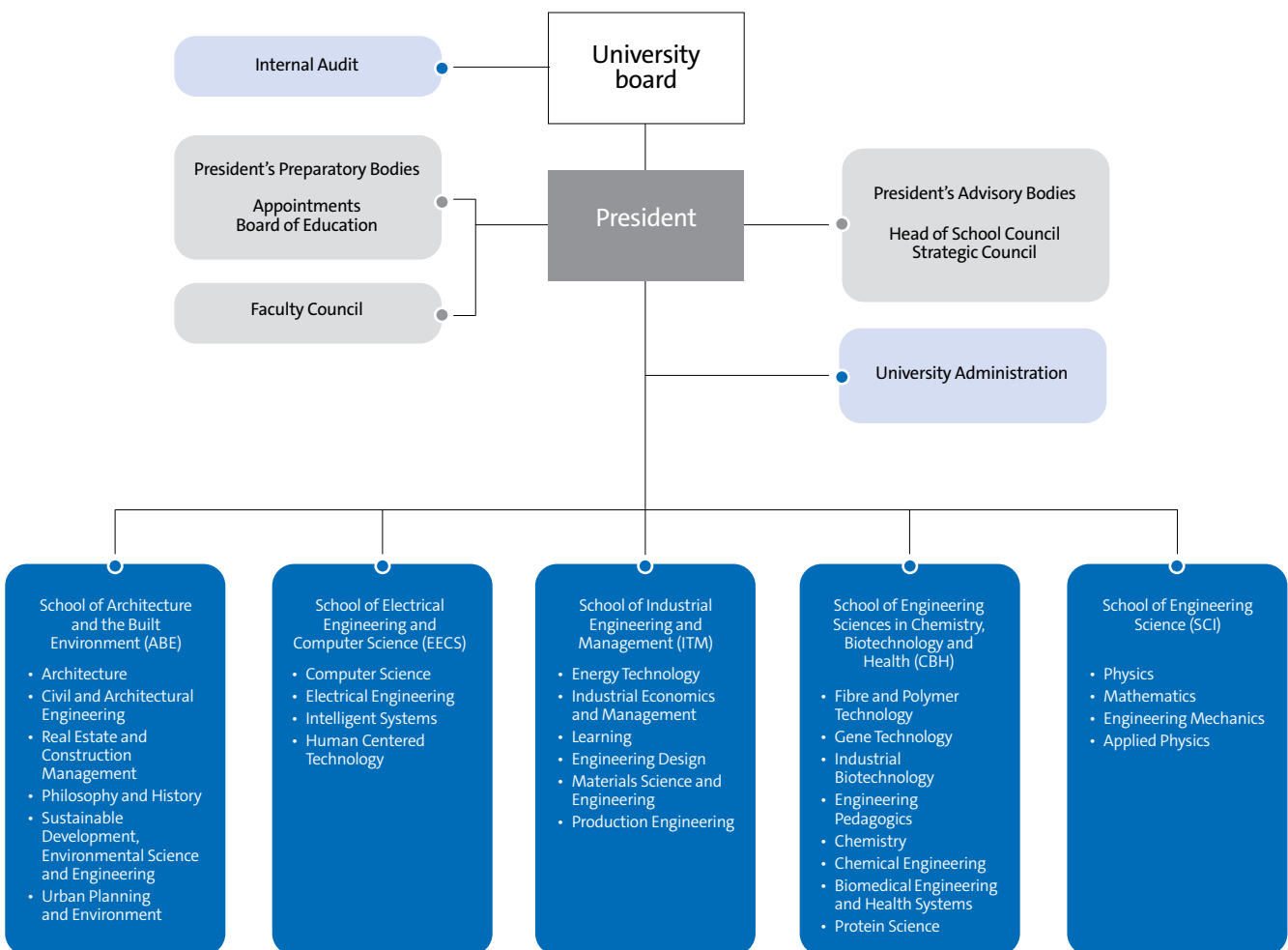
The President is the head of the public authority and bears overall responsibility for KTH's activities under the University Board. The Deputy President is the President's deputy. The University Director is the highest head of administration at the University. There were also Vice Presidents for research, education, digitalisation, global relations, sustainable development and gender equality and values in 2022.

The President has a strategic council which deals with school-wide strategic issues and acts as a forum for information and discussion. The strategic council consists of the President,

the Deputy President, Deans of Faculty, Vice Deans of Faculty, Vice Presidents, heads of school, the University Director, the Assistant University Director, the head of communications and three student representatives. There is also a council of heads of schools comprising the President, the Deputy President, heads of schools, the University Director and the Assistant University Director. The council of heads of schools deals with school-specific issues.

The Faculty Council is a university-wide body for KTH's quality development and faculty support work. The Faculty Council bears overall responsibility for issues related to quality in courses and study programme, research and collaboration. The majority of members are academically qualified and are elected by teachers and researchers.

The organisation described above was in place in 2022. The organisational chart below shows the structure from late 2022/early 2023. A review of the KTH organisation will be carried out in 2023.



# President's foreword

2022 has involved further successes in KTH education and research, but at the same time we have faced challenges in terms of recovery following the pandemic, the war in Ukraine and the sharp increase in expenses for KTH due to high inflation.

Our programmes remain popular, as evidenced by the high number of applications at both first and second cycle level. As before, the most popular programmes are architecture and Master of Science in Computer Engineering. KTH's lifelong learning offering has been developed during the year in accordance with increased demand and expanded opportunities to study within the framework of an active professional life. A new joint Master's programme in biostatistics and computer science

is planned to start in 2024 within the framework of the Stockholm Trio cooperation.

## Support for Ukraine

The international recruitment of students to Master's programmes has largely returned to pre-pandemic levels, although international contacts are now increasingly being carried out in various ways that avoid travel. Exchange activities have almost recovered compared to 2019.

As a result of Russia's invasion of Ukraine, KTH has worked in various ways to support refugee students and researchers within the framework of our mission to conduct research and education. KTH's activities have involved raising over SEK 700,000 for the KTH Ukraine Scholarship Programme through private donations.

## Major initiatives

We have enjoyed many research successes. The major initiatives relating to research infrastructure such as SciLifeLab (together with the Karolinska Institute,

Stockholm University and Uppsala University) have continued to be successful, and the special Data-Driven Life Science initiative has developed very positively. The same applies to research on digitalisation in fields such as Digital Futures and KTH's strong commitment to energy research and the development of energy systems.

Other impacts in 2022 include the hosting of the We Don't Have Times hub by KTH and the KTH Climate Action Center during the UN COP27 climate conference, for example. A number of broadcasts were made from this hub which, together with other hubs around the world, reached 52 million viewers. KTH has also launched KTH Food, a new interdisciplinary and transdisciplinary research centre on food, as a hub for research, education and collaboration relating to an efficient and sustainable food system.

## Reduce expenses

The increase in expenses caused by inflation is worrying for KTH. Rent and energy expenses in particular are rising sharply, which has led KTH to actively seek solutions for more efficient premises provision and reduced expenses. This work will continue undiminished in the future, too.

All in all, the experiences of 2022 are still positive and form a basis for continued development work going forward in respect of education, research and collaboration. KTH remains a university with great relevance to contemporary and future societal challenges, and this is and will be the starting point for the strategic development of the university.



*Anders Söderholm, KTH President*



# The students have the floor

## **Community, development and joy**

The Student Union at the Royal Institute of Technology, THS, has been working for all students at KTH since 1902. The purpose of THS is to monitor and contribute to the development of education and study conditions at KTH. In practice, this means that we want our students to get the best education they can get, while having the most enjoyable and fulfilling time of their lives. As the representatives of our students, we are proud to say that we work with and not against KTH for this. We can move forward together by being an active partner that highlights the needs of students while also familiarising ourselves with KTH's opportunities and limitations!

## **Key issues of the year**

During the spring, we were able to slowly return to a new normal in all operations following the pandemic. This opened up many opportunities for change and development, not least through the Future Education at KTH change programme, which has come to characterise the whole year. The discussion on premises has proved to be a key issue in this respect, economic uncertainty being a strong contributing factor. We have come a long way in addressing these and other issues in Future Education at KTH during the year, moving from evaluation to implementation of changes. Our parallel operational support work has provided us with a great opportunity to conduct student influence in more bodies.

This is mainly apparent in a new position within THS which focuses on the study environment, gender equality, diversity and equal opportunities issues and safety representatives. We welcomed our new President at the end of the year and have made efforts to quickly familiarise him with our activities, be clear about what we want to achieve going forward, and establish a good relationship.

## **Orientation for newly admitted students**

For many students, their orientation provides the first and biggest memory of their time with us. This is a high-intensity period where the whole of KTH is bursting with colourful and energetic students, who are doing everything in their power to make new students feel as welcome as possible in the big world of the university. This year's orientation reverted to a structure more akin to how things were before the pandemic, which paves the way for many opportunities we have missed in recent years. However, a loss of knowledge has characterised our orientation activities this year, which has indicated where we need more initiatives in the future, while also giving us the opportunity for new traditions and approaches. We were able to adopt a preventive approach with KTH to develop the orientation and make it a safer and fun experience for both recipients and new entrants.

*Cornelia Haag, THS Student Union President*

# Education

## Education at first and second cycle level

### Educational programmes

KTH's courses and programmes offered are made up mainly of programme-based courses. Less than three per cent of KTH's total education volume is provided in the form of freestanding courses, but the ambition at KTH is to increase the proportion of lifelong learning, including in-service training courses with direct government funding. Priorities in courses and programmes offered are mainly defined between programmes and programme types. During the year, however, both the government's special lifelong learning initiative and KTH's internal goal, to increase the proportion of lifelong learning in its courses and programmes offered, have meant that priorities have been defined so that more freestanding courses can be offered.

KTH is working to ensure that lifelong learning will grow in the coming years, in line with the needs of the labour market. Lifelong learning refers to both contract education and continuing professional development with direct government funding and other, more informal learning activities such as open lectures. Priorities and assessments are based mainly on student demand, labour market needs and KTH's existing competence, but also on the basis of the government's initiatives such as the lifelong learning initiative and the recently introduced redeployment study funding.

Increased internationalisation is one of KTH's goals.

The courses and programmes offered are influenced by internationalisation efforts such as exchange agreements and international partnerships.

Education at KTH includes digital elements and learning activities to a great extent, but courses in programmes are rarely run entirely remotely. Distance learning courses mostly relate to lifelong learning. KTH offers about 2,000 courses in total. In 2022, KTH offered a total of 78 distance learning courses that have generated 264 full time equivalent students. Of these courses, 63 were in continuing professional development with direct government funding, generating a total of 118 full time equivalent students. This represents 55 per cent of the total number of full-time students in continuing professional development with direct government funding. See the section on Digitalisation for more information on the digitalisation of education.

Labour market representatives participate in several of the strategic councils and programme councils within each school at KTH, and they have the opportunity to express their opinions. There are also external representatives on the Faculty Council and the University Board. These groups regularly discuss what programmes are needed in society and are in demand by companies, public authorities and organisations, for example. More specific discussions are also held within the strategic partnerships that KTH has with a number of companies, public authorities and organisations. See the section on Collaboration.

There is a significant shortage of teachers in some natural sciences and technology subjects. That was why KTH started a Master of Arts/Science in Education programme in Södertälje in the autumn of 2019. KTH also meets the great need for trained teachers by conducting bridging teacher training programmes together with Stockholm University. Furthermore, KTH – also together with Stockholm University – has been commissioned to provide bridging teacher training programmes for people with third-cycle qualifications. In addition, KTH has been tasked since 2022 with running a new shorter bridging teacher training programme worth 60 higher education credits. KTH already offers the Master of Science in Engineering and Education programme, which leads to a Master of Arts/Science in Education and a Master of Science in Engineering. See the section on Teacher training programmes.

### Government education initiatives

KTH's direct government funding for first and second cycle education decreased in 2022 in relation to 2021, but remained significantly higher than in 2020 due to the Government's various education initiatives. These consist partly of a permanent investment in shortage occupation programmes (SEK 33 million), and partly of temporary investments – mainly qualifying education (about SEK 24 million in 2022), second cycle education (about SEK 29 million in 2022) and lifelong learning (SEK 11 million in 2022).

### Qualifying and higher education access programmes

KTH started two completely new qualifying programmes in the autumn of 2020 as a result of the initiative. These have been offered during the 2020/2021 and 2021/2022 academic years, and partly as distance learning courses. The programmes were discontinued in 2022 and no admissions were made for the 2022 autumn semester. KTH achieved a total of 692 full time equivalent students during the period of the initiative: see Figure 7. The total number of beginners on qualifying programmes in 2020 and 2021 was 1,204 and 1,092 respectively. The number of beginners on KTH's regular qualifying programmes was 776 in 2022, compared to 720 beginners in 2019, i.e. before the government's special initiative. See Figure 2.

### Shortage occupation programmes

Virtually all of KTH's degree programmes fall into the category of shortage occupation programmes.

A total of 57 more beginners have started their studies at KTH in 2022 compared to 2019. The corresponding figures for 2021 and 2020 in comparison with 2019 were 618 and 664 more beginners in total. The number of beginners has increased annually since 2019 for Master of Science in Engineering programmes, albeit to a very small extent between 2021 and 2022. For Bachelor of Science in Engineering programmes, the number of beginners has

increased from 2019 to 2022, but the number of beginners has decreased if we compare just 2021 and 2022. See Figure 2.

The number of full time equivalent students has decreased marginally on KTH's Master of Science in Engineering programmes since 2019. The length of the programmes means that the increase in the number of beginners from 2020 has not yet had a full impact on the total number of full time equivalent students. For Bachelor of Science in Engineering programmes, the number of full time equivalent students has increased since 2019, but decreased slightly compared to the previous year. See Figure 7.

The increase in the number of beginners since 2019 on KTH's Master of Science in Engineering, Bachelor of Science in Engineering and Teacher training programmes corresponds to an increase of 694 full time equivalent students and 577 annual performance equivalents: see Figure 7. This calculation assumes that each additional beginner generates 0.5 full time equivalent students per semester. Annual performance equivalents have been calculated in accordance with KTH's average performance indicator for each year.

### Lifelong learning

The government's special lifelong learning initiative coincided with the extensive development and reorganisation work involved in the switch to distance education from on-campus education at KTH due to COVID-19. KTH has continued to develop continuing professional development with direct government funding during the year, in the form of courses and concepts that are scalable, effective and attractive to professionals, companies, public authorities and organisations. This format provides temporal and spatial flexibility and accessibility and is more clearly targeted at professionals. The experience is providing new opportunities for contract education and regular programme education as well. KTH is continuing to maintain close dialogue with companies and organisations in this work. KTH is striving to develop more far-reaching and operation-integrated cooperations on education and lifelong learning, particularly with strategic partners.

KTH's goal is for lifelong learning to form an integral part of KTH's education and eventually cover around 20 per cent of the total education volume.

In 2022, KTH has continued its efforts to facilitate the development of lifelong learning. Each school has a lifelong learning officer who works as part of a network. Common working methods and support functions have continued to be developed.

- **Continuing professional development with direct government funding:** Courses within the special lifelong learning initiative have generated a total of 215 (149) full time equivalent students. See Figure 7. In total, KTH offered 205 (146) in-service training courses generating full time equivalent students in 2022. The number of unique

individuals who have taken at least one in-service training course has increased significantly since last year, from 1,451 to 2,521 participants. This increase in the number of courses, full time equivalent students and unique participants reflects KTH's internal goal to significantly increase the proportion of lifelong learning.

- **Contract education:** KTH is continuing to train staff from companies in fields such as radio systems technology and radio measurement technology, artificial intelligence and neural networks, Lean and industrial production, sustainable transport systems, property valuation and analysis, and cyber defence and information security. In 2022, KTH's credit-bearing contract education courses have generated the equivalent of 41 full time equivalent students and 37 annual performance equivalents. Co-operation with Scania on lifelong learning has continued during the year with the joint steering committee for learning as a platform. A more informal and operation-specific learning process for selected employees at Scania has been tested and evaluated during the autumn and winter.

### Expansion of second level education

For two-year Master's programmes, the number of beginners with direct government funding has decreased between 2019 and 2022, from 1,733 beginners in 2019 to 1,605 in 2022. However, the number in 2020 was higher, at 1,803 beginners. For one-year Master's programmes, the number of beginners has decreased since 2019, from 57 beginners in 2019 to 21 in 2022. KTH has reduced the number of one-year Master's programmes in recent years and, in connection with this, reallocated the number of beginner places from one-year Master's programmes to two-year Master's programmes.

The number of full time equivalent students at second cycle level, i.e. for one and two-year Master's programmes, has increased from 3,358 to 3,450 between 2019 and 2022. The report refers only to students who are not required to pay tuition fees. See Figure 7.

KTH does not have courses where placement periods are included, except for School Placement as part of the teacher training programmes: see the section entitled Teacher training programmes.

### *KTH's sustainable production initiative in Södertälje, Sweden*

KTH is implementing an education and research initiative in Södertälje together with the municipality of Södertälje, Scania and AstraZeneca. One of the aims of the programme is to strengthen the competitiveness of Swedish industry through cutting-edge education and research. The education initiative includes three degree programmes: Industrial Technology and Sustainability, Industrial Technology and Production Maintenance, and Sustainable Production Development. KTH Södertälje already had a Bachelor of Mechanical Engineering

programme and a technical foundation year programme. These programmes have been developed – and several of the courses are run – in close cooperation with industry in Södertälje.

In the 2022 autumn semester, there were 37 (39) beginners on the Master of Science in Industrial Engineering and Sustainability programme, and 15 (10) on the two-year Master of Science in Sustainable Production Development programme. The two-year Master's programme is closely linked to the burgeoning research activities at KTH Södertälje and industry in the vicinity.

Furthermore, there were 16 (18) beginners on the Bachelor of Science in Industrial Technology and Production Maintenance programme and 65 (100) on the Bachelor of Science in Mechanical Engineering programme. The Master of Arts/Science in Secondary Education programme paused admissions in 2022. Regular qualifying programmes at KTH Södertälje had 185 (144) beginners. The distance technical foundation year qualifying programme with campus meetings came to an end in 2022. This programme was developed on the basis of the targeted two-year government initiative due to COVID-19, where KTH accepted students in 2020 and 2021.

There was a total of 318 (539) beginners in education at KTH Södertälje in 2022. The decrease from the previous year is mainly due to the ending of the distance technical foundation year qualifying programme with campus meetings.

See the section on Research for information on the sustainable production initiative within research in Södertälje.

## Teacher training programmes

### *Master of Science in Engineering and Education*

The Master of Science in Engineering and Education programme leads to both a Master of Science in Engineering and a Degree of Master of Arts/Science in Upper Secondary Education in mathematics and physics, chemistry or technology. Students studying engineering choose one of two specialisations: computer science or energy and environment. KTH has the right to award both Master of Arts in Education and Master of Science in Engineering degrees. In 2022, some of the compulsory courses in educational sciences were purchased from Stockholm University.

The programme had 115 (94) first choice applicants in the 2022 autumn semester. 62 (54) students started the programme in 2022; with 40 per cent women and 60 per cent men.

The proportion of women has increased by three percentage points compared to 2021. 34 (27) students graduated from the programme in 2022; 47 per cent women and 53 per cent men.

All students on the Master of Science in Engineering and Education programme have mathematics as their first teaching subject. In Year 1, students acquire a basic knowledge of the four subject areas included in the various programme specialisations. These subjects are physics, chemistry and technology specialising in computing or technology specialising in energy and environment. Prior to Year 2, students choose one of the four possible subject specialisations and are then assigned their second teaching subject.

When choosing a specialisation, students are informed that there is a high demand for teachers in all these subjects. Chemistry and technology are the subjects where the teacher shortage is at its most acute. It has been difficult since 2017 to find enough placements at upper secondary schools as a consequence of the teacher shortage.

The transition to digital education due to COVID-19 that took place in the spring of 2020 and was still having an impact in 2022 has placed new demands on teachers. In some cases, students doing their placements have been used as a teaching resource. All students studying on the Master of Science in Engineering and Education programme were eventually offered a school placement in 2022, although this sometimes came close to the start of the period or involved long travel times for a small number of students. In 2022, KTH has reviewed the options for taking further action to increase the number of school placements by initiating cooperation with independent school groups.

### *Subject Teacher Education in Technology*

The Subject Teacher Education in Technology specialising in technology comprises 270 higher education credits and started in its current form in the autumn semester of 2019. In the autumn of 2022, KTH chose not to allow any admissions to the Subject Teacher Education in Technology. This was due to the fact that KTH was given a time-limited government assignment in 2022 to develop a bridging teacher training programme of 60 higher education credits, which also provides a Subject Teacher Education in Technology. Few people have applied for the Subject Teacher Education in Technology, and implementing the temporary supplementary teacher education programme requires the same resources as the Subject Teacher Education in Technology.

This programme leads to two different degrees: a Degree of Master of Science in Secondary Education in technology and mathematics, and a Degree of Bachelor of Science in Engineering. The programme comprises a total of four and a half years of full-time studies, including two summer semesters. Two (one) students have completed school placements in 2022.

### *Practice-based research and practice schools*

KTH is already involved in the government initiative ULF (Education, Learning, Research), which will run until 2024 and is expected to become a permanent activity in 2025. Compensatory teaching for learning and research, K-ULF, is a project run at KTH as part of ULF. This activity is part of the government's initiative to develop long-term collaboration between universities and higher education institutions and accountable authorities in the school system with regard to practice-based research. In 2022, KTH has expanded its network for practice-based research in cooperation with accountable authorities.

KTH has now signed partnership agreements for

practice-based research with the Municipality of Värmdö, the Municipality of Lidingö, the City of Stockholm, the Municipality of Nynäshamn and the Municipality of Haninge. Agreement negotiations have also started with NTI-gymnasiet in 2022. Representatives from the accountable authorities participate in the K-ULF steering committee, where access to school placements and forecasts of the availability of school placements are a recurring theme.

In 2022, KTH has continued its work on developing what are known as practice schools. KTH has identified senior and upper secondary schools through the existing network of schools in K-ULF and initiated processes to ensure that a number of school placements per semester are guaranteed by the accountable authorities with which KTH has signed agreements as described above. There is a great deal of interest, but the availability of sufficient qualified supervisors in schools still presents a challenge. This is why KTH has continued to develop courses for future supervisors in 2022, and an initial course offering has been conducted in 2022. To enable more people to study the courses, they have been divided into smaller modules, the first of which has been offered as a continuing professional development course with direct government funding in 2022: Supervising students on school placements, 3 higher education credits.

The work on practice schools is still under development. In 2022, a total of 31 students – corresponding to 4 full time equivalent students – have participated in placements at one of KTH's proposed practice schools within the framework of the above-mentioned partnership agreement on practice-based research. KTH's ambition is for an agreement to be signed with NTI-gymnasiet as well, and for the first school placement students to be placed with NTI-gymnasiet in 2023. KTH is continuing to work with challenges linked to the need for increased coordination between school placements that take place via practice schools and those that take place via what is known as the VFU portal. This portal is governed by a collaboration agreement between universities and municipalities in Greater Stockholm.

### ***Bridging teacher training programmes***

The bridging teacher training degree programme comprises 90 higher education credits and leads to a Degree of Master of Science in Secondary Education in one or more of the subjects physics, chemistry, mathematics or technology. Admission to the programme requires sufficient academic qualifications in one or more of these subjects. This programme is delivered in part as a distance learning course, with some face-to-face meetings at KTH. Some parts of the programme are delivered by Stockholm University. The programme also continues during the summer, which means that any student who starts in June can be a qualified teacher by the end of August the following year. One third of the programme involves placement, which means that students are on site at a school where they participate in

day-to-day work under supervision. Placements for KPU students have become more difficult to arrange in the right subjects and at the right levels. This is particularly true in the subjects of mathematics and technology in secondary schools. Some students do their placements in Years 7 to 9 even though they will be qualified to teach their subjects in upper secondary schools.

There were 137 (184) first choice applicants for the programme in 2022. 35 (65) students started the programme at the beginning of the summer semester, of whom 43 per cent were women and 57 per cent men. 23 (45) students were still active in December 2022. No students were admitted in 2022 based on prior learning in the main, or to such an extent that treating the entry requirement as a formality would be unjustified. In 2021, eight students of those who started the programme were admitted after validation of prior learning for any entry requirement or part thereof. It is often difficult to distinguish between formal entry requirements and prior learning in individual cases. The difference in the number of admissions through prior learning between 2021 and 2022 is mainly due to overlapping conceptual definitions, not changes in working methods, applicant base or admission process outcome. KTH provides guidance via email and telephone to applicants on the assessment of prior learning and on supplementary studies in the form of freestanding courses. KTH works systematically with validation of prior learning in the admissions process and communication with prospective students and applicants, and identifies cases with alternative qualifications even when there is no formal application or clearly formulated question about eligibility through prior learning.

It has been noted that several students have later been admitted to one of KTH's Master's programmes after starting studies on bridging teacher training programmes. They have therefore taken a break from their bridging teacher training programmes and returned after completing their Master's studies. In 2022, 16 (29) students have graduated with a Master of Science in Education.

### ***New short bridging teacher training programme***

The government has commissioned KTH to organise a pilot project involving bridging teacher training programmes leading to a Bachelor or Master of Science in Education. The purpose of this pilot project is to increase the number of qualified and licensed teachers in schools by enabling a broader target group of people with a previous university degree to study to become teachers through a bridging teacher training programme. This programme shall be organised in accordance with the provisions of the ordinance regulating pilot projects involving bridging teacher training programmes leading to a Bachelor or Master of Science in Education.

The bridging teacher training degree programme comprises 60 higher education credits and leads to a Degree of

Master of Science in Secondary Education in technology and mathematics. Admission to the programme required completion of professional qualifications or a general first cycle degree. This programme is delivered in part as a distance learning course, with some face-to-face meetings at KTH. One third of the programme consists of school placements.

In 2022, there were 39 first choice applicants for the programme. 8 students started the programme at the beginning of the autumn semester, of whom 38 per cent were women and 62 per cent men. 6 students were still partially active in December 2022. The partial distance form of study should make it possible for students who do not live in Stockholm to study the programme, but no students from outside Stockholm have started the programme this year. All students have previously studied at KTH, too. Otherwise, there is a spread of age and previous professional experience among the students.

#### ***Bridging teacher training programmes for individuals with third cycle qualifications***

The government has commissioned KTH and Stockholm University to organise KPU for people with third cycle qualifications. KTH offers bridging teacher training programmes for the Degree of Master of Arts/Science in Education in mathematics, natural sciences and technology for people with third cycle qualifications. Students admitted to the programme have the opportunity to receive a special doctoral grant during their studies. The number of places on the programme is determined by the allocation of doctoral grants, which is limited to an average of 70 students per year on a national basis. The programme comprises 90 higher education credits and is run at an accelerated pace over 12 months.

The assignment is limited in time. It was initiated in 2016 and was initially intended to continue until mid-2021. An extension was decided in spring 2021. The programme was adapted to the revised Degree Ordinance, and a new cohort of students started in January 2022. The number of applications was low. Of the 30 places reserved for Stockholm, 14 students started their studies. Several of them have discontinued their studies during the year, usually because they found a job or were awarded research funding. The initiative will continue until the end of 2026, with the programme starting annually in January. 4 (18) students have graduated from the programme in 2022.

#### **Recruitment of students to KTH's first cycle programmes**

KTH's ambition is for technical education to be emphasised as a natural choice for young people who want to contribute to the sustainable development of society. The personal encounter between KTH representatives and prospective students is prioritised in the recruitment process. This is mainly done through what are known as student ambassadors, about 45 in number, who are KTH's representatives

in meetings with upper secondary school students. They represent most KTH study programmes and campuses. The student ambassadors reflect the diversity of KTH in terms of gender, geographical origin, ethnicity and social background. Ambassadors are selected with great care, and the ability to inspire young people is a high priority. All student ambassadors undergo training that includes communicating with young people, presentation techniques, student recruitment messages, target group knowledge and one-on-one coaching.

In 2022, KTH's student ambassadors conducted 76 student recruitment meetings with upper secondary school classes by visiting upper secondary schools, and when upper secondary school students made study visits to KTH. These activities were still affected by COVID-19 restrictions at the beginning of the year, and nine of the student recruitment meetings were held online. By way of comparison, in a typical recruitment year there are 120 to 150 student recruitment meetings.

The KTH website and face-to-face meetings, such as visits to upper secondary schools, are the most important channels for reaching the target group before they choose their programmes. The website, together with other digital initiatives such as social media, are important as a way of creating the opportunity to make KTH accessible to more people, regardless of where they live. The website was restructured in 2022, creating separate access points for prospective students and for target groups interested in continuing professional development and lifelong learning. This has made relevant information easier to find.

Every year, KTH organises an Open Day to provide information about KTH's programmes in the learning environment. The Open Day was conducted online in 2022 due to COVID-19 and great uncertainty about the restrictions applicable to major events. Programme-specific videos were produced prior to the Open Day and prospective students had the opportunity to obtain information and ask questions of teachers, study counsellors and other staff at KTH via a chat facility. Videos and the Ask a KTH student function were highlighted when physical events were cancelled.

About half of the participants in KTH's student recruitment activities are women. The gender distribution is also equal in KTH's direct target group, second and third year upper secondary students studying natural sciences and technology. One of KTH's challenges is that some educational environments and programmes have a major imbalance between men and women. Efforts to recruit women have therefore focused to some extent on the educational environments and programmes with the greatest gender imbalance.

Since 2021, KTH has been running an initiative entitled Fill the Gap to increase the number of female students in computer engineering, IT, electronics, mechanical engineering, vehicle engineering, engineering physics and technical mathematics. Fill the Gap is a further development of the initiative previously known as Giants. A digital inspiration

event was organised in 2022, consisting of a live broadcast with inspirational speakers. The event also included separate digital rooms where participants could get information and ask questions about specific programmes and student life at KTH. The digital inspiration event was attended by 150 prospective students.

KTH is working to increase the knowledge and interest of children and young people in technology, natural sciences and mathematics and create an understanding of how these subjects are necessary for the transition to a sustainable society. The House of Science is the hub for this work, and reaches a large number of students every year thanks to its activities. The House of Science is run by KTH and Stockholm University together with the City of Stockholm as a long-term partner. For instance, during the year the House of Science offered supervised activities in biology, physics, chemistry, mathematics and technology in well-equipped laboratories at the AlbaNova University Centre and the Bergianska trädgården botanical garden. The supervisors are often students from universities who act as role models for the students. In 2022, the House of Science has also offered continuing professional development for teachers and weekend and holiday courses for young people, and hosted events such as Teknikåttan and European Researchers' Night.

