ETH zurich

Sustainability Report 2017/2018

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Use the navigation bar and the links for the best on-screen viewing experience.

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In brief: Sustainability at ETH Zurich

With almost 30,000 people studying, researching, teaching, and working at ETH Zurich, it is not only one of Switzerland's major universities, but also one of the biggest employers in the region. Founded in 1855, the Swiss Federal Institute of Technology in Zurich (ETH Zurich) is consistently ranked among the leading universities of the world. Aware of its responsibility towards students, employees, and society, the university integrates the principles of sustainable development in its core activities of research and education, as well as on campus and in dialog with society.

Sustainability Report 2017/2018

This report reviews the progress that ETH Zurich has made in contributing to sustainable development. Covering the reporting period 2017/2018, it also highlights the challenges the university is facing and monitors the status of sustainability goals. This is the fifth of ETH Zurich's biennial Sustainability Reports. The report has been prepared in accordance with the GRI Standards: Core option and the ISCN Sustainable Campus Charter. It targets internal as well as external audiences, including employees and students of ETH Zurich, but also the interested public and representatives of the political sphere, the public administration, civil society, and the corporate sector. Not every aspect of ETH Zurich's sustainability-related activities and achievements can be covered in this report, which is why the report focuses on the most relevant topics (page 91). The GRI Annex document is available online.

Annual Report 2018

This Sustainability Report is published together with the university's Annual Report 2018. The Annual Report discloses details of the university's performance and services rendered. The Annual Report consists of a status report, which summarises key events and developments at the university, as well as a detailed annual financial statement in line with the International Public Sector Accounting Standards (IPSAS). The Annual Report briefly outlines the university's approach to sustainability, but leaves the details to the Sustainability Report. It is available in German, English, and French.

AR

This reference icon appears in the Sustainability Report where more information on the respective topic is provided in the Annual Report (AR).

OVERVIEW

1 RESEARCH

2 EDUCATION

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4 DIALOG

ABOUT THIS REPORT

CONTENT INDICES

Cover
The cover page shows one of the 18 teams of the ETH Week in 2017. Every morning of the one-week programme, the teams came together for an "Energizer" to kick off their day. Read more about ETH Week on page 34 of this report.

OVERVIEW

Welcome by the President

On 25 September 2015, all member states of the United Nations unanimously committed to the 2030 Agenda. The 17 Sustainable Development Goals (SDGs) form the core of this agenda. This milestone underscores the international consensus on the importance of sustainable development. At the same time, it shows that the major societal challenges of our time require cooperation and a political will to take action. I am convinced that universities have a responsibility to help address these challenges in order to develop sustainable solutions for the benefit of society.

Sustainable development already has a long tradition of strategic importance at ETH Zurich. Our integrated approach has been developed over the past decades in close exchange with a large number of stakeholders inside and outside ETH Zurich. We defined four strategic fields of action along the core activities of a university. In our Sustainability Report, we have dedicated a chapter to each of these four fields of action:

In the Research chapter, this report shows how our researchers generate technical and scientific knowhow for long-term development. The Education chapter describes our approach towards preparing future generations for major societal issues. In the third chapter, Campus, we explain how we align ourselves with the principles of sustainability and integrate them into our decisions. Finally, in the chapter Dialog, we outline how we interact with the public and communicate the latest results of our research and teaching.

Our sustainability reporting, which was awarded the "Swiss Ethics Award" in 2018, documents our successes and challenges in all four fields of action. Through the regular monitoring of our sustainability goals, we are able to identify areas where we need to improve.

We appreciate the support of the Federal Government, but also the intrinsic motivation of all members of ETH Zurich and our numerous partners beyond the university. In view of the global relevance of these challenges, the lively exchange with universities from all over the world, such as in the International Sustainable Campus Network (ISCN) or the International Alliance of Research Universities (IARU), is of great importance.

Over the course of the current reporting period, several cases of personal misconduct were reported at ETH Zurich. The university takes each of these incidents very seriously. On an institutional level, a set of measures has been initiated to further strengthen long-lasting trust and improve the university's capability to deal with conflicts in a highly competitive working environment.

This report has been compiled in accordance with the GRI Standards and the ISCN Sustainable Campus Charter and for the first time explicitly refers to the SDGs in the individual chapters. It covers a broad spectrum of sustainability-related topics. Therefore, it also offers a good opportunity to enter into a conversation with you, our readers.

I would like to invite you to read our Sustainability Report with a critical eye, in line with the 2030 Agenda, so that we can all work together to make the world a more sustainable place.

Prof. Dr. Joël Mesot
President of ETH Zurich

ETH Zurich and the Sustainable Development Goals

End extreme poverty worldwide by 2030. Significantly reduce marine pollution by 2025. Raise USD 100 billion annually by 2020 to finance urgent climate protection in developing countries. These are some of the many demands the United Nations (UN) has set out in its Sustainable Development Goals (SDGs). They were adopted in 2015 by all UN member states, within the framework of the 2030 Agenda. But how should a university like ETH Zurich deal with politically formulated sustainability goals? Despite legitimate criticism concerning their practical feasibility, the SDGs relate directly to our planet's most pressing problems and integrate the economic, social, and environmental dimensions of sustainable development. More importantly, unlike the Millennium Development Goals, which focused primarily on developing countries, the goals of the 2030 Agenda apply to all countries. This means all countries are called upon in equal measure to solve the pressing challenges of the world together, and to commit themselves to sustainable development within their scopes. With the rise of fake news and a boom in conspiracy theories, objective knowledge and sound technical solutions are needed more urgently than ever. The university community must learn to appreciate the value of political negotiation and put its expertise to work in the service of the general public. Promoting sustainable development is therefore both our mission and our goal. Showcasing examples from research, teaching, campus, and dialog with society, this report illustrates how ETH Zurich is taking on this responsibility and working specifically to implement SDGs.

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Virtual conferencing: The frequent-flyer researcher's dilemma

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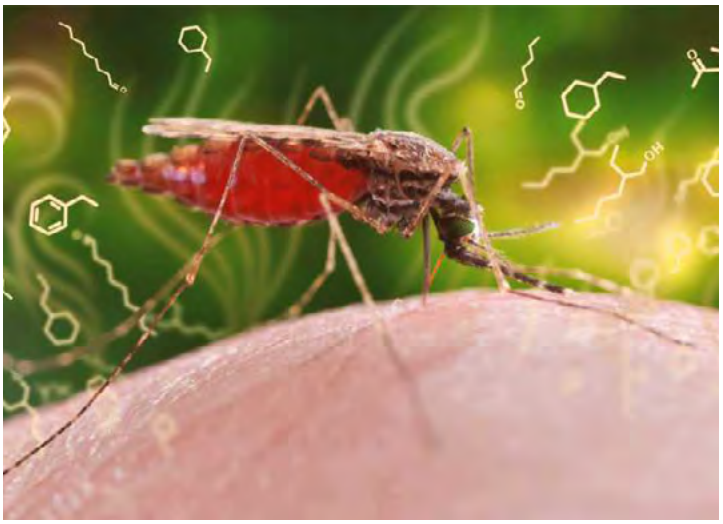
Undisputed excellence: Swiss Science Prize for conflict research

3 GOOD HEALTH AND WELL-BEING | 17 PARTNERSHIPS FOR THE GOALS

INSIGHT p. 25 RESEARCH

Sniffing out a killer disease



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Representation matters: Visibility is key to improving gender equality

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On the menu today: Climate-friendly nutrition

11 SUSTAINABLE CITIES AND COMMUNITIES

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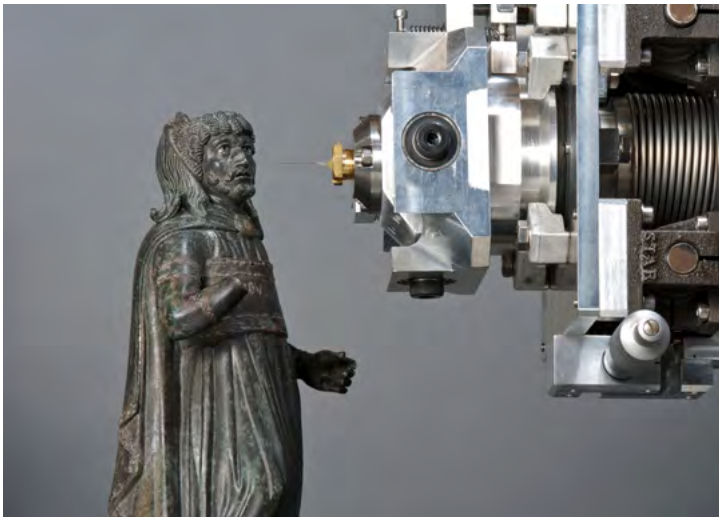
A treasury of knowledge and a resource for research: Cultural heritage in the ETH collections



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Scientists and citizens team up to do research

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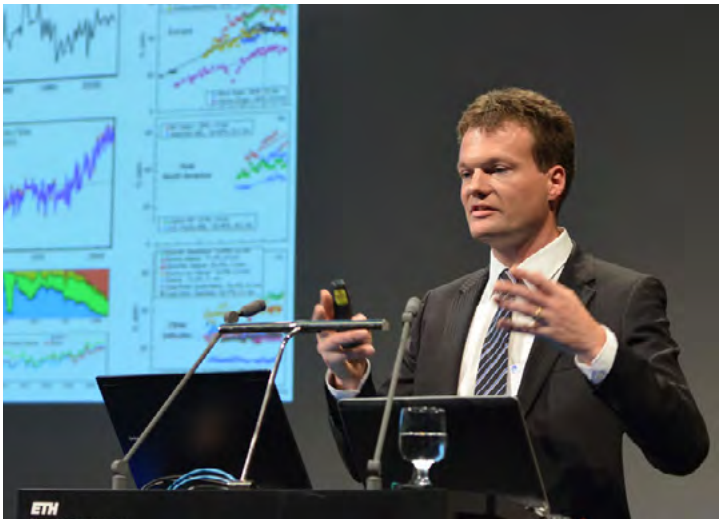
Award for climate researcher and climate ambassador



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INSIGHT p. 86 DIALOG

CH2018 scenarios model effects of shifting climate

Sustainability goals at a glance

Concrete and measurable goals are essential for benchmarking, monitoring, and progress. This report gives updates on goal achievements within the reporting period 2017/2018. It contains 41 goals in 15 categories, the bulk of which are environmental goals (e.g., energy, mobility, waste, etc.), which were identified by the university's Environmental Commission. All other goals were either derived from the Objective Agreement with the ETH Board or in coordination with the responsible units at ETH Zurich (i.e., diversity, talent retention and development). Goals achieved in the last reporting period are no longer listed in this report.

Sustainability goals (1/3)

Research page 16

Strengthen collaboration of engineering and natural science disciplines with the humanities and social and management sciences in fields relevant for sustainable development

International partnership page 18

Extend collaborations with peer institutions globally

Maintain existing alliances and networks with first-rate partner universities abroad

Ethics page 19

Evaluate research projects in which humans are the object of research for their compliance with legal and ethical norms

Conduct research in compliance with the "Guidelines for Research Integrity and Good Scientific Practice at ETH Zurich"

Educational development page 32

Continue recruitment measures for the best students nationally and internationally

Promote the education of exceptional personalities on all levels that are in high demand in science, business, and society

Support particularly gifted master students by providing grants to incoming students

Extend dual-mode teaching, i.e., the combination of in-classroom teaching and e-learning, as well as further methods of self-study

Increase in the number of online examinations through new infrastructure and projects

Improve mentoring relations through the appointment of additional assistants and full professorships

Sustainability goals (2/3)

Sustainability education page 36

- Offer a diverse summer and winter school programme on sustainable development at ETH Zurich
- Improve the ability of doctoral students to interact with non-academic stakeholders and provide recommendations for research topics
- Provide a platform for students to tackle sustainability-specific questions with practice partners from public and private sectors
- Offer innovative activities and events for students and other members of ETH Zurich to learn about sustainability
- Develop an overview that describes cross-departmental sustainability and critical thinking-related educational activities at ETH Zurich

Talent retention and development page 42

- Recruit and support of the best scientists to ensure highest quality of research and teaching
- Support employee development through comprehensive personnel development measures

Diversity page 50

- Preserve diversity among students and staff of ETH Zurich
- Increase gender balance on all levels of the academic career

Building efficiency page 54

- Implement MINERGIE®-ECO standard (or similar) in new buildings and MINERGIE® standard (or similar) for renovations
- In major investment projects, assess costs, energy usage, and emissions over the entire life cycle of the investment. In newly constructed buildings, only state-of-the-art construction standards and energy-efficient construction types are used
- Increase the use of rainwater in building projects

Energy page 57

- Continue to encourage energy-related dialogs with employees, students, and the public
- For operation of the energy supply system at Campus Hönggerberg (Anergy Grid), ETH Zurich will use energy from sources that comply with high ecological standards
- By 2025, 50 percent of the total heating requirements on Campus Zentrum (incl. external consumers) will be covered by waste heat.
- Implement first phase of "Masterplan Energy" at Campus Zentrum

Sustainability goals (3/3)

Emissions page 63

Reduce direct CO_2 emissions on Campus Hönggerberg by 50 percent by 2020 (4,600 t CO_2eq per year) through the implementation of the "Energy Concept Campus Hönggerberg" based on geothermal storage systems (base year 2006)

Mobility page 67

Limit air travel

Increase number of students travelling between the two campus sites using non-motorised traffic

Optimise public transportation between Campus Zentrum and Campus Hönggerberg

Reduce fuel consumption at ETH Zurich continuously

Paper consumption page 68

Reduce paper consumption continuously

Increase the proportion of recycled paper

Waste page 70

Host "Recycling Days" on campus

Direct 50 percent of total waste material to a recycling stream

Provide infrastructure for disposing of biogenic waste

Food page 73

Development of a general set of criteria for assessing the climate-friendliness of offerings in the catering industry

Development of recommendations for catering companies to reduce packaging and advance the substitution of disposable dishes with reusable dishes

Dialog page 81

By maintaining various channels of dialog, strengthen public understanding of the importance of fundamental and engineering sciences for politics, business, and society

Provide services for the benefit of the whole country by fulfilling diverse national tasks

Our approach to sustainability

Since its foundation in 1855, ETH Zurich has been a place where tradition and innovation are intrinsically linked. The university's lasting success can be attributed to a culture of empowerment fostered throughout its history and the ability to anticipate and adapt to new requirements. Sustainability has a long tradition at ETH Zurich, not only in research and education, but in all aspects of university life. The university's comprehensive approach to sustainability that encompasses environmental, social, and economic aspects has guided its strategic development throughout.

ETH Zurich believes that universities have not only a great opportunity, but also a responsibility towards society to develop innovative solutions for the challenges facing mankind. They should support their implementation, and thereby help prepare the path towards sustainable development of present and future generations.

Four fields of action for sustainable development

ETH Zurich is committed to sustainability in its core areas of Research, Education, Campus, and Dialog with society. For each of these four areas, the university has defined a strategic field of action:

1 RESEARCH

With its research activities, ETH Zurich provides the scientific and technical know-how for the sustainable development of society. In order to strengthen this commitment, ETH Zurich defined sustainability as one of the thematic foci in its strategic development plan 2017–2020. Besides the broad spectrum of cutting-edge research conducted in its departments, ETH Zurich can build on the inter- and trans-disciplinary expertise of its various competence centres to address the grand challenges of society, such as energy supply, food security, risk, or climate change.

2 EDUCATION

ETH Zurich trains the future generation of experts to incorporate aspects of sustainability in their professional lives. Over the course of the last decades, ETH Zurich has not only developed internationally recognised degree programmes, courses, and other teaching formats, but also founded new departments and institutes to impart sustainability-specific knowledge to its students. ETH Zurich further aims to instil intellectual agility in its students by giving them the tools to address socially and ethically relevant aspects with confidence during their student life, in their careers, and as members of society.

3 CAMPUS

On campus, ETH Zurich lives and promotes the principles of sustainable development with respect to social, environmental, and financial aspects. As an employer, ETH Zurich aims to provide the best possible working conditions, including the maintenance of a participatory, respectful, and diverse environment. In its operations, the university is keen to serve as a "living lab" to develop, implement, and test pioneering solutions to preserve natural resources and reduce its environmental impact. Finally, as a publicly funded university, ETH Zurich places great value on transparent budgeting and controlling, financial accountability, and risk management.

4 DIALOG

ETH Zurich actively informs the wider public about the latest findings of its research. It contributes its expertise to public debates in matters concerning sustainable development. In accordance with its performance mandate, ETH Zurich has developed a range of dialog formats and public outreach activities devoted to making research insights accessible in a comprehensible manner to society. The university also performs a series of services for the Federal Government, providing its expertise to inform decision-making based on scientific facts.

Managing sustainability

The President of ETH Zurich is responsible for the strategic orientation of sustainability at ETH Zurich. Management and implementation fall under the responsibility of the staff unit ETH Sustainability, the Safety, Security, Health and Environment (SSHE) department, the Real Estate Management department, and the Mobility Platform. If not covered in this report, the respective activities and achievements are disclosed in complementary sources, such as the SSHE's annual report or the respective websites.

ETH Sustainability is the university's sustainability office. It supports initiatives, projects, and individuals who contribute to enhancing sustainability at the university. In the organisational structure of ETH Zurich, ETH Sustainability is embedded as a staff unit directly reporting to the President. The unit is directed by a Steering Committee comprising the Associate Vice President for Sustainability (Chair), the Vice President for Research and Corporate Relations, and six ETH Zurich professors who conduct research in fields related to sustainability.

The SSHE department is responsible for safety and security as well as the health of the members of ETH Zurich. Reporting directly to the Vice President for Human Resources and Infrastructure, SSHE advises and trains members of ETH Zurich on how to deal with risks and hazards in order to protect people, infrastructure, and the environment and assists them in realising corresponding measures. The SSHE department also coordinates the Environmental Commission of ETH Zurich, which is responsible for environmental management at ETH Zurich.

The Real Estate Management department develops and manages the university's property portfolio, ensures that the value of the buildings is preserved on a long-term basis, and provides other infrastructural services. Through the sustainable development of the real estate portfolio, the Real Estate Management department provides an important prerequisite for high-quality teaching and research at ETH Zurich and covers the needs of owners, users, and operators.

Since 2016, ETH Zurich has operated a Mobility Platform. This platform serves as the central hub and contact point for all topics related to mobility at ETH Zurich. Under the responsibility of the Vice President for Human Resources and Infrastructure, it promotes sustainable mobility at ETH Zurich in order to reduce CO_2 emissions as well as energy consumption. Additionally, the platform initiates and coordinates projects in collaboration with research and operational units. Campus mobility and air travel are its two priority themes.

Sustainability reporting

The university's commitment to sustainability is also reflected in the evolution of its reporting tradition: In 2002, ETH Zurich published its first Energy Report. From 2005 onwards, the report was expanded into a more comprehensive Environmental Report. Since 2009/2010, ETH Zurich has covered all three dimensions of sustainable development in its biennial Sustainability Report. This is ETH Zurich's fifth Sustainability Report, and it covers the reporting period 2017/2018. For the second time, it is published together with the university's Annual Report. In 2018, ETH Zurich received the Swiss Ethics Award for its sustainability reporting. According to the jury, the reporting process at ETH Zurich not only promotes a broad internal dialog on the university's contribution to sustainable development, but also addresses employees and students interested in sustainability topics and ensures that the causes to which they are committed are given appropriate visibility. Since 2005, the Swiss Ethics Award has been awarded by the School of Management and Engineering Vaud (HEIG-VD) to companies, public institutions, or Swiss municipalities that are committed to sustainable development and socially responsible action.

Globally engaged for sustainability

ETH Zurich combines strong connections at the regional and national levels with a global outlook and network. To promote sustainable development in Switzerland and beyond, ETH Zurich maintains strong links with international partner institutions and actively contributes to the exchange in global alliances such as the International Alliance of Research Universities (IARU), the International Sustainable Campus Network (ISCN), or the Global University Leaders Forum (GULF) of the World Economic Forum (WEF).