### **Recruitment of students to second cycle study programmes**

According to KTH's development plan, an international presence is essential for KTH and qualified students should be recruited both nationally and internationally. A large number of fee-paying students is a measure of KTH's strong position on an international level, and further efforts must be made to strengthen recruitment efforts in this regard. International degree programme students are mainly found in KTH's 60 or so one and two-year Master's programmes, all of which are taught through the medium of English.

### **Focus during the year**

KTH has attracted an increasing number of qualified international applicants to its Master's programmes in recent years, making it possible to select the most qualified students. Slightly fewer non-European students admitted were able to come to KTH due to the restrictions and obstacles imposed by the pandemic. Conditions were more favourable in 2022, and KTH was back to the same level of fee-paying international Master's students as before the pandemic.

KTH is participating in two national cooperation projects where one of the aims is to recruit international talents to Sweden. One of the initiatives is SIREUS, which is coordinated by the Swedish-American Chamber of Commerce. This initiative is in a start-up phase, and the ambition is to market Swedish education to American students. Furthermore, KTH has been participating in a similar initiative with South Korea

for a couple of years now, where KTH, together with a couple of other Swedish universities, cooperates with the Swedish Embassy in Seoul. This project has conducted a number of digital activities during the year to meet and support Korean students during the application period. KTH also participated in a Study in Sweden event in Seoul during a delegation trip for the participating universities.

A major target group survey aimed at admitted Master's students was conducted in the autumn in cooperation with a communications agency. This survey has been conducted every two years since 2014. This year's results showed that respondents mainly learned about KTH through search engines, ranking lists, web portals and family and friends. The main reasons for applying to KTH were programme content, KTH's ranking, the programme's good reputation and the attractiveness of Stockholm and Sweden. The most common reasons for admitted students not starting their programmes at KTH are that the cost of tuition fees is too high and that they have been admitted to another university, usually another prominent technical university in Europe. A significant proportion stated that the pandemic or financial crisis in their home country prevented them from starting their programme at KTH. Furthermore, KTH's communication with the students had developed positively as the communication channels received good ratings, and respondents indicated to a greater extent than before that they were satisfied with the answers to their questions before they arrived.

### **Activities to raise awareness of KTH**

Investments have been made in digital advertising for all Master's programmes in order to reach out to prospective international students who are not already familiar with KTH. This initiative is evaluated and adapted on an ongoing basis in order to reach the right target group in a cost-effective manner. A separate advertising campaign has been targeted at prospective female students in order to achieve a more equal gender balance.

KTH has participated in a large number of fairs and events during the year, both online and physical. The quality of the digital platforms has been strengthened during the pandemic, and in total KTH participated in about twenty virtual fairs aimed at all major markets in cooperation with the Swedish Institute and other stakeholders. In addition, digital events were organised, under KTH's own auspices, for around 20 partner universities and other partners. In the autumn, participation in physical fairs and university events resumed and delegates travelled to Indonesia, Thailand, India, South Korea, Chile and Mexico. Participants at all fairs and events have the opportunity to register their interest in receiving further information from KTH, and these contacts are followed up through regular newsletters.

Social media communication is constantly being developed in terms of both content and choice of channels. During the

year, particular emphasis was placed on providing daily insights into KTH's education and student life with the help of student ambassadors via Instagram and Chinese channels, for example. For a number of years, KTH has been working on communication on Chinese social media as students in China cannot view the larger international channels. KTH uses recruitment agents in Indonesia, Thailand and Vietnam as a complement to other initiatives in these countries. All agents work on a commission basis. Of the new students registered in 2022, 4 (18) were recruited via agents.

KTH has several partnership agreements with scholarship organisations, mainly in Latin America and Indonesia. This makes it easier for student groups in the countries concerned to fund their studies at KTH. It also increases KTH's visibility in the regions.

As in previous years, KTH students have been hired to communicate with prospective students. Students from virtually all two-year Master's programmes are engaged to answer questions regularly, contact admitted students, contribute content to social media and participate in digital fairs and events. The opportunity for contact with existing students was evaluated positively in this year's target group survey aimed at admitted Master's students.

Communication with applicants and admitted Master's students.

#### ***Communication with applicants and admitted students***

Recruitment work continues until the admitted students begin their studies at KTH, and so communicating with them and supporting them until registration is a priority.

KTH has offered around 20 webinars for prospective international students throughout the recruitment cycle. Topics have included a presentation of KTH, Master's programmes in various subject areas, frequently asked questions in connection with application, and preparations prior to arrival. Following the webinars, there was an opportunity to chat with staff and student ambassadors. The concept was developed during the autumn to be even more interactive, as participants could enter smaller digital rooms and communicate directly with staff and students from the various Master's programmes. These webinars have been recorded and are available on YouTube and the KTH website.

When international students received their admission notifications in April, a digital initiative was launched where admitted students could ask questions and chat with staff and student ambassadors. Groups were also created on social channels where participants can access information and connect with one another. Admitted students are also sent regular newsletters containing up-to-date information and tips for what to do when they arrive.

As in previous years, digital meetings were arranged with students from different countries or regions, with the opportunity to interact with responsible administrators, graduates and KTH students from the region.

#### **Activities funded by tuition fees**

Activities funded by tuition fees bring in a large number of students with non-European educational backgrounds and help to promote diversity and internationalisation in the education and study environment at KTH. These activities also influence the planning of courses and study programmes, which means that discussions on the dimensioning of education, particularly at second cycle level, have to be ongoing. There are also requirements for customised processing and support regarding fee and grant management and cooperation with relevant public authorities, for example.

KTH has built up a good knowledge of interest in degree programmes among applicants required to pay tuition fees and their opportunities for taking part in them. In 2022, COVID-19 was still a factor affecting students' ability to start their studies in Sweden. The high number of applicants to KTH's programmes meant that the total number of fee-paying students in 2022 was higher than in 2021. Fewer people applied for deferment of the start of their studies or a refund of their tuition fees. A total of 12 (21) admitted fee-paying students applied for deferment of the start of their studies for the 2022 autumn semester. The number of admitted students requesting a refund of tuition fees was lower than last year, 60 (75).

KTH has made efforts to recruit qualified international students since fees were introduced. As the volume of KTH's activities for fee-paying students increases, so do student services and orientation activities, both at the schools and centrally at KTH.

KTH offers fee-paying students comprehensive support from admission to registration, the majority of activities being aimed at all international students. When issuing admission notifications, KTH organised an Admission Weekend to provide information and answer questions before students embarked upon their studies: see the section entitled Communication with applicants and admitted students.

In cooperation with THS, KTH organises arrival and induction services for all international students before the spring and autumn semesters. During special orientation days, students are offered a lift from Arlanda to KTH Entré, where they can take out a contract for accommodation and receive services and information. In 2022, this induction also included digital school meetings, a digital orientation ceremony and social and digital activities organised by THS.

As well as the basic arrival and induction services, students who paid tuition fees are offered guaranteed accommodation, free primary healthcare, extended insurance cover and preparatory courses in English and Swedish.

The activities funded by tuition fees already have an accumulated surplus. The outcome for 2022 is negative, which is due to the continued investment in excellent educational environments and continued identification of expenses within support. The organisation has an accumulated surplus of SEK 34 million at the end of the year, compared to SEK 40 million at the end of 2021.



The following tuition fee levels apply to programmes starting in the 2021/2022 or 2022/2023 academic year. The fee for first cycle courses and study programmes and Years 1 to 3 of the Master of Science in Engineering programme and the Master of Arts/Science in Education programme is SEK 122,000 per academic year. The fee is SEK 205,000 per academic year for architectural programmes (Years 1 to 3) and first cycle courses in architecture. The fee is SEK 260,000 per academic year for Years 4 and 5 and second cycle study programmes and courses in architecture. The tuition fee for other second cycle study programmes and courses is SEK 155,000 per academic year. Study programmes delivered in cooperation with other universities may have different fee levels.

### Cooperation with the Swedish Migration Agency

Communication with the Swedish Migration Agency largely takes place via a central functional address at KTH. The Swedish Migration Agency also has direct contact with administrators at KTH on certain issues.

KTH tells students what rules apply when applying for residence permits and, if necessary, acts as a link between the student and the Swedish Migration Agency. When the Swedish Migration Agency receives an application for a residence permit, the student's tuition fee status is checked. If the student is required to pay tuition fees, the Swedish Migration Agency checks against KTH's study documentation system to ensure that the tuition fee has been paid.

KTH has been in contact with the Swedish Migration Agency when necessary during the year. Processing times for residence permit applications in 2022 have been generally acceptable for new incoming students. One challenge was that the Swedish Migration Agency was unable to produce residence permit cards for a few weeks in July 2022. The Swedish Migration Agency informed students and universities via its website. This caused a delay in subsequent administrative processing for KTH. A persistent problem in 2022 has been the fact that students as part of partnership agreements who are only studying the second year of their programmes at KTH are allowed a twelve-month residence permit at most, and so cannot get a Swedish personal identity number. This creates problems for students in their day-to-day lives, and means increased administration for KTH.

The pilot project involving two-year residence permits and study intentions that was initiated by SUHF and the Swedish Migration Agency in 2019 has continued and been extended until March 2023. KTH has participated in the project. In 2020, the Swedish Migration Agency and the universities participating in the project implemented a procedure for reporting back to the Swedish Migration Agency, which has made it possible to grant two-year residence permits. The Swedish Migration Agency has carried out random checks in 2022 to find out whether the universities in the pilot project have correctly reported interrupted studies among students. There were no observations for KTH. The project is

continuing to work on analysing applicants' study intentions.

On 1 November 2022, the Swedish Migration Agency introduced new rules on how passports are checked when someone applies for a residence permit. This decision was unexpected and has major consequences for KTH as an international stakeholder, and for the university's recruitment of international students. A negative effect can be seen for activities related to exchange studies immediately before the spring semester of 2023, and also for outgoing students. Exchange agreements have to be reciprocal, and so this means that if a student who planned to travel to KTH on an agreement with a university in the US, for example, is unable to do so because of new visa rules, KTH cannot send a student on that agreement either.

### Demand for KTH study programmes

Demand for KTH study programmes leading to a professional qualification remains high. The total number of first choice applicants for these programmes in 2022 was 6,265 (6,713). The number of planned beginner places was 2,605 (2,595): see the section on Beginners.

The most sought-after study programmes were, as before, architectural studies with 1,043 (1,146) first choice applicants, Master of Science in Engineering with 715 (690), industrial economics with 673 (681) and engineering physics with 403 (410). The highest number of first choice applicants among the Bachelor of Science in Engineering programmes was in civil engineering and design, with 203 (363).

KTH has an English-language first cycle programme, the Bachelor's programme in information and communication technology. In 2022, the programme had 1,021 (856) first choice applicants. There were 570 (384) first choice applicants in the national admissions round and 499 (508) in the admissions round for English-language programmes, of whom 48 (36) people applied in both admissions rounds. This shows a continued strong interest in English-language programmes at first cycle level.

The number of applications for one and two-year Master's programmes taught through the medium of English remains high. Of the 24,325 (24,133) online registrations for the English-language second cycle programmes for the 2022 autumn semester, 18,835 (18,187) came from fee-paying students, of whom 6,411 (6,528) paid the application fee.

KTH coordinates admission to two of the two-year Master's programmes offered within the framework of the European Institute of Innovation and Technology (EIT). One is a seven-track umbrella programme provided by EIT Digital, and the other is a one-track programme provided by EIT Urban Mobility. Students on the programmes study at two of the affiliated partner universities, one of which may be KTH. Admissions to EIT Digital and EIT Urban Mobility are managed through the EIT's admissions portals.

The EIT Digital programme received a total of 671 (1,028) applications. This decline may be due partly to the effects of

COVID-19, and due to the introduction of an application fee by EIT Digital for admissions in 2021. The EIT Urban Mobility programme received a total of 315 (211) applications. See also the section entitled International cooperations.

The technical preparatory year is a one-year qualifying programme aimed at students who have not achieved full eligibility for KTH study programmes during their upper secondary school studies. The preparatory year provides bridging education at upper secondary level in mathematics, physics and chemistry. Students are offered the opportunity to start qualifying programmes in both the autumn and spring semesters. Until 2022, it was also possible to apply only for the second semester of the preparatory year, which was particularly suitable for students who had pursued the upper secondary school technology programme. Successful completion of KTH's preparatory year or preparatory semester allows students to apply for specially reserved places on any of KTH's Master of Science in Engineering, Bachelor of Science in Engineering or Master of Science in Education programmes.

The technical preparatory year and semester had a total of 1,574 (1,731) first choice applicants in 2022. One reason for the decrease is that no admissions were made to the qualifying programmes that were partly delivered remotely: see the section on Government education initiatives.

Admission to KTH study programmes takes place in nationally coordinated admissions rounds in the joint admissions database for higher education in Sweden, which is managed by the Swedish Council for Higher Education.

### Alternative selection

In the 2022 autumn semester, KTH has used the mathematics and physics exam and the architecture exam as an alternative selection for up to one third of the places on a number of Master of Science in Engineering programmes and the architecture programme. 41 (46) applicants were admitted to the Master of Science in Engineering Physics programme, 8 (7) to the Master of Science in Electrical Engineering, 5 (3) to the Master of Science in Vehicle Engineering, 18 (21) to the Master of Science in Engineering Mathematics and 1 (1) to the Master of Science in Materials Design in the selection group for the mathematics and physics exam in selection two. The architecture programme admitted 55 (34) applicants from the selection group for the architecture exam in selection two.

### Separate admissions of fee-paying students

Universities and higher education institutions have the option of admitting fee-paying students in a separate selection group. KTH has applied this to the English-language Bachelor's and one and two-year Master's programmes.

An assessment is made of how many fee-paying students KTH has the capacity to accept, based on KTH's financial scope for beginners with direct government funding. Prior knowledge should be equivalent for applicants admitted from both selection groups, as they are integrated into the same

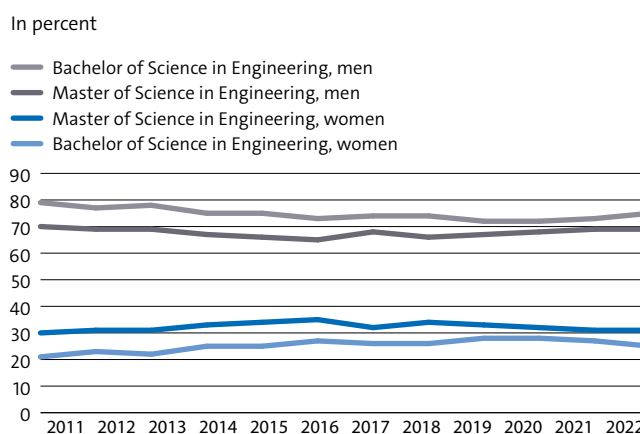
programmes. In 2022, the number of fee-paying applicants admitted with separate admission to these programmes was 1,659 (1,759). The corresponding number for non-fee paying applicants was 1,016 (1,054).

### Assessment of real competence

KTH has a focus group that works with applications and questions regarding validation of prior learning. In 2022, KTH has been a referral body for SUHF and participated in an information meeting for Ukrainian students within the framework of the EU Temporary Protection Directive. A review of the KTH website was carried out during the year, which helped to clarify information regarding prior learning and validation for admission and credit transfer.

KTH has noticed an increased awareness among the general public – regarding both national and international students – of the possibility of validating prior learning. This is reflected in an increased number of enquiries received by email and telephone calls, how questions are formulated and the higher quality of applications for prior learning made in connection with admission and credit transfer. See also the section on Bridging teacher training programmes.

Figure 1. Gender structure – new female and male students 2011-2022



Source: Ladok

### Beginners

In 2022, a total of 2,742 (2,852) beginners in year 1 began studies on KTH's degree programmes leading to professional qualifications, of whom 117 (114) studied architecture, 1,853 (1,852) studied on the Master of Science in Engineering programmes, 715 (815) studied on the Bachelor of Science in Engineering programmes, 0 (6) studied on the Master of Science in Secondary Education programme and 35 (65) studied on the bridging teacher training programme worth 90 higher education credits, 14 (0) studied on the bridging teacher training programme for education at third cycle level

Figure 2. Total number of new students 2019-2022

	2022		2021		2020		2019	
	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men
<b>Master of Architecture, Degree Programme 300 HE credits</b>	<b>117</b>	<b>46/54</b>	<b>114</b>	<b>60/40</b>	<b>93</b>	<b>61/39</b>	<b>117</b>	<b>58/42</b>
<b>Master of Science in Engineering Degree Programme 300 HE credits</b>								
Biotechnology	82	56/44	85	73/27	79	76/24	76	58/42
Engineering and Education	62	40/60	54	37/63	58	34/66	53	45/55
Computer Science and Engineering	201	18/82	194	21/79	196	19/81	175	18/82
Design and Product Realisation	110	45/55	109	53/47	107	46/54	107	46/54
Electrical Engineering	87	20/80	95	13/87	77	9/91	92	20/80
Energy and Environment	73	47/53	78	49/51	78	56/44	77	61/39
Vehicle Engineering	89	9/91	96	14/86	95	12/88	94	15/85
Industrial Engineering and Management	159	30/70	156	34/66	160	28/72	153	24/76
Industrial Technology and Sustainability	37	32/68	39	18/82	33	39/61	34	38/62
Information and Communication Technology	72	17/83	67	19/81	69	22/78	66	17/83
Mechanical Engineering	136	14/86	145	15/85	146	18/82	138	17/83
Materials Design and Engineering	51	24/76	53	23/77	45	31/69	41	49/51
Medical Engineering	51	51/49	38	55/45	57	44/56	51	59/41
Media Technology	88	43/57	80	31/69	73	36/64	69	52/48
Civil Engineering and Urban Management	190	43/57	172	47/53	176	48/52	163	45/55
Engineering Physics	129	20/80	148	15/85	121	24/76	128	28/72
Engineering Chemistry	66	61/39	73	58/42	75	47/53	61	48/52
Engineering Mathematics	64	16/84	57	18/82	49	23/77	-	-
Open entrance	106	33/67	113	26/74	125	27/73	114	25/75
<b>Sub-total</b>	<b>1 853</b>	<b>31/69</b>	<b>1 852</b>	<b>31/69</b>	<b>1 819</b>	<b>32/68</b>	<b>1 692</b>	<b>33/67</b>
<b>Bachelor of Science in Engineering, Degree programme 180 HE credits</b>								
Constructional Engineering and Design	210	31/69	236	38/62	182	35/65	170	34/66
Computer Engineering	186	17/83	199	17/83	167	20/80	146	23/77
Electronics and Computer Engineering	41	12/88	51	20/80	37	11/89	33	9/91
Electrical Engineering	51	12/88	63	14/86	57	16/84	37	14/86
Industrial Technology and Production Maintenance	16	19/81	18	28/72	28	21/79	23	13/87
Chemical Engineering	47	49/51	51	55/45	46	54/46	46	43/57
Mechanical Engineering	65	12/88	100	11/89	91	20/80	80	28/72
Medical Engineering	42	40/60	37	49/51	32	56/44	24	29/71
Engineering and Economics	57	37/63	60	30/70	52	33/67	50	32/68
<b>Sub-total</b>	<b>715</b>	<b>25/75</b>	<b>815</b>	<b>27/73</b>	<b>692</b>	<b>28/72</b>	<b>609</b>	<b>28/72</b>
<b>Subject Teacher Education in Technology, Secondary Education 270 HE credits</b>	-	-	<b>6</b>	<b>0/100</b>	<b>6</b>	<b>67/33</b>	<b>6</b>	<b>50/50</b>
<b>Supplementary teacher education 60 HE credits</b>	<b>8</b>	<b>38/62</b>	-	-	-	-	-	-
<b>Supplementary teacher education 90 HE credits</b>	<b>35</b>	<b>43/57</b>	<b>65</b>	<b>37/63</b>	<b>61</b>	<b>43/57</b>	<b>29</b>	<b>55/45</b>
<b>Supplementary teacher education for Graduates with a third cycle degree 90 HE credits</b>	<b>14</b>	<b>36/64</b>	-	-	<b>26</b>	<b>50/50</b>	<b>15</b>	<b>55/45</b>
<b>Bridging programme for architects with foreign qualifications</b>	-	-	-	-	-	-	<b>3</b>	<b>67/33</b>
<b>Bridging programme for engineers with foreign qualifications</b>	-	-	-	-	-	-	<b>6</b>	<b>100/0</b>
<b>Masters programmes</b>								
Masters programmes 120 HE credits	2 168	35/65	2 279	38/62	2 380	35/65	2 392	35/65
<i>of which within Master of Science in Engineering programmes</i>	970	33/67	1 122	37/63	1 217	35/65	1 207	35/65
Masters programmes 60 HE credits	41	56/44	66	65/35	52	50/50	73	49/51
<b>Sub-total</b>	<b>2 209</b>	<b>36/64</b>	<b>2 345</b>	<b>39/61</b>	<b>2 432</b>	<b>35/65</b>	<b>2 465</b>	<b>35/65</b>
<b>Bachelors programmes 180 HE credits</b>	<b>120</b>	<b>37/63</b>	<b>119</b>	<b>32/68</b>	<b>119</b>	<b>36/64</b>	<b>123</b>	<b>37/63</b>
<b>University Diploma programmes 120 HE credits</b>	<b>31</b>	<b>19/81</b>	<b>31</b>	<b>35/65</b>	<b>33</b>	<b>45/55</b>	<b>36</b>	<b>31/69</b>
<b>Technical Preparatory Year, Technical Preparatory Semester 60/30 HE credits</b>	<b>776</b>	<b>29/71</b>	<b>1 092</b>	<b>32/68</b>	<b>1 204</b>	<b>35/65</b>	<b>720</b>	<b>30/70</b>
<b>Total</b>	<b>5 878</b>	<b>32/68</b>	<b>6 439</b>	<b>34/66</b>	<b>6 485</b>	<b>34/66</b>	<b>5 821</b>	<b>34/66</b>

Source: Ladok

and 8 (o) on the bridging teacher training programme for secondary education. See Figure 2. The two final years of the Master of Science in Engineering programmes are also two-year Master’s programmes, which means that students studying for a Master of Science in Engineering are registered as beginners on a two-year Master’s programme when they start the fourth year of their Master of Science in Engineering. This does not apply to the Master of Science in Engineering and Education programme, which is a combined five-year programme. 62 (54) beginners started the Master of Science in Engineering and Education programme in 2022.

There were 2,168 (2,279) beginners for two-year Master’s programmes. Of these, 970 (1,122) were already students on the Master of Science in Engineering programme. The one-year Master’s programmes had 41 (66) beginners.

Of the total number of beginners in 2022, 32 (34) per cent were women and 68 (66) per cent were men. On the Master of Science in Engineering programmes in the 2022 autumn semester, 31 (31) per cent were women and 69 (69) per cent were men. Of beginners on the Bachelor of Science in Engineering programmes in 2022, 25 (27) per cent were women and 75 (73) per cent were men. However, the distribution between men and women differs greatly between the various KTH programmes: see Figures 1 and 2. In its development plan for 2018–2023, KTH highlights the fact that women are in the minority for a number of study programmes. KTH is taking several measures to broaden recruitment: see the section on Recruitment of students to KTH’s first cycle programmes.

The median age of beginners studying architecture was 23 for both men and women. The median age of beginners on the Master of Science in Engineering programmes was 20 for both men and women. The median age of beginners on the Bachelor of Science in Engineering programmes was 21 for women and 22 for men. The median age for one and two-year Master’s programmes was 24 for both men and women. The median age for qualifying programmes was 21 for both men and women. The median ages have remained stable over time.

In addition to the admission of beginners in Year 1, some programmes also offer the opportunity to start at a later point in the programme. The number of students from universities other than KTH who started the later parts of a Master of Science in Engineering was 155 (155). The corresponding number for Bachelor of Science in Engineering programmes was 5 (5), for Bachelor’s programmes 0 (3), and for one or two-year Master’s programmes 140 (142).

### Preparatory courses for university following upper secondary school

Online preparatory courses in mathematics and programming have been offered to applicants to technical and scientific programmes in 2022, as in previous years. These courses aim to support beginners and facilitate the transition from upper secondary school to higher education. Work on further

development of the courses has continued during the year according to an evidence-based digital learning model from the international Open Learning Initiative network. The development of new preparatory courses in mathematics and physics began in 2022, also serving as part of KTH’s efforts to broaden recruitment. Going forward, these courses will be able to prepare individuals for the entrance exam in mathematics and physics held annually in May through a cooperation between several of the country’s universities: see the section on Alternative selection.

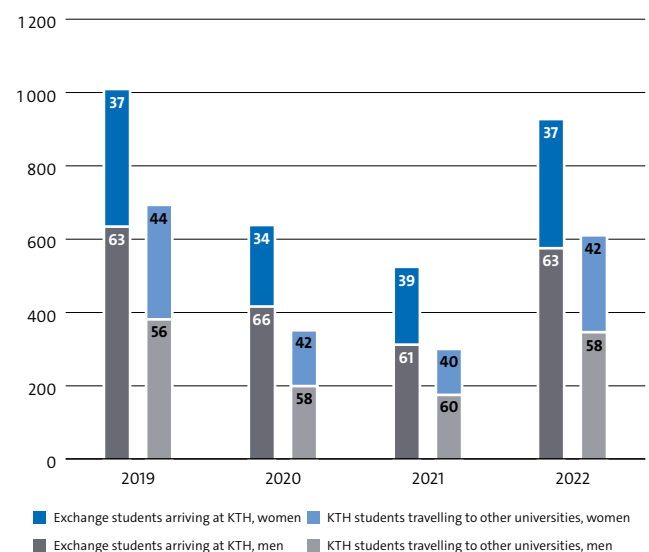
### International mobility

KTH works actively to encourage more students to undertake part of their education abroad. The aim of KTH’s development plan for 2018–2023 is to encourage a large proportion of students to study abroad for at least one semester as part of their study programmes.

607 (296) students started studying abroad in 2022. Mobility is thus almost back to pre-pandemic levels, for both incoming and outgoing students. It should also be recognised that interest in exchange studies within Europe remains higher than before the pandemic. Quarantine rules in some countries outside Europe have acted as a deterrent, while European partner universities have been a stable choice for KTH students during the pandemic. The most common countries for studying abroad in 2022 are France, Switzerland, the US and Italy.

Figure 3. Student exchange 2019-2022

Number of students who began student exchange per year, in absolute numbers and proportion of women and men in percent

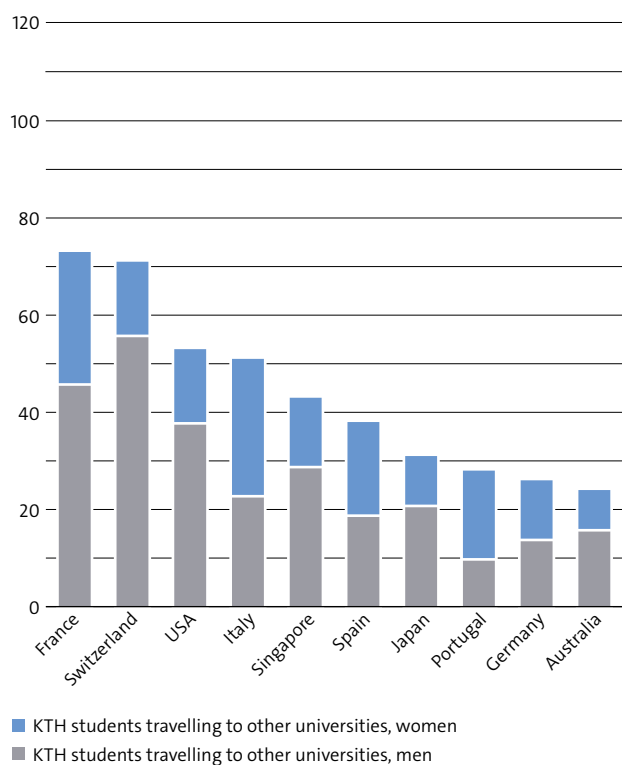


Source: Ladok

There continues to be considerable interest in studying as an exchange student at KTH. 924 (521) exchange students began

Figure 4. Student exchange – most popular countries 2022

Number of students who began student exchange during the year: the most popular countries KTH students travel to



Source: Ladok

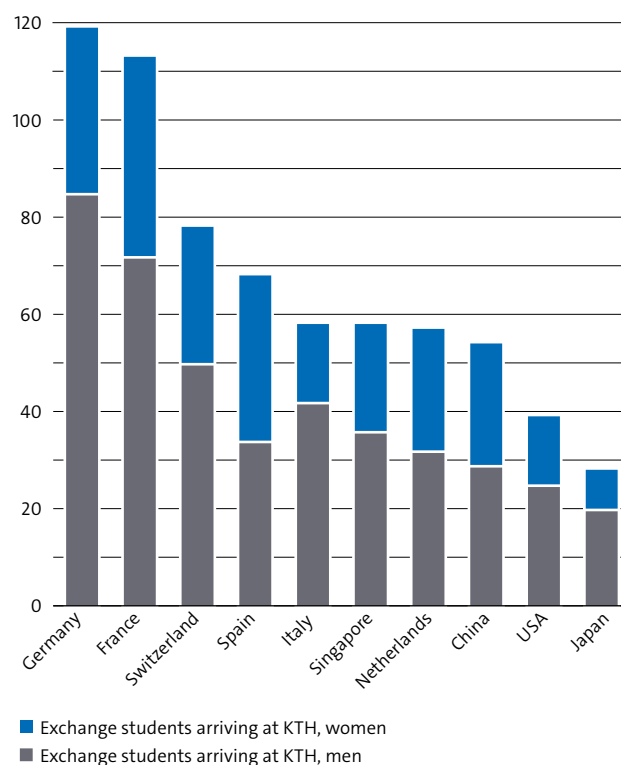
their studies at KTH during the year. Within Europe, most students came from universities in Germany, France, Switzerland and Spain.

Of the incoming exchange students, 305 (87) came from outside the EU/EEA/Switzerland, most of them from Singapore, China, the US and Japan.

In 2022, KTH continued to work on new forms of mobility as a complement to traditional exchange studies. Virtual mobility in the field of energy technology went from a pilot project as part of the Unite! network to a regular activity. Erasmus+ Blended Intensive Programmes are another form of mobility that KTH works with. Short programmes with innovative ways of learning and teaching online are complemented by elements of physical mobility.

KTH Global is the annual event that highlights all the international opportunities offered to KTH students during their studies. The aim is to increase interest in exchange studies and other opportunities abroad. Students spent four days taking part in a live and recorded talkshow about studying abroad, information about opportunities abroad for existing international students, and online and physical

Number of students who began student exchange during the year: the most popular countries exchange students originate from



information meetings at KTH's schools. A well-attended fair was held in parallel in order to highlight the various exchange and international opportunities available to KTH students. Feedback on the various activities has been positive.

### Double degree

In addition to exchange students, KTH has a relatively large group of incoming double degree students under special partnership agreements with universities in Europe and Japan. These students mainly study at second cycle level for 18 months to two years and are then able to obtain a Degree of Master of Science in Engineering from KTH and an equivalent degree from their home university. 149 (130) double degree students began studying at KTH during the year. In 2022, two (two) KTH students began double degree studies abroad.

### Placements

Erasmus placements provide another opportunity for KTH students to gain international experience. 130 (35) KTH students started Erasmus placements at companies or organisations in Europe during the year. The most popular countries are France, Switzerland, Germany and the Netherlands.

### **Minor Field Studies**

Minor Field Studies (MFS) is a Sida-funded programme through which first cycle students have the opportunity to conduct field studies in a low- or middle-income country. As no students were able to receive the scholarship or pursue studies under MFS during the 2021 spring semester because of the pandemic, the scholarships awarded for both 2020 and 2021 could be announced for the 2022 spring semester. 24 students were awarded Minor Field Studies scholarships for the 2022 spring semester. Four of these students declined the scholarship, which meant that 20 MFS scholarships were paid out. Sida has decided to allow the MFS programme to remain dormant going forward, and whether the programme will return in the future is uncertain. KTH intends to make a decision to create its own travel grant for degree projects in low- and middle-income countries, KTH Field Studies, as of 2023.

### **KTH-NOC**

KTH has been working in collaboration with the National University of Singapore (NUS) since 2005 on placements at start-up companies in combination with courses. Five KTH students went to NUS as part of the programme in the 2022 spring semester. 13 students from NUS started the programme at KTH in 2022.

### **Integration initiatives**

The Intensive Swedish for Engineers and Architects (Sfinx) programme in the county of Stockholm has been part of KTH's regular activities since 2011. Its aim is to facilitate entry into the labour market for engineers and architects who have immigrated to Sweden. Sfinx is a cooperation between KTH, the Municipality of Järfälla, the City of Stockholm and the Stockholm County Administrative Board. Sfinx is part of the regional cooperation Swedish for Professionals, Sfx.

Participants spend 18 months learning Swedish, from Swedish for immigrants level up to and including upper secondary level, as well as English. They also have the opportunity to participate in teaching courses at KTH without being registered, and the opportunity to participate in a mentoring programme run by the Swedish Association of Graduate Engineers. One new aspect for 2022 is that the mentoring programme includes Architects Sweden, and that there are mentors who are architects. They also receive information about the Swedish business community and the Swedish labour market. The number of participants in 2022 was 50 (100). The programme has in fact attracted almost 1,350 participants in total. Students' reports are integrated into Swedish lessons and contribute to the grade in Swedish. A high proportion of participants find work during the programme, or after its completion.

KTH has been running a Wallenberg-funded project since 2017, the Software Development Academy (SDA), where new arrivals are rapidly trained in software development using innovative educational methods and cooperation with the

business community. This project has also received funding from the European Social Fund since 2018. The project has trained a total of 352 people, 83 per cent of whom found jobs in the IT sector within six months. The SDA project came to an end in 2022 when the external funding ran out.

A subsequent Erasmus+ project, IncluSTEM, integrates the lessons learned from SDA with other projects from Technische Universität Berlin and Universidad Politécnica de Madrid. Cooperation on language learning and continuing professional development was implemented in 2022 to promote the integration of students with a migration background in higher education. Online courses for university staff on intercultural issues and focusing on the regulatory framework regarding refugees in higher education were attended by participants from all over Europe. The IncluSTEM project will continue until 2023.

### **Bridging programme for architects and engineers who have completed foreign qualifications**

KTH has planned and established supplementary programmes for architects and engineers. These programmes comprise 120 higher education credits and include general vocational courses such as law, social sciences, communication, sustainable development, entrepreneurship and leadership, as well as subject-specific advanced courses. The aim is to provide anyone who has completed a foreign degree programme in architecture or engineering with the supplementary knowledge they need to practise the profession in Sweden. These programmes do not culminate in a degree.

KTH has admitted students to both versions of the study programme in the spring and autumn semesters of 2018 and 2019. 26 architects and 19 engineers embarked upon the study programmes in 2018, which generated 22 full time equivalent students. Three architects and six engineers embarked upon the study programmes in 2019, which generated five full time equivalent students. KTH decided to discontinue admission for studies starting in the 2020 spring semester as there were insufficient numbers of qualified applicants for the programmes.

### **The war in Ukraine and the Temporary Protection Directive**

Due to Russia's invasion of Ukraine in February 2022 and the enabling of the EU Temporary Protection Directive, KTH has taken various steps to support researchers and students fleeing Ukraine within the framework of the university's mission to conduct education and research. See the section on Research.

In April 2022, KTH arranged a physical information event in Ukrainian and English, with general study counselling on the Swedish education system and possible ways to be admitted to education at KTH. This information event attracted around 120 participants, consisting of university students and young people of upper secondary age from

Ukraine. As part of this information meeting, engineering students from Ukraine were given the opportunity to study at KTH as incoming exchange students.

In the spring of 2022, KTH raised over SEK 700,000 for the KTH Ukraine Scholarship Programme through private donations. These funds have been used to provide scholarships to students who have fled Ukraine under the Temporary Protection Directive and applied to study at KTH. See the section on Collaboration.

### Performance

The number of full time equivalent students and annual performance equivalents, offset against public funding, who were studying at first and second cycle level in 2022 totals 12,547 (12,533) and 10,435 (10,570) respectively: see Figure 5 and 7. Some of the examinations for the autumn semester are always scheduled late in December. Besides the outcome for 2022, 510 annual performance equivalents have been registered in 2022, related to examinations that took place in December 2021.

Of the total number of full time equivalent students, 77 per cent were linked to the disciplinary domain of technology and 17 per cent to the disciplinary domain of natural sciences, which adds up to 94 per cent. According to the 2022 public service agreement, KTH had the opportunity to offset a maximum of 141 full time equivalent students and annual performance equivalents against the disciplinary domain of

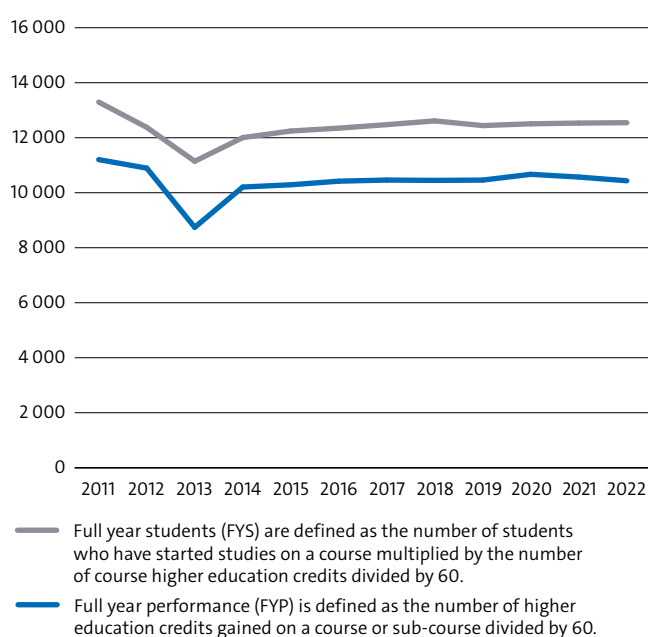
design. However, the design domain included 382 (349) full time equivalent students and 346 (331) annual performance equivalents for 2022. The full time equivalent students and annual performance equivalents in excess of 141 are offset against the disciplinary domain of technology.

The performance indicator for education at first and second cycle level was 83 (84) per cent, calculated as the number of annual performance equivalents in relation to the number of full time equivalent students. The performance rate is remaining relatively stable over time, within the range of 83–85 per cent for the 2019–2022 period. See Figure 7.

The proportion of women among full time equivalent students was 35 per cent and the proportion of men was 65 per cent, which is the same percentage distribution as in the previous two years. The proportion of women on Master of Science in Engineering programmes was 32 per cent, and for men 68 per cent. The KTH Architecture programme has the highest proportion of women: 58 per cent women and 42 per cent men. The proportion of women on Bachelor of Science in Engineering programmes was 27 per cent, and for men 73 per cent.

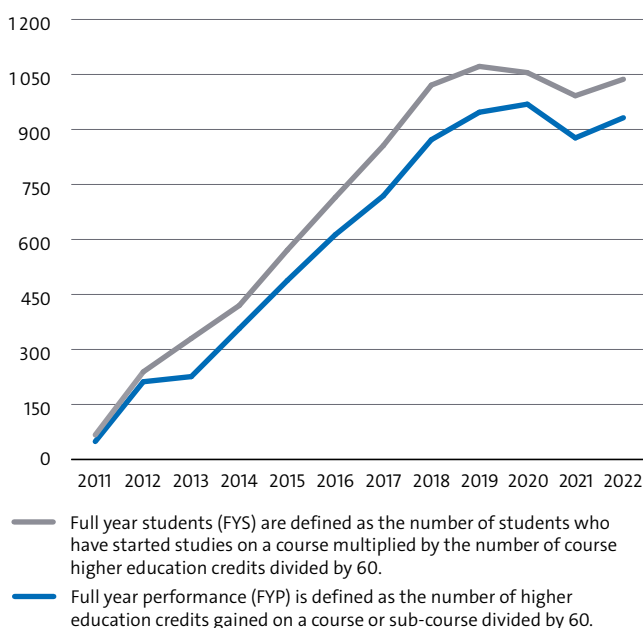
This is therefore the education type with the largest percentage difference between the sexes. The two-year Master’s study programme had 36 per cent women and 64 per cent men. The students for the qualifying programme were 31 per cent women and 69 per cent men. In general, the percentage distribution between women and men has

Figure 5. Full year students and full year performances 2011-2022



Source: Ladok

Figure 6. Full year students and full year performances, fee-paying students 2011-2022



Source: Ladok

Figure 7. Full year students 2019-2022

	2022		2021		2020		2019	
	FYS	Pro-portion (%) of women/men	FYS	Pro-portion (%) of women/men	FYS	Pro-portion (%) of women/men	FYS	Pro-portion (%) of women/men
Master of Architecture, 270/300 HE credits	430	58/42	429	61/39	461	60/40	446	58/42
Master of Science in Engineering 270/300 HE credits	5 076	32/68	5 033	33/67	5 165	34/66	5 371	34/66
<i>in addition, within Master programmes</i>	2 268	34/66	2 392	36/64	2 351	35/65	1 995	34/66
Bachelor of Science in Engineering 180 HE credits	1 600	27/73	1 633	28/72	1 513	29/71	1 511	28/72
Supplementary teacher education 60/90 HE credits	66	38/62	65	40/60	70	48/52	52	49/51
Subject Teacher Education in Technology, Secondary Education, 270 HE credits	6	25/75	9	39/61	5	55/45	2	53/47
Masters Programmes 60/90 HE credits	28	58/42	38	57/43	50	49/51	63	55/45
Masters Programmes 120 HE credits	3 422	36/64	3 519	36/64	3 486	35/65	3 295	34/66
<i>of which within Master of Science Engineering programmes</i>	2 268	34/66	2 392	36/64	2 351	35/65	1 995	34/66
Bachelors Programmes 180 HE credits	263	35/65	262	36/64	272	35/65	261	34/66
Technical Preparatory Year, Technical Preparatory Semester 60/30 HE credits	774	31/69	951	33/67	811	32/68	605	32/68
University Diploma 120 HE credits	45	29/71	54	33/67	61	35/65	59	30/70
Exchange students arriving at KTH	530	38/62	306	37/63	431	35/65	634	37/63
Courses <sup>3)</sup>	307	40/60	234	38/62	184	41/59	143	39/61
<b>Total</b>	<b>12 547</b>	<b>35/65</b>	<b>12 533</b>	<b>35/65</b>	<b>12 507</b>	<b>35/65</b>	<b>12 442</b>	<b>34/66</b>

Source: Ladok

Figure 8. Full year students and performance rate, fee-paying students 2018-2021

	2022		2021		2020		2019	
	FYS	performance rate (%)	FYS	performance rate (%)	FYS	performance rate (%)	FYS	performance rate (%)
Master of Architecture, 270/300 HE credits	0	68	0	479	-	-	-	-
Master of Science in Engineering 300 HE credits	9	67	4	79	7	71	2	36
Bachelor of Science in Engineering 180 HE credits	12	62	5	67	3	71	3	85
Bachelors Programmes 180 HE credits	16	77	16	75	15	93	12	88
Supplementary teacher education 60/90 HE credits	1	167	1	52	-	-	-	-
Masters Programmes 60 HE credits	23	91	16	94	13	99	18	87
Masters Programmes 120 HE credits	973	91	949	89	1 013	92	1 032	88
Courses	1	89	1	107	0	105	0	119
Science without Borders	0	0	0	0	0	0	0	137
Study Abroad Programmes	2	56	0	0	3	98	4	96
Nordig	0	0	0	492	1	105	1	214
<b>Total</b>	<b>1 037</b>	<b>90</b>	<b>992</b>	<b>88</b>	<b>1 055</b>	<b>92</b>	<b>1 072</b>	<b>88</b>

Source: Ladok



Figure 9. First degrees 2019-2022

Education	2022		2021		2020		2019	
	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men
<b>Degree of Master of Architecture 270/300 HE credits</b>	<b>72</b>	<b>60/40</b>	<b>99</b>	<b>57/43</b>	<b>86</b>	<b>55/45</b>	<b>114</b>	<b>57/43</b>
<b>Degree of Master of Science in Engineering 270/300 HE credits</b>	<b>1 134</b>	<b>36/64</b>	<b>1 310</b>	<b>37/63</b>	<b>1 119</b>	<b>37/63</b>	<b>1 150</b>	<b>35/65</b>
Biotechnology	46	70/30	54	70/30	38	55/45	39	64/36
Engineering and Education	34	47/53	27	56/44	27	37/63	35	54/46
Computer Science and Engineering	113	16/84	129	24/76	110	15/85	87	14/86
Design and Product Realisation	73	52/48	84	54/46	85	55/45	91	53/47
Electrical Engineering	58	21/79	62	13/87	54	24/76	63	13/87
Energy and Environment	56	57/43	69	58/42	57	68/32	56	57/43
Vehicle Engineering	94	19/81	116	16/84	92	14/86	100	15/85
Industrial Engineering and Management	120	39/61	151	36/64	132	35/65	140	37/63
Information and Communication Technology	32	22/78	47	28/72	35	37/63	34	18/82
Engineering Chemistry/Chemistry and Chemical Engineering	2	0/100	4	50/50	36	50/50	30	57/43
Mechanical Engineering	112	27/73	141	32/68	109	28/72	123	25/75
Materials Design and Engineering	20	50/50	25	48/52	34	44/56	25	36/64
Medical Engineering	41	56/44	31	58/42	36	58/42	30	57/43
Media Technology	35	37/63	43	63/37	42	48/52	34	38/62
Microelectronics	2	0/100	2	50/50	0	0/0	4	0/100
Civil Engineering and Urban Management	154	45/55	127	45/55	146	50/50	142	53/47
Engineering Physics	93	17/83	120	24/76	77	22/78	98	18/82
Engineering Chemistry	41	56/44	68	49/51	0	0/0	0	0/0
Not within programme/specialisation	8	75/25	10	20/80	9	22/78	19	47/53
<b>Degree of Bachelor of Science in Engineering 180 HE credits</b>	<b>292</b>	<b>35/65</b>	<b>388</b>	<b>32/68</b>	<b>311</b>	<b>30/70</b>	<b>267</b>	<b>32/68</b>
<b>Degree of Master of Science</b>	<b>52</b>	<b>48/52</b>	<b>74</b>	<b>61/39</b>	<b>57</b>	<b>42/58</b>	<b>72</b>	<b>44/56</b>
in Secondary Education, 225 HE credits, 2 teaching subjects	1	0/100	4	100/0	1	100/0	4	0/100
in Upper Secondary Education, 210 HE credits, 1 teaching subject	9	33/67	14	64/36	4	75/25	5	40/60
in Upper Secondary Education, 300 HE credits, 2 teaching subjects	37	54/46	46	54/46	41	34/66	53	45/55
in Secondary Education, 270 HE credits	1	0/100	6	67/33	9	44/56	10	60/40
in Secondary Education, 180 HE credits, 1 teaching subject	4	50/50	3	67/33	1	100/0	-	-
in Secondary Education, 240 HE credits, 2 teaching subject	0	0/0	1	100/0	1	100/0	-	-
<b>Degree of Master of Science 120 HE credits</b>	<b>1 602</b>	<b>36/64</b>	<b>1 894</b>	<b>34/66</b>	<b>1 743</b>	<b>33/67</b>	<b>1 904</b>	<b>33/67</b>
of which also graduated as a Master of Science in Engineering <sup>1)</sup>	519	38/62	704	36/64	636	36/64	661	35/65
of which joint degree	53	32/68	38	47/53	47	41/59	31	48/52
<b>Degree of Master of Science 60 HE credits</b>	<b>70</b>	<b>60/40</b>	<b>73</b>	<b>52/48</b>	<b>74</b>	<b>61/39</b>	<b>106</b>	<b>61/39</b>
<b>Master Degree 60/90 HE credits <sup>2)</sup></b>	<b>0</b>	<b>0/0</b>	<b>1</b>	<b>0/100</b>	<b>4</b>	<b>75/25</b>	<b>2</b>	<b>50/50</b>
<b>Degree of Bachelor of Science 180 HE credits</b>	<b>736</b>	<b>36/64</b>	<b>1 020</b>	<b>40/60</b>	<b>891</b>	<b>34/66</b>	<b>934</b>	<b>37/63</b>
<b>University Diploma 120 HE credits</b>	<b>20</b>	<b>25/75</b>	<b>27</b>	<b>22/78</b>	<b>17</b>	<b>47/53</b>	<b>28</b>	<b>14/86</b>

<sup>1)</sup> This year and earlier.<sup>2)</sup> According to older regulations.<sup>3)</sup> Antal studenter som även har civilingenjörsexamen från programmet civilingenjör och lärare: 2019: 33 st, 2020: 27 st, 2021: 27 st och 2022: 34 st.

Source: Ladok

remained relatively stable between 2019 and 2022. See Figure 7.

In addition to the performances offset against public funding, students required to pay tuition fees have generated 1,037 (992) full time equivalent students and 932 (877) annual performance equivalents in 2022. This corresponds to a performance indicator of 90 (88) per cent for 2022. See figure 8. Besides the outcome for 2022, 47 annual performance equivalents have been registered in 2022, related to examinations that took place in December 2021.

KTH had a total of 1,687 (1,559) fee-paying degree programme students in 2022, of whom 572 (512) were women and 1,115 (1,047) were men. Of these, 157 (208) were scholarship holders funded by Swedish or KTH-affiliated scholarship programmes, corresponding to about 9 (13) per cent of fee-paying students. Of scholarship holders, 59 were women and 98 were men. In addition, there were 14 (8) paying students, 7 women and 7 men, on freestanding courses. The largest proportion of fee-paying students pay their own fees or are funded through scholarship programmes on which KTH holds no information.

## Degrees

A total of 1,134 (1,310) Degrees of Master of Science in Engineering, 72 (99) Degrees of Master of Architecture and 292 (388) Degrees of Bachelor of Science in Engineering were awarded in 2022. KTH awarded a total of 1,602 (1,894) Degrees of Master of Science during the year. 519 (704) of students awarded a Degree of Master of Science were also awarded a Degree of Master of Science in Engineering in 2022 or earlier. KTH thus awarded 1,083 (1,190) Master's degrees to students who had not graduated from KTH with a Degree of Master of Science in Engineering. Degrees of Master of Science were awarded to 70 (73) people. See Figure 9.

Of the 736 (1,020) Degrees of Bachelor of Science awarded, 605 (882) were awarded to students studying on the Master of Science in Engineering programme, and 44 (24) to students on the Architecture programme. The number of students who have completed one of KTH's three Bachelor's programmes or who have graduated with a Bachelor's degree without having followed a degree programme is 53 and 34 respectively.

The trend for students to obtain multiple degrees based on the same studies is continuing, but both the number and percentage have fallen slightly since last year. In 2022, 581 students graduated with one or more additional degrees in combination with a Degree of Master of Science in Engineering. In relation to the total number of Degrees of Master of Science in Engineering, the proportion was 51 (57) per cent.

Women accounted for 36 (37) per cent of students awarded Degrees of Master of Science in Engineering, while men accounted for 64 (63) per cent. The proportion of women awarded Architecture degrees was 60 (57) per cent, and for men 40 (43) per cent. See Figure 9 for gender distribution

within programme types and programmes.

KTH awarded 52 (74) Degrees of Master of Science in Education in 2022. In total, KTH has thus issued 126 teaching degrees between 2021 and 2022, which is equivalent to 63 per cent of the assignment for the entire four-year period. These were issued upon completion of the Master of Science in Engineering and Education programme, or upon completion of a bridging teacher training programme or a bridging educational education for students holding third cycle qualifications. 48 (61) per cent of students awarded Degrees of Master of Science in Education were women, and 52 (39) per cent were men. See Figure 9 and Teacher training programmes.

KTH also awards Master's degrees jointly with other universities. 53 (38) Degrees of Master were awarded jointly with other universities in 2022, of which 12 (7) were awarded to fee-paying students.

## Career support

KTH's career services offer support to students as they make the transition to the world of work. Doctoral students are offered career coaching sessions and seminars. Activities in 2022 have included one-on-one career coaching, reviews of CVs and application letters, lunchtime career development seminars in English and participation in events and fairs. On behalf of KTH, an international student has blogged about her experiences of applying for jobs and degree projects in Sweden. A total of almost 800 students have participated in the various activities. Some activities are online, while others are carried out physically on site. National coordination of career guidance at Swedish universities has begun in 2022. The aim is to exchange experiences and develop the coordination of career support activities.

## Alumni relations

Alumni activities aim to establish and maintain good relations with KTH's former students, and to increase long-term involvement of alumni both in Sweden and elsewhere. The emphasis during the year has been on developing and expanding the mentoring programme so that more students at KTH have the opportunity to meet a mentor and forge ties with working life. The aim has also been to enable more alumni to share their experiences. Over 200 students and alumni have benefited from the programme in 2022. Alumni have also participated as guest lecturers for career counselling purposes and at international events.

Following the pandemic, it has been relevant to rebuild contacts with KTH's international network. A discussion has been held with alumni abroad regarding how alumni activities can best contribute to KTH's activities going forward. This has included visits to France, Germany and the UK for this purpose. KTH's management made a delegation trip to the US in the spring of 2022, also visiting the alumni network in New York.

## Third cycle education

### Recruitment

KTH conducts coordinated advertising for vacant doctoral studentships. The purpose of coordinated advertising is to raise the profile of KTH as both a workplace and a university, thereby increasing interest among potential applicants. KTH advertises vacant doctoral studentships nine times a year.

A total of 263 (264) doctoral studentships have been advertised in 2022. 14,103 people applied, including 3,670 women, 10,409 men and 24 who did not declare their gender. Recruitment to third cycle programmes also takes place after advertising in a different order and also without prior advertising, as is the case for externally employed doctoral students, for example.

### Admissions

196 (293) newly admitted doctoral students began their studies in 2022. Of students who began their studies, 39 (35) per cent are women and 61 (65) per cent are men. Eight per cent of newly admitted doctoral students are admitted with the aim of obtaining a Degree of Licentiate. These comprise 40 per cent women and 60 per cent men. See Figure 10. The number of admissions varies over time. The larger decrease in 2022 may also be due to stricter visa rules, less willingness from external stakeholders to fund projects longer than three years and failure to renew a number of research and education cooperations.

Of the year's new admissions, 18 (25) doctoral students – of whom 17 (36) per cent are women and 83 (64) per cent are men – have their main activities outside the higher education institution and conduct their third cycle education within the scope of their employment and are thus externally employed doctoral students. The employer may be a private or public organisation.

Of the new admissions in education at third cycle level in 2022, 39 per cent – or 76 people – have a qualifying degree from KTH. Of new admissions with a KTH degree, 67 per cent have a Master's degree and 30 per cent have an Master of Science in Engineering. Of the new admissions in 2022, 46 per cent have a degree from a country other than Sweden.

### Degree of activity and study funding

Of all 1,713 unique registrants with some activity in education at third cycle level in 2022, 1,582 doctoral students had an degree of activity of at least 50 per cent and 1,699 had an degree of activity of at least 10 per cent.

At the end of the year, 1,278 – or 73 per cent – of KTH's doctoral students had study funding in the form of full-time or part-time doctoral studentships. Of students with doctoral studentships, 35 (34) per cent were women and 65 (66) per cent were men.

Of the doctoral students, 14 per cent fund their studies through gainful employment related to their study pro-

grammes (externally employed doctoral students), two per cent through other employment at higher education institutions, and six per cent through full-time or part-time scholarships. Four per cent of doctoral students fund their studies, either full-time or part-time, by other means. The majority of doctoral students who fund their studies through scholarships receive these through KTH's cooperation with the China Scholarship Council.

### KTH's doctoral programmes

Doctoral programmes were established in 2011, and there are now 31 of them. Establishment of a doctoral programme is subject to a number of quality requirements in terms of purpose, target group, content, etc. All new doctoral students are admitted to a doctoral programme or a programme offered by KTH in collaboration with one or more partners, in addition to a third cycle subject. The purpose of doctoral programmes is to ensure the quality of the study programme through an organised study structure.

### Student mobility in education at third cycle level

There is a significant international element in KTH's education at third cycle level, which includes many international doctoral students and supervisors. Statistics Sweden, on behalf of the UKÄ, requests information on stays abroad for doctoral and licentiate graduates during the past year. The last survey conducted in 2020 showed that 31 per cent of graduates had spent time abroad as part of their education. KTH should continue its efforts to improve the documentation of doctoral students' stays abroad. There are also opportunities for more doctoral students to spend time abroad during their studies.

### Degrees

250 (258) doctorates and 38 (46) licentiates were awarded in 2022. Of the doctorates awarded, 28 (33) per cent went to women and 72 (67) per cent to men. Of students who completed Degrees of Licentiate, 29 (35) per cent were women and 71 (65) per cent were men. Of this year's doctoral degrees, four (three) were awarded jointly with other universities. See Figure 13.

Completing a Degree of Licentiate as a stage in a third cycle study programme is still relatively common at KTH. Of graduate doctors in 2022, 18 (21) per cent have previously completed a Degree of Licentiate. KTH's assessment is that a technical Degree of Licentiate is highly relevant for employment in industry.

The actual period of study for doctoral students completing third cycle qualifications in 2022 was 4.3 (4.2) years for Degrees of Doctor and 3.2 (2.8) years for Degrees of Licentiate. Women had a slightly shorter actual period of study than men for both doctoral degrees and Licentiate degrees. Programme length is calculated according to the procedures provided by the Ladok student registry.