ETH Zurich and the Sustainable Development Goals

With its comprehensive approach to sustainability, ETH Zurich is contributing in many ways to achieving the United Nations' Sustainable Development Goals (SDGs), as defined in the 2030 Agenda. For the first time, the university presents an exemplary selection of its contributions in this report. The compilation does not claim to be complete. Rather, it illustrates the role of universities in the implementation of the SDGs. For a more comprehensive version of the overview, please refer to: www.ethz.ch/sdg.

RESEARCH

In the project Leaf2Canopy, researchers from the Grassland Sciences group at the Department of Environmental Systems Science investigated vertical gradients of photosynthesis in tree canopies. They characterised the underlying leaf traits and investigated the effect of the microclimate (light, temperature, and humidity) on the photosynthesis gradients. The research combined ecophysiological and microclimatical measurements, with the aim of improving forest CO_2 exchange- and remote sensing models.

Research environment

For the university's researchers to unfold their full potential, ETH Zurich must provide the best possible working conditions and an inspiring environment. ETH Zurich's success depends on the ability to make space for creativity and innovation. Freedom and individual responsibility, as well as the cultivation of an atmosphere of empowerment, have been cornerstones of ETH Zurich's progress since its early beginnings. Likewise essential are trust and ethical behaviour. Therefore, ETH Zurich has issued a number of pertinent guidelines and monitors their compliance continuously.

With its cutting-edge research infrastructure, flexible organisation, and its active promotion of integrated and interdisciplinary thinking, the university can anticipate and adapt to emerging challenges. Over the course of the years, various programmes and initiatives have been established to encourage cooperation across disciplines and institutions, in Switzerland and abroad. ETH Zurich fosters a global network of strategic alliances, bilateral agreements, and international projects in search of solutions to global challenges. As an institution of the ETH Domain, ETH Zurich engages in annual dialog meetings with the ETH Board to assess the status of mission and goal achievement. Evaluation results and the university's scientific achievements underline the success of ETH Zurich's unique research environment. Within the reporting period 2017/2018, ETH Zurich maintained its leading position in terms of securing internationally renowned research grants, in terms of its position in global university rankings, and in terms of the quality of scientific output produced by its researchers.

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For additional information, please refer to the chapters Research and Honours and awards in the Annual Report.

Goal **Research**

Strengthen collaboration of engineering and natural science disciplines with the humanities and social and management sciences in fields relevant for sustainable development	Beyond their departmental affiliations, many researchers at ETH Zurich are actively engaged in inter- and transdisciplinary research projects in the context of NCCRs, Competence Centres, programmes, and other initiatives. More than 260 professorships are involved in the Competence Centres at ETH Zurich.	
	Four of the eight Competence Centres provide a platform for researchers at ETH Zurich to engage in projects in the university's core areas of sustainable development research.	
	ETH Zurich is the Leading House of three Swiss Competence Centres for Energy Research (SCCER), which are funded by innosuisse in cooperation with the Swiss National Science Foundation (SNSF). Researchers of ETH Zurich participate in all of the eight SCCERs.	
	In 2017, the Executive Board of ETH Zurich launched the ETH+ initiative. The initiative's aim is to build capacities and open up new fields of knowledge, particularly at the intersection between disciplines. The core of ETH+ is the creation of new professorships in promising areas. The university-wide call for proposals had attracted 68 ideas by May 2018. All departments and staff units as well as the Association of ETH Students (VSETH) and the Academic Association of Scientific Staff (AVETH) contributed ideas. Nine projects were funded in the first round. The projects of the second round are currently under review.	

Inter- and transdisciplinary research in Competence Centres
Complementing its disciplinary research focus, ETH Zurich promotes inter- and transdisciplinary research in eight Competence Centres that operate either within ETH Zurich or in collaboration with other universities and institutions (see table). Competence Centres are networks in which researchers from various fields coordinate their research and education, in some cases with external partners, while pursuing a shared strategic mission.

Strong involvement in NCCRs and SCCERs
In addition to their engagement in the Competence Centres, ETH Zurich's researchers are actively involved in seven National Centres of Competence in Research (NCCRs) of the Swiss National Science Foundation (SNSF) and all eight Swiss Competence Centers for Energy Research (SCCER). NCCRs promote long-term research projects in areas of vital strategic importance for the development of science in Switzerland, for the economy of the country, and for society. They improve the research landscape in Switzerland, promote research of outstanding and internationally recognised quality, enable knowledge and technology transfer, offer training, and foster the promotion of women in research. ETH Zurich acts as the Leading House for three NCCRs, and as a Co-Leading House for four. The university also acts as the Leading house for three SCCERs (see table below).

Competence Centres

Competence Centres at ETH Zurich	Competence Centres in collaboration with other universities and institutions
Energy Science: Energy Science Center (ESC)	Climate Systems Modeling: Center for Climate Systems Modeling (C2SM)
Materials and Processes: Competence Center for Materials and Processes (CC-MaP)	Citizen Science: Competence Center Citizen Science (CC-CS)
Integrative Risk Management: Risk Center	Imaging: Center for EXperimental and Clinical Imaging TEchnologies (EXCITE) Zurich
World Food System: World Food System Center	Plant Science: Zurich-Basel Plant Science Center (PSC)

Leading roles of ETH Zurich to National Centres of Competence in Research (NCCR) and Swiss Competence Centers for Energy Research (SCCER)

ETH Zurich as Leading House	ETH Zurich as Co-Leading House
Molecular Ultrafast Science and Technology (NCCR MUST)	Robotics (NCCR Robotics)
Quantum Science and Technology (NCCR QSIT)	Molecular Systems Engineering (NCCR MSE)
Digital Fabrication (NCCR DFAB)	RNA & Disease (NCCR RNA & Disease)
Efficiency and Industrial Processes (SCCER EIP)	Mathematics of Physics (NCCR Swiss MAP)
Supply of Electricity (SCCER SoE)	
Efficient Technologies and Systems for Mobility (SCCER Mobility)	

HIGHLIGHT

Virtual conferencing: The frequent-flyer researcher's dilemma

Does successful science require air travel? Many academics appreciate opportunities to attend conferences and to meet and exchange ideas with peers in a scholarly setting. Physical encounters are seen as important for research collaborations, fieldwork, networking, and establishing a scholarly reputation – a view often reinforced by peer pressure and the nature of the scientific evaluation system. However, air travel and associated emissions contribute a sizeable share of greenhouse gases; at ETH Zurich, emissions from air travel account for more than half of the university's total CO_2 emissions. In autumn of 2017, members of the International Alliance of Research Universities (IARU) network discussed the problem of "conference tourism" and its climate impact. Appropriately enough, this "Virtual Conference on University Air Miles Reduction", initiated by ETH Zurich and the sustainability team of the University of Zurich under the patronage of the IARU network, took place in cyberspace, without the need for air travel. "The conference served as a proof of concept for the feasibility of videoconferencing for collaboration in cyberspace to avoid emissions from air travel", says **Armin Brunner**, Head of Multimedia Services. The event generated policy briefs for the IARU universities' executive boards and the broader public, and a presentation at the 2018 ISCN conference in Stockholm. ETH Zurich is improving videoconferencing facilities as a way of mitigating climate change not only through research, but by offering the hardware needed for sustainable information transfer. As such, it furthers several UN Sustainable Development Goals by leveraging innovation expertise for industry and infrastructure (SDG9) with climate action (SDG13) for the benefit not only of ETH and its project partners, but of humanity at large.

More information: Virtual Conference

Goals **International partnership**

		STATUS
Extend collaborations with peer institutions globally	Collaborations between professors of ETH Zurich and their partners abroad have steadily increased over the past years. In 2017 and 2018, an annual average of almost 9,000 contacts were officially registered, which is about 13 percent higher than the annual average in the previous reporting period (8,000).	
Maintain existing alliances and networks with first-rate partner universities abroad	ETH Zurich is part of various international university alliances such as the International Alliance of Research Universities (IARU), the IDEA League, the International Sustainable Campus Network (ISCN), the Global University Leaders Forum of the World Economic Forum (GULF), UNITECH International, or the Scholars at Risk (SAR) network.	

STAKEHOLDER PERSPECTIVES Professors at ETH Zurich have great autonomy and a high degree of personal responsibility. Accordingly, in addition to the traditional selection criteria of "excellence in research and teaching", management and social skills are increasingly taken into account when recruiting new professors. These include, in particular, the ability to develop teams and promote young scientists, self-reflection and integrity, as well as the willingness to network within the scientific community and to commit oneself to ETH Zurich as a whole.

Dr. Birgit Kessler
Head of Office for Faculty Affairs

Transparency and ethical conduct in research
Ethical conduct and research integrity are important pillars of the university's identity. Managed by the Office of Research, ETH Zurich maintains an Ethics Commission that consists of 11 professors and senior scientists from various departments as well as external experts. The Ethics Commission evaluates research projects in which humans are the object of research for their compliance with legal and ethical norms. Within the reporting period 2017/2018, the Ethics Commission evaluated a total of 210 projects.

FURTHER INFORMATION

- Office of Research
- ETH Global
- ETH+ initiative
- Commission on Good Scientific Practice (GSP)
- Office for Faculty Affairs

Goals **Ethics**

		STATUS
Evaluate research projects in which humans are the object of research for their compliance with legal and ethical norms	In 2017 and 2018, 85 and 125 projects and programmes were brought to the ETH Ethics Commission for review, respectively.	
	After issuing a "Policy on Experimental Animal Research" in 2012, ETH Zurich established the "Animal Welfare Group" in 2018. As a member of the Swiss 3R Competence Centre (3RCC), ETH Zurich actively promotes the principles of 3R (reduction, refinement, and replacement) of animal experimentation in its research operations.	
Conduct research in compliance with the "Guidelines for Research Integrity and Good Scientific Practice at ETH Zurich"	In 2017, a new Commission on Good Scientific Practice (GSP) was established that started its operations in 2018. Consisting of 16 GSP delegates of the university's departments, the commission promotes debate over research integrity at the interface between the departments and the executive board. It is currently working on better incorporating aspects of research integrity in the field of education and on a critical revision of existing integrity guidelines.	