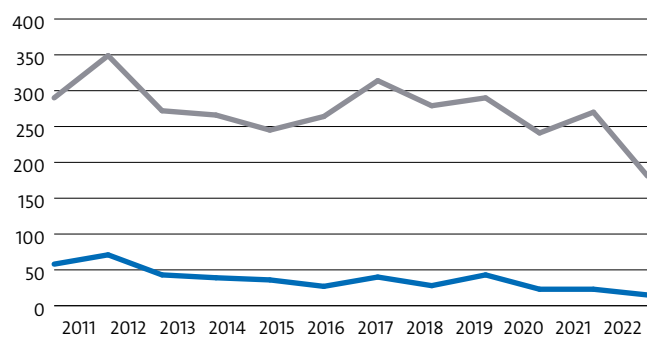
Figure 10. Newly admitted and registered research students 2019-2022

**New students per research field**

Ämnesgrupp	2022		2021		2020		2019	
	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men
Biological Sciences	2	50/50	4	25/75	3	67/33	4	0/100
Computer and Information Science	45	24/76	74	32/68	62	27/73	65	15/85
Economics and Business	0	0	4	50/50	1	100/0	0	0
Electrical Engineering, Electronic Engineering, Information Engineering	22	27/73	42	17/83	29	17/83	47	30/70
Philosophy, Ethics and Religion	1	0/100	1	100/0	1	100/0	0	0
Physical Sciences	14	50/50	14	36/64	18	22/78	24	33/67
History and Archaeology	0	0	2	50/50	1	100/0	3	67/33
Health Sciences	2	100/0	9	67/33	6	67/33	3	67/33
Industrial Biotechnology	24	42/58	20	60/40	16	63/38	23	52/48
Chemical Sciences	11	64/36	5	40/60	8	38/63	9	22/78
Chemical Engineering	20	55/45	29	45/55	16	56/44	28	71/29
Arts	4	50/50	2	100/0	1	100/0	7	71/29
Mechanical Engineering	10	30/70	25	20/80	36	17/83	42	45/55
Mathematics	8	25/75	10	30/70	19	16/84	7	14/86
Materials Engineering	13	31/69	18	22/78	21	38/62	36	31/69
Medical Engineering	3	67/33	3	33/67	0	0	0	0
Environmental Engineering	5	60/40	1	100/0	1	100/0	2	0/100
Civil Engineering	12	50/50	26	31/69	21	29/71	23	35/65
Educational Sciences	0	0	4	75/25	4	75/25	10	90/10
<b>Total new research students</b>	<b>196</b>	<b>39/61</b>	<b>293</b>	<b>35/65</b>	<b>264</b>	<b>32/68</b>	<b>333</b>	<b>37/63</b>
<b>Total number of students registered</b>	<b>1713</b>	<b>34/66</b>	<b>1839</b>	<b>33/67</b>	<b>1803</b>	<b>32/68</b>	<b>1841</b>	<b>32/68</b>

Source: Ladok

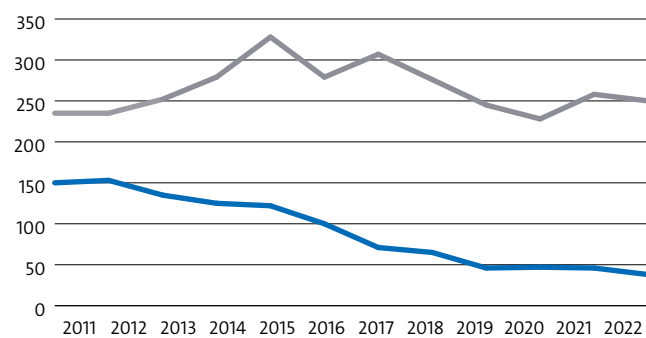
Figure 11. Newly admitted research students 2011-2022



— Newly admitted to research education, 4 years (doctoral degree)  
 — Newly admitted to research education, 2 years (licentiate degree)

Source: Ladok

Figure 12. Licentiate and doctorate degrees 2011-2022



— Doctorate degrees awarded  
 — Licentiate degrees awarded

Source: Ladok

Figure 13. Doctorate and licentiate degrees 2019-2022

## Doctorate degrees per research field

Research field	2022		2021		2020		2019	
	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men
Biological Sciences	2	0/100	4	25/75	2	0/100	2	50/50
Computer and Information Science	34	29/71	26	35/65	19	32/68	28	14/86
Economics and Business	2	100/0	2	50/50	0	0	1	100/0
Electrical Engineering, Electronic Engineering, Information Engineering	27	15/85	44	23/77	37	16/84	36	31/69
Philosophy, Ethics and Religion	2	50/50	1	0/100	0	0	1	0/100
Physical Sciences	27	22/78	22	32/68	12	33/67	18	22/78
History and Archaeology	1	0/100	2	50/50	2	0/100	1	0/100
Health Sciences	4	25/75	8	50/50	4	0/100	5	80/20
Industrial Biotechnology	25	44/56	14	29/71	13	38/62	19	63/37
Chemical Sciences	7	14/86	13	38/62	23	48/52	8	38/62
Chemical Engineering	15	20/80	16	50/50	18	44/56	32	34/66
Arts	0	0	6	50/50	2	0/100	0	0
Mechanical Engineering	33	36/64	35	26/74	33	30/70	29	48/52
Mathematics	12	25/75	9	11/89	8	25/75	10	20/80
Materials Engineering	27	7/93	27	33/67	24	13/87	18	17/83
Medical Engineering	3	33/67	1	100/0	5	80/20	6	0/100
Environmental Engineering	2	0/100	1	0/100	5	40/60	9	33/67
Civil Engineering	26	42/58	27	41/59	16	31/69	21	29/71
Educational Sciences	1	100/0	0	0	5	40/60	1	0/100
<b>Total</b>	<b>250</b>	<b>28/72</b>	<b>258</b>	<b>33/67</b>	<b>228</b>	<b>30/70</b>	<b>245</b>	<b>32/68</b>

## Licentiate degrees per research field

Research field	2022		2021		2020		2019	
	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men	Total	Proportion (%) of women/men
Biological Sciences	0	0	0	0	1	0/100	0	0
Computer and Information Science	2	0/100	3	33/67	2	0/100	4	0/100
Economics and Business	0	0	0	0	1	0/100	1	100/0
Electrical Engineering, Electronic Engineering, Information Engineering	9	33/67	9	22/78	13	23/77	11	45/55
Philosophy, Ethics and Religion	0	0	2	50/50	2	50/50	0	0
Physical Sciences	0	0	1	0/100	2	0/100	2	0/100
Health Sciences	1	100/0	1	0/100	0	0	0	0
Industrial Biotechnology	1	0/100	2	50/50	0	0	1	100/0
Chemical Sciences	0	0	0	0	1	0/100	1	0/100
Chemical Engineering	0	0	3	100/0	1	0/100	3	0/100
Arts	0	0	0	0	1	100/0	1	100/0
Mechanical Engineering	8	25/75	2	0/100	2	50/50	4	0/100
Mathematics	0	0	0	0	2	0/100	1	100/0
Materials Engineering	5	20/80	6	17/83	4	50/50	6	17/83
Environmental Engineering	1	100/0	1	0/100	2	50/50	1	0/100
Civil Engineering	10	20/80	15	40/60	13	31/69	10	30/70
Educational Sciences	1	100/0	1	100/0	0	0	0	0
<b>Total</b>	<b>38</b>	<b>29/71</b>	<b>46</b>	<b>35/65</b>	<b>47</b>	<b>28/72</b>	<b>46</b>	<b>28/72</b>

Source: Ladok

## Programme development

### Future Education at KTH change programme

KTH has implemented extensive changes towards more digital forms of teaching and examination in 2020 and 2021. In 2022, work was in progress on ensuring that KTH's education is designed and implemented to make it relevant to future students, as well as professionals and the business community. This resulted in a decision on 13 principles for Future Education at KTH. These principles apply from 1 July 2022 and will provide a framework for the development of KTH's courses and study programmes.

The implementation of Future Education at KTH is planned to continue in the form of a change programme until 2027. This work is being coordinated by a programme management team as of 1 December 2022.

#### Principles for Future Education at KTH

- **Principle 1: Essential subject knowledge**  
KTH's courses and study programmes are designed to provide both broad knowledge in the subject and specialised knowledge in parts of the subject area.
- **Principle 2: An ability to deal with stubborn problems for sustainable societal development**  
At KTH, courses and study programmes are designed to allow students to develop knowledge and profession-based skills so that they can handle complex and uncertain systems in a changing environment.
- **Principle 3: Active, student-centred learning**  
At KTH, teaching and learning are characterised by student-centred methods and learning activities that achieve long-term, in-depth learning and streamline teaching.
- **Principle 4: Assessment and examination for learning**  
Constructive linking of examination and learning activities is applied at KTH, which enhances goal fulfilment for both course targets and qualitative targets.
- **Principle 5: Open experimental environments**  
Education at KTH is characterised by a high degree of interactive teaching elements and open experimental environments that develop practical professional knowledge and help to promote new approaches, innovative solutions and new ways of working.
- **Principle 6: Vibrant campus**  
KTH's physical and digital campuses are sustainable, accessible and social environments for study and work where proficiencies and professional knowledge are developed, ideas and dreams become reality and innovation is created.
- **Principle 7: User-oriented operational support**  
At KTH, operational support is designed to support management, teachers and researchers in the implementation of the

university's mission to conduct education and research through close collaboration with users.

- **Principle 8: Flexible and structured study pathways**  
At KTH, education is designed to give students the opportunity to have flexible study pathways and to shape the focus of the education on the basis of individual goals and qualification criteria.
- **Principle 9: A stimulating educational culture**  
At KTH, we have a stimulating educational culture where staff and students aim to go on developing. KTH's educational culture means that staff and students venture to try completely new ways of conducting teaching and examination that promote learning, inclusion and renewal and the sharing of experiences with colleagues.
- **Principle 10: Continuous continuing professional development of the role of the teacher**  
At KTH, the role of the teacher is characterised by continuing professional educational and digital development on the basis of a disciplinary foundation and proven educational experience.
- **Principle 11: A management system for quality development**  
KTH has a quality system that promotes the planning, implementation, evaluation and further development of education, that identifies quality deficiencies and that supports everyone active at KTH to help them participate in long-term quality development.
- **Principle 12: Broader recruitment and participation**  
KTH is working actively to attract a student population that reflects society in general, and the courses and study programmes are designed to give each student the opportunity to complete their studies.
- **Principle 13: Integrated lifelong learning**  
KTH's education is designed to facilitate and promote individual continuing professional development and professional adjustment for students and professionals at different stages of their lives.

## National cooperations

Cooperations should help KTH to develop in terms of both education and research. KTH has a large number of educational cooperations on both a national and an international level. KTH has previously developed a regulatory framework that is applied when planning educational cooperations. The university has a preparation group to support the organisation in its work on educational cooperations.

### Stockholm Trio

The University Alliance Stockholm Trio consists of KTH, the Karolinska Institute and Stockholm University.

In 2022, the steering committee has adopted five priority areas for 2022–2024:

- Education. The aim is to develop both joint programmes and independent courses.
- Stockholm Trio for Sustainable Actions. A platform was created in 2022 for work on the 2030 Agenda. This platform is linked to the Stockholm Trio secretariat. Each university has decided to invest SEK 1 million per year in the cooperation for four years, which is followed up annually by the Stockholm Trio steering committee.
- Research infrastructure. This area aims to make research infrastructure more accessible in order to facilitate further cooperation on research and education. This cooperation also provides greater opportunities for any new joint infrastructure.
- Accessibility in terms of physical meeting places and physical communication between campuses. This work contributes to the perception of belonging to a unified campus and facilitates the utilisation of shared research infrastructure. Improved transport routes between campuses are needed, for instance.
- Internationalisation. The Joint Brussels Office is working on the development of responsible internationalisation and the international profiling of universities.

A number of activities linked to the five areas adopted by the steering committee were conducted in 2022:

As regards courses and study programmes, the Alliance's education officers have promoted the development of a new joint Master's programme in biostatistics and computer science, which is scheduled to start in 2024. The Stockholm Trio for Sustainable Actions organised a conference on the topic: Sustainable Planet, Sustainable Health – How Science-Based Solutions Can Drive Transformative Change, together with the Stockholm Environment Institute. This conference was a side event linked with the UN Stockholm +50 environment and climate change conference.

As regards physical meeting places and physical communications, letters have been sent to the City of Stockholm and Region Stockholm in order to arrange meetings with responsible people to discuss solutions for better communications between the campuses.

As regards internationalisation, a renewed five-year agreement has been signed with regard to strategic cooperation between Stockholm Trio and the University of Tokyo. This agreement calls attention to student and researcher exchanges, faculty development activities and joint research.

Cooperation between Stockholm Trio and University College London within the Cities Partnerships Programme 2020–2023 has continued. Climate change and urban health define the theme for this cooperation. Seed funding for cooperation projects was announced in the autumn, and joint workshops were arranged in order to encourage EU applications.

The Brussels Office has collected and distributed information on strategies and policy documents to universities.

There has also been emphasis on following the planning for Sweden's EU presidency and planning activities within the alliance linked to the presidency. With support from the office, KTH Innovation has presented KTH's Innovation Readiness Level in the UniLion network, an informal international network of university offices. A pilot round of an EU course for researchers was held in autumn 2022. This course was provided for researchers with limited experience in an EU context, focusing on how researchers can become more involved in various networks, expert groups and platforms so that they can eventually participate in EU projects.

### Cooperation with university colleges of fine, applied and performing arts

KTH is working to develop its cooperation with university colleges of fine, applied and performing arts. A centre known as Navet, the Hub, was established in 2019 to offer doctoral students, supervisors and researchers a good shared environment. This centre is working to strengthen research in the domains of art, technology and design. KTH, Konstfack (the University of Arts, Crafts and Design), the Royal College of Music in Stockholm and Stockholm University of the Arts all collaborate to form Navet. The Museum of Technology and the Performing Arts Museum are other partners in the cooperation. The centre provides a venue for networking that can initiate and accommodate new research projects that have been scattered across different environments, with support in the form of shared resources for laboratories, equipment, courses and study programmes.

The centre has continued its work with seminars in 2022, and Navet Week took place in December. Work done was presented here through lectures, performances, workshops, exhibitions and installations. Three thematic working groups have also been formed in 2022: Too Light and Too Bright, Music for All, and Arts and Crafts.

### Other cooperations

KTH and Mid Sweden University have been collaborating on Master of Science in Engineering programmes since 2011. This cooperation means that students can continue to pursue certain two-year Master's programmes at KTH after completing the first three years of the Master of Science in Engineering programme for which Mid Sweden University is responsible. 17 (18) students from Mid Sweden University started a two-year Master's programme at KTH in the 2022 autumn semester. After completing the programme, students can obtain a Master of Science in Engineering and a Degree of Master from KTH and a Degree of Bachelor from Mid Sweden University. This cooperation has been developed further, and a joint Master of Science in Engineering in technical chemistry was established in 2020. Eleven students embarked upon the programme in the 2022 autumn semester, and they can then study at Master's level at KTH from the autumn of 2025. These students will spend their first three years of study at Mid

Sweden University for the most part, and the last two years at KTH. This study programme culminates in a joint Master of Science in Engineering from KTH and Mid Sweden University.

The two-year Master's programme in Sports Technology is offered in cooperation with the Swedish School of Sport and Health Sciences (GIH), and 21 students started the programme in the 2022 autumn semester. KTH is also one of Sweden's five national sports universities together with GIH, the cooperation leading to greater opportunities for elite athletes among the student body to combine an elite programme with their university studies.

KTH already cooperates with the Stockholm Trio partners. A two-year Master's programme in Mathematics is being conducted in cooperation with Stockholm University, with 27 (26) beginners in 2022. A two-year Master's programme in Molecular Techniques in the Life Sciences, with 36 (27) students, is being run together with Stockholm University and the Karolinska Institute. There is also a joint third cycle programme in the field of medical technology with the Karolinska Institute. Three doctoral degrees have been awarded during the year as part of this cooperation.

## International cooperations

### Strategic partners and networks

KTH extended its cooperation with the five strategic partner universities in 2022: Nanyang Technological University in Singapore, Shanghai Jiao Tong University in China, the Indian Institute of Technology Madras in India, Hong Kong University of Science and Technology in Hong Kong and the University of Tokyo in Japan.

The partnership with the University of Tokyo also involves with the Karolinska Institute and Stockholm University within the framework of the Stockholm Trio. The President of the University of Tokyo visited Stockholm Trio in June and signed a renewed partnership agreement for the next five-year period. Four research visits to various departments at the University of Tokyo were also held during the year.

In 2022, Shanghai Jiao Tong University has offered the Jiao Tong Global Virtual Classroom, where KTH students have had the opportunity to participate in virtual courses.

As part of the partnership with the Indian Institute of Technology Madras, a trip involving representatives of KTH took place in May to discuss ongoing and future cooperations and student mobility. The strategic partnership has also been awarded Erasmus+ International Credit Mobility funding to support future staff and student mobility. There is also joint supervision of doctoral students.

A pilot programme for joint doctoral students was launched in 2022 together with the Technical University of Denmark, Nanyang Technological University, Shanghai Jiao Tong University and the University of Tokyo, with

a view to strengthening relations with certain partner universities. Seven projects received funding.

KTH continued to engage in international networks during the year, including T.I.M.E, CESAER, Nordic Five Tech and CLUSTER.

### European Institute of Innovation and Technology

KTH currently participates in five of eight consortia in the EU's European Institute of Innovation and Technology (EIT) initiative. KTH participates in ICT (EIT Digital), energy (EIT InnoEnergy), materials

(EIT Raw Materials), health (EIT Health) and transport systems (EIT Urban Mobility) through the EIT's Knowledge and Innovation Communities (KICs). An internal evaluation and review of KTH's involvement in the EIT was conducted at the beginning of the year on account of KTH's strategy for participation in Horizon Europe 2021–2027. This review has considered the development of the EIT and submitted proposals on how KTH's involvement could be adapted in order to strengthen its participation. It can be noted that the KICs have undergone major organisational changes since the start of the cooperation, and the financial frameworks have become narrower.

EIT Urban Mobility admitted its third cohort of students for the 2022 autumn semester. 13 (19) students started at KTH.

Like EIT Digital, KTH is responsible for coordinating the entire Master School. It is thought that interest in the Master's programmes within the scope of the EIT will remain high despite the challenges facing the programmes in connection with the pandemic and changing economic conditions.

471 (701) applicants were admitted to the EIT Digital Master's programme during the year. Of these students, 36 (34) began their studies in Year 1 at KTH. 51 (70) students started their second year at KTH in 2022 after spending their first year at one of the partner universities.

KTH participates in five of the two-year master programmes offered as part of EIT InnoEnergy. In the autumn of 2022, 123 (95) students started their first year and 51 (28) students the second year of their studies at KTH after a year at one of the consortium's partner universities. Student numbers are increasing steadily, despite increases in tuition fees and major cuts in the number of scholarships on offer.

### Erasmus+

As in previous years, KTH has received a large number of mobility scholarships within Europe for studies, placements and staff exchanges. During the year, KTH has also been granted funding via Erasmus+ International Credit Mobility for exchanges with strategic partner universities in Africa and India.

In 2022, the Erasmus+ project component has been reopened for calls. KTH has been granted funding during the year for seven projects within Erasmus+ capacity building,



acting as coordinator for two of them. These projects are aimed at partner universities in Ukraine, the Caucasus and African countries, focusing on sustainable development, climate and digitalisation.

Within Erasmus+ cooperation partnerships, KTH was granted funding for two new projects as a partner.

KTH is a partner in two joint Erasmus Mundus Master's programmes. A total of 19 (22) Erasmus Mundus Joint Masters students were registered in 2022.

### **Unite!**

The University Network for Innovation, Technology and Engineering, Unite!, is part of the EU's major European Universities initiative, which aims to create European university alliances. Its aim is to create a new European university model where students at all levels can shape their degree programmes by means of virtual or physical mobility at any of the seven universities included. The aim of this cooperation is also to create innovative educational methods and harmonised governance models, and to jointly develop models for collaboration with the surrounding community and dissemination of research findings to the same.

A conference, Unite! Dialogue, is arranged twice a year for all parties involved in the various working groups.

KTH organised the conference in June, with around 200 participants attending the three-day event.

The last dialogue for the current project was arranged in Turin in September.

The first Unite! Project, which ran from 2019 to 2022, ended in October. A project application was submitted in March and approved in July. Unite! will now receive funding for another four years, starting in November 2022. The alliance now includes nine members.

### **KTH Global Development Hub**

The KTH Global Development Hub (GDH) supports the development of challenge-driven education at KTH and partner universities in East and Southern Africa. The aim of this is to create innovation skills and innovation by providing relevant solutions that are implemented in society as well. GDH currently has partnerships with three universities in Kenya, Tanzania and Botswana, and is also developing partnerships with universities in South Africa. The student exchange has suffered from cancelled external funding, and no students came to KTH in the spring of 2022. Two incoming exchange students arrived in the autumn of 2022.

A strategy for KTH activities in Africa was established in 2022. The President travelled to all partner universities within the GDH in order to confirm the importance of the cooperation, and to enable and develop further cooperation.

### **China Scholarship Council**

The initiative for creating a project within the Swedish Institute's framework for participation in existing projects as

part of Erasmus+ has had a positive outcome. Teachers and researchers from Ukraine and the Caucasus have therefore been able to participate in study programmes and conferences as part of projects coordinated by KTH.

The Information Support for Quality Higher Education and Research in Uganda project funded by Sida was finalised during the year. KTH participated in the project, part of a Swedish-Ugandan research cooperation, in order to reinforce research capacity and third cycle education at Makerere University in Uganda. Another aim was to reduce poverty and increase sustainable development.

# Research

There is a natural place for basic research and research driven by curiosity at a technical university, alongside applied and operation-related research. KTH conducts world-leading research in a number of fields such as technology, natural sciences, architecture, industrial economics, social planning and learning.

The research community is now more or less back to what it was before the pandemic. COVID-19 has affected a number of research projects, resulting in delays, but has also resulted in the initiation of new research projects and studies on the effects of the pandemic. Operations in 2022 have also been characterised by Russia's invasion of Ukraine, and rapid action has been taken to help researchers from Ukraine.

## External research funding

KTH has a high proportion of external funding, from both the public sector and other stakeholders in Sweden and elsewhere. External funding accounted for about 62 per cent in 2022, while research with direct government funding accounted for about 38 per cent.

## National research funding

KTH's external research funding from Swedish funding bodies is following the same pattern as in recent years. KTH has been successful in obtaining funding from the Swedish Foundation for Strategic Research (SSF) during the year, and also from the Swedish Research Council's major call, which largely supports basic research.

KTH has conducted a large number of activities in the form of seminars, workshops and individual guidance in 2022 in order to increase national external funding. Researchers are back on campus after the pandemic, and a large proportion of activities are now being arranged on campus. The technology put in place quickly during the pandemic allows activities to be arranged online when this is more appropriate, too.

Grant income is made up of grants that have been utilised during the year to fund expenses. Revenue from grants is different to grants awarded, which have a forward-looking and multi-year perspective. Some of the new developments during the year are described below. The amounts indicated are grants awarded.

**The Swedish Research Council** awarded KTH a grant of SEK 263 million in 2022. Most of this funding was awarded as part of the major call for project grants in natural and technological sciences. KTH was the university that received the most projects and the most funds awarded under this call in 2022, with 58 grants awarded totalling SEK 214 million. In the call for consolidation grants in natural and technological sciences, the EECS school was awarded 1 of 7 grants of SEK 10 million for its project on Long-range data transmission in the near field with extensive layering.

**The Knut and Alice Wallenberg Foundation (KAW)** decided in 2022 to provide additional funding to the Science for Life Laboratory, SciLifeLab. SciLifeLab was allocated SEK 25 million for the purchase of sequencing equipment for the period 2023–2027. The cooperation with the Wallenberg Center for Molecular and Translational Medicine, together with Lund University, the University of Gothenburg, Linköping University and Umeå University, was granted SEK 20 million for the Academic Leaders in Life Science programme for the period 2024–2028. SciLifeLab was also granted SEK 10 million for the Science and SciLifeLab Prize for Young Scientists for the period 2023–2028. In 2022, the KAW also decided on final funding to the Human Protein Atlas project, awarding SEK 50 million for the period 2025–2028.

The SCI School was awarded two grants in the Foundation's call for research projects with high scientific potential. The From Atom to Organism: Bridging the Scales in the Design of Ion Channel Drugs project was granted SEK 27 million, while the Light-matter Interaction in the Ultrafast Regime project was granted SEK 25 million. Both projects will run over a five-year period. Two researchers at the SCI School have also been promoted to Wallenberg Scholars, a programme aimed at supporting and encouraging successful senior researchers at Swedish universities. In 2022, researchers at KTH received 8 out of 15 grants in the KAW initiative for outstanding mathematicians.

**The Swedish Foundation for Strategic Research (SSF)** awarded KTH a grant totalling SEK 162 million in 2022.

The EECS school was awarded 3 grants totalling SEK 100 million for the period 2022–2027 as part of SSF's Future Software Systems call, which is a software development initiative. These projects are Härdning och analys av programvaruleveranskedjor [Hardening and Analysis of Software Supply Chains] (SEK 31 million), Hållbar cyber-fysisk mjukvarudefinierad systemklyvning [Sustainable Cyber-Physical Software-Defined System Clustering] (SEK 34 million) and Software Artificial Intelligence for Communications (SEK 35 million).

SSF has appointed Research Leaders of the Future for the eighth time, and two researchers from the CBH School are among the 16 researchers selected. The Hållbar omvandling av biomassa till funktionella föreningar [Sustainable Conversion of Biomass to Functional Compounds] and Hållbar omvandling av biomassa till funktionella föreningar [Polymeric Materials with Environmentally Specific Degradation] projects will run over a five-year period and were granted SEK 15 million each. The EECS School was granted 1 of a total of 7 projects with SEK 15 million over a five-year period in the Research Infrastructure Fellows call. This programme contributes to career pathways for key personnel working with the development and operation of research infrastructure at Swedish universities in SSF's areas

of activity. KTH is participating in five of a total of nine projects awarded funding in the Strategic Mobility call.

**The Swedish Energy Agency** awarded KTH a grant of just over SEK 140 million in 2022. The existing Sunrise project is being coordinated by the SCI School and is shared between research groups at KTH, Luleå University of Technology and Uppsala University. Sunrise is continuing through the Solstice project, which was awarded a research grant of SEK 99 million to build a test reactor in Oskarshamn. The aim of this project is to demonstrate on a pilot scale what is known as a Swedish Advanced Lead Reactor, which is a lead-cooled small modular reactor. This project is a partnership between Swedish Modular Reactors, Blykalla Reaktor Stockholm AB, Sydkraft Nuclear Power AB/Uniper and KTH.

**Vinnova** has awarded KTH funding totalling SEK 134 million in 2022.

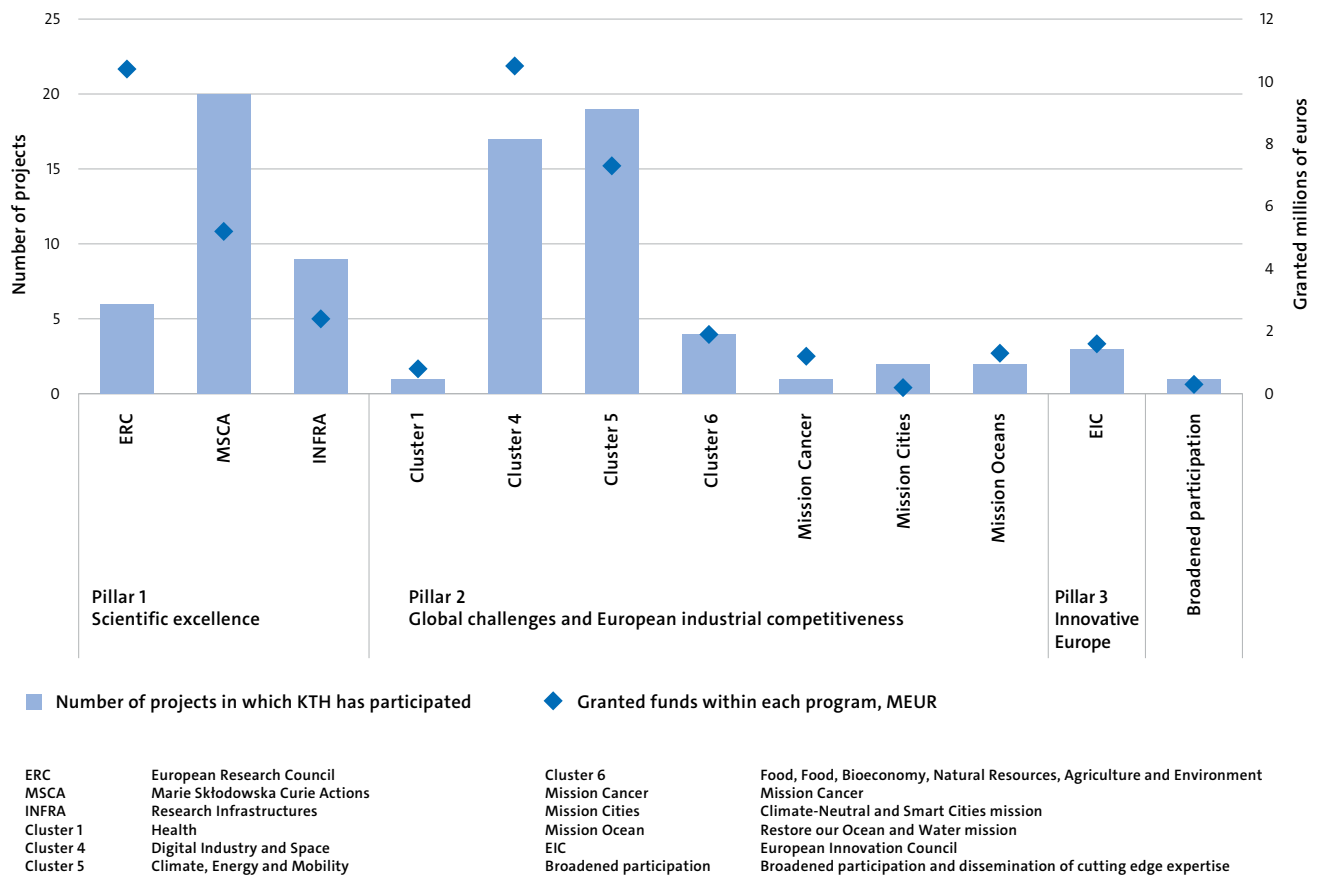
**Formas, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning**, has awarded KTH funding of SEK 89 million in 2022. The ABE School was awarded one of a total of five grants in the Graduate Schools for Sustainable Spatial Planning call, which is an initiative within the framework of the national research programme for sustainable spatial planning. The Graduate School Transformation at the planning interface: Accelerating the sustainability transition at the intersection of urban development and transport planning through reflexive capacity building was granted SEK 40 million.

**International and EU funding, including Horizon Europe**

International research funding accounts for about eight per cent of research revenue. The EU is the largest source of funding. KTH also receives research funding from other funding bodies, mainly in Europe and the US.

KTH has participated in 303 applications in 2022 within the Horizon Europe framework programme, which started in 2021.

Figur 14. KTH's participation within Horizon Europe for 2021 and 2022



Horizon Europe has three main focal points, known as pillars:

- pillar one – Excellent Science
- pillar two – Global Challenges And European Industrial Competitiveness
- pillar three – Innovative Europe

In 2022, KTH was awarded funding for 80 participations worth a total of about EUR 38 million.

Of the projects awarded funding, 33 come under pillar one. Of these, 20 fall under Marie Skłodowska-Curie Actions (MSCA), the EU's researcher mobility programme. KTH has increased the number of participants and the award rate in 2022 compared to the previous year. KTH participated in a total of 61 (59) projects within the programme. Of the projects awarded funding, six are in the field of incoming postdocs, Postdoctoral Fellowships, seven Doctoral Networks projects, five Staff Exchange projects and one Citizens project. The European Commission launched an additional MSCA programme focusing on Ukraine in the latter part of 2022. Two applications were submitted to KTH.

Four grants were awarded under the European Research Council's (ERC) individual pioneering research grant programme. The grants are what are known as Consolidator Grants and provide five-year grants of around EUR 2 million to researchers with the potential to become world leaders in their field. The EECS School was awarded funding for the Intimate Touch: Developing Interaction Design Knowledge and Materials where Technology Touches the Body project, which studies how people interact with technology. The CBH School was awarded funding for its DOSAGE2FUNC, Gene Expression Dosage as a Driver of Cellular and Physiological Traits project, with the aim of developing better drugs to treat genetic disorders. The SCI School was awarded two projects: DEEPCONTROL, which aims to reduce fuel consumption and emissions from air travel by improving aerodynamic performance, and the fitsCAN project, which aims to study different cannulation techniques and placement strategies for haemodialysis or extracorporeal membrane oxygenation treatments where blood is cleaned and oxygenated outside the body.

44 projects were approved under pillar two: 12 in cluster five (climate, energy and mobility), and 10 in cluster four (digital, industry and space). KTH is coordinating seven of the projects awarded grants. KTH was awarded grants for five participations in the strategically focused initiatives on selected societal challenges termed Missions, and twelve participations in the institutionalised European partnerships, three of which as coordinator.

Besides Horizon Europe, KTH has also been awarded funds for participations in other EU instruments such as the Digital Europe Programme (DIGITAL) with three participations, Euratom with eight participations, and the European Defence Fund (EDF) with two participations.

KTH's outcome in Horizon Europe is well in line with the KTH strategy for participation in Horizon Europe. Through the strategy, KTH is also contributing to the goals of the national Horizon Europe strategy, which aims to maximise benefits for Swedish research and innovation.

## Strategic initiatives and special initiatives

### Research centres

Research centres contribute to the development of competitive research environments together with external partners and provide networks for researchers and other stakeholders. These generate collaborative research where different partners agree on a common operational plan and contribute resources for its implementation. KTH has more than 50 research centres. Guidelines for the management of research centres were adopted in 2022 in order to achieve more consistent management within KTH. Some of the new developments for the centres during the year are described below.

The Stockholm Senseable Lab (SSL) was launched in 2019 as a cooperation between KTH, Massachusetts Institute of Technology (MIT) and the City of Stockholm in order to jointly conduct research in sustainable urban development. On 1 March 2022, SSL was established as a centre at KTH with the aim of exploring new dimensions of a smart city together with the City of Stockholm: mobility, energy production and energy efficiency, environmental monitoring, water and waste management, public health and governance models. This centre is funded by partners KTH, MIT, the City of Stockholm, the Stockholm Chamber of Commerce and Newsec.

The KTH Center for Sports Engineering was established as an interim centre for two years, starting on 1 October 2022. Its aim is to use technology to improve sports training and equipment for both professional and amateur athletes. The centre is also focusing on increasing participation in sport across all social groups and making sports infrastructures and events more environmentally sustainable. Partners during the interim period are the City of Stockholm, Region Stockholm, the Municipality of Falun, the Swedish Sports Confederation, Monark Exercise AB and Dalarna University.

The Centre for Advanced BioProduction by Continuous Processing was established in 2017 with funding from Vinnova with a view to developing competitive technology for bioproduction of potent therapeutic products. In 2022, Vinnova made a decision to extend its support by SEK 39 million over the next five years. In addition to this, the industrial partners involved will be contributing EUR 40 million during the centre's new term of office.

The Center for X-rays in Swedish Materials Science was

established in 2019 with funding from the Swedish Research Council, KTH and Linköping University. This centre aims to develop methodologies for increased use of the VR-funded PETRA III beamline at the German Electron Synchrotron DESY research institute in the field of particle physics and synchrotron research. The Swedish Research Council made a decision in 2022 to extend the allocated funds for operation during 2023.

Furthermore, the initiative regarding multidisciplinary environments, initiated by the KTH Board, has resulted in the establishment of KTH Food as an interim centre for three plus two years. KTH Food will develop, integrate and expand existing initiatives across the entire food supply value chain, including sustainable food production and consumption, functional food products for improved nutrition and health, and utilisation of agricultural residues and food waste.

In 2021 and 2022, the Swedish Energy Agency issued a call for competence centres in sustainable energy systems. Three projects in which KTH is a partner were granted funding in the call. Of these, two were centres already established: the Swedish Centre for Sustainable Hydropower led by Luleå University of Technology, and the Swedish Electromobility Centre led by Chalmers University of Technology. The Academic-Industrial Nuclear Initiative, coordinated by Uppsala University, was established as a new centre with a view to achieving a future sustainable energy supply.

### **KTH's involvement in Wallenberg's strategic initiatives**

**Wallenberg AI, Autonomous Systems and Software Program, WASP**, is a research programme that began in 2015. This programme will run until 2031, with funding from KAW totalling SEK 4.9 billion. Linköping University is hosting the programme, and KTH is a partner together with Chalmers University of Technology, Lund University and Umeå University.

The research funded by WASP focuses on autonomous systems and artificial intelligence in vehicles, robots and other systems that will be autonomous and able to cooperate with one another and humans, as well as data-driven artificial intelligence and advanced mathematics that can be used to interpret, analyse and present large data volumes for analysis and decision support in various sectors.

**The Wallenberg Centre for Quantum Technology, WACQT**, is a research centre with funding from KAW of SEK 1.2 billion for the period 2018–2029. This centre is hosted by Chalmers University of Technology. KTH is a partner, together with Lund University, Linköping University and Stockholm University. This centre consists of a main project aimed at building a quantum computer at Chalmers University of Technology and three excellence programmes for different subfields: quantum communication led by KTH, quantum sensing led by Lund University, and quantum computing and algorithms led by Chalmers University of Technology.

**Data-Driven Life Science (DDL)** is a research programme in the life sciences. See the section on Science for Life Laboratory.

**Wallenberg Initiative Materials Science for Sustainability (WISE)** is a research programme in materials science aimed at promoting a sustainable society. KAW will be providing funding of SEK 2.7 billion to WISE between 2022 and 2033, and SEK 270 million has been reserved for the first three years. Linköping University is hosting the programme, and KTH is a partner together with Chalmers University of Technology, Lund University, Stockholm University and Uppsala University.

**Wallenberg Wood Science Center, WWSC**, is a research centre that was established in 2009. WWSC's focuses on making it possible to create new products from Swedish forest raw materials by utilising more of the timber. KAW provided the centre with funding of SEK 160 million in 2022. In 2022, WWSC was granted continued funding totalling SEK 380 million for the period 2023–2028. KTH is hosting the centre, with Chalmers University of Technology and Linköping University as partners.

**The Wallenberg Center for Protein Research (WCPR)** is a research centre with funding of SEK 400 million for the period 2016–2023. This centre is hosted by KTH, with Chalmers University of Technology and Uppsala University as partner universities. The centre focuses on research into proteins and biopharmaceuticals. The aim is to build a leading international knowledge centre for protein research, focusing on the study of human proteins and the production of biopharmaceuticals. The research builds on the infrastructure and knowledge built up in the Human Protein Atlas project.

### **Research infrastructures**

KTH is reliant on access to current research infrastructure in order to conduct cutting-edge courses, study programmes and research. KTH has continued to drive development work in 2022 with a view to providing long-term conditions for strategically important research infrastructures. The opportunities for improvement presented in RAE 2021 within the panel for the evaluation of research infrastructures have been utilised during the year.

The call for the Swedish Research Council's 2023 grant for infrastructures of national interest opened in November 2022, involving processing and coordination between the universities concerned. KTH coordinates two national research infrastructures that are seeking extended funding, the National Genomics Infrastructure and the National Microscopy Infrastructure, and the new initiative Large-scale research infrastructure for ICT systems research. KTH is also coordinating Swedish participation in two projects at CERN,

Atlas and Alice, which are submitting applications for the call. KTH is also participating as a party in several applications.

KTH is a party in three European research infrastructures: EBRAINS, Scientific largescale infrastructure for computing/Communication experimental studies (SLICES) and SoBigData, which in 2021 was included in the roadmap defined by the European Strategy Forum on Research Infrastructures (ESFRI). KTH coordinates Swedish participation as part of EBRAINS, and in 2022 a consortium agreement has been drawn up between the Swedish universities that form a node. Furthermore, KTH has also been coordinating Sweden's participation in the EuroBioImaging European Research Infrastructure Consortium (ERIC) since 2019, where the membership is funded by the five participating Swedish universities: KTH, Stockholm University, Umeå University, University of Gothenburg and Uppsala University.

In 2022, KTH has participated in the Vinnova-funded collaboration project Swedish collaboration for access to lab infrastructure. This project aims to bring together universities and research institutes in Sweden along unified, legal and functional guidelines for making research infrastructure available and how to uniformly implement the new fee regulation for research infrastructures that was issued in 2022.

A workshop was held in the autumn within the framework of Nordic Five Tech on the participating universities' research infrastructures with research on or relating to the Arctic, with the aim of increasing their use and establishing more cooperation.

A number of activities were held within KTH's research infrastructures in 2022. KTH has what are known as established research infrastructures that are of particular strategic importance to KTH. These have long-term plans for organisation, quality development and funding. A call was issued in early 2022, and a decision was made to allocate SEK 50 million to the established KTH research infrastructures so that they could invest in new instruments or upgrade existing ones. A new KTH research infrastructure, KTH Laser Lab, was established during the year, which means that KTH now has twelve established research infrastructures.

### Strategic research domains

KTH is active in ten strategic research domains (SFOs), and is the accountable authority for five. In 2022, funding for the strategic research domains where KTH is the accountable authority amounted to approximately SEK 326 million. In total, KTH as an accountable authority has received almost SEK 3 billion in funding for strategic research domains between 2010 and 2022.

The five national strategic research domains for which KTH is the accountable authority are transport, production, e-science, IT and mobile communication, and molecular bioscience. The extensive funding of the strategic research domains contributes to world-leading and interdisciplinary cooperations between different disciplines and has made it

possible to create a number of world-leading interdisciplinary environments.

KTH's strategic research domains are run in cooperation with other universities or private and public organisations. This is why KTH has signed agreements with constituent partners for each strategic research domain.

**The strategic transport research domain, TRENoP**, is run in cooperation with Linköping University and the Swedish National Road and Transport Research Institute. Several new staff have been recruited to TRENoP in 2022, and a number of doctoral students employed in the environment have graduated. TRENoP involves a multidisciplinary research collaboration on transport, communication and energy systems that includes a number of external partners.

Within the framework of TRENoP, KTH also participated in the Beredskapshänsyn i utveckling och långsiktsplanering av transportsystem [Contingency considerations in the development and long-term planning of transport systems] project, which was led by the Swedish Defence Research Agency.

COVID-19 has affected a number of research projects, resulting in delays but also the creation of new research projects and studies aimed at understanding the impact of the pandemic on transport and changing behaviour.

**Excellence in Production Research (XPRES)**, the strategic production research domain, is run together with Mälardalen University, RISE and the metals research institute Swerim. A new strategic plan for XPRES has been developed in 2022. According to the strategic plan, XPRES will develop and maintain excellence in production research through basic research, education of doctoral students and recruitment of postdocs. The aim is to add value to Swedish industry and society with emphasis on sustainability that spans the fields of circular manufacturing and resource-efficient use.

**The Swedish e-Science Research Center (SeRC)**, the strategic e-science research domain, is run together with Stockholm University, Linköping University and the Karolinska Institute. SeRC research is conducted within what are known as multidisciplinary collaborative programmes.

The aim is to achieve added value through cooperation between strong research environments in applied research, methodology development and infrastructure. SeRC conducts research into modelling of the brain and nervous system, large-scale data analysis and patient data models in medicine, supercomputing software, visualisation, data analysis and machine learning. SeRC researchers have achieved a number of notable results in 2022, such as in machine learning in order to predict how proteins interact, models of how molecules in our nervous system explain signalling, properties of airflow over aircraft wings, and results related to COVID-19.

SeRC has worked to promote international initiatives in computing infrastructure through participation in a number of new projects funded by the European High Performance Computing Joint Undertaking, in particular in respect of the Swedish-Finnish-Swiss LUMI supercomputer in Finland. A large number of SeRC groups have published papers in fields such as life sciences, materials science, fluid mechanics and visualisation in high-profile journals.

**The strategic research domain IT and Mobile Communications** is made up of two parts: Information and Communication Technology – The Next Generation and the Digital Futures Centre.

### Digital Futures

Digital Futures was established in 2020 by KTH, Stockholm University and RISE with the ambition to shape a sustainable society through digital transformation with emphasis on interdisciplinarity and collaboration. Digital Futures research addresses societal challenges in the smart built environment, digitalised industry, health and well-being, cybersecurity and reliability, and connected and cyber-physical systems.

Digital Futures includes around 200 research teams and a research programme that has generated around 100 ongoing research projects to date, as well as mobility and guest research programmes. A partnership programme was launched in 2022, with seven public and private sector partners. The programme helps to bring about increased collaboration and dissemination of research. The programme runs projects in cooperation with partners in areas such as smart building, infrastructure for autonomous vehicles, life cycle assessment and remote rehabilitation.

Several major research projects are conducted within Digital Futures. These projects include digital assistants in elderly care, management of sensitive personal data, smart water distribution solutions, use of satellite data to monitor urban development, and micro-scale programmable robotics.

Ten interdisciplinary research pairs are conducting projects that address a societal challenge from two different perspectives. These societal challenges range from cybersecurity and human-robot interaction to smart packaging and systems in order to optimise renewable energy sources.

In 2022, several new research projects have been launched in the areas of frameworks based on artificial intelligence for harmonising climate policies and projects with the UN Sustainable Development Goals, safety aspects of autonomous vehicles and digital tools for assessing reading comprehension. Two new diversity projects were also launched during the year, focusing on how digital tools can empower children and young people with reading difficulties and make life easier for people with neuropsychiatric disabilities.

The cooperation with the American consortium c3.ai Digital Transformation Institute, where KTH – through Digital Futures – is the first and so far only international

partner, has been expanded. There are now nine projects ongoing in cooperation between KTH, Stockholm University and American universities in the consortium.

### Science for Life Laboratory

The Science for Life Laboratory, SciLifeLab, is one of the government's major investments in research infrastructures in Sweden. SciLifeLab provides a national research infrastructure in molecular life sciences, using advanced technologies and expertise to facilitate cutting-edge research and answer complex biological and medical questions.

SciLifeLab's overall vision is to enable pioneering interdisciplinary research that would otherwise not be possible in Sweden, and to promote research that leads to societal benefits.

The organisation is run by the four founding universities, the Karolinska Institute, KTH, Stockholm University and Uppsala University, as well as via nodes at universities all over Sweden. Cooperation within SciLifeLab is governed by procedural regulations and agreements between the founding universities. Decisions have been made on updated agreements and procedural regulations in 2022.

SciLifeLab has also had an extended assignment from the government, Laboratorieberedskap för pandemier [Laboratory Preparedness for Pandemics], since 2021 in order to coordinate and establish national laboratory capacity that provides Sweden with better conditions for coping with future pandemics. In 2022, work has progressed on building and creating a national network of these capacities.

The direct government funding for SciLifeLab amounted to about SEK 343 million for infrastructure and targeted funds for pandemic preparedness in 2022. SciLifeLab activities are also funded through strategic research domains from SciLifeLab's four founding universities. Funding for strategic research domains amounted to about SEK 166 million in 2022. These funds are helping SciLifeLab to make targeted efforts to further reinforce the local research community at each university.

To contribute to internationally competitive research, the infrastructure's technologies need to be at the forefront and of relevance to the Swedish research community in order to enable and conduct cutting-edge research with global impact. Following the last international assessment of the infrastructure's technologies that was carried out in 2020, a new updated infrastructure and platform structure with constituent service units was launched the following year. In autumn 2022, the updated infrastructure underwent a minor international evaluation to ensure that operations are continuing as intended.

Over the years, grants from KAW have enabled several major investments to be made in SciLifeLab's infrastructure. Funding from KAW made is possible for SciLifeLab to initiate a national COVID-19 research programme and a number of initiatives to address the needs identified as most important in the fight against the pandemic. This was done by promoting

national research cooperations and open data sharing, among other aspects. Increased availability of both analytical methods and expert support for research projects related to COVID-19 in molecular life sciences was made possible through a web portal for sharing collected COVID-19 research data, which was created by the SciLifeLab Data Centre.

Datadriven Life Science (DDLs) was launched in 2021 and is a twelve-year initiative for a national programme in data-driven life science to which KAW is donating SEK 3.1 billion. This programme is coordinated and hosted by SciLifeLab. SciLifeLab is collaborating with the Wallenberg Center for Molecular and Translational Medicine at the University of Gothenburg, Lund University, Linköping University and Umeå University as part of the DDLs programme. Other partners include Chalmers University of Technology, the Swedish University of Agricultural Sciences and the Swedish Museum of Natural History. The programme has been extended in 2022 and has gained momentum, as the recruitment of 16 DDLs Fellows, as they are known, has been completed in the first phase of the programme, out of a total of 20.

Besides the research infrastructure and its users, SciLifeLab's scientific activities include unique research environments with researchers affiliated to SciLifeLab. The research infrastructure, its users and the research community collectively create an ecosystem in which technologies and knowledge are utilised and developed to facilitate competitive research in molecular life sciences in Sweden. SciLifeLab sites have been established in Umeå, Gothenburg, Linköping and Lund in 2022.

The SciLifeLab Fellows Programme is helping to improve the quality of research in the life sciences. This programme is funded by SFO funds at the founding universities where the

admitted SciLifeLab fellows are employed. 29 team leaders were active in the SciLifeLab Fellows Programme in 2022.

More information about activities at SciLifeLab is available in the separate annual report submitted by KTH to the government.

### European Institute of Innovation and Technology

KTH is the main partner in five of the EIT's knowledge and innovation programmes in the fields of information and communication technology, energy, materials, health and mobility. These programmes are called EIT Digital, EIT Energy, EIT Raw Materials, EIT Health and EIT Urban Mobility. This engagement has helped to achieve higher levels of EU funding for KTH and promoted researchers' networking and cooperation with European research groups and industrial partners. An internal review was carried out during the year to better adapt KTH's participation to developments within the EIT.

Within EIT Digital, KTH has participated in innovation projects in fields such as personal data management and environmental monitoring. Within EIT Health, KTH has continued to coordinate the Behealsy doctoral programme. Within EIT Raw Materials, KTH has participated in a number of new scale-up projects. These projects relate to the recycling of magnets and batteries, valorisation of industrial waste and resource efficiency in metallurgical processes. See also the section on Courses and study programmes.

### KTH's research platforms

KTH has six research platforms in the fields of digitalisation, energy, industrial transformation, materials, life science and transport. These research platforms are linked to KTH's

Figure 15. Professors 2022

During the year, KTH appointed professors in the following areas

#### Newly appointed professors (externally recruited)

- Power Electronic Systems
- Wireless Communication

#### Promoted to professor

- Computer Science with specialization in Software Engineering
- Computer Architecture
- Energy Systems and Environmental Assessment
- Fibre and Polymer Technology
- Fusion Plasma Physics with emphasis on Analysis of Experiment Data
- Physics with specialization in Experimental Astroparticle Physics
- Industrial Information Systems
- Materials Technology
- Medical Image Processing
- Metagenomics
- Microbial Bioenergy Production
- Fluid Mechanics
- Science and Technology Studies with Historical Orientation

#### Direct appointed

- Real Estate Law
- Transport Modelling with specialization Policy in Analysis

#### Newly appointed visiting professors

- Mathematics

#### Newly appointed adjunct professors

- Rock Engineering
- Physics with specialization in the Physics of Medical Imaging
- Sustainable Leadership and Systematic Improvement
- Embedded Avionic Systems
- Trustworthy Cyber-Physical Systems
- Resource Efficiency and Environment
- Applied Computational Thermodynamics

Source: HR+



interdisciplinary research domains and aim to promote organisation-wide activities and strategic initiatives in various research domains. In 2022, KTH has organised a large number of workshops, conferences and platform days within the platforms, aimed at both external and internal participants with a view to facilitating and enabling cooperation between KTH researchers and other strategic initiatives within the research domains. Some examples of activities in 2022 are listed below.

During the year, the digitalisation platform conducted a matchmaking workshop that was co-organised with the platform for Life Science for the Health, Medicine and Technology 2022 call that KTH and Region Stockholm have within the framework of the strategic partnership. The Energy Platform has published a popular science anthology during the year in cooperation with the VA (Public & Science) association, which aims to raise awareness of the energy challenges and opportunities of the future. The Industrial Transformation Platform organised this year's Transformation Day on the theme of transformation of the food industry. The Life Science Platform organised the KTH Life Science Day 2022, highlighting the need for theoretical tools and causal models. The Materials Platform has mapped KTH's use of MAX IV, Petra II and various neutron facilities.

## Specific areas of support

### Ethics in research

KTH has continued to develop its ethics and compliance system. This includes offering support on ethical review, handling of sensitive personal data, research funding bodies' requirements, authorship issues and other aspects of good research practice. The Faculty Council's Ethics Committee assesses research projects at the request of researchers and organises lectures and debates. Three research projects were assessed in 2022.

### Export control

KTH has an export control function in order to support researchers with export control classification of technical information in projects. This function also supports the organisation in carrying out due diligence for partners and others. The 2019 inspection by the National Inspectorate of Strategic Products (ISP) meant that new guidelines for KTH's export control work would be formulated and that procedures for the entire organisation would be developed. KTH reported the requested measures in November 2021. In April 2022, ISP announced that KTH was deemed to have implemented the measures specified, and the case was closed without further action.

2022 has seen increased emphasis on export controls, partly due to the entry into force of several new regulations on dual-use items. Increased sanctions due to Russia's invasion of Ukraine, as well as increased sanctions due to the situation in Iran, have also contributed to increased focus on export controls.

## Focus on sustainable production in Södertälje

KTH receives directed funding to operate in Södertälje. The research activities in Södertälje have three specialisations: production management, industrial reliability and production logistics. Operations in Södertälje are conducted in close collaboration with partners Scania, AstraZeneca and the Municipality of Södertälje. A new partnership agreement was signed between KTH and the partners in 2022.

KTH is working in close partnership with Scania and AstraZeneca to recruit more employed doctoral students. Collaboration within the framework of Södertälje Science Park has been further reinforced in 2022 through a number of joint initiatives and projects.

The Department of Sustainable Production in Södertälje and the Department of Industrial Production in Stockholm have merged in 2022 to create the Department of Production Development, a combined stronger environment for production at KTH.

## Publishing and bibliometrics

Publication volume and bibliometric indicators can help to provide a better understanding of a university's research footprint and citation impact. They can also be used for ongoing quality enhancement activities and monitoring. For several years, KTH has conducted an annual bibliometric follow-up that provides an overview of KTH's publications, citation impact and co-authorship with other universities. Figures presented in this section are taken from the annual bibliometric follow-up for 2022.

KTH's publication volume of peer-reviewed articles has remained relatively constant in recent years at between 4,200 and 4,400 articles. The number of articles in journals shows a slight upward trend, while the number of conference papers shows a downward trend. 2020 and 2021 saw the biggest decrease in conference papers. This is probably an effect of the pandemic to some extent, but conference papers were showing a decreasing trend even before that. Data for 2022 can only be presented next year due to delays in recording such data in the publication databases.

KTH's field standardised citation impact (cf) is 1.11 in the latest evaluation period, 2018–2020. A value of 1 corresponds to the average in the various subject areas on a global level. KTH's value shows a citation rate 11 per cent above the world average. The value for the period 2015–2020 is 1.14. However, the cf indicator is relatively sluggish when measured at university level. KTH's cf has been in the 1.10–1.18 range for many years. Cf varies more at department level, from values below one to above three. The proportion of articles in the top 10 per cent most cited in their respective subject areas is 11 per cent in the latest evaluation period, 2018–2020. The top 10 per

cent indicator is relatively stable over time for KTH as a whole.

The field standardised journal indicator (jcf) is usually interpreted as a way of measuring the visibility of publication channels. KTH's jcf is 1.22 for the period 2019–2021. This means that the average citation impact for KTH's publication channels is 22 per cent above the global average. KTH's jcf is stable over time.

### Open access publications

In 2021, KTH issued almost 75 per cent of its peer-reviewed research results as open access publications. KTH is thus well on the way to achieving the goals of the bill *Forskning, frihet, framtid – kunskap och innovation för Sverige* [Research, Freedom, Future – Knowledge and Innovation for Sweden] (Government Bill 2020/21:60), which indicates that all published material should be openly accessible immediately upon publication. About 90 per cent of KTH's doctoral and licentiate theses are openly accessible.

### Digitisation initiative for research data

KTH develops services and support for research data management. This is done partly to facilitate the actual research where projects need to share data within the project between various collaborating parties, and partly to be able to publish data openly in connection with publication. Three pilot studies were carried out during the year using user-centred methods. The aim of this has been to get a clearer picture of the services needed for a digital infrastructure for management of research data.

## KTH's response to the war in Ukraine and Scholars at Risk

Due to Russia's invasion of Ukraine in February 2022 and the enabling of the EU Temporary Protection Directive, KTH has taken various steps to support researchers and students fleeing Ukraine within the framework of the university's mission to conduct education and research. KTH established a working group in March 2022 to coordinate KTH's actions.

KTH decided early on to prioritise initiatives aimed at researchers and students seeking temporary protection in Sweden under the Temporary Protection Directive. Therefore, KTH adopted special guidelines to enable fixed-term employment for Ukrainian researchers and asked KTH's departments whether they would be interested in welcoming researchers. KTH also decided that Ukrainian students should have exchange student status, which later became a national guideline.

KTH has been a member of the Scholars at Risk (SAR) organisation since 2017, and actively participates in the Swedish section, SAR Sweden. SAR works on issues relating to academic freedom and helps researchers at risk by

providing them with refuge during a brief period of employment. KTH has hosted six Ukrainian researchers through SAR in 2022. The researchers are funded

by KTH and external funding bodies, primarily SSF and KAW. The experiences of the research environments that have welcomed researchers from Ukraine via SAR are put to good use and are an asset for the continued work of welcoming at-risk researchers at KTH. More Ukrainian researchers have been employed at KTH outside the SAR framework as a result of the war. See also the section on Courses and study programmes.

# Collaboration

Strategic collaboration helps to enhance quality and relevance in education and research, while creating benefits for external stakeholders. KTH is working to support and strengthen a systematic approach to collaboration within strategic partnerships and collaboration with small and medium-sized enterprises and regional stakeholders. Strategic collaboration efforts are based on KTH's plan for 2021 and 2022 involving specified goals for collaboration.

## Strategic partnerships

KTH has 15 established strategic partnerships with major global corporations, with the public sector and with leading research institutes related to KTH's activities. The aim of strategic partnerships is to create long-term cooperations with a view to improving the quality of courses, study programmes and research at KTH and reinforcing the capacity of students, teachers, researchers and partners to innovate. The work with the strategic partnerships is followed up annually by KTH's management together with the management of each partner. Regular meetings are held with KTH's partner officers and partner managers in order to exchange information and experiences. Directors of KTH's research platforms and directors of KTH's research infrastructures also participated in some meetings in 2022.

Strategic partnerships help to enhance the quality of KTH courses, study programmes and research, increase opportunities to obtain research funding, increase opportunities for the university's students to work on relevant projects and increase co-utilisation of research infrastructure. Examples of initiatives in 2022 are as follows:

- granting of funds to research centres and participation in the same
- preparations for joint applications with Horizon Europe partners and other funding bodies
- degree projects, guest lectures, project courses, study visits, participation in programme councils and participation in interdisciplinary second cycle courses via
- OpenLab.

Besides activities within each partnership, KTH has organised joint activities, including what are known as partner events. On two occasions during the year, these have brought together almost 100 people from the partnerships' steering committees and management teams to discuss current issues for the partnerships. These events help to develop the work of the strategic partnerships.

The strategic partnerships were subject to a number of reviews in 2021. A plan for the development of KTH's work with partnerships was decided upon as a result, with measures to further develop the existing strategic partnerships.

## Personal mobility

Personal mobility between the academic community and other organisations such as companies and the public sector is an important element in KTH's strategic collaboration. Personal mobility helps to increase knowledge transfer between different organisations and is therefore a feature of the dialogue within the strategic partnerships and external web communication. KTH offers several forms of personal mobility: adjunct professor, affiliated faculty and employed doctoral student.

In accordance with KTH's development plan for 2018–2023, KTH is developing its collaborative skills as a qualification for employment and promotion: this is an important prerequisite if personal mobility is to be viewed as an attractive career choice.

## Societal impact of KTH's research and education

KTH has a clear ambition to be a leader in terms of societal impact, particularly societal impact through collaboration.

The work on sectoral and societal impact involves creating conditions for increased societal impact, analysing results and effects and communicating information on societal impact. Impact officers, who have been in place at all KTH schools since 2015, work on behalf of the school management teams and have provided support to staff during the year for the development and evaluation of societal impact. The impact officers have also helped to integrate the impact perspective into operational planning at the schools. There are also third cycle courses with emphasis on impact, workshops on impact in research applications and research projects, support for researchers and teachers to develop impact cases and activities to strengthen the communication of research results.

A plan was adopted in 2022 for the development of KTH's societal impact work. This decision means further development of work on societal impact for KTH in general and a clearer direction for the further work of the schools.

## Small and medium-sized enterprises and regional development

KTH promotes collaboration with small and medium-sized enterprises and regional development by making it easier for both companies and KTH teachers and researchers to initiate and implement collaborative projects.

EU structural funds are aimed at projects that promote growth and employment in Sweden, with emphasis on cooperation with small and medium-sized enterprises. In 2022, KTH has been involved in two partnership projects

financed by structural funds. During the year, Frontrunners for Innovation was granted funding to continue its operations in 2022 and 2023. This project is run by Kista Science City and Södertälje Science Park in cooperation with KTH. The aim is to identify and make available regional resources in respect of cybersecurity and secure digitalisation for small and medium-sized enterprises.

KTH has been participating in Fordonsdalen REACT with the Competence project Since June 2021. The aim of this is to investigate and secure the skills needed in the transition that the automotive industry is undergoing. In 2022, KTH has worked on developing a digital learning platform to ensure continuing professional development for employees in small and medium-sized enterprises in the automotive and transport industry.

KTH's digital degree project portal makes it possible for students and employers to get in touch with one another. The degree project portal allows companies, organisations, institutes and institutions to publish proposals for degree projects, as well as seasonal work and spare-time jobs. More than 1,300 jobs were published on the portal in 2022. The development of the portal is currently being planned.

## Fundraising

KTH's fundraising activities are a long-term initiative with a view to increasing private external funding for KTH. This activity is complementary to traditional funding. Major funding bodies with a multi-year commitment include the Erling-Persson Family Foundation, Birthe & Per Arwidsson's Foundation and Spotify founder Daniel Ek. A complementary and important part of this work involves arranging seminars to increase awareness of KTH's activities and strengthen relations with the surrounding community.

In 2022, special mention should be made of the fundraising that took place in favour of displaced Ukrainian students, which raised more than SEK 700,000 for scholarships. See also the section on Courses and study programmes. Other areas supported by donations during the year included KTH's Baltic Sea research and health data research.

## Innovation office

KTH has worked closely with universities in the region since the innovation office was established. These partnerships have deepened over the years. KTH is allocated funding to provide support to other universities, in particular the Stockholm School of Economics (HHS), the Swedish School of Sport and Health Sciences (GIH) and Södertörn University (SH). KTH has collaborative agreements with these universities to provide services for innovation development and the transfer of funds to build up basic recipient expertise and

own innovation support at each university. Innovation development services include support and advice on business development, funding, patents and recruitment. Together with KTH, the three universities have developed an action plan for activities and initiatives to strengthen innovation support on a local level. At the same time, KTH has opened its innovation support activities to individual researchers and students at the three universities.

In 2022, GIH and the Innovation Office jointly planned and implemented the GIH Innovation Day for alumni, students, researchers and employees at GIH. The aim of this was to capture and encourage interest in innovation at the university and to launch an ideas competition on the theme of Exercise Intelligence.

The Innovation Office implemented a joint programme, IDEATE, in 2022 together with the SSE Business Lab at HHS. This aims to bring together students interested in innovation from the two universities and provide them with inspiration, tools and coaching to form teams around an idea and turn it into reality. This year's twelve-week programme involved 30 students.