Research for sustainable development

The complexity of the challenges related to sustainable development calls for comprehensive research approaches and skills. ETH Zurich, where disciplinary expertise is combined with inter- and transdisciplinary experience under one roof, has the potential to be at the forefront of developing pioneering solutions to these challenges at the regional, national, and international levels. As a world leading university, ETH Zurich is eager to provide the infrastructure and framework conditions to match the strong motivation and drive of its researchers. This means not only well-equipped departments and institutes, but also the establishment of Competence Centres, the participation in national programmes, and other initiatives beyond the own institution.

Committed to focusing on the world's most urgent problems, ETH Zurich has defined in its strategic development plan core research themes of sustainable development. Worked out by the Strategy Commission in collaboration with the Executive Board, it is broadly based on the strategic plans of the individual departments. The five themes include energy, the world food system, climate change, future cities, and risk. Each of these themes is addressed both on the level of the departments and in the corresponding research centres: the Energy Science Center (ESC), the World Food System Center (WFSC), the Center for Climate Systems Modeling (C2SM), the Future Cities Laboratory (FCL), and the ETH Risk Center. ETH Zurich further facilitates interaction with stakeholders outside the university, such as policy-makers, the public administration, businesses, NGOs, and the general public. This stakeholder involvement, which is well received, is a key requirement for sustainable development research to yield applied solutions. At the same time, this immediate exchange enables ETH Zurich and its research community to obtain important feedback, which in turn is taken into account in its research activities.

STAKEHOLDER PERSPECTIVES Growth and sustainability should not be played off against each other. Swiss policies try to combine both objectives. To master this challenge, new findings are necessary. The researchers of ETH Zurich help us to develop sustainable growth strategies.

Christine Bulliard-Marbach
Member of the Swiss National Council (CVP) and President of the Science, Education and Culture Committee (SECC-N)

HIGHLIGHT

Undisputed excellence: Swiss Science Prize for conflict research

How and why do ethnic tensions erupt into conflict, and how can escalations of political violence be prevented? Sadly, these questions are only too relevant for our times. Even in Europe, which has long enjoyed unparalleled peace and prosperity, concerns over separatism and a resurgence of political violence are very real. In 2018, the Marcel Benoist Foundation awarded the Swiss Science Prize, generally regarded as Switzerland's premier award for academic excellence, to **Lars-Erik Cederman**, professor of Political Science at ETH Zurich's International Conflict Research (ICR) group, for his work on the causes and possible solutions of conflicts between ethnic minorities and central state governments. The award announcement was made on September 3, 2018, by Federal Councillor Johann Schneider-Ammann. In studying the socio-political causes of political violence, Cederman and his team spent several years collecting data on ethnic groups and their participation in conflict processes. Their studies showed that regional autonomy and political participation of minorities are essential elements of lasting peace, as are fair distribution of wealth and provision of basic care and services. The recognition of this research by the Marcel Benoist Foundation underscored the importance of the social sciences at ETH Zurich and the emphasis on equitable solutions for societal conflicts, in line with the UN's Sustainable Development Goals of reducing inequalities (SDG10) and fostering peace, justice, and strong institutions (SDG16). "I see the prize as recognition for my group's research and for the entire field of conflict and peace research", said Cederman, who was selected from a group of 26 nominees.

More information: International Conflict Research

Examples from the core research areas on sustainable development at ETH Zurich

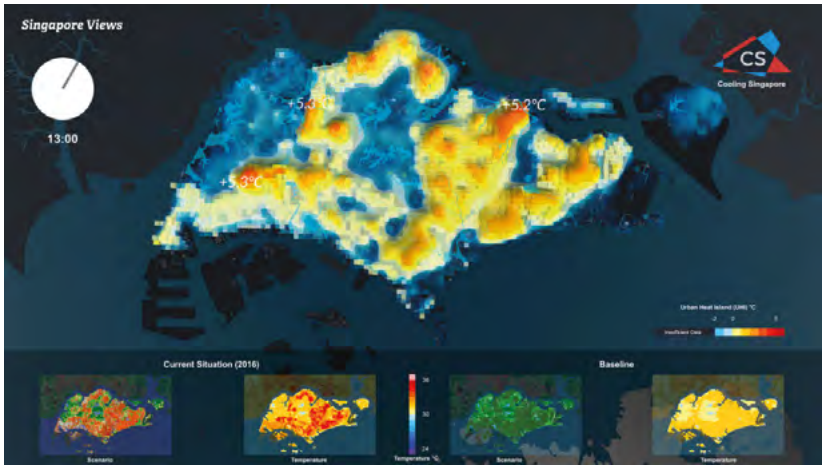
Energy: New materials for sustainable, low-cost batteries
The energy transition depends on technologies that allow the inexpensive temporary storage of electricity from renewable sources. Although existing lithium-ion batteries are ideal for electromobility due to their low weight, they are also quite expensive and therefore unsuitable for economical large-scale, stationary power storage. Researchers from ETH Zurich and Empa have developed new materials that could bring about key advances for the development of inexpensive aluminium batteries. The first is a corrosion-resistant material for the conductive parts of the battery; the second is a novel material for the battery's positive pole that can be adapted to a wide range of technical requirements. Read more

Researchers at the Sustainable Food Processing group at the Department of Health Sciences and Technology cultivate microalgae for the accumulation of target compounds

World Food System: Algae and insects to feed livestock
The consistently growing meat consumption of the past decades has challenged the conventional production of livestock feed. Currently, 80 percent of harvested soy goes to feed animals at the expense of human nutrition. Researchers from ETH Zurich together with researchers from Eawag, industrial partners, and local processing facilities in developing countries are researching to identify new sources for livestock feed, such as the larvae of the black soldier fly, or algae. The latter are a promising emerging protein source, as they contain up to 70 percent protein by dry mass, essential amino acids, and high amounts of micronutrients such as iron. Read more

Climate systems: Increasing model resolution
Recent years have seen immense progress in the capacity to predict weather and climate evolution using numerical models. An important driver for this development has been the rapid progress in high-performance computing (HPC). From a weather and climate science perspective, increasing model resolution will make it possible to base such models on a set of equations that are much closer to first principles. The ENIAC project operates in the framework of the Center for Climate Systems Modeling (C2SM) at ETH Zurich, MeteoSwiss, and the Swiss National Supercomputing Center (CSCS) in Lugano, and in collaboration with the Max Planck Institute for Meteorology (MPI-M) and the German Weather Service (DWD). Read more

Risk: Developing cross-disciplinary risk research
Funded by an ETH Zurich Research Grant, a doctoral student is conducting a project on "Risk Sharing under Joint Longevity and Interest-Rate Risk". Supervised by two senior members of the ETH Risk Center, the project aims at improving the risk management and risk sharing of longevity risk through annuity pensions under dependent mortality and interest rates. It develops quantitative methods with applications in real-world situations. The project takes an integrative risk-management approach, treating both risks in a unified framework and allowing for an evaluation of the social benefit of risk sharing while offering innovative annuity products that may increase social welfare. Read more



Visualising the urban heat island in Singapore. To sustainably reduce the UHI effect, the combined effort from various stakeholders, including government agencies and private companies, is necessary.

Future Cities: Cooling Singapore
Singapore has become warmer in recent years because of the so-called Urban Heat Island (UHI) effect. Reducing this effect will bring considerable benefits to Singapore that can be measured not only in economic terms, but also in terms of the improved health and wellbeing of citizens. Achieving a substantial and lasting reduction, however, is a complex undertaking that will require a combined effort of many stakeholders from the government, academia, and the private sector. Researchers at the Singapore-ETH Centre for Global Environmental Sustainability teamed up with researchers from MIT, TU Munich, Nanyang Technical University (NTU), and the National University of Singapore (NUS) to work on "Cooling Singapore", a cross-institutional initiative dedicated to improving the thermal comfort of tropical Singapore. Read more

FURTHER INFORMATION

Research for sustainable development
Zukunftsblog: Blog posts on sustainability
ETH Zurich's Competence Centres

Knowledge transfer

Besides research and education, the third core task of ETH Zurich is knowledge and technology transfer. For the most part funded by the Federal Government, the university assumes this responsibility by translating generated knowledge and technologies for the benefit of society. It is important to maintain ecosystems for discovery, innovation, and entrepreneurship, which are key factors in ensuring that the best ideas materialise and yield a positive impact for society and sustainable development.

ETH transfer is the university's technology transfer office. It facilitates a structured technology transfer and runs several programmes and facilities like the Pioneer Fellowship programme and the Innovation & Entrepreneurship Lab (ieLab). Central aspects of this transfer are training of graduates, collaborations and partnerships with the private sector, securing and licensing of intellectual property rights (e.g., patents), and the creation of spin-off companies. In the reporting period 2017/2018, ETH Zurich gave rise to 52 spin-off companies and supported them through consulting and advice, infrastructure, and its dense network. The continuous increase in the number of new companies over the past two decades is solid proof that internal university support programmes pay off.

A look at the balance sheets shows clearly that the founders have more to offer than simply good ideas and faith in their own abilities: In 2018 alone, ETH spin-offs were able to attract more than CHF 170 million in capital. For example, the companies Climeworks, Verity Studios, and Beekeeper concluded rounds of financing with over CHF 30 million, CHF 18 million, and CHF 13 million respectively. Alongside these investments, acquisitions and an initial public offering (IPO) also showed the success of ETH spin-offs.

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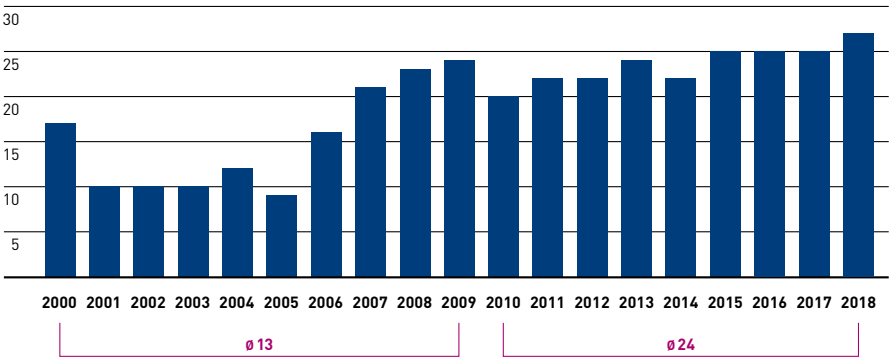
For additional information, please refer to the chapter Industry and society in the Annual Report.