The innovation office at KTH has worked closely with Uppsala University on patent support and participated in experience sharing with other innovation offices since it was formed.

## Innovation support activities

KTH Innovation helps researchers, students and employees at KTH to commercialise their research results and business concepts in the earliest phases.

The overall objectives for KTH Innovation are to:

- Create conditions that will allow innovations to emerge and develop throughout KTH in order to strengthen KTH's competitiveness and attractiveness as an innovative and entrepreneurial university.
- Make it possible for more ideas and results from KTH students, researchers and employees to meet market needs and become successful innovations helping to bring about sustainable social development.
- Run and advance an effective and inclusive innovation process that will develop and support people with ideas and their path towards the market in the best way possible.
- Further develop a strong, complementary ecosystem for innovation support at KTH with international connections.

In 2022, KTH Innovation has continued its efforts to highlight and follow up how individual innovation projects relate to the UN Sustainable Development Goals. These activities are also in line with KTH's sustainability goals. One example of such an initiative is the Sustainable Fashion Day organised in April together with the annual H&M Foundation Global

Change Award event. The day also saw the launch of a sustainable fashion ideas competition that was open to all students, researchers and staff at KTH.

New winners of the Global Change Award have been selected during the spring and are now participating in a twelve-month accelerator programme in which KTH is a partner.

In 2022, both the European Patent Office and the Swedish Intellectual Property Office recognised the lack of female inventors in patent applications. In Sweden, women make up just over twelve per cent of inventors. The European average is just over 13 per cent, which is low compared to the rest of the world. At KTH, a total of 21 patent applications have been filed from projects supported by KTH Innovation, 50 per cent of which involve female inventors. The trend for a number of years has been for an increasing proportion of women to be involved.

KTH Innovation has expertise in process-oriented innovation development. The proprietary tool KTH Innovation Readiness Level™ is made available through a creative commons licence via the website that KTH Innovation has set up. This website describes the tool and how it can be integrated into innovation development at companies, public authorities and organisations. By the end of 2022, 1,377 people from 1,081 unique organisations had registered. The organisations that have registered range from incubators, science parks and innovation offices to universities, global companies, charities, banks, public authorities and start-ups.

The Brighter Startup internationalisation programme took place for the tenth consecutive year, this time with visits to the UK and the US. The programme was open to innovation projects from KTH, Stockholm School of Economics, the Swedish School of Sport and Health Sciences and Södertörn University and includes ten projects. The aim of this programme is to increase participants' knowledge of entrepreneurship in an international context and create encounters between Swedish start-up companies and international stakeholders.

The second recipient of the KTH Innovation Award was announced in July 2022. This is an award established by KTH with donations from Professor Mathias Uhlén and Spotify founder Daniel Ek. The award recognises individuals from KTH who have tackled global challenges by exhibiting creativity, perseverance and courage. This year's recipient, Janne Wallenius, a KTH professor and founder of the company Blykalla, has been presented with the award "For taking on the important task of providing the world with fossil-free basic power, and for working for decades towards a clear vision with perseverance and creativity, often against public opinion".

Three major open events known as KTH Innovation Collide have been organised to create the conditions for more innovations to emerge at KTH. The aim is to bring together people interested in innovation from both KTH and the entire

Stockholm innovation system. More than 600 people attended the events, which were characterised by networking, socialising around a specific innovation theme and exhibitions on innovations from KTH.

KTH wishes to promote cooperation between industry and start-up technology companies so that even more innovations can benefit society. In 2022, a special initiative was launched to bring together start-up companies originating from KTH's research and education with major industrial companies. This initiative will include KTH's industrial partnerships, as well as other major companies and organisations. The initiative is expected to lead to more and better cooperations between established industrial companies and the technology companies recently launched using ideas from KTH.

# Digitalisation

Digitalisation is one of the four pillars of KTH. Work on digitalisation is helping to make KTH a more modern and efficient university offering high research and education quality. KTH conducts leading research in a variety of domains in the field of digitalisation, and digitalisation is a natural part of the majority of KTH's courses. See the section on Research and the section on Courses and study programmes.

## Digitalisation strategy

The Strategy for KTH's digitalisation for the period 2023–2027 was decided in autumn 2022. This strategy includes four general objectives:

- Strengthening the digital skills of staff and students.
- The right digital conditions for the management, planning and monitoring of operations.
- Simplified and efficient administration through user-oriented operational support.
- Digital infrastructure ensuring that data is made available internally and externally in the right way at the right time.

## Portfolio management

KTH has established a model for working with IT portfolio management in 2022. This includes an approach to both identifying and prioritising the organisation's IT development needs and implementing new IT systems and monitoring their benefits. IT portfolio management is organised in a portfolio steering committee with overall responsibility and three IT development portfolios in the fields of education, research and administration. A roadmap has been developed for each portfolio in 2022, describing future investment needs and IT development initiatives. Long-term development is planned in three areas within the education IT development portfolio: learning support, examination and decision support. The IT development portfolio for research prioritises research data and research support for analysis of research publications and case management systems for research projects. The IT development portfolio for administration focuses on developing system support for HR, planning, budgeting, follow-up and staffing.

## Digitalisation and the Future Education at KTH programme

KTH has initiated the Future Education at KTH change programme. Digitalisation is a prerequisite if KTH is to be able to realise the development that Future Education at KTH involves. Various digitalisation initiatives within Future Education at KTH have been identified in the autumn of 2022.

Digitalisation is particularly important for the following principles of Future Education at KTH: assessment and examination for learning, integrated lifelong learning, continuous professional development of the teaching role and a management system for quality development. See the section on Courses and study programmes.

## Use of Zoom and Canvas

Before the outbreak of the pandemic in spring 2020, the use of Zoom was marginal and increased within four weeks from just over 1,000 meeting hours per week to over 80,000. Most pandemic restrictions were lifted on 9 February 2022, which was reflected in a sharp decrease in the use of Zoom. The use of Zoom in 2022 is more extensive than before the pandemic, but significantly lower than in 2020 and 2021. Zoom is used by both staff and students. Use of the tool increases during study periods.

Canvas is KTH's digital learning platform. Use of Canvas has increased in recent years, with a clear increase at the time of the outbreak of the pandemic in 2020. The number of page views in Canvas has remained high in 2022, and even increased slightly in autumn 2022 compared to autumn 2020 and 2021. This indicates that Canvas is now being used more systematically than in previous years. There is an increase in the number of page views at the beginning of each study period, when most courses start. The use of Canvas is higher in the autumn semester, due to the fact that more and larger courses are offered in the autumn semester than in the spring semester. The highest level, over 5 million page views per week, corresponds to up to 2,000 page views per minute during weekday working hours.

## Digital accessibility to public services

The Access to Digital Public Service Act (2018:1937) (DOS Act) contains provisions on requirements for access to digital services provided by a public stakeholder. KTH produces an annual accessibility report that describes the accessibility of the KTH website in accordance with the requirements of the DOS Act. KTH is well ahead of the curve according to the 2022 accessibility report, although there is still work to be done for full KTH compliance with the DOS Act. During the autumn, the Agency for Digital Government (DIGG) conducted what is known as simplified monitoring of the accessibility of the KTH website. KTH will take action on the basis of the recommendations and remarks made by DIGG as a result of the audit.

In 2022, digital training modules on digital accessibility have been developed and offered to staff and students. During the year, KTH has also made decisions on new guidelines for handling KTH's web publishing.

## Digital workplace

KTH has conducted studies on the digital workplace in recent years. A study has been conducted in 2022 to understand hybrid meeting and teaching environments and how these could be better designed to become effective working tools within the organisation. A research project has also been conducted in cooperation with Folkbildningsförbundet in Östergötland that resulted in study material for managers and teachers on how to conduct hybrid education and hybrid meetings, as well as a toolkit for hybrid work. Based on this study material, a report has been produced on hybrid meetings and working methods based on KTH's criteria.

## Digital working environment

The digital working environment can be defined as the working environment, with its problems and opportunities of a physical, psychosocial and cognitive nature, resulting from the digitalisation of work support systems and tools. KTH conducted a pilot project in 2021 with digital safety inspections. In 2022, work has begun on implementing digital safety inspections in systematic working environment management, and safety representatives have received training on the method.

## External digitalisation initiatives

In 2020, KTH began working on an application to launch a European digital innovation hub following a call from the European Commission. After a delay due to the pandemic, the application was submitted in February 2022 and granted in June 2022. KTH is now coordinating the new national Health Data Sweden (HDS) initiative, which comprises 18 partners from universities, regions, innovation environments and research institutes. Expertise and service offerings will transfer knowledge to the public sector, the business community and the general public through HDS.

In 2019, the Government commissioned the Swedish Agency for Economic and Regional Growth and the Swedish Higher Education Authority (UKÄ), in dialogue with universities and higher education institutions, to analyse and propose how the provision of digital excellence can be developed in both the short and the long term. KTH conducted a baseline study with a view to defining the concept of digital excellence, how it can be measured and what measures are needed to achieve an increase in digital excellence. The results were published in a scientific journal in 2022. KTH developed various future scenarios for digital excellence during the year, together with Linköping University, Örebro University and Uppsala University. The results are published in the report "Digital spetskompetens 2023 – Framtidsanalys för kompetens-

försörjningen av digital spetskompetens" [Digital excellence 2023 – Future analysis for the provision of digital excellence]. The final report on the government assignment was submitted to the government on 31 October 2022. The conclusions are published in the report "Förbättrad kompetensförsörjning av digital spetskompetens – satsningar för ökad tillväxt och konkurrenskraft" [Improved provision of digital excellence – initiatives for increased growth and competitiveness].

In 2018, the government commissioned KTH – together with six other universities – to establish a knowledge platform for artificial intelligence. This cooperation between universities has continued and expanded, with more universities participating. This has also resulted in AI Competence for Sweden, a cooperation for lifelong learning on applied artificial intelligence. In 2022, KTH has conducted lifelong learning programmes in artificial intelligence with KTH Executive School AB and others for a large number of external participants.

In 2019, the government commissioned RISE to formulate Sweden's AI agenda together with other stakeholders. KTH has coordinated the work in research and education. As part of this work, KTH provided input to the EU White Paper on Artificial Intelligence: a European approach to excellence and trust. Work on Sweden's AI agenda has continued in 2022. The AI Agenda provides a platform for identifying further opportunities for collaboration and for political influence in this area.

# Gender equality, diversity and equal opportunities

KTH's ethical policy states that gender equality between men and women and rejection of all forms of discrimination are both a quality matter and a natural element in the university's core values. KTH's development plan for 2018–2023 states that in-depth efforts to raise awareness and develop skills in terms of gender equality and the core values are required if the university is to achieve its goal of being an open and welcoming place.

Greater gender equality at KTH means:

- more equal representation of men and women in activities and on decision-making bodies
- gender-aware leadership
- gender mainstreaming in courses, study programmes and research
- promoting gender equality outside KTH as well
- allocation of resources with a gender equality perspective and equal conditions for staff within various parts of KTH

The KTH operational plan for 2022 describes how the university will be working with gender equality in education, research and collaboration over the year. The plan has been followed up as follows:

- **Regulations**  
The plan for continued work for a gender-equal KTH has been revised for the period 2023–2025. A review of other regulations, such as the ethics policy, has continued during the year.
- **Resource allocation from a gender perspective**  
The assignment has been followed up in order to identify the opportunities and obstacles to obtaining data on internal resource allocation on the basis of gender.
- **More equal gender distribution among KTH professors**  
The heads of school were tasked with identifying environments in which there are gender imbalances among professors. This assignment was awarded as part of a strategic investment in female visiting professors in order to achieve more even gender balance in the long term. Work has begun in 2022 and will continue over a number of years.
- **Combating discrimination and promoting equal rights**  
Work has begun on creating a structure that ensures access to current qualitative data on the occurrence or risk of discrimination, in respect of all grounds for discrimination, among KTH students and employees.
- **Integration of sustainable development and gender equality in all degree programmes**  
Extensive and continuous efforts to integrate knowledge

of gender equality, diversity and equal opportunities into all degree programmes (JMLIU) has continued during the year. This process has been consolidated in a reference group. Workshops, training courses and coaching to support teachers have been conducted.

- **In-depth work and activities on core values**  
The KTH Equality Office has worked during the year on clarifying KTH's core values throughout the organisation.
- **Sustainable working life**  
Knowledge of the prevalence of gender-based vulnerability and sexual harassment at KTH has been disseminated in connection with activities to develop an inclusive culture and zero tolerance for sexual harassment.

KTH's gender mainstreaming work is based on the Plan for continued efforts towards a gender-equal KTH in 2021 and 2022. This plan has four priority goals: collective organisation, knowledge and awareness, equal conditions and inclusive cultures.

## Collective organisation

Collective organisation refers to a structure for systematic gender equality, diversity and equal opportunities work, linking together discrimination legislation, working environment legislation, gender mainstreaming and work on the core values and pursuing these aspects in the same way throughout KTH.

### KTH Equality Office

KTH uses the KTH Equality Office to conduct research-based proactive work at both strategic and practical levels with a view to increasing gender equality, diversity and equal conditions from an intersectional perspective throughout the entire university organisation. This is based on legal requirements, government assignments and KTH's own regulations and guidelines. This work is carried out in collaboration with teachers and researchers, the University Administration and THS. Gender equality work is targeted at staff and students at all levels and focuses on both structural and cultural aspects of inequality and gender inequality.

### JMLA Group

There is a gender equality, diversity and equal opportunities officer (JMLA) in each school's management team, in joint operational support and in the student union. The JMLA group is a strategic group for gender equality, diversity and equal opportunities issues at KTH. A gender equality, diversity and equal opportunities partner at the schools' University Administration supports the JMLAs.



The JMLA group is responsible for coordinating and driving local gender equality, diversity and equal opportunities initiatives, with emphasis on both the working environment and the study environment. Every JMLA organises at least one local gender equality, diversity and equal opportunities group within their own organisation. The JMLA group has held regular meetings in 2022, along with a residential course together with the Future Faculty Group. Newly appointed members of gender equality, diversity and equal opportunities groups and newly formed gender equality, diversity and equal opportunities groups at the schools have received training. The support to gender equality, diversity and equal opportunities groups is tailored to their needs and includes both knowledge and guidance. At the end of 2022, presentations of the schools' gender equality, diversity and equal opportunities initiatives took place at JMLA meetings to allow for experiences to be shared and ideas to be developed between the schools.

### **Integration of gender equality, diversity and equal opportunities into the Sustainable Development Goals**

The fact that gender equality, diversity and equal opportunities are integrated into sustainability efforts at KTH was clarified when a decision was made on KTH's sustainability goals for the period 2021–2025. Particular emphasis has been placed on this in the integration of gender equality, diversity and equal opportunities aspects in all degree programmes, highlighting sustainable development as an entry point for gender equality, diversity and equal opportunities knowledge in education.

### **Knowledge and awareness**

Knowledge and awareness involves raising awareness about gender and gender equality throughout the organisation. This must be done in such a way that the knowledge can be put into practice, both in society and at KTH, in fields such as leadership development, teaching and learning in higher education and student education. Research-based gender knowledge forms a basis for problem description and analysis, while knowledge of change work in organisations is crucial for gender equality work in practice.

### **Integration of gender equality, diversity and equal opportunities in education, JMLIU**

Various initiatives have been implemented over a number of years to integrate knowledge of gender equality, diversity and equal opportunities into courses and study programmes at KTH. A concerted effort was made in 2020 to integrate gender equality, diversity and equal opportunities into courses and study programmes on a mandatory basis. Work on integration of gender equality, diversity and equal opportunities has continued in 2022 through dialogues, workshops and other initiatives. An internal reference group for JMLIU

is supporting KTH in developing a plan for designing, implementing and following up broader integration of gender equality, diversity and equal opportunities.

### **Compulsory module: basic knowledge of gender equality, diversity and equal opportunities**

Gender equality is one of KTH's priority development areas. This means that gender equality must also characterise processes, decisions and regulations. KTH's core values, the gender equality policy goals and the government's mandate on gender mainstreaming also require a compulsory module involving a basic knowledge of gender equality, diversity and equal opportunities to be integrated into all programmes. Gender equality, diversity and equal opportunities must be integrated into all degree programmes at all levels so that students can help ensure the sustainable development of society after they graduate.

KTH has a compulsory module called Track 1, which relates to basic knowledge of gender equality, diversity and equal opportunities. This must be included in all programmes at all levels and examined within the course in which the module is included. The content of the compulsory module provides the following knowledge about gender equality, diversity and equal opportunities:

- what the terms gender equality and equality mean
- how they are linked to sustainable development
- how gender inequality and inequality may be expressed
- that gender equality and equality require change work.

Third cycle education also provides a research perspective on gender. Teaching and learning in higher education must also include knowledge of gender awareness and inclusive teaching and learning.

When designing track 1, there is a clear structure in place indicating when and how integration takes place in each programme, and a clear structure for follow-up via programme analyses in the quality system. Support for programme directors and teachers with regard to implementation is provided through Necessären, a web-based resource that was updated continuously in 2022, other training materials, a teaching and learning in higher education entitled *Genusforskning och jämställdhet i teknisk högre utbildning* [Gender Research and Gender Equality in Technical Higher Education], and workshops. The course on teaching and learning in higher education was held through the medium of English for the first time in 2022. The examination for the course consists of work with the participant's own courses and programmes from a gender equality or gender perspective.

Teachers work through integration work to promote a gender-equal and equal educational environment that is free of discrimination by means of procedures and information to counteract harassment and sexual harassment, for example, and by practising gender-aware and inclusive teaching and learning as part of their work with KTH's core values.

### Equality Forum

In 2022, KTH has organised an Equality Forum to further make gender equality, diversity and equal opportunities efforts at the university available to staff and students. The Equality Forum is a regular digital hub for continuing professional development and exchange on issues relating to gender equality, diversity and equal opportunities.

### Equal opportunities

Equal opportunities refers to equal conditions in terms of pay, power and career. KTH should increase the percentage of women in senior academic positions, in leadership positions, among its students, and among teachers and researchers. KTH needs equal processes for recruitment and employment, as well as criteria for equal allocation of resources.

### Study of the process for faculty recruitment and promotion

A study focusing on monitoring the process of recruitment and promotion of teachers from a gender perspective was implemented in 2021. In 2022, the results were presented and discussed at a residential course with internal groups at KTH. The chairs and members of recruitment and promotion committees have received training on gender equality, diversity and equal opportunities in 2022. A special course for chairs has also been held on a number of occasions.

### Partners in Learning (PIL)

The PIL programme is a career support programme for assistant professors. This programme is delivered regularly. It is led by two expert researchers and always includes modules on gender equality, diversity and equal opportunities aspects and core values.

### Continuous follow-up and quality discussions

Work on gender mainstreaming and active anti-discrimination measures is integrated into the quality system, including the schools' skills provision and faculty development plans. This work has involved analysing problems, identifying active measures and implementing and monitoring these for the annual quality dialogue.

### Coordination of data on distribution of research funding by gender

A pilot study was conducted in 2022 to develop proposals for a systematised process for general, standardised indicators by gender for KTH's funding for research and third cycle education at KTH. It was concluded that there is no system support for obtaining statistics by gender regarding resource allocation, and hence it is not possible to develop indicators. The issue will be taken further in the

review of KTH's resource allocation models that began in autumn 2022.

### Trade union collaboration

In 2022, employer representatives for KTH and the central collaboration group have continued their efforts with trade union collaboration regarding several priority issues in respect of KTH's gender equality, diversity and equal opportunities work. Regular preparation meetings and decision-making meetings in the specialist area are held according to the partnership agreement. Work on the annual salary survey is conducted in a joint working group led by a coordinator from the KTH Equality Office.

### Extended salary survey

KTH conducts an annual salary survey that is finalised before the salary review in order to provide information for managers who set salaries. KTH monitors the incidence of excessive salaries and pays attention to unequal pay structures in budget and payroll processes. In 2022, there has also been a degree of extended analysis following joint discussions on the need for broader pay expertise in certain areas. Men's salaries in relation to women's have been analysed, and an in-depth analysis has been made of the salaries of cleaners and librarians, where the factors of age and length of employment seem to play a role in pay structures.

### Inclusive cultures

Inclusive cultures are based on an awareness of core values, codes of conduct and how to create an inclusive culture. It also includes awareness of the relationship between sustainable development and gender equality, diversity and equal opportunities issues, a clear zero tolerance approach to harassment and discrimination, and transparency and clarity in communication about gender equality, diversity and equal opportunities initiatives at KTH.

### Collaboration programme against sexual harassment and gender-based vulnerability

KTH initiated the Research and Collaboration Programme against Sexual Harassment and Gender-based Vulnerability together with the Karolinska Institute, Malmö University and the Swedish Secretariat for Gender Research at the University of Gothenburg. Its aim is to establish research-based knowledge on inclusive work and study environments and sustainable organisation for the prevention of sexual harassment and gender-based vulnerability in the academic community. Ultimately, this programme will help to reinforce and intensify efforts relating to the university's organisational culture, with emphasis on quality, sustainable development, the working environment, leadership, gender equality and equal opportunities.

# Environment and sustainable development

KTH's ambition is to be a leading technical university in respect of the environment and sustainable development, and to have an identity and a brand associated with these matters. As a technical university, KTH has a key role to play in influencing social development in a positive direction in order to contribute to the UN Sustainable Development Goals.

KTH's courses and study programmes provide the next generation with the knowledge and skills they need to address current and future challenges. If the university is to contribute to a sustainable society, it is vital for research to be passed on and put into practice. That is why KTH places great emphasis on collaboration with various societal stakeholders, and on highlighting new research findings.

KTH has the commitment and leadership to go on developing and enhancing environmental and sustainability work. KTH's strategic efforts in respect of these issues are based on the KTH sustainable development policy, the Sustainable Development Goals for the period (2021–2025) and the climate goals for the 2021–2045 period.

## Organisation and working methods

KTH has a Vice President for Sustainable Development, who bears overall responsibility for sustainable development in education, research and collaboration. KTH also has a sustainability manager who is responsible for operational environmental and sustainability work and heads the KTH Sustainability Office, which is tasked with supporting the management, KTH's five schools and operational support in their efforts to integrate sustainable development into the organisation. They must also act as a driving force in efforts to implement and follow up on KTH's sustainability and climate goals and associated action plan. The KTH Sustainability Office works with sustainability rankings, participates in national and international meetings and networks, and is responsible for maintaining and developing KTH's certified environmental management system.

One of KTH's sustainability goals aims to ensure that sustainable development and gender equality are integrated into the organisation, and that employees and people working on behalf of KTH have knowledge and are given the prerequisites to participate on the basis of their roles. Workshops were organised during the year with the staff of the operational support divisions. The aim of this has been to engage in a dialogue with employees about how they can contribute to sustainable development in their day-to-day work, and what they can improve. The proposed measures are addressed in action plans within the scope of the environmental management system.

When the annual internal environmental audit was conducted, a review has been carried out in respect of

working methods and regulations regarding recruitment and promotion processes for teaching appointments. This review led to suggestions for improvement to ensure that sustainable development is included wherever relevant. The KTH Sustainability Office has also participated in the review of KTH's procedural regulations and efforts on the KTH's operational plan to ensure that sustainable development is taken into account wherever relevant.

In 2022, KTH has worked to update the basic environmental training available for all employees and people who work on behalf of KTH. This training will also be aimed at students going forward, and will be launched in early 2023.

## Environmental management system and ranking

KTH is driving the implementation of the 2030 Agenda and the Sustainable Development Goals within the framework of its environmental management system by linking KTH's degree programmes to the Sustainable Development Goals and ensuring that research projects describe how they are addressing the Sustainable Development Goals, for example. The work with the 2030 Agenda is set out annually in a report containing good examples of how KTH contributes to all 17 of the Sustainable Development Goals.

KTH's environmental management system has held accreditation to the international environmental management standard ISO 14001 since 2015, and is compliant with the requirements of the Environmental Management in State Agencies Ordinance (2009:907). KTH's environmental management system covers sustainable development in education, research and collaboration. It also includes impacts from its own operations, such as sustainable meetings, use of space and energy in buildings, procurement, chemical and waste management, food and catering, and biodiversity.

KTH conducts annual internal and external environmental audits where suggestions for improvement are highlighted. KTH follows up sustainability work at various levels within the organisation twice a year. This includes following up the results from the Swedish Environmental Protection Agency's reporting to the government. KTH was ranked 42nd in the world in the THE Impact Rankings, which focus on the UN's 17 Sustainable Development Goals and the implementation of the 2030 Agenda. See the section on Systematic quality enhancement activities. For the first year, KTH has also participated in the QS World University Rankings: Sustainability.

During the 2021–2022 period, KTH has maintained its ranking in the Academic Ranking of World Universities in Environmental Sciences and Engineering, 201st–300th.

KTH has improved its QS ranking in the field of Environmental Sciences to 98th (101st–150th). However, KTH has seen a decline in its ranking from 206th to 218th in Environmental Science and Engineering in the National Taiwan University Ranking. See the section on Systematic quality enhancement activities.

KTH needs to continue to step up the pace of its sustainability work and strengthen students' and employees' knowledge of how they can assist with sustainable development. The following priority areas have emerged in 2022:

- Sustainable development within the scope of the Future Education at KTH change programme and lifelong learning. Continuing professional development of teachers in sustainable development and students' and partners' perspectives on how we address sustainable development.
- How researchers address sustainability issues in their research, strengthening faculty commitment to sustainability research with funding and networking opportunities, and rewarding outstanding researchers in sustainability. Strengthening interdisciplinary research to enhance the ability to resolve complex societal problems.
- Clarifying sustainable development work within the strategic partnerships and increasing cooperation with Stockholm Trio, organisations, foundations and the local community. Increased visibility for KTH research in sustainable development and improved placements in rankings.
- Reducing KTH's climate impact through sustainable meetings, more efficient use of premises and energy, and developing circular flows in respect of the goods and services used to conduct education and research.

## Education

Work on the sustainability goals for education that were adopted in 2021 has continued during the year. In programme assessments, programme managers analyse the level of sustainability integration within programmes on the basis of aspects such as programme objectives, forms of intended learning outcomes (knowledge and abilities) and progression between sustainability courses.

A call for an education initiative in the field of sustainable development was issued in 2022, with funds from both direct government funding for courses and study programmes at first and second cycle level (SEK 700,000) and direct government funding for courses, study programmes and research at third cycle level (SEK 300,000). The initiative will also be conducted in 2023. Five projects were awarded funding under this call. These included a mathematics-related project by the name of A Mathematical Approach to Complex Systems and Sustainability and a third cycle course focusing on energy systems for sustainable development.

As well as integrating sustainable development into all KTH programmes, there are also programmes that focus specifically on sustainable development. The number of these programmes remains the same as in recent years: two Master of Science in Engineering programmes, ten two-year Master's programmes and one doctoral programme. The number of courses categorised as relating to the environment and sustainability has increased from 947 in 2021 to 990 in 2022.

KTH was judged to have "a well-developed process for working with sustainable development in education" in the Swedish Higher Education Authority's thematic evaluation in 2017. Among other things, it was emphasised that there are university-wide goals for sustainable development, that these are systematically followed up and that continuing professional development for teachers is available in respect of sustainable development. This work has been developed further to include new sustainability goals, more courses on teaching and learning in higher education where sustainable development is integrated, and follow-up in the quality system of sustainability in the programmes.

## Research

Research that promotes sustainable development is available at all KTH schools, according to the KTH Research Assessment Exercise (RAE) conducted in 2021. KTH has both strong basic research that contributes to new knowledge and new opportunities, and applied research that helps to resolve immediate societal challenges. Research to address both the climate challenge and other sustainability goals is conducted in many disciplines. Some strong areas are represented in the interdisciplinary research platforms, such as energy, transport and industrial transformation. These, together with the formation of centres in different fields, also interact with other societal stakeholders. KTH launched a new interdisciplinary and transdisciplinary research centre on food, KTH Food, during the year. This centre will bring together research in food and related areas. See the section on Research.

Nine research and collaboration initiatives have been awarded funding of up to SEK 200,000 each in 2022 as part of the Environment and sustainability without boundaries programme. Several of the research platforms and centres have funded new projects in a similar way to develop new research domains in sustainability.

In 2022, 44 per cent of advertised teaching positions were related to sustainable development, up 24 percentage points from the previous year.

## Collaboration

KTH's collaboration takes place through education, research and innovations, and helps to bring about sustainable development,

gender equality and climate transformation. KTH has arranged more than 200 events, workshops, seminars and other activities focusing on sustainable development during the year in order to develop collaboration and discussions with existing and new partners, stakeholders and students.

KTH and the KTH Climate Action Center hosted the We Don't Have Times hub in Stockholm during the UN's COP27 climate conference. A number of broadcasts with Swedish participants were made from this hub. The broadcasts reached 52 million viewers together with the other hubs in Nairobi, Washington D.C. and Sharm el Sheikh.

Current news, events and information for staff, students and other stakeholders are communicated via the external website, the intranet and external and internal newsletters. The external newsletter is aimed at the business community, policy makers, public authorities and organisations.

Sustainable development at KTH is a recurring topic on social media, with prospective students as a target group, and in the KTH Library's channels. Information on research calls in the field of sustainable development and the environment has also been sent to doctoral students and researchers about twice a month.

In 2022, KTH has been mentioned in about 6,450 national and international editorial media in respect of sustainable development, representing a slight decrease from 6,550 mentions in 2021. For 2022, 42 (48) per cent of KTH's total national media exposure and 25 (19) per cent of KTH's total international media exposure is linked to sustainable development.

KTH has led a working group within the International Sustainable Campus Network, which exchanged experiences on how a university's sustainability work can be reported externally in annual reports and followed up and measured on the basis of different methods and approaches.

KTH researchers are members of several state councils and delegations with links to sustainable development. These include the Climate Policy Council, the Research Council for Sustainable Development and the Circular Economy Delegation. In autumn 2022, KTH has extended its collaboration in the DG Forum for the 2030 Agenda by participating in the operational group. The DG Forum is a platform for public authorities' work on implementing the 2030 Agenda in central government. KTH is participating in the steering committee for the Swedish universities' Climate Network and has participated in the implementation of the The Sustainable Scientist conference.

A sustainability group has been established in 2022 within the framework of Stockholm Trio, under the name Stockholm Trio for Sustainable Actions. The purpose of this group is to strengthen collaboration between Stockholm University, the Karolinska Institute and KTH with regard to sustainability issues in education, research and collaboration, and within the framework of operational support. See the section on National cooperations.