FURTHER INFORMATION

- List of ETH spin-offs
- ETH News: ETH spin-off machine running at full speed
- Guidelines for spin-off companies at ETH Zurich

Spin-off companies founded at ETH Zurich



In average, 13 spin-offs per year were founded at ETH Zurich between 2000 and 2009, and 24 per year between 2010 and today.

Female Anopheles mosquitos are the main vectors for malaria infections.

INSIGHT

Sniffing out a killer disease

The struggle to eradicate malaria relies on identifying infected individuals, both for individual treatment and in order to stop the further spread of disease. This is especially difficult because some infected people do not show symptoms. Researchers at ETH Zurich have discovered a distinctive indicator that helps to identify carriers of the disease using non-invasive methods – through their body odor.

Malaria is a killer: In 2015, there were an estimated 212 million malaria cases and 429,000 malaria deaths worldwide, with 90 percent of victims under five years of age, according to the World Health Organization (WHO). Even those who survive the infection often experience severe impairments in their quality of life and health and suffer from recurring bouts of malaria for the rest of their lives. Naturally, this also has considerable knock-on effects for the countries where the disease is endemic – in terms of economic performance, demographics, and the allocation of limited healthcare resources across the entire population. In past decades, efforts have been stepped up – including notably with funding from the Bill and Melinda Gates Foundation – to combat this global health

Researchers from ETH Zurich collected skin volatiles from children in Mbita, western Kenya – one sample each from their feet and arms. Children who tested positive for malaria were treated.

crisis, which disproportionately affects underdeveloped regions in Sub-Saharan Africa.

While increased prevention and control efforts are helping to push back the disease and reduce mortality rates, one factor that complicates the complete eradication of malaria is the fact that many individuals who have contracted it may appear healthy, even as they continue to function as hosts and potential transmission sources for the disease when bitten repeatedly by mosquitos. As the WHO points out, early diagnosis and treatment reduces disease and prevents deaths from malaria while also helping reduce transmission.

"One reason why it is so difficult to eradicate malaria is because it is hard to identify infected people that do not show symptoms", says Consuelo De Moraes, Professor of Biocommunication and Ecology at the Department of Environmental Systems Sciences. "A recent study suggests that asymptomatic malaria carriers may account for up to 90 percent of onward transmission. This makes it all the more important to be able to identify those who are capable of transmitting the disease".

Together with her colleague Mark Mescher, who also heads a team of researchers, she has identified a human odor cue that is characteristic of individuals with both acute and latent or asymptomatic malaria infections, with a detection rate of nearly 100 percent. Field research for this project was conducted at an experimental station at Mbita Point in western Kenya in collaboration with the International Centre of Insect Physiology and Ecology (icipe) in Nairobi. The scent cues detected serve as reliable indicators of infection status even when only small numbers of pathogens are present. Therefore, the ETH researchers hope to use the distinctive odor to develop new, non-invasive diagnostic tools for broad-based use.

While tests already exist for detecting malaria infections, these have several drawbacks. Reliable testing can be done with DNA or blood samples, but these are comparatively expensive and require laboratories for processing. In less developed and remote regions, such as in sub-Saharan Africa, where malaria is particularly prevalent, these tests are not suitable for mass screening of populations. On the other hand, existing rapid diagnostic tests for use in the field are relatively cheap, but not very accurate. "Eradicating malaria is essentially a question of economic resources", says Mark Mescher". Just excluding mosquitoes from people's homes with effective screening of doors and windows would go a long way toward solving the problem, as it did in regions of the US where malaria was once prevalent. But in the less developed regions where malaria remains a serious problem, cost is a critical issue for any potential intervention".

Having identified the chemical compounds responsible for differences between the odors of healthy individuals and of infected ones, the next step of the ETH group is to develop a proof of concept for applying this discovery to the development of concrete diagnostic tools for inexpensive, practical, and easy use. The researchers hope to work on the development of such an instrument in the future, perhaps in collaboration with the Gates Foundation, which contributed funding for the current study.

By helping to ensure and advance human health, ETH Zurich is making a substantial contribution to UN Sustainable Development Goal SDG3 (Good health and well-being). It promotes partnership (SDG17) for these goals by fostering close collaboration between the two groups of researchers in Switzerland and the group in Kenya. This work by ETH Zurich researchers underscores the significant and cutting-edge research being done at the university not just in the engineering and technical departments, but also by research groups in the fields of medicine, life sciences, and chemistry. The discoveries made by these and other ETH researchers contribute significantly to sustainable living, including quality of life, in the developing world. They are potential game-changers when it comes to the health of both children and adults in the affected regions and states.

www.usys.ethz.ch
www.icipe.org

EDUCATION

In 2017 and 2018, the student body consisted of individuals from more than 120 countries. With 20,607 students enrolled in Bachelor, Master, and doctoral programmes in 2017, the number of students enrolled at ETH Zurich topped the 20,000 mark for the first time.

Educational environment

Creating and maintaining an inspiring study environment is one of the major challenges of higher education institutions. The educational environment is an important factor not only for those already enrolled, but also for prospective students. When framework conditions are favourable, students can excel and achieve their full potential. Therefore, a substantial part of ETH Zurich's efforts are dedicated to critical reflection on its educational programmes, and to the constant development of innovative teaching. The growing number of enrolled students at all levels of education shows that ETH Zurich is attractive for Bachelor, Master, and doctoral students. At the same time, the university uses extensive student evaluations and graduate feedback to develop the educational environment further. To ensure the quality of teaching at ETH Zurich, the university has issued a series of policies dealing with topics such as critical thinking, guiding values for teaching, or curriculum development.

Two "City Gardens" on the rooftop of the LEE building offer students and employees an attractive place to exchange ideas and to relax.

STAKEHOLDER PERSPECTIVES The Romans in their day said it in their own way: "Mens sana in corpore sano". When students must absorb and process new knowledge, it is all the more important to have the right environment. A balanced combination of teaching and independent study in a suitable infrastructure that also offers space for physical activity is therefore crucial.

Valentina Kumpusch
Manager of the Gotthard tunnel project
and ETH Alumna

HIGHLIGHT

Just what the doctor ordered: New career pathways in medicine

In the autumn of 2017, ETH Zurich expanded its course offerings to include a new Bachelor's degree course in Human Medicine. In this program, students study fundamental aspects of human health, but also gain a quality education in the technical and scientific aspects of medical science including in areas such as digital medicine, medical engineering, and medical imaging. Graduates can apply to enroll in a three-year Master of Medicine program at one of the partner universities – the University of Basel, the Università della Svizzera Italiana, and the University of Zurich – to complete the full six-year training. "The new course helps future medical professionals understand and use new developments in areas such as molecular biology, bioinformatics, or imaging technology", explains **Roland Müller**, Study Coordinator at the Department of Health Sciences and Technology (D-HEST). "As humans live longer and more dynamic lives, doctors must have both medical expertise and an understanding of the technical and scientific underpinnings of new methods, approaches, and treatment technologies". Already in their first week of training, students experience a hands-on introduction to clinical practice in a hospital environment. This prepares them for interdisciplinary teamwork in a real-life setting while teaching them important basic procedures in primary care and rehabilitation, including ultrasound scans and wound suturing – which they practice on pigskin skins rather than patients. With this innovative Bachelor's course, ETH Zurich contributes to the UN Sustainable Development Goals by developing health and well-being (SDG3) as well as fostering fruitful partnerships (SDG17) aimed at achieving those goals.

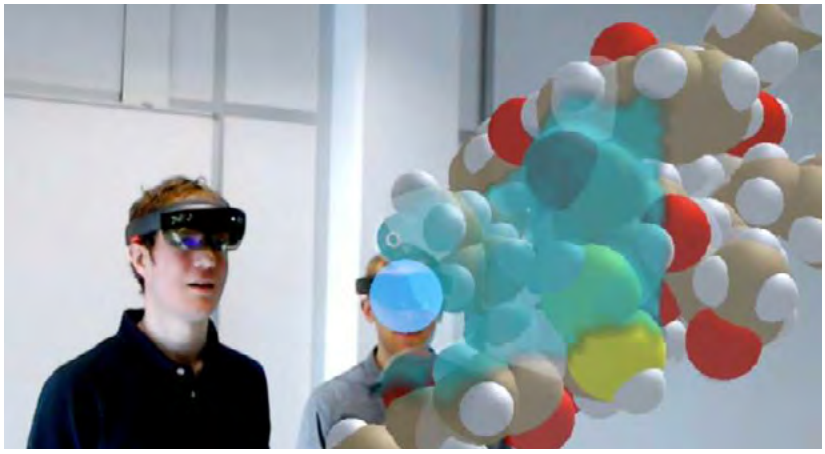
More information: Human Medicine

First-class education

ETH Zurich's student numbers have increased by roughly 70 percent since 2000. As this increase indicates, ETH Zurich has continuously attracted talented students to join its vibrant community. In 2017 and 2018, the student body consisted of individuals from more than 120 countries. With 20,607 students enrolled in Bachelor, Master, and doctoral programmes in 2017, the number of students enrolled at ETH Zurich topped the 20,000 mark for the first time. In 2018, that figure increased slightly to 21,397. While the traditional degree programmes at ETH Zurich continue to attract most students, the latest rise is partly due to the students enrolling in two new programmes in Human Medicine (Bachelor) and Data Science (Master). About 95 percent of all Bachelor degree graduates continue their studies with a Master's degree programme at ETH Zurich, emphasizing the degree of satisfaction of the Bachelor students.

Quality assurance for teaching and examination

According to an internal Student Satisfaction Survey conducted in early 2015 (next survey scheduled for 2020), 82 percent of all students rated their education as "satisfactory" or "very satisfactory". In order to satisfy the high expectations of its students and staff, ETH Zurich promotes systematic quality management in education at all levels. Quality is understood as an expression of the institution's culture of change and of learning. Teaching evaluation consists of four comprehensive processes: student semester feedback, student evaluation of teaching, graduate surveys, and departmental evaluation. In addition, examination methods are also subject to quality assurance. During a Rector's retreat in 2017, around 100 participants from the university's departments, groups, and Academic Services discussed the ongoing development of examinations. By 2022, ETH Zurich plans to triple its capacity for online exams. Already today, the university conducts over 100 online tests every year for more than 10,000 students enrolled in some 70 different courses. Almost half of these assess individual skills in a way that would not be possible with traditional pen-and-paper methods.