## Resource management

### Travel and transport

COVID-19 helped to bring about a rapid transition to digital forms of meeting, teaching and examination. Public defences of doctoral theses were conducted remotely, leading to an increase in the participation of international experts. After the pandemic, KTH has continued to work on the transition to digital forms of meeting and teaching. KTH continues to offer opportunities for working from home, which has resulted in a reduction in commuting. The option of signing decision documents electronically is offered, which both facilitates working from home and reduces the use of resources.

Support for employees for more sustainable travel has been developed and communicated on the KTH intranet and in the travel booking system. A checklist has been devised for staff to use when booking travel.

In 2022, KTH has developed a visualisation tool within the framework of the CERO project (Climate and Economic Research in Organisations). In autumn 2022, KTH sent out a survey to employees to map travel to and from work and business travel. In the 2022 survey, questions have also been asked in order to take advantage of experiences from the transition to digital forms of meeting and examine the need for continuing professional development. The results of the survey will be analysed in 2023. Workshops were held in 2022 that resulted in action plans for climate-efficient meetings. This work will be continuing in 2023.

KTH's sustainability goals for travel and transport must be achieved by the end of 2025 at the latest, with a base year of 2015.

One of the targets states that KTH's climate impact from business travel (carbon dioxide equivalents per full time equivalent) must be reduced by 25 per cent by the end of 2022, and by 40 per cent by the end of 2025.

In 2021, air travel accounted for around 95 per cent of carbon dioxide emissions per full time equivalent from business travel. In 2021, business travel was at low levels due to COVID-19 and the transition to digital forms of meeting and teaching. Emissions from air travel in 2021 fell by 85 per cent compared to 2019. This meant a further reduction from 2020, when emissions from business travel by air were reduced by 60 per cent compared to 2019.

Business travel by air has again increased in 2022 following the low levels seen during the pandemic. Compared to 2019, carbon dioxide emissions from business travel by air have increased by almost eight per cent per full time equivalent.

### Procurement and waste

A project has been in progress during the year to increase the service life of purchased furniture in accordance with KTH's sustainability and climate goals, thereby economising on both environmental and financial resources. The execution and implementation of measures will continue in 2023.

Renovation of the chemistry building on the KTH Campus has been in progress since 2022, with lofty ambitions regarding the reuse of office furnishings and textiles.

KTH's waste project group has increased recycling opportunities in the organisation during the year. KTH has collaborated with THS and the property owners to make it possible to sort waste more accurately. This has resulted in the provision of recycling facilities for glass and corrugated cardboard from the students' chapter halls. Project proposals have been developed to increase the opportunity to recycle items, mainly food waste, at all chapter halls on the KTH Campus. During the year, the waste project group has also worked to expand the central environmental station on larger premises on the KTH Campus, due to more stringent legal requirements for the separation of waste.

Picking analyses were conducted on three containers and in five waste rooms during the 2022 internal environmental audit. The results showed that KTH's operations are not entirely compliant with the legal requirements for sorting hazardous waste, even though the conditions for compliance are present, and further work on this will be done in 2023.

Students and staff have received information and guidance on waste management during the Campus Fair, an annual welcoming day for new students.

### Sustainable buildings

Several of the buildings used by KTH for its activities hold environmental certification. In 2022, Undervisningshuset was rated Gold on all indicators except for the noise level indicator.

A number of energy saving measures have been implemented on the KTH Campus in 2022. A working group has been established to implement the proposed measures presented in KTH's premises supply plan for 2022–2025, such as premises optimisation. KTH and property owners Akademiska Hus have created new working methods in order to devise a joint energy saving plan. Measures that have been implemented include adapting ventilation operating times to operations, installing sensors for more efficient use of premises, collecting convector elements, optimising fume cupboards, replacing lighting and adding energy glass. A number of measures have been implemented to reduce the need for supplementary heating, such as sealing windows.

The KTH Campus was used for various research and educational activities during the year in collaboration with property owners Akademiska Hus and others. For instance, there are projects in progress that are examining the impact of nudging, a tool for changing people's behaviour by making it easier to make certain choices, linked to resource use.

A project is also in progress to test sensor boxes with a feedback function to link the measured indoor environment to subjective experience. One project is examining the systemic effects of interconnecting wastewater heat exchangers and geothermal systems.

As part of the Kostnads- och energieffektiva styrsystem för byggnader [Cost- and energy-efficient control systems for buildings] project, high-resolution property data from KTH Live-in Lab has been used to identify cost-effective solutions that increase resource efficiency in systems and buildings.

The Co-Kitchen project investigated new ways of living and cooking together in the sustainable student accommodation of the future, and studies on the use of resources related to different floor plans have been conducted in full-scale tests. The results from the study form the basis for the design of the new Lund University Living Lab.

### Food and catering

Several food and food waste events linked with research were organised during the year. These activities have been open to the public, such as the Mistra Sustainable Consumption train tour, which included a seminar on food in public kitchens and the development of regions as culinary destinations. The theme of this year's Industrial Transformation Day was Food Systems in Transition. The Community Christmas Meal was conducted by KTH in December together with the KTH Food Tech student organisation, serving food from local organisations that would otherwise have gone to waste. The aim was to share a meal with people in need.

A procurement procedure for fine catering has been conducted, defining stringent sustainability and climate requirements. All suppliers for everyday catering have been evaluated and followed up.

### Biodiversity and ecosystem services

Planting operations were extended during the year, and existing flower beds were restored. Work has also begun on creating a meadow area in two locations in place of the current lawns. Dead trees have been replaced by trees that are more suitable for the area, and an inventory of trees has been carried out on the KTH Campus. The KTH Campus has had beehives since 2015, and about 100 kg of honey was produced in 2022.

# Systematic quality enhancement activities

## KTH's quality system

The design of KTH's quality system is based on the KTH quality policy. This is based on KTH's development plan for 2018–2023 and the quality requirements set out in the Higher Education Act, the Higher Education Ordinance and European standards and guidelines for quality assurance in higher education.

According to the quality policy, quality enhancement activities must be characterised by clear responsibility, broad engagement and inclusion. The Faculty Council bears overall responsibility for ensuring the quality of education, research and collaboration. The Faculty Council is also responsible for managing and developing the KTH quality system.

The KTH quality system consists of two parts: continuous follow-up and regular review. Continuous follow-up takes place every year. The intention is for regular reviews to be carried out every six years and include external peer review.

## Continuous follow-up

### *Education*

KTH has established assessment areas for first, second and third cycle courses and study programmes. A few of the assessment areas are selected each year as part of the continuous follow-up initiative.

The continuous follow-up was implemented as planned in 2022. The follow-up included gender equality, sustainable development and student perspectives as assessment areas for first and second cycle programmes. The working life perspective was also included for doctoral programmes. The 2022 follow-up for Bachelor of Science in Engineering programmes, which underwent regular review in 2021, involved devising action plans based on the outcomes and recommendations of the external peer review.

In the field of gender equality, it emerged – for all three education levels – that KTH is continuing to make good progress with mainstreaming gender equality in education, even though this may pose challenges. All five schools now have plans in place for integration into the school's overall courses and programmes offered, and implementation will take place gradually. The follow-up shows that there is still a need for support, including continuing professional development for teaching staff. See also the section on Reviews and evaluations conducted by the Swedish Higher Education Authority.

Sustainable development is a strategic area at KTH, and as a result the majority of programmes have included sustainability in their programme objectives, and courses

have been implemented that bear environmental and sustainable development labels. The focus going forward, based on the follow-up, should be on developing progression in sustainable development. This year's follow-up also shows that the inclusion of sustainable development is less developed at third cycle level than at other levels.

With regard to the student perspective, the follow-up showed that KTH provides formal prerequisites for student influence, but that this is not satisfactory in practice as it is difficult to recruit students to positions on preparatory and decision-making bodies. It also emerged that students are given good opportunities to evaluate courses, but that the response rate to course evaluations is perceived as being too low. Furthermore, the follow-up showed that student-centred learning needs continued focus, and that there are many good examples of this that can be communicated within KTH.

For third cycle education, it emerged that course follow-up often takes place via interviews, as the course evaluation questionnaire is not perceived as working optimally for that education level. The verbal course evaluation is not conducted systematically, however, and teachers responsible for the course do not write course analyses to a sufficient extent. When it comes to the working life perspective in third cycle education, it emerged that this works well, but that KTH should improve its career counselling.

The review of the quality system for education – which has been an assignment in the operational plan for KTH in 2022 – has been the focus of the development of KTH's quality system during the year. The starting point for this review is to evaluate whether the system is efficient and appropriate, is adapted to KTH's operations and organisation, and creates value for KTH's management, teachers and students. Work on the review will continue in 2023.

### *Faculty development*

The faculty's continuing professional development and subject specialisation are important prerequisites if KTH is to be able to maintain high quality in its courses, study programmes and research. This year's continuous follow-up showed that all schools are working to increase the proportion of women in the faculty.

KTH offers courses in courses on teaching and learning in higher education in order to promote the development of education. KTH also organises workshops and network meetings for programme directors and directors of studies, as well as "major meetings" for the entire organisation. The needs of courses and study programmes and teachers for educational development are analysed as part of the continuous follow-up process. The follow-up in 2022 showed that the work on strengthening cooperation and creating

synergies between different stakeholders working with career development and continuing professional development for staff at KTH needs to continue to develop. See also the Staff section.

## Regular review

### Education

No regular audit of education has been conducted in 2022 due to the fact that the quality system for education is undergoing a review in 2022 and 2023.

### Research

A Research Assessment Exercise (RAE), a regular review of KTH's research, was initiated in 2020 and was completed at the end of 2021. The RAE is an external peer review of the quality of the research conducted at KTH. The results at KTH level showed that research at KTH is maintaining an excellent standard, but that strategies or specific visions, what are known as roadmaps, may need to be developed.

Action plans have been devised at both departmental and school level on the basis of the recommendations of the expert groups and the strategic discussions on priorities that each school had internally with all departments. The schools' action plans were completed in autumn 2022 and will form a basis for the continuous follow-up of research in the spring of 2023.

## Quality work in Unite!

KTH is part of the European university alliance Unite! and participates in the project group covering quality assurance. See also the sections on Staff and Courses and study programmes. Unite! completed its first four-year funding cycle in the autumn. The European Commission has granted continued funding for four years. In the new application, the quality system and quality work have been stated as a separate and explicit part in work package one, together with issues of governance and organisation of Unite! as a whole. The application also clarifies the fact that all groups within the different work packages are responsible for quality assurance of the activities carried out. Overall, this gives quality issues greater focus within Unite!. The working group responsible for quality assurance will have an advisory role in respect of the managers of the various work packages. They will also support the Unite! steering committee in developing the strategic level of the alliance.

## Reviews and evaluations conducted by the Swedish Higher Education Authority

### Review of KTH's quality system for education

The UKÄ reviewed KTH's quality system for education in 2019/2020. KTH was approved, but with reservations as there were deemed to be shortcomings in the assessment area for gender equality. These shortcomings included the fact that gender equality had not been integrated into all education programmes at KTH. The actions taken in response to this review include, for example, the development of a mandatory module which has now been – or is about to be – included in all programmes at KTH. See also the section on Gender equality, diversity and equal opportunities. Other measures include annual monitoring of gender mainstreaming via the quality system. A number of activities have been carried out at all schools in order to ensure that the line organisation creates good conditions for KTH's teachers to work with gender mainstreaming. KTH submitted its action report in March 2022, and the UKÄ subsequently decided that KTH's quality system is now approved in its entirety.

### Programme evaluations

The third cycle subject areas analytical chemistry, physical chemistry and organic chemistry were evaluated by the UKÄ in 2021. The UKÄ's decision meant that analytical chemistry was judged to be of high quality, while physical chemistry and organic chemistry were judged to be of debatable quality. KTH was mainly criticised for the fact that doctoral students in these areas do not have the opportunity to achieve sufficient breadth in their field.

KTH has established a revised general study plan for chemistry in 2022, which includes analytical, physical and organic chemistry. This clarifies factors such as how breadth of knowledge can be achieved by making certain courses compulsory and introducing new elective courses. KTH has also worked to improve its procedures regarding the use of the individual study plan for all doctoral students in chemistry, which was one criticism set out in the evaluation of physical chemistry.

KTH has submitted action reports at the end of the year. A decision is expected from the UKÄ in early 2023.

### Thematic evaluation

In 2019–2022, the UKÄ has conducted a thematic evaluation of how universities in Sweden are working to promote and broaden recruitment. KTH submitted a self-evaluation to the UKÄ in 2021. A decision from the UKÄ and the assessment panel's opinion were issued in February 2022. In spring 2024, the universities have to report back on how they have addressed the recommendations made by the assessment panel.

The assessment panel's recommendations to KTH include



the fact that KTH needs to interpret what the concept of broader recruitment is for KTH and, on the basis of this, to clarify goals and target groups and clarify the follow-up work in respect of the student population. KTH also needs to work more systematically with initiatives linked to broader recruitment and follow-up of the same.

A pilot study on broader recruitment has been conducted in 2022. The purpose of this pilot study was to identify which data KTH has access to in order to follow up the student population at different levels, and also to clarify the composition of the student population. The idea is for the data produced to be used for further work on developing more systematic work on broader recruitment and concretising the goals for broader recruitment and widening participation.

## Survey follow-ups

KTH conducts regular follow-ups of students, alumni and doctoral students in its start-up survey, mid-year survey, career survey and doctoral follow-up. These surveys are part of KTH's systematic quality enhancement activities, and regular implementation provides the opportunity to monitor developments over time. In 2022, the focus has been on analysing the survey activities for development and change. This is why no survey was conducted during the year.

## Ranking

KTH is compared with other universities in various rankings on the basis of research, education and collaboration, which can be viewed as a measure of a university's international competitiveness. The importance of visibility and rankings affects student recruitment, recruitment of international researchers and international cooperations, for instance.

KTH performed relatively well in 2022. In the QS World University Rankings, KTH is ranked 89th among the universities of the world. This is unchanged from the previous year and remains KTH's best ever placing in this ranking. The QS rankings measure academic reputation, reputation as an employer, student-teacher ratio, citation rate, proportion of international researchers and teachers, and proportion of international students. Of these factors, KTH's ranking has improved slightly in terms of student-teacher ratio and the proportion of international researchers, teachers and students. However, it has deteriorated slightly in terms of academic reputation, reputation as an employer and citation rate.

In the THE World University Rankings, KTH rose from the 201st–250th range to 155th place, which is KTH's best ranking since 2016. The THE ranking measures teaching, research, citation rate, internationalisation and research funding from industry. KTH's teaching, research and citations have improved compared to last year, while its international

profile and research funding from industry have deteriorated. The results vary between QS and THE as different data is used as a basis for the rankings. The rankings use different indicators to an extent, and also different methods when calculating them. They also attach different levels of importance to the indicators.

KTH was ranked 42nd in the world – one place lower than the previous year – in the THE Impact Rankings, which focuses on the UN's 17 Sustainable Development and the 2030 Agenda. KTH has received higher scores in six of the eight selected objectives, but KTH's ranking has improved in only two of these on account of increased competition. KTH is ranked particularly well for Goal 11 Sustainable cities and communities (20th), Goal 12 Ensure sustainable production and consumption patterns (18th) and Goal 13 Combating climate change (9th). These rankings are based on extensive documentation of texts related to the Sustainable Development Goals, taken mainly from the KTH website, as well as bibliometrics and other quantitative data. See also the section on Environment and sustainable development.

KTH has also performed well in several subject area and subject rankings. KTH climbed three places in the QS's subject area ranking for engineering and technology, and is ranked the world's 28th best university and Sweden's best.

KTH climbed seven places in the QS subject area ranking for natural sciences, and is ranked the 78th best university in the world. In the THE's subject area ranking for engineering and technology, KTH is ranked 53rd best in the world, up 15 places on the previous year.

In the THE's subject area ranking for computer science, KTH has climbed 8 places and is ranked 77th best in the world. In the QS subject ranking, KTH is included in 16 subjects, 6 of which are in the top 50. KTH was ranked highest in petroleum engineering (21st), architecture (22nd) and electrical engineering (23rd).

KTH's main strength in terms of rankings is its very high production of publications per teacher and researcher. There is also a very high proportion of co-publication with researchers from international universities, and also with the business community. KTH is successful in obtaining research funding from external funding bodies and performs relatively well in reputation surveys. KTH performs better in QS than most Nordic universities, and is ranked second among Nordic universities after the University of Copenhagen. KTH has a high proportion of international researchers, teachers and students, which is important in terms of rankings. KTH does not perform as well in terms of indicators that measure research impact and excellence. This is reflected in the measure of citation rate in the rankings, where KTH appears only in 510th place in the THE World University Rankings, for example. Although this is an improvement of 144 places compared to the previous year, and breaks a downward trend, KTH is still at a significantly lower level than the other indicators included in the THE's ranking. See also the Research section.

# Staff

KTH is a university where people with different backgrounds and experiences work together with the common objective of administering, renewing and communicating knowledge for the society of today and tomorrow. KTH aims to be a workplace where the desire for personal development and personal responsibility is encouraged. KTH's development plan for 2018–2023 states that KTH is to be a leading technical and international university that creates knowledge and expertise for a sustainable future. A number of activities conducted in 2022 in respect of staff are presented below, based on the development plan.

## Skills provision

The overall aim of KTH's skills provision is that KTH should always have access to the skills that the organisation needs to achieve its goals. This assumes that skills provision efforts are strategic and structured, and that KTH works actively with its employer brand in all communications, both internally and externally.

Measures to ensure that competence is available to fulfil KTH's assignments are implemented continuously: through the annual follow-up of faculty renewal and the faculty development plan, which is part of the systematic quality assurance system, and also through the European Charter for Researchers.

One crucial competitive factor is KTH's ability to work actively on attracting, recruiting, introducing and developing employees. The need for an integrated approach for all staff categories has been identified. This is why a common strategic skills provision plan will be drawn up for all staff categories. In this context, the faculty renewal and faculty development plans will be reviewed and changes deemed to enhance usability will be implemented. Proposals on how to develop a strategic skills provision plan that includes processes, support systems and funding for long-term planning and management of personnel and skills needs is to be prepared in connection with this.

According to the operational plan for 2022, KTH has to establish a coordinating function for strategic career development and continuing professional development, as well as support for leadership and organisational development within operational support. Initially, an inventory of needs and an analysis of the current situation will be carried out against the background of KTH's risk analysis, development goals and the four pillars, and also on the basis of the societal trends that challenge and change the requirements profile at KTH. A collective portal for services and development initiatives linked to careers and skills will be established for employees, managers and leaders in order to create transparency and accessibility on equal terms. In 2022, the emphasis has been on creating the conditions for these tasks by reviewing the organisation and processes linked to the area.

Two major change programmes were launched in 2022, resulting in priorities that have affected the pace of development. The overall aim of the programme for joint and coordinated operational support is to ensure consistent and efficient support that balances the support for teachers and researchers with the requirements that follow from KTH's role as a public authority, with high quality and high compliance. The Future Education at KTH programme will develop KTH's educational activities according to 13 principles. See the section on Courses and study programmes. Work on the change programmes will continue in 2023.

Ongoing actions and development work:

- Initiatives linked to gender mainstreaming for KTH's employees will be implemented by means of a development programme that aims to provide support in efforts to promote more equal and inclusive environments at KTH. Heads of schools have also been tasked with identifying environments where there is an imbalance in the gender balance among professors, with the possibility of offering places for visiting professors.
- Coordinated management of the recruitment and induction of invigilators has been established in order to meet KTH's overall needs.
- A number of training sessions were held at management level in 2022 in order to enhance skills on responsible internationalisation.

Further activities to develop skills provision are planned according to KTH's operational plan for 2023–2025.

## The European Charter for Researchers and guidelines for recruitment of researchers

KTH was presented with the HR Excellence in Research Award for 2021. This award reflects KTH's commitment to continuous development of its human resources policy in line with the European Charter for Researchers and the EU Charter & Code of Conduct for the Recruitment of Researchers. This consists of general principles and requirements that define the roles, responsibilities and rights of researchers and their employers, and is a fundamental and common quality framework aimed at strengthening research in Europe.

The implementation of the action plan for the HR Excellence in Research Award began in 2022 and was integrated into the work with other development projects according to KTH's operational plan for 2022. KTH will report the results to the European Commission in the first six months of 2023. Follow-ups with the European Commission on the basis of identified development areas will then continue every three years.

## Unite!

2021 saw the launch of the Unite! H2020 project, where KTH is one of seven participating universities from seven European countries within the Unite! Alliance, began in January 2021. This project is divided into nine work packages, Strengthening Human Capital being one of them. This work consists of five interim projects with the overall objective of identifying best practices and developing common strategies for skills and career development for researchers, thereby promoting an open, attractive and sustainable European labour market. One of the five interim projects was completed in December 2021, resulting in a joint handbook to support researchers early on in their careers. Three additional sub-projects focusing on working on best practices regarding mobility, career development, diversity and gender equality and assessment criteria came to an end in 2022.

## Continuing professional development and organisational development

A major effort in the field of strategic continuing professional development was made during the year in terms of staff development. This included the organisation, processes, templates and procedures for needs assessment, case management of requests and demands, and establishment of partnerships with suppliers for human resources development. A process flow from need to implementation was developed in order to meet the need for continuing professional development activities in an equal manner.

New opportunities for learning and development could be offered to the organisation with a new framework agreement for employee, manager and leadership development.

Training and continuing professional development took place during the year in areas such as labour law, rhetoric, interview techniques and recruitment, staff mobility, cardiopulmonary resuscitation and fire safety. Training in basic project management was organised in order to safeguard skills related to operational development, partly due to the merger of operational support. Group development initiatives were implemented on the basis of individual needs in order to strengthen and streamline cooperation following the pandemic. Rehabilitation and return to work workshops were organised jointly with HR, managers, trade unions and safety representatives.

### *Continuing professional development for collaborative research leaders*

Research funding bodies and partners are increasingly demanding that KTH work towards sustainable development, gender equality, open data, privacy issues, utilisation, management of intellectual assets, etc. KTH has therefore created a series of seminars in the form of training modules in these areas. The aim is to increase the skills and opportunities for exchange between collaborative leaders and other relevant staff.

In 2022, the seminars involved around 50 participants per session and addressed issues such as finance, administrative support for research centres and support for bibliometric analysis. Modules on ethics and collaborative leadership skills, as well as gender equality, diversity and equal opportunities and sustainability, were developed during the year. These will be launched in 2023.

### *Courses on teaching and learning in higher education*

In 2022, 10 (11) courses on teaching and learning in higher education were conducted with 479 (478) participants, of whom 188 (184) were women and 291 (294) men. Participants in virtually all courses develop their own courses, learning environments or degree programmes. Examples of courses include Digital Learning in Higher Education and Learning for Sustainable Development.

A new course was developed during the year where a web-based module is to be completed by all examiners at KTH. Expertise can be deepened within the course on teaching and learning in higher education entitled Examinership for Courses at KTH.

Furthermore, the first round of KTH's new qualifying programme for teachers in 2022, Future leaders in strategic educational development, was carried out. This aims to be a development-oriented programme providing a useful qualification for talented teachers at KTH. After application, selection and admission, 12 teachers participated in the programme. The development and evaluation work carried out addressed various key themes.

## Induction

An experience group mapped the need to develop induction programmes for new employees. Proposals for measures that were particularly highlighted were the establishment of a common digital platform for the induction process, development of equivalent HR support for induction and development of a digitised common induction for good establishment at KTH. The group also started a joint development initiative for common digital induction of new employees.

## Career support

A position within tenure track, the academic career path, involves a long-term commitment from KTH in terms of resources and development opportunities. Career development support clarifies what is required for qualification as an associate professor or professor and offers opportunities for development in relevant areas. Skills support for active career planning for assistant professors is offered as part of the Partners in Learning programme. The programme had 18 participants in 2022, 8 men and 10 women. The Leadership for Associate Professors course had 19 participants, 11 men and 8 women.

Every year, KTH managers are invited to participate in mentoring programmes.

KTH offers two one-year mentoring programmes in collaboration with other universities in the Stockholm region and companies in Sweden. The number of participants from KTH during the year was 21, 12 women and 9 men. Subject-specific training is also provided on rules, processes and practices that are essential knowledge for managers and leaders at KTH. Training on basic labour law for managers and HR was conducted with 22 participants, 20 women and 2 men.

Since 2008, KTH has offered its staff the opportunity for life and career planning, partly to promote personal development and partly to support internal and external mobility. Life and career planning includes one-on-one guidance and coaching and is funded by local joint transition funds. During the year, a total of 21 staff members, 15 women and 6 men, applied for and completed life and career planning.

### Relocation

KTH Relocation works primarily with orientation and integration of people recruited by KTH from abroad. Orientation is provided to employees and scholarship holders as well as staff employed by employers other than KTH with the intention of completing a longer exchange or sabbatical at KTH. Around 650 people registered with KTH Relocation in 2022. The primary request is for assistance with finding accommodation, which is provided during the first year at KTH. Other activities include excursions, guided tours, meetings with both Swedes and other new recruits, and language and cultural training. The purpose of these activities is to facilitate integration at KTH and in Stockholm and Sweden. There is a procured career support programme for people accompanying professors, senior lecturers and assistant professors.

## Management and leadership

2022 was initially characterised by COVID-19, requiring continued remote leadership and extensive self-leadership for managers and staff alike. The demand for working from home gradually decreased, and a return to on-campus work placed new demands on leadership. The focus was on managing employees with continued extensive self-leadership and securing the working environment during the working day with working from home in combination with physical attendance. Challenges arose when it came to leading staff in a post-pandemic situation, and team development support was offered. All operational support managers were also offered a digital lecture on creating sustainable teams and workplaces in a hybrid working environment. This lecture was attended by 89 managers, 28 men and 61 women. A lecture was also offered to some operational support staff on understanding how thoughts, feelings and behaviours are affected in times of change.

Focusing on leadership development, a comprehensive needs assessment has been carried out with a view to providing a basis for strategic development initiatives. The previous Leadership Step 1 course has been further developed using this needs assessment as a basis. This will now be called Leading at KTH as a manager and is aimed at the target group of newly appointed managers. Nominations were made in 2022 for the course starting in January 2023.

The leadership development initiative Dialogue for Development has been developed to ensure that managers and leaders in each operational area develop their formal skills for their roles as managers or leaders. This aims to give managers the right conditions to lead development work according to the collaborative process applied at KTH in order to develop operations and the working environment in dialogue and collaboration with employees.

The leadership experience group increased the frequency of its meetings to ensure leadership support tailored to needs. It was also extended to include HR representatives from all schools. Current activities for leadership support tailored to needs were inventoried. The leadership support areas that were identified as suitable for joint development for KTH as a whole were listed in order of priority.

Systematic work on leadership development is also conducted through leadership and management forums.

## Working environment

The year began with the Public Health Agency of Sweden's recommendations due to the ongoing pandemic, and many KTH employees worked from home. As in the previous year, work in 2022 was characterised by digital solutions, which led to a particularly high demand for training and IT support. Digital solutions included digital and hybrid meetings.

Following an evaluation of the previous year's initiatives, the digital stress programme was implemented in 2022 as well with a view to empowering employees in coping with stress. Around 300 employees took part. A three-day training course on dialogue methodology was arranged in the spring in order to create the conditions for employees to act in situations that may be perceived as challenging, in connection with cases relating to discrimination and victimisation.

A procedure for the procurement of an employee survey tool was completed in 2022, and a project for implementing the tool in 2023 began in the autumn.

Systematic occupational health and safety at KTH involves regular health checks, digital support material and training. The schools compile annual working environment plans in which physical, organisational and social working environment activities are documented and followed up. The organisation conducted safety inspections as before, but has also taken infection risks into account during the year. A pilot project to introduce work on safety inspections into the

digital system for managing risks in the working environment, the IA system, was conducted at the EECS School during the autumn. This system continued to be used to report incidents, risks and occupational injuries.

The reporting rate increased significantly in parts of the organisation, which was one of the objectives of the implementation. Work began on developing a training package for managers on the working environment within the framework of the merger of operational support and the Arena for Leadership and Pedagogy.

Efforts to find ways to investigate the digital working environment at KTH continued during the year, and plans were put in place to conduct a survey in the spring of 2023.

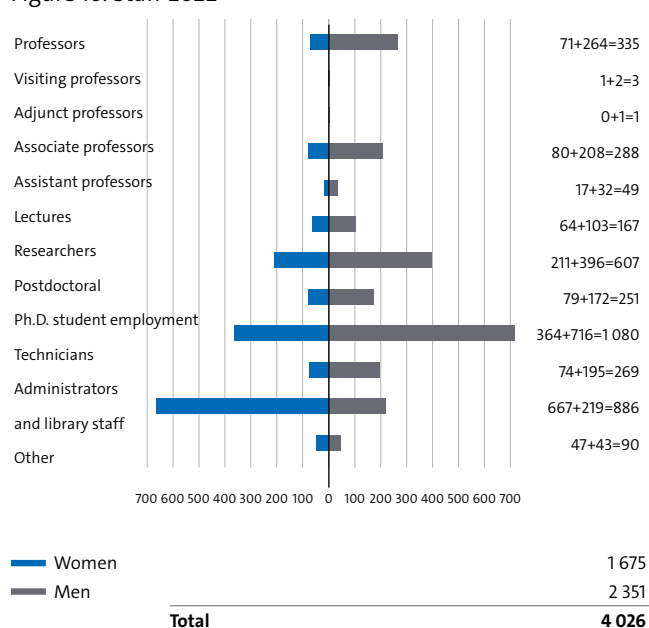
Activities were scheduled for implementation in 2023 as part of the President's priority working environment area Sustainable Working Life.

The external chemical audit has indicated development areas. KTH's lab safety coordinator prepared a proposal to address common deficiencies.

## Staff structure

The average number of employees in 2022 has increased by 43 people to 5,240 (2,263 women and 2,977 men), compared to 5,197 in 2021 and 5,035 in 2020. In terms of full time equivalents, there is a reduction of 25 in 2022 to 4,026, 1,675 women and 2,351 men (4,051 full time equivalents in 2021 and 3,895 in 2020).

Figure 16. Staff 2022



Source: HR+

In terms of full time equivalents, the proportion of women has increased by 1 percentage point to 42 per cent compared to 2021.

### Age structure

The average age of KTH employees is 40 (41 for women and 39 for men). The average age of teachers and researchers is 41 (40 for women and 41 for men). The average age of doctoral students with employment is 30 (31 for women and 30 for men). The average age of technical and administrative staff is 46 (46 for women and 45 for men).