"Mixed Reality" are applications in which computer-generated images overlap with views of the real world. Funded by the Rector's Impulse Fund, ETH Zurich purchased 12 so-called HoloLens glasses and launched the "Learning in Mixed Realities" project in 2018.

Innovation for teaching and learning

As a leading institution of higher education for technology, ETH Zurich has a vested interest in being at the forefront of educational innovation, especially where it can generate significant added value for the development of students' professional skills. In pursuit of this goal, supported by the Educational Development and Technology (LET) unit, ETH Zurich engages in systematic planning and promotes new themes in the areas of teaching and teaching technology. Current innovation themes include learning in mixed realities, eCollaboration, the strategic use of videos in teaching, and the concept of the "flipped classroom". Interested teaching staff can also discover more about ongoing innovation processes via various blogs, workshops, a database, and through peer networking. LET's Innovation Management group provides support with handling hybrid teaching formats, such as TORQUEs (Tiny, Open-with-Restrictions courses focused on QUality and Effectiveness), MOOCs (Massive Open Online Courses), the interactive smartphone application ETH EduApp, and the learning and examination platform Moodle. Through the Rector's innovedum fund, lecturers and persons responsible for degree programs may apply for financial support to promote initiatives and complex innovative projects in the area of teaching.

Educational development
LET also provides a wide range of services to teaching staff in order to foster and maintain excellence in education. The educational development portfolio includes ad-hoc coaching; didactic continuing education; guidance in issues related to examination design, administration, or grading; curriculum development and monitoring; and a broad range of documents comprising introductory reading, handouts, and checklists.

Continuing education under one roof
In a world marked by the rapid growth of knowledge and constant change, continuing education is a lifelong task. Against this background, ETH Zurich founded the School for Continuing Education in 2018. Under the leadership of the Vice Rector of Continuing Education, the school provides guidance to professionals, educational institutions, companies, and professional associations regarding continuing education issues and fosters cooperation between universities, the corporate sector, and society. Under the umbrella of the new School, ETH Zurich's existing continuing education offerings – 17 Master of Advanced Studies (MAS) programmes, eight Diploma of Advanced Studies (DAS) programmes, and 20 Certificate of Advanced Studies (CAS) programmes as well as continuing education courses and online offerings – are grouped into four clusters: "Environment, Infrastructure & Architecture", "Technology, Management & Innovation", "Public Policy & Governance", and "Health, Life & Natural Science". Sustainability-related offerings include the MAS in Sustainable Water Resources (MAS ETH SWR), Nutrition and Health (MAS ETH NH), or Development and Cooperation (MAS ETH DC). Almost a dozen of these programmes were carried out for the first time during the reporting period 2017/2018, including the MAS ETH Mediation in Peace Processes and the CAS ETH ARC Digital.

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For additional information, please refer to the chapter Teaching in the Annual Report.

FURTHER INFORMATION

- Educational Development and Technology unit (LET)
- ETH unterwegs
- Network of Educational Developers
- Innovedum fund
- ETH Globe Magazine (1/2017)
- KITE Award

Degrees

	2000	2015	2016	2017	2018
Bachelor degrees		**1,564**	**1,571**	**1,606**	**1,678**
Architecture and Civil Engineering	-	335	318	373	281
Engineering Sciences	-	491	524	537	607
Natural Sciences and Mathematics	-	402	358	365	425
System-oriented Natural Sciences	-	326	356	318	349
Management and Social Sciences	-	10	15	13	16
Master degrees	**1,341**	**1,879**	**2,015**	**2,072**	**2,196**
Architecture and Civil Engineering	322	404	397	381	410
Engineering Sciences	258	608	691	733	786
Natural Sciences and Mathematics	317	512	527	506	559
System-oriented Natural Sciences	231	283	315	355	359
Management and Social Sciences	213	72	85	97	82
Doctorates	**523**	**718**	**851**	**827**	**802**

Goals **Educational development**

		STATUS
Continue recruitment measures for the best students nationally and internationally	With its "ETH unterwegs" programme, ETH Zurich visited 12 high schools, reaching out to thousands of potential students all over Switzerland in 2017 and 2018. During the same period, ETH Zurich organised 11 "ETH Study Weeks" with around 300 participants, featuring outreach contributions from six of ETH Zurich's departments. ETH Zurich also offered a comprehensive overview of its academic programmes at two "Study Information Days" in cooperation with the University of Zurich and EPFL, respectively. In 2017 and 2018, more than 13,000 high school students attended the programme. The university was also represented at educational fairs in Switzerland and abroad.	
	In 2017 and 2018, ETH Zurich opened its doors for the "Nationaler Zukunftstag" (National Future Day) and invited schoolchildren from the region to experience life as a researcher for a day.	
Promote the education of exceptional personalities on all levels that are in high demand in science, business, and society	In a 2013 study (the last study conducted), the Swiss Federal Statistical Office found that 87 percent of graduates assessed their education as "good" or "very good". 94 percent were employed within less than one year after graduation. An additional 3 percent were not seeking employment.	
Support particularly gifted Master students by providing grants to incoming students	With the Excellence Scholarship and Opportunity Programme (ESOP), outstanding students receive special mentoring for the duration of their studies and a grant that covers the costs of studies and living during their Master degree programme (100 students during the reporting period). With the Master Scholarship Programme (MSP), students receive a generous grant for the duration of their studies, as well as the opportunity to work as assistants (56 students during the reporting period). Other merit-based scholarship opportunities are offered by the Departments of Civil, Environmental and Geomatic Engineering (D-BAUG), Chemistry and Applied Biosciences (D-CHAB), and Mechanical and Process Engineering (D-MAVT).	
Extend dual-mode teaching, i.e., the combination of in-classroom teaching and e-learning, as well as further methods of self-study	ETH Zurich operates a network of Educational Developers, who act as points of contact for teaching-related issues in their departments. Thanks to their connection with the Educational Development and Technology (LET) unit, they are familiar with best-practice scenarios, current educational technology, and services and tools for teaching development, including dual-mode teaching. As of 2018, Educational Developers were working in 12 of the 16 departments at ETH Zurich. The most recent departments to have joined the network are the Departments for Management, Technology and Economics (D-MTEC), Computer Science (D-INFK), and Information Technology and Engineering (D-ITET).	
	In 2017/2018, 37 new projects were initiated through the Innovedum fund. These projects received a total of CHF 4.14 million in funding. The number of applications increased by 43 percent over the previous reporting period 2015/2016.	
Increase in the number of online examinations through new infrastructure and projects	Until spring semester 2017, around 55 online examinations were conducted per semester. When the new online examination room ONA E7 became available in autumn semester 2017, this enabled an increase in the number of examinations to 120 (involving nearly 10,000 students) by autumn semester 2018. The "Mobile Examinations" project will be piloted until autumn 2019. After this, the number of mobile examinations can be increased.	
Improve mentoring relations through the appointment of additional assistants and full professorships	The ratio of students to faculty at ETH Zurich is much higher than at other leading universities. Although ETH Zurich has established a large number of new professorships and assistant professorships, the ratio is driven to a large extent by the increasing student numbers. As a result, the situation is deteriorating, with a ratio of 42:1 in 2017 (32:1 in 2000 and 39:1 in 2008). To ensure a high quality of education despite growing student numbers, ETH Zurich is not only appointing new professors, but also plans to increase the number of senior scientists. By 2020, ETH Zurich will in total be employing 1,000 professors and senior scientists to maintain an appropriate faculty-to-student ratio.	

Education for sustainable development

Graduates of ETH Zurich take on key positions in various segments of society. Hence, it is of utmost importance that the education of this generation of future leaders should look beyond their specialist expertise. In most of its educational offerings, ETH Zurich stresses the capacity for system-oriented, independent, and critical thinking. As also reflected in the latest infrastructural developments (i.e., new classrooms or equipment), teaching at ETH Zurich is increasingly becoming more project-based and interactive. The university aims to instil intellectual agility, a responsible approach to taking action, and the ability to address socially relevant aspects guided by ethics and the principles of sustainable development. With its comprehensive Critical Thinking Initiative, educational offerings in various departments and degree programmes, and the development of innovative formats, ETH Zurich is making education for sustainable development accessible to all members of its community. Complementing the institutional efforts, the student-organised Sustainability Week is a prime example of a grassroots initiative designed to raise visibility and awareness for sustainability. Initiated by students of ETH Zurich and the neighbouring University of Zurich, the format is now a country-wide success story.

STAKEHOLDER PERSPECTIVES Burning societal problems do not neatly match the departmental structure of ETH Zurich. Thus, students need to be trained crossing boundaries, both within ETH Zurich and, even more importantly, by engaging with actors from outside academia. It is this kind of education that the Transdisciplinarity Lab (TdLab) of the Department of Environmental Systems Science offers at the Bachelor, Master, and doctoral levels.

Prof. Dr. Michael Stauffacher
Co-Director USYS TdLab

Critical Thinking Initiative
One of ETH Zurich's endeavours in developing the university's educational environment was the launch of the Critical Thinking Initiative. It aims to provide graduates with the ability to work on complex, interdisciplinary, and system-oriented problems, in addition to methodological skills and disciplinary knowledge. It focuses on the promotion of institutional diversity, interdisciplinary exchange, critical and self-critical thinking, and responsible behaviour. Specifically, ETH Zurich promotes dialog platforms, such as open-space structures in teaching and research. It also cultivates and creates new teaching and learning methods, such as those that support information transfer in self-study and enhance the classroom through interactive solution of concrete problems. ETH Week, where students from all departments come together to tackle societal challenges, is a typical format in this approach, as is the Science in Perspective study programme at the Department of Humanities, Social and Political Sciences (D-GESS), which provides students with the context that allows them to reflect on the content of their studies from new, normative, historical, or cultural perspectives.