### Teachers and researchers

The number of teachers has increased by 3 full time equivalents to 843 (840), 233 (221) women and 610 (619) men. The Teachers group includes professors, visiting professors, adjunct professors, associate professors, assistant professors and lecturers. The proportion of female teachers has increased by 2 percentage points to 28 per cent.

### Professors, visiting professors and adjunct professors

The number of full time equivalents in the professor group, which includes professors, visiting professors and adjunct professors, has increased by 4 full time equivalents in 2022 to 339 (335), 72 (65) women and 267 (270) men. The proportion of women has increased by 2 percentage points to 21 per cent, compared to 19 per cent in 2021 and 2020. The number of visiting professors has fallen by one full time equivalent in 2022 to three (four), one (one) woman and two (three) men.

18 new professors and visiting professors were appointed in 2022. The proportion of women among these was 44 per cent. The proportion of new recruits in this category was 36 per cent in 2021, 14 per cent in 2020 and 25 per cent in 2019.

The number of adjunct professors has fallen by 4 in 2022, numbering is 46 (50) at the end of the year, 7 (6) women and 39 (44) men. All adjunct professors are employed by KTH, but their primary activities are conducted outside KTH. The position comprises at least 20 per cent and no more than 30 per cent of full time hours, and most adjunct professors do not receive a salary from KTH. The number of full time equivalents for people receiving salaries is rounded to one full time equivalent in 2022.

### Associate professors and lecturers

The number of associate professors has decreased to 288 (290), 80 (76) women and 208 (214) men. The proportion of women is 28 (26) per cent. 22 new associate professors were recruited during the year, 7 women and 15 men. The proportion of women among new recruits has fallen by 1 percentage point to 32 per cent compared to 2021. The number of lecturers has increased compared to 2021, to 167 (166) full time equivalents. The proportion of women in this category is 38 (39) per cent.

### **Career development positions: assistant professors and postdocs**

At KTH, assistant professors and postdocs jointly form the Career-development position category. The number of career development positions has increased to 300 (291) full time equivalents in 2022, 96 (98) women and 204 (193) men. The proportion of women has declined by 2 percentage points to 32 compared to 2021.

Six new assistant professors were hired during the year, three women and three men. The proportion of women among new recruits is thus 50 per cent, compared to 37 and 47 percentage points in 2021 and 2020 respectively. The number of associate senior lecturers in terms of full time equivalents was 49 (49), 17 women and 32 men, while all teaching and research staff numbered 1,701 (1,721), 523 women and 1,178 men. The proportion of assistant professors among all research and teaching staff thus stood at just under 3 (3) per cent.

The number of postdocs has increased to 251 (242) full time equivalent students compared to the previous year, 79 (82) women and 172 (160) men. The proportion of women has decreased by 3 percentage points to 31 per cent compared to 2021.

### **Researchers and research engineers**

The number of researchers and research engineers has decreased to 607 (639) full time equivalent students compared to the previous year, 211 (211) women and 396 (428) men. The proportion of women has increased by 2 percentage points to 35 per cent compared to 2021.

### **Doctoral students with employment**

The number of doctoral students with employment has increased to 1,080 (1,069) full time equivalent students in 2022, 364 (345) women and 716 (724) men. The proportion of women among doctoral students with employment is 34 (32) per cent.

### **Technical and administrative staff**

The technical and administrative staff, including library staff, has increased to 1,155 full time equivalents in 2022 (1,145 full time equivalents in 2021 and 1,128 full time equivalents in 2020), 741 (734) women and 414 (411) men. The proportion of women is 64 per cent, as in 2021 and 2020.

### **Docents**

KTH admitted 23 (28) docents in 2022, 7 (12) women and 16 (16) men. The proportion of women among those admitted was thus 30 (43) per cent. Admission as a docent is part of an academic career in which teachers and researchers can build up their own research teams through principal supervision of doctoral students. Anyone who has been admitted as a docent is expected to be the principal supervisor of doctoral students, act as an external reviewer and participate in examining committees for public defence of doctoral theses in the subject area, contribute to teaching in the subject area at second and third cycle level, and conduct research activities at an international level.

# Premises

KTH had around 288,400 sq m (292,000 sq m) of premises at the end of 2022, excluding accommodation for students and guest researchers. The decrease in area compared to 2021 is due to the fact that about 860 sq m has been vacated at Albano and 1,400 sq m has been vacated in a building at Campus Valhallavägen. More than 41,000 sq m of space is sublet to parties such as the Swedish Red Cross University (Flemingsberg), Stockholm University (Albano/AlbaNova/SciLifeLab) and the Karolinska Institute (SciLifeLab).

In autumn 2022, KTH regained access to the newly renovated premises in building 43:19, where the Department of Fibre and Polymer Technology and the Wallenberg Wood Science Center are located. The renovation and development of university-wide educational facilities has also continued.

KTH's expenses with regard to premises will increase significantly in the coming years due to rising inflation and the increasing cost of electricity. Most of the increase is due to the indexation of the rental contracts linked to the consumer price index (CPI). The premises management plan is important for premises planning in a longer perspective; the premises management plan for 2022–2025 was adopted in 2022.

In the autumn of 2022, KTH investigated opportunities to streamline the use of premises and improve the control of expenses with regard to premises. KTH has intensified its efforts on this to see which areas can be left or utilised more efficiently, and this will include conducting occupancy surveys.

## Accommodation for students and visiting researchers

KTH provided accommodation to approximately 1,400 exchange students and international Master's students in 2022. The rental portfolio comprises a total of 880 apartments with a total of about 1,100 beds, divided over 371 studio apartments, 287 corridor rooms and about 440 beds in shared apartments. The occupancy rate was around 87 per cent over the whole year. The occupancy rate was 98 per cent in the autumn semester and 94 per cent in the spring semester. Maintenance and cleaning are carried out during the summer, when many homes are empty. The occupancy rate was 42 per cent in the summer of 2022.

KTH also arranges accommodation for foreign doctoral students and visiting researchers. KTH had a total of 280 homes available for the target group in 2022, distributed across Greater Stockholm. The occupancy rate over the year was around 95 per cent. More than 650 new foreign guest researchers and doctoral students received accommodation through KTH in 2022. It is deemed necessary to prioritise doctoral students and postdocs, as well as people who would be staying at KTH for longer. Only a small number of people who applied for short-term accommodation had their applications rejected. The need for accommodation remains

high for the coming years as well. However, KTH estimates that the need for accommodation for foreign doctoral students and visiting researchers will be covered for the next few years, and that no increase in stock is necessary.

The loss on rental of accommodation amounted to just over SEK 8 million; which is an improvement on 2021, when the deficit was just over SEK 23 million. This improvement is due to a reduction in expenses while revenues remain stable. Details on income and expenditure can be found in note 2 to the financial statements.

# Finance – earnings, use of resources and financing

## Earnings and change in capital

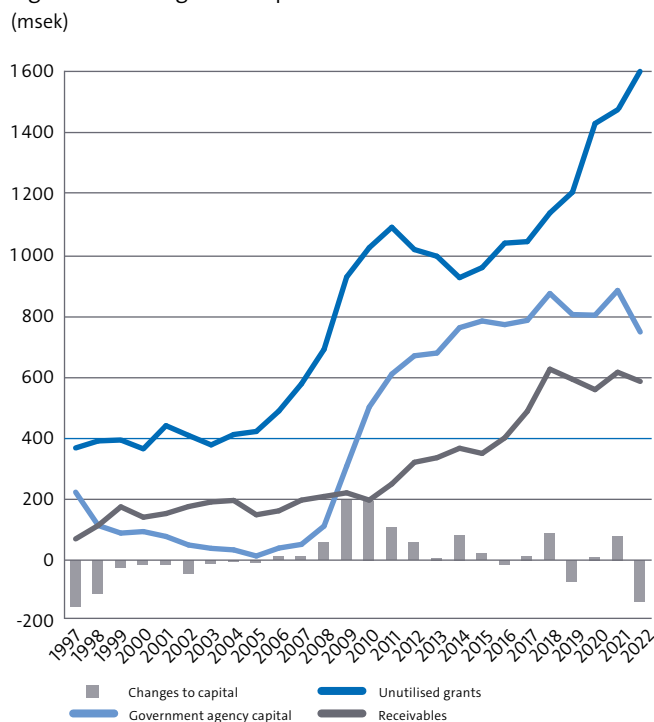
KTH shows a negative result of SEK 137 million in 2022 compared with a positive result of SEK 80 million in 2021. The amount for 2021 is corrected with the direct government funding savings of SEK 91 million that were not recognised in the income statement for 2021. The 2021 comparative figures for profit, revenue and agency's capital have thus been adjusted. Revenues for 2022 have fallen by almost SEK 30 million compared to 2021. Expenses increased by almost four per cent (SEK 188 million). Education at first and second cycle level is reporting a deficit of almost SEK 115 million, compared to a deficit of SEK 24 million for 2021. The deficit within research and education at third cycle level is SEK 23 million, compared with a surplus of SEK 103 million in 2021.

This result is partly due to a decrease in revenues from direct government funding and an increase in expenses, mainly due to an increase in other operating expenses. Turnover is in line with 2021 and amounts to SEK 6,065 (6,067) million, measured as operating income including funds for financing transfers. KTH's turnover has increased by 37 per cent in ten years, with operating revenue increasing by 31 per cent and transfers by 104 per cent.

Government capital amounts to SEK 741 (877) million at the end of 2022, corresponding to 12 (14) per cent of turnover according to the above definition and 14 (16) per cent of operating revenue. KTH has made a number of decisions on strategic initiatives funded using government capital. These initiatives have affected earnings by around SEK -70 (-52) million in 2022.

KTH's involvement in SciLifeLab affects KTH's finances in several ways. For example, activities conducted within SciLifeLab generated revenue in the form of direct government funding, contributions and fees of SEK 258 (285) million, corresponding to just under five per cent of KTH's total revenue. Further information on SciLifeLab's activities and funding can be found in the section on Research, and also in the annual report submitted by KTH to the government in connection with the annual report. The role as accountable authority also affects KTH's financial performance and government capital through the research grants received by KTH, which are largely transferred to other participating universities. KTH received SEK 459 million within the research grant for SciLifeLab in 2022, SEK 121 million being assigned to KTH's activities. Direct government funding is settled in full when KTH receives the funds and is not accrued in the accounts. This means that previous years' funds within the direct government funding for the development of the infrastructure at SciLifeLab and funds within SciLifeLab for research in earlier stages of drug development that have not been fully utilised, have resulted in a surplus that is included in KTH's government capital. In 2022, all funds within the direct government funding for SciLifeLab have been decided upon and distributed within KTH and to the other participating universities. KTH's agency's capital within the role as accountable authority for SciLifeLab has not been affected, therefore.

Figure 17. Earnings and Capital Trend



Source: Financial system

Figure 18. Surplus/deficit (msek)

	2022	2021
Revenues	5289	5317
Costs	5426	5238
<b>Profit/loss</b>	<b>-137</b>	<b>80</b>
Revenues for transfers	776	750
Grant issued (costs for transfers)	776	750
<b>Profit/loss</b>	<b>-137</b>	<b>80</b>

Source: Financial system

Figure 19. Capital development (msek)

	Balance carried 2022	Profit / loss 2022	Profit / loss 2021	Balance brought 2021
First and second level studies	-145	-114	-22	-9
Purchased courses	5	0	0	6
Commissioned courses	0	0	-1	1
Research and doctoral studies	864	-18	97	782
Commissioned research	18	-5	7	16
<b>Total</b>	<b>741</b>	<b>-137</b>	<b>80</b>	<b>796</b>

Source: Financial system



## Revenue

Operating revenue has decreased by almost SEK 30 million compared to 2021 and amounts to SEK 5,289 million.

### Education at first and second cycle level

Revenue has fallen by SEK 61 million and amounts to SEK 1,570 million, representing 30 (31) per cent of total revenue. Income from direct government funding for education at first and second cycle level has decreased by five per cent and amounts to SEK 1,243 (1,304) million. Direct government funding has increased by the price and salary adjustment, but has still fallen for a number of reasons. In 2021, KTH received increased direct government funding for temporary initiatives that have been scaled down in 2022, qualifying programmes being the largest. The decrease is also explained by underproduction in first and second cycle education in relation to the funding cap. The total for the year is settled against direct government funding with the number of full time equivalent students and annual performance equivalents. In 2022, KTH cleared SEK 109 million under the funding cap in addition to the existing direct government funding savings of SEK 91 million from 2021. This resulted in total underproduction of SEK 200 million and direct government funding savings of more than 10 per cent of the funding, which is the maximum permitted proportion of direct government funding savings. KTH therefore needs to pay back the difference of SEK 64 million of the allocated funding cap for 2022.

Revenue from fees and other remuneration in education has increased by five per cent, SEK 15 million, and amounts to SEK 283 million in 2022. This increase is due to higher income from activities funded by tuition fees, the income in 2022 amounting to SEK 148 (139) million, while the remainder can be explained by increased income from contract education. Tuition fees account for about ten (nine) per cent of total education revenue.

Income from grants has fallen by 49 per cent and amounts to SEK 40 (77) million. This change is due to the fact that KTH received grants from the Legal, Financial and Administrative Services Agency for temporary initiatives in 2021, and that funding from the EU has decreased.

Revenues in respect of contract education are continuing to rise after the major decline in 2020 and have now exceeded the 2019 level.

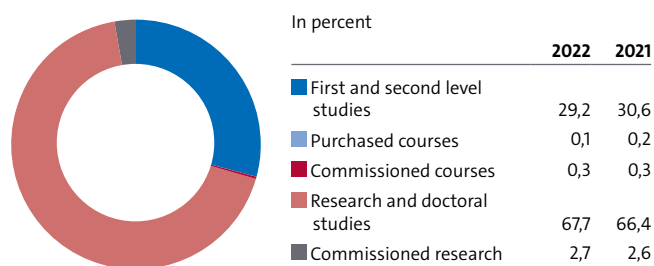
### Research and education at third cycle level

KTH's income for research and education at third cycle level accounts for just over 70 per cent of total income and amounts to SEK 3,719 (3,668) million, an increase of just over one per cent compared to 2021.

Income from direct government funding for research and education at third cycle level has increased by SEK 11 million compared to 2021. This change is mainly due to the price and salary adjustment of direct government funding. Some of the direct government funding for research has been used to fund

Figure 20. Field of activity 2022 (2021)

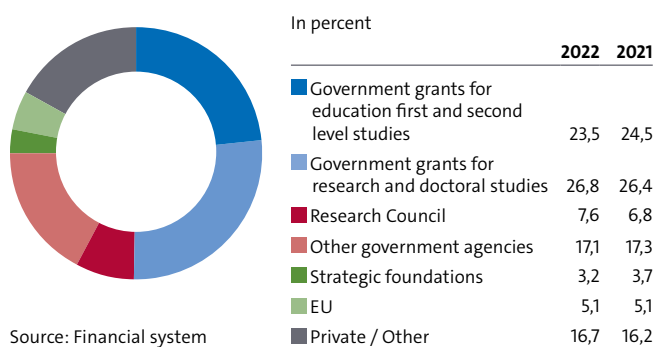
Total msek



Source: Financial system

Figure 21. Sources of income 2022 (2021)

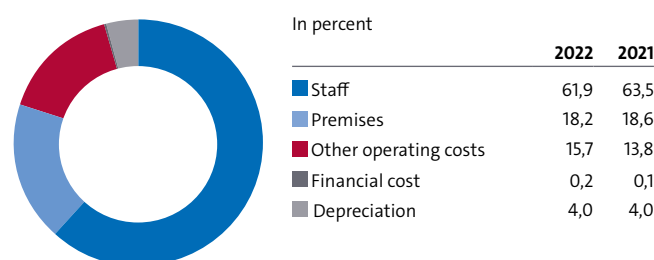
Total msek



Source: Financial system

Figure 22. Costs 2022 (2021)

Total msek



Source: Financial system

on at third cycle level. KTH's three largest funding bodies in respect of research and education at third cycle level, alongside direct government funding, have not changed compared to 2021. As before, the Swedish Research Council is KTH's largest external funding body, with revenue from grants totalling SEK 337 (288) million, followed by the EU with SEK 253 (243) million and the Wallenberg Foundations with SEK 235 (254) million. More information about KTH's research

funding bodies can be found in the section on Research.

Income from fees and other remuneration has increased by SEK 10 million, almost three per cent, and amounts to SEK 421 million in 2022.

Financial income has increased from SEK 4 million in 2021 to SEK 22 million in 2022, explained primarily by the general increase in interest rates.

## Costs

Operating costs amount to SEK 5,426 (5,238) million, which is an increase of just over four per cent compared with 2021.

Payroll expenses have increased by SEK 32 million, corresponding to an increase of almost one per cent compared to 2021.

The number of full time equivalent students has decreased by 25 compared to 2021. The increase in expenses between 2022 and 2021 is explained mainly by the annual salary review. Further information on KTH's personnel structure is provided in the section on Personnel.

Costs with regard to premises have increased by just over one per cent compared with the previous year, from SEK 973 million to SEK 987 million. The cost increases are mainly due to the indexation of rental contracts.

Other operating costs have increased by almost 18 per cent, corresponding to an increase of SEK 127 million compared to 2021. This is explained mainly by an increase in expenses for travel and conferences. Expenses for consultancy services have also increased, partly due to increased expenses in educational administration. Financial expenses have increased by almost SEK 8 million due to increased interest expenses.

## Education at first and second cycle level

Expenses for education at first and second cycle level constitute 31 per cent of the total operating expenses, amounting to SEK 1,684 million in 2022. Total expenses have increased by one per cent or SEK 11 million compared to 2022. Payroll expenses have increased by one per cent, which is less than the annual salary review. This is due to a decrease in the number of full time equivalents in 2022. Other operating expenses have increased by almost six per cent, SEK 16 million, compared to 2021, partly due to increased consultancy expenses, and partly to increased travel expenses. However, travelling is at a lower level than before the pandemic. Expenses with regard to premises have decreased by three per cent, SEK 11 million, compared to 2021. This decrease is partly due to reduced expenses for student accommodation: see note 2.

## Research and education at third cycle level

Expenses for research and education at third cycle level amounts to SEK 3,741 million and represents 69 per cent of total operating expenses. The total expenses for research and education at third cycle level have increased by SEK 177 million, five per cent, compared to 2021. Payroll expenses have increased by just under one per cent. This is less than the annual salary review, and is due to a small reduction in the number of full time equivalents in 2022. Other operating expenses have increased by almost SEK 112 million, corresponding to an increase of almost 25 per cent compared to 2021. Above all, travel expenses and other services have increased, which can be viewed as an expression of the fact that operations have largely returned to the situation that prevailed prior to the pandemic. Depreciation expenses have increased by SEK 13 million, nine per cent, compared to 2021, partly on account of the investment in research infrastructure made by KTH in recent years. Expenses with regard to premises have increased by four per cent compared to 2021.

Figure 23. Outcome for research and education at third cycle (msek)

	2022	2021	2020
<b>Operating revenues</b>			
Government grants	1,417	1,406	1,341
Revenues from tuition fees and other charges	421	411	390
Revenues from grants	1,858	1,847	1,752
Financial income	22	4	1
<b>Total operating revenues</b>	<b>3,719</b>	<b>3,668</b>	<b>3,484</b>
<b>Operating costs</b>			
Staff costs	2,377	2,356	2,229
Costs for premises	631	606	592
Other operational costs	565	454	461
Financial costs	9	3	1
Depreciation	159	146	155
<b>Total operating costs</b>	<b>3,741</b>	<b>3,564</b>	<b>3,437</b>
<b>Total operating outcome</b>	<b>-23</b>	<b>103</b>	<b>47</b>

Source: Financial system

Figure 24. Outcome for education at first and second cycle (msek)

	2022	2021	2020
<b>Operating revenues</b>			
Government grants	1,243	1,304	1,215
Revenues from tuition fees and other charges	283	268	285
Revenues from grants	40	77	89
Financial income	5	0	0
<b>Total operating revenues</b>	<b>1,570</b>	<b>1,650</b>	<b>1,589</b>
<b>Operating costs</b>			
Staff costs	981	970	944
Costs for premises	356	367	371
Other operational costs	287	271	244
Financial costs	2	0	0
Depreciation	59	65	66
<b>Total operating costs</b>	<b>1,684</b>	<b>1,673</b>	<b>1,626</b>
<b>Total operating outcome</b>	<b>-115</b>	<b>-24</b>	<b>-36</b>

Source: Financial system

# Management of foundations

KTH currently manages 96 private foundations via related management.

The foundations have been formed via various donations to KTH. The oldest foundation originated in a gift dating back to 1874, which was donated to KTH's predecessor, Kongl. Teknologiska Institutet [the Royal Technical Institute]. Both foundations still award scholarships to students at KTH. The purpose of the Hultqvist Foundation is to award scholarships to poor or less well-off and diligent students at the university who have earned them through diligence and good behaviour. The Samuel Owen Scholarship Foundation also has the purpose of awarding scholarships to students at KTH.

The P Eriksson Foundation and the Remy Schwartz Foundation have distributed their entire foundation capital for their respective purposes in 2022 and have been closed.

The pandemic has also had a negative impact on the take-up rate of scholarships awarded this year, as some trips and conferences have been cancelled.

## Management for the purpose of the foundations

The charter sets out the purpose of each foundation. The KTH-affiliated foundations distributed SEK 17 (16) million in 2022.

A large proportion – 42 – of the KTH-affiliated foundations provide scholarships to students at first and second cycle level. Almost SEK 9 million was distributed through 282 scholarships, of which almost SEK 5 million came from the Henrik Göransson's Sandviken Scholarship Fund, the largest of the foundations managed by KTH. This foundation has capital amounting to SEK 216 million.

Travel grants for teachers, researchers and doctoral students are awarded by 29 foundations. Grants totalling more than SEK 5 million were awarded through 190 scholarships in 2022.

The other 25 foundations contribute to research activities at KTH. A decision was made during the year to award grants for such activities totalling almost SEK 8 million over 70 scholarships.

The second largest foundation managed by KTH is the KTH Great Prize Foundation from a donation made in 1944. The donor stipulated that the prize should be awarded to a Swedish citizen who has been of major significance to Sweden through epoch-making discoveries, ingenious applications or artistic endeavours. This year's prize was worth SEK 1.2 million and will be awarded in connection with KTH's professorial inauguration in March 2023. The recipient of the 2022 prize is Petra Wadström. The University Board's citation is as follows: "Clean water is crucial to people's health, opportunities and quality of life.

It is also a key issue for future generations and the possibilities for sustainable development. Petra Wadström is a unique, single-minded problem-solver who with her innovation, Solvatten, has changed the lives of many people – and particularly women – around the world. Petra Wadström has created a simple yet clever, ingenious and sustainable construction, enabling water to be purified by the sun alone. This invention will allow more people access to vitally important clean water every day. Petra Wadström is a highly deserving recipient of the KTH Grand Prize."

KTH receives compensation from the foundations for the costs incurred in connection with their management. This remuneration for 2022 amounted to SEK 2.3 million.

## Asset management

The capital of the affiliated foundations is managed on a discretionary basis by two external asset managers. This means that the asset managers are authorised to make reallocations in the portfolio, within the framework specified in the University Board's guidelines for the investment of capital for KTH's affiliated foundations.

Total foundation assets at the end of the year amounted to SEK 959 (1,135) million.

Figure 25. Size and number of foundations  
Capital, MSEK at end of December 2022

	Number	Capital, MSEK
Foundations, 15–250 MSEK	16	658
Foundations, 5–15 MSEK	19	170
Foundations, 1–5 MSEK	49	123
Foundations, up to 1 MSEK	12	8
<b>Total</b>	<b>96</b>	<b>959</b>

Source: Bank statements of the foundations

# Financial Statement

	2022	2021	2020	2019	2018
<b>Operating revenues</b>					
Government grants	2.660,597	2.710,769	2.556,455	2.409,564	2.367,083
Revenues from tuition fees and other charges	703,808	678,842	674,633	670,376	645,225
Revenues from grants	1.898,095	1.923,698	1.840,929	1.878,724	1.769,529
Financial income	26,301	4,075	1,738	2,908	4,001
<b>Total operating revenues</b>	<b>5.288,801</b>	<b>5.317,385</b>	<b>5.073,756</b>	<b>4.961,571</b>	<b>4.785,838</b>
<b>Operating costs</b>					
Staff costs	3.357,468	3.325,956	3.173,160	3.027,200	2.839,754
Costs for premises	987,230	972,857	963,441	944,574	880,878
Other operational costs	852,007	724,670	704,745	845,588	772,464
Financial costs	10,549	2,963	834	4,754	7,623
Depreciation	218,718	211,212	220,945	210,442	206,842
<b>Total operating costs</b>	<b>5.425,973</b>	<b>5.237,658</b>	<b>5.063,126</b>	<b>5.032,557</b>	<b>4.707,562</b>
<b>Total operating outcome</b>	<b>-137,172</b>	<b>79,727</b>	<b>10,630</b>	<b>-70,986</b>	<b>78,276</b>
<b>Outcome from shares of subsidiary companies and other interests</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,072</b>	<b>9,491</b>
<b>Transfers</b>					
Funds allocated from government budget for financing of grants	435,058	427,799	372,472	353,460	339,865
Funds allocated from government agencies for financing of grants	181,636	169,998	153,025	158,431	150,459
Other funds received for financing of grants	159,457	152,036	83,370	92,664	89,621
Grants made	-776,151	-749,833	-608,867	-604,555	-579,945
<b>Outcome of transfers</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Changes to capital for year</b>	<b>-137,172</b>	<b>79,727</b>	<b>10,630</b>	<b>-68,914</b>	<b>87,767</b>

## Financial Statement per operational area

	Total	Education at first and second cycle		Research and education at third cycle		
		First and second level studies	Purchased education	Commissioned education	Research and doctoral studies	Commissioned research
<b>Operating revenues</b>						
Government grants	2.660.597	1.243.184	0	0	1.417.413	0
Revenues from tuition fees and other charges	703.808	258.359	6.938	17.274	278.268	142.969
Revenues from grants	1.898.095	39.604	0	0	1.858.491	0
Financial income	26.301	4.594	0	37	21.629	42
<b>Total operating revenues</b>	<b>5.288.801</b>	<b>1.545.740</b>	<b>6.938</b>	<b>17.310</b>	<b>3.575.801</b>	<b>143.010</b>
<b>Operating costs</b>						
Staff costs	3.357,468	971,729	2,000	6,998	2.326,238	50,503
Costs for premises	987,230	355,984	0	0	631,010	235
Other operational costs	852,007	270,718	5,177	10,731	474,608	90,774
Financial costs	10,549	1,688	0	0	8,823	39
Depreciation	218,718	59,466	0	8	152,862	6,382
<b>Total operating costs</b>	<b>5.425,973</b>	<b>1.659,585</b>	<b>7,177</b>	<b>17,737</b>	<b>3.593,541</b>	<b>147,933</b>
<b>Total operating outcome</b>	<b>-137,172</b>	<b>-113,845</b>	<b>-238</b>	<b>-427</b>	<b>-17,739</b>	<b>-4,923</b>
<b>Outcome from shares of subsidiary companies and other interests</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Transfers</b>						
Funds allocated from government budget for financing of grants	435,058	8,811	0	0	426,247	0
Funds allocated from government agencies for financing of grants	181,636	28,918	0	0	152,718	0
Other funds received for financing of grants	159,457	2,768	0	0	156,689	0
Grants made	-776,151	-40,497	0	0	-735,654	0
<b>Outcome of transfers</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Changes to capital for year</b>	<b>-137,172</b>	<b>-113,845</b>	<b>-238</b>	<b>-427</b>	<b>-17,739</b>	<b>-4,923</b>

# Balance Sheet

	2022-12-31	2021-12-31
<b>ASSETS</b>		
<b>I. Intangible fixed assets</b>	<b>14,462</b>	<b>111</b>
Capitalised expenditure for development	87	111
Intellectual rights and other intangible assets	14,375	0
<b>II. Tangible fixed assets</b>	<b>873,869</b>	<b>754,432</b>
Improvements to non-owned real estate	286,164	300,146
Machines, inventory items, installation etc.	554,186	428,290
Construction in progress	33,518	23,800
Advance payments for tangible fixed assets	0	2,196
<b>III. Finansiella anläggningstillgångar</b>	<b>29,014</b>	<b>28,014</b>
Interests in wholly and partially owned companies	28,925	27,925
Other investments held as fixed assets	90	90
<b>VI. Receivables</b>	<b>183,463</b>	<b>109,991</b>
Receivables - costumers	35,911	25,225
Receivables - other government agencies	146,529	84,467
Other receivables	1,023	299
<b>VII. Cut of items</b>	<b>885,431</b>	<b>936,744</b>
Prepaid expenses	299,823	276,907
Accrued grant revenues	579,224	609,418
Other accrued revenues	6,384	50,420
<b>VIII. Settlement with Government</b>	<b>-199,946</b>	<b>-90,960</b>
Settlement with Government	-199,946	-90,960
<b>X. Cash and cash equivalents</b>	<b>2.090,469</b>	<b>1.947,091</b>
Balance and interest-bearing account at Swedish National Debt Office	1.823,583	1.885,041
Other credit balances at Swedish National Debt Office	266,885	62,050
<b>TOTAL ASSETS</b>	<b>3.876,760</b>	<b>3.685,424</b>
<b>CAPITAL AND LIABILITIES</b>		
<b>I. Agency capital</b>	<b>740,985</b>	<b>877,050</b>
Government Capital	30,363	29,255
Changes to capital brought forward	847,795	768,067
Changes to capital according to Financial Statement	-137,172	79,727
<b>III. Provisions</b>	<b>47,167</b>	<b>44,551</b>
Provisions for pensions and similar commitments	9,900	9,445
Other provisions	37,267	35,106
<b>IV. Liabilities etc.</b>	<b>1.377,458</b>	<b>1.177,567</b>
Loans from Swedish National Debt Office	676,195	610,034
Accounts payable - other government agencies	81,661	76,957
Accounts payable - suppliers	206,340	294,981
Other accounts payable	413,782	196,114
Deposits	-520	-519
<b>V. Cut-off items</b>	<b>1.711,150</b>	<b>1.586,257</b>
Accrued expenses	82,878	102,426
Unutilised grants	1.606,542	1.468,862
Other prepaid revenues	21,730	14,969
<b>TOTAL CAPITAL AND LIABILITIES</b>	<b>3.876,760</b>	<b>3.685,424</b>
<b>CONTINGENT LIABILITIES</b>		
Government guarantees for loan and credits	none	none
Other contingents liabilities	11 100	13 300