HIGHLIGHT

ETH Week: Innovative ideas for a sustainable future

Although ETH Week is a relatively young teaching format, it already has a proven track record of success: 2017 and 2018 saw the third and fourth iterations of this unusual learning environment where students work together to develop interdisciplinary solutions for global, sustainability-related challenges. The 2017 event, headlined "Manufacturing the Future", looked at a crucial segment of the Swiss economy and the future prospects for its global competitiveness. Similarly, the 2018 ETH Week, attended by over 160 students, discussed the topic of "Energy matters" with a critical new perspective on our consumption patterns and the importance of power and electricity. Participants debated technologies and paths for efficient and sustainable energy consumption, including Switzerland's recently adopted national Energy Strategy 2050. "Today's students are tomorrow's change agents", says **Christine Bratrich**, Director of ETH Sustainability, the staff unit for sustainability at ETH Zurich. The learning format, based on Design Thinking, lets students engage with issues autonomously through teamwork, field excursions, and direct contact with experts. To ensure that the innovative learning format has a lasting impact and the best ideas are further developed into actual prototypes, ETH Zurich started to offer a follow-up program at the Student Project House, "The Hatchery", in 2017. All of these efforts aim at offering high-quality education through interdisciplinary work and the involvement of internal and external experts, in line with the UN's Sustainable Development Goals of quality education (SDG4) and partnerships for the goals (SDG17).

More information: ETH Week

Student Project House

Another flagship of the Critical Thinking Initiative is the Student Project House, a platform where students can implement their own projects and develop their abilities outside the curriculum. At the Student Project House, students learn how to identify an actual need, design solutions, and test their hypotheses with real prototypes. Beyond housing a foyer, a course room, and a project co-working space, the Student Project House offers the Makerspace workshop. Operating since 2016 as a pilot at the HPZ building at Campus Hönggerberg, the Student Project House will open its second outlet in the renovated FHK building in Campus Zentrum in 2020.

Open to everyone affiliated with ETH Zurich, the Makerspace workshop is run by a team of trained students, thus facilitating a student-to-student learning experience.

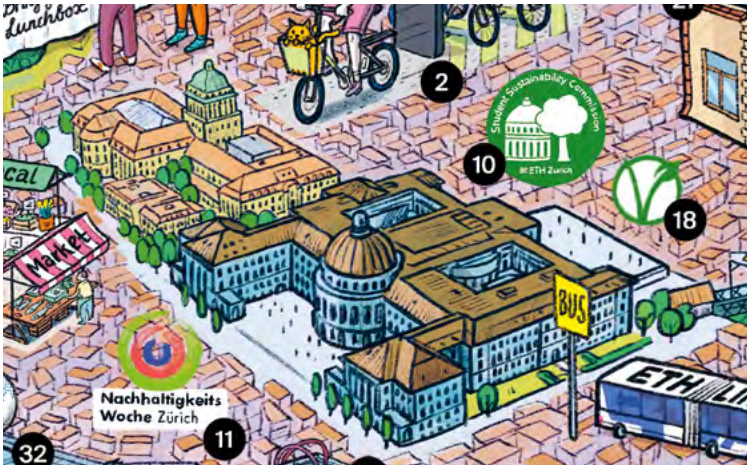
Departments and degree programmes offering education for sustainable development

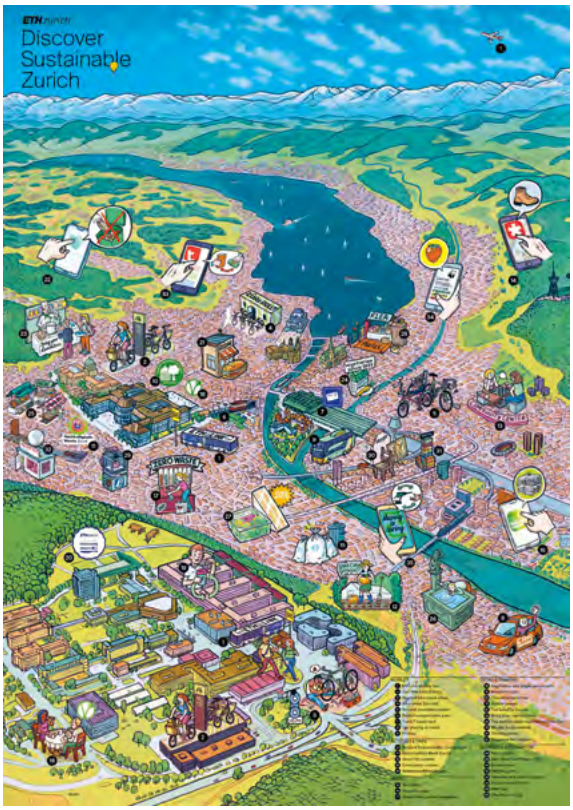
The university's traditional commitment to sustainability has catalysed institutional developments as well as the development of courses and programmes. One prominent example is the Department of Environmental System Sciences (D-USYS), which can boast a 30-year world-class track record in offering system-oriented education programmes in Environmental Sciences and Agricultural Sciences that foster sustainable development. Other examples include the Master of Science in Energy Science and Technology (MEST) at the Department of Information Technology and Electrical Engineering (D-ITET), the Master of Science in Environmental Engineering (D-BAUG), the Masters programmes at the Institute of Science, Technology and Policy (ISTP), or the multidepartmental Master of Science in Integrated Building Systems (D-ARCH). ETH Zurich also offers a broad range of extracurricular summer and winter school programmes dealing with topics related to climate change, energy supply, or aspects of the world food system. Sustainable development is also addressed in ETH Zurich's continuing education portfolio, such as in the Masters of Advanced Studies (MAS) in Development and Cooperation, Future Transport Systems, or Nutrition and Health.

FURTHER INFORMATION

Critical Thinking Initiative
Science in Perspective

The "Discover Sustainable Zurich" map offers students and employees 35 useful tips for a sustainable life on campus, in Zurich, and in Switzerland. The map includes recommendations on mobility, activities and trips, waste, eating and drinking, as well as shopping and consumption.





Goals **Sustainability education**

		STATUS
Offer a diverse summer and winter school programme on sustainable development at ETH Zurich	In 2017 and 2018, ETH Zurich hosted and co-organised a variety of summer and winter schools covering specific sustainable development themes such as the ETH Sustainability Summer School on Mountain Forests and Risk Management, World Food Systems Summer Schools, the Plant Science Center Summer School, the Climate-KIC Summer School (The Journey), the Swiss Competence Center in Energy Research (SCCER) Summer School, the Swiss Climate Summer Schools, the Engineering for Development (E4D) Winter School, and the TdLab Winter School.	
Improve the ability of doctoral students to interact with non-academic stakeholders and provide recommendations for research topics	In 2017 and 2018, the TdLab Winter School (formerly CCES Winter School) hosted a total of 39 doctoral students and postdocs. It focused on training scientists to conduct a fruitful dialog with stakeholders and institutions outside the scientific community.	
Provide a platform for students to tackle sustainability-specific questions with practice partners from public and private sectors	In the context of the "Sustainable Catering at ETH Zurich" project, a total of seven interdisciplinary Master's and MAS theses were successfully completed, in addition to several scientific publications and a general implementation proposal for sustainable catering at ETH Zurich. Plans are underway to address other sustainability-specific and campus-relevant topics, such as "circular economy", in a similar "living lab" context in the future.	
Offer innovative activities and events for students and other members of ETH Zurich to learn about sustainability	In collaboration with the Student Sustainability Commission (SSC), the ETH Zurich Mobility Platform, and the sustainability team at the University of Zurich, ETH Sustainability compiled a "Discover Sustainable Zurich" map including sustainability tips for its campus, the city of Zurich, and Switzerland.	
Develop an overview that describes cross-departmental sustainability and critical thinking-related educational activities at ETH Zurich	All courses associated with the "Science in Perspective" (SiP) study programme are listed in the course catalogue of ETH Zurich, differentiated into "Type A: Fostering general reflection skills", encompassing all SiP courses, and "Type B: Reflecting on subject-related methods and topics", highlighting courses that are particularly suited to students of specific departments.	

MAS students at NADEL gain personalised on-the-job work experience based on their own academic and professional background.

INSIGHT

NADEL: Quality training for sustainable development

For five decades, NADEL has prepared ETH postgraduates for jobs in international development. In close collaboration with other ETH departments as well as Swiss and international organisations, it gives MAS and CAS students a broad-based, hands-on introduction to the theory and practice of sustainable development.

We learn not for school, but for life, as the old saying goes. But what do you need to learn in preparation for a career in international development? For Isabel Günther, Director of NADEL – Center for Development and Cooperation, there is one key to success in sustainable development, both in the field and in an academic setting: A broad viewpoint that considers all possible paths towards building a better and more sustainable future for all.

In the late 1960s, as wealthier states began to coordinate and institutionalise their aid to developing countries, the Swiss Agency for Development and Cooperation (SDC/DEZA) asked the nation's leading universities for help in training professionals for work in the field. Since 1970,

ETH Zurich has been running a programme that prepares postgraduates for a career in development cooperation and for research, policy, and industry positions with a focus on sustainable development. The mission of NADEL is to foster quality education that can help reduce inequalities by creating long-term partnerships geared towards achieving that goal. As such, its work contributes to most of the UN Sustainable Development Goals, especially those of poverty reduction (SDG01) and reduced inequalities (SDG10), quality education (SDG04), and partnerships (SDG17).

NADEL students include natural scientists, engineers, social scientists, and humanities graduates. They can either enrol in the four-semester full-time programme for the Master of Advanced Studies in Development and Cooperation (ETH MAS D&C) degree, or study part-time for three years in a Certificate of Advanced Studies (ETH CAS D&C) programme that includes both compulsory courses and electives.

MAS students are chosen from a pool of applicants interested in using their knowledge and skills for sustainable development; a rigorous selection process ensures a good mix of candidates from all disciplines, ranging from ethnologists to engineers. Since the ETH programme is designed to convey both academic knowledge and hands-on skills in development work, it includes eight to ten months of on-the-job-training with one of about 30 national and international partner organisations, including DEZA, the Swiss State Secretariat for Economic Affairs (SECO), Terre des Hommes, Helvetas, Caritas, and UNDP. The practical overseas training module is bracketed by two study semesters of lectures, papers, and block courses.

The CAS students typically already have several years' work experience in international development cooperation with relevant international organisations. At NADEL, they learn about the results of cutting-edge research related to poverty reduction and sustainable development, but also acquire tools for results-based management, reflection on experiences gained, and exchange of best practices.

"We are constantly adapting our syllabus to reflect changes in global development", says Isabel Günther. "Our teaching covers all aspects of sustainable development, since we believe that only a holistic approach can do justice to the realities of development cooperation in a rapidly shifting world". Thus, the coursework for MAS and CAS students covers environmental aspects, but also politics and economics as well as the technological and anthropological side of development. Lecturers from various ETH departments teach at NADEL on specific development-related issues in their own field of expertise, whether it be climate change, urban transformation, water quality, or conflict research.

Current trends in this field are shaped by the extremely divergent development trajectories of emerging economies, Isabel Günther explains. "While some of the countries have experienced a great deal of progress, others remain extremely impoverished and racked by political instability. In the field of development, this means that we need to foster economic growth, but we must do so in an ecologically sustainable manner while bearing in mind other development aims, such as the elimination of energy poverty. The trick is to get academia, practitioners, and the political sphere to collaborate in extracting insights from data and developing better policies and programmes", she believes.

This is what NADEL has aimed to achieve in the past five decades, during which more than 1,000 postgraduates have been well prepared for professional roles in Switzerland and abroad.

Looking forward, Isabel Günther argues that it is insufficient to conceive of development simply in terms of reducing poverty in the poorest countries. "It's about global development that benefits everybody. We need to find ways to balance ecological and economic goals", Only then can NADEL fulfil its mission of building and teaching effective policy-making that addresses global and local development challenges.

www.nadel.ethz.ch

Students of the MAS Class 2016-2018 joined a HELVETAS team on a cotton project in southern Madagascar, studying climate risks and possible mitigation strategies.

CAMPUS

CAMPUS

PEOPLE

Participation

Active encouragement of the expression of opinions is part of ETH Zurich's institutional identity and a key factor for the high level of motivation among all members of the university. ETH Zurich values this exchange – not only because gaining experience in the active representation of their interests will serve students and trainees in their later professional lives, but also because a a fundamental disposition towards dialog can help them identify emerging problems and challenges and address them in a systematic manner. In an organisation of ETH Zurich's scale, however, despite all efforts, critical issues may not always be identified and addressed in time. In these cases, ETH Zurich attaches great importance to transparent processing and the initiation of corresponding measures. With a commitment to cultivating a transparent environment, ETH Zurich fosters a variety of boards, university groups, and commissions to act as bodies to discuss, elaborate, and represent the matters and concerns of students and employees at ETH Zurich in a participatory environment.

In order to facilitate constructive exchange and sustainable cooperation, ETH Zurich promotes various channels of participation.

University Assembly: Representation and participation
Based on the principle of equal representation, the University Assembly (HV) is made up of representatives of the Lecturers' Conference (KdL), the Academic Association of Scientific Staff (AVETH), the Association of ETH Students (VSETH), the Staff Commission (PeKo), and a number of (permanent) guests, for example from the Corporate Communications department of ETH Zurich or the ETH Board. In 2017 and 2018, the University Assembly issued 13 official statements to various decision-making bodies and other units or representatives of ETH Zurich on such diverse issues as the university's strategic plan 2021–2024, the equal opportunity strategy, the Code of Conduct, or the tuition fees for the Language Center.

Permanent commissions

Besides the representative bodies mentioned above, a total of ten permanent commissions act as advisory bodies to the Executive Board of ETH Zurich: the Strategy Commission, the Teaching Commission, the Research Commission (founded in 1942), the ICT Commission, the Risk Management Commission, the Investment Commission, the Ethics Commission, the Commission for Good Scientific Practice, the Catering Commission, and the Environmental Commission.

The Student Sustainability Commission (SSC) is a key commission on the student side for promoting sustainability. Formerly known as [project21], the SSC is a commission of the VSETH, where it represents students' interests for a more sustainable ETH Zurich vis-à-vis the Executive Board and other bodies.

For a comprehensive overview of internal and external stakeholder dialog channels, please refer to pages 82–84 of this report.

STAKEHOLDER PERSPECTIVES We have numerous opportunities to bring up various topics and to shape ETH Zurich. The status quo can be improved, and new ideas can be devised thanks to our participation in working groups, commissions, and personal conversations with the management and other stakeholders. This kind of participation provides the necessary support to effectively implement changes while contributing substantially to a sense of belonging and to the continued success of ETH Zurich.

Martin Roszkowski
President of the Academic Association of Scientific Staff at ETH Zurich (AVETH)

Ombudspersons and trusted intermediaries

For critical issues that are not covered by the participatory mechanisms listed above, the Executive Board of ETH Zurich appoints ombudspersons and trusted intermediaries. Ombudspersons are a general point of contact for conflicts that cannot be solved by direct communication and for reporting suspected illegal actions. The trusted intermediaries can help with issues concerning research integrity and scientific misconduct. Both are independent and treat all information they receive confidentially. They will only involve further persons or units if the case requires it, and with full confidentiality. While they cannot issue instructions, they may point out solutions, establish contacts, and initiate processes.

FURTHER INFORMATION

- Organisation of ETH Zurich
- Report of the University Assembly on participation channels at ETH Zurich (in German, 2013—2016)

Employee retention and turnover

As the university's main assets, excellent employees – from professor to administrative staff – are indispensable for the university to fulfil its mandate and achieve its strategic goals. In 2018, ETH Zurich counted a total of 12,151 employees. Historically, and all the more so today, the university has been a hub for people from all over the world. Since this diversity remains a central factor of its continuous success, ETH Zurich must ensure that working conditions match needs and requirements on all levels of employment. These vary depending on the stage of the career, and according to whether people are working in research, administration, or technical fields. As research innovation needs constant influx, momentum, and steady development, it is not unusual for universities to experience high levels of employee fluctuation. Especially at the early stages of an academic career, researcher mobility is becoming increasingly common. At ETH Zurich, a significant share of mid-career researchers (assistants and scientific staff) are therefore employed in temporary positions (up to six years) related to a specific stage of their academic path or a research grant. Young talents are supported and prepared for the global stage in academia and beyond. Technical and IT or laboratory staff, in turn, may unfold their full potential in the longer term, growing in experience and institution specific expertise. For them, ETH Zurich offers a wide range of development possibilities, including advanced training or internal mobility.

Retention and turnover

Looking at all employees of ETH Zurich, turnover rates have ranged between roughly 5 and 7 percent over the course of the last four reporting periods (since 2011), with 6.6 percent in 2017 and 6.9 percent in 2018. In both 2017 and 2018, retention rates were highest among professors and assistant professors. In the same period, retention rates were lowest among senior assistants and scientific staff. For female employees, retention rates were highest among assistant professors in in both 2017 and 2018. The lowest rates were among female senior assistants in 2017, and among female technical and IT staff in 2018. The turnover rates consider only those that fall under "notice given" or "retirement" (see tables on pages 43–44).

Goals **Talent retention and development**

		STATUS
Recruit and support the best scientists to ensure highest quality of research and teaching	In 2017 and 2018, ETH Zurich recruited 56 new professors, 37 of whom came from abroad (total in 2018: 418 professors and 93 assistant professors). Various offices and services are in place to support newly arrived professors in administrative matters and help them integrate and take on their core activities as smoothly as possible. The Dual Career Advice office at the Office for Faculty Affairs, for example, assisted 22 partners entering the Swiss job market during the reporting period.	
Support employee development through comprehensive personnel development measures	In 2017 and 2018, 45 and 50 internal training courses were offered, respectively, with around 1,000 participants annually. The main topics covered were leadership, project management, personal development, and work techniques. In addition, around 100 customised team workshops were offered, and around 300 employees availed themselves of personal coaching offerings.	
	In 2017 and 2018, CHF 234,000 and CHF 251,000 were invested in external professional development offerings. During the same period, 78 and 108 employees availed themselves of these offerings, respectively.	

Summary of employee turnover rates 2017

	New entries from outside	Persons leaving				No of employees	Turnover[3]
		Total[1]	Contract expired	Notice given[2]	Retirement		total in %
Total ETH Zurich	**4,841**	**4,472**	**3,742**	**614**	**93**	**11,445**	**6.2**
male	3,207	3,030	2,572	389	54	7,419	6.0
female	1,634	1,442	1,170	225	39	4,026	6.6
Professors[4]	14	7	0	1	6	420	1.7
male	10	7	0	1	6	365	1.9
female	4	0	0	0	0	55	
Assistant professors	13	2	1	1	0	94	1.1
male	11	2	1	1	0	74	1.4
female	2	0	0	0	0	20	
Assistants	1,533	1,158	881	267	0	4,951	5.4
male	1,029	820	608	204	0	3,380	6.0
female	504	338	273	63	0	1,571	4.0
Senior assistants	34	111	66	42	2	447	9.8
male	25	84	50	33	0	355	9.3
female	9	27	16	9	2	92	12.0
Scientific staff	29	109	73	33	3	289	12.5
male	15	80	53	24	3	195	13.8
female	14	29	20	9	0	94	9.6
Senior scientists and scientific staff on permanent contracts	2	19	0	5	14	278	6.8
male	2	15	0	2	13	231	6.5
female	0	4	0	3	1	47	8.5
Scientific staff on hourly wages	2,650	2,556	2,455	101	0	1,472	6.9
male	1,816	1,768	1,713	55	0	925	5.9
female	834	788	742	46	0	547	8.4
Technical and IT staff	277	236	127	70	29	1,785	5.5
male	210	176	95	53	23	1,394	5.5
female	67	60	32	17	6	391	5.9
Administrative staff	289	274	139	94	39	1,709	7.8
male	200	78	52	16	9	500	5.0
female	89	196	87	78	30	1,209	8.9

1 including deaths and dismissals
2 by employee
3 excluding contractual expiration
4 does not include externally employed dual professors

Summary of employee turnover rates 2018

	New entries from outside	Persons leaving				No of employees	Turnover[3]
		Total[1]	Contract expired	Notice given[2]	Retirement		total in %
Total ETH Zurich	**5,180**	**3,921**	**3,121**	**674**	**109**	**12,151**	**6.4**
male	3,387	2,533	20	425	63	7,890	6.2
female	1,793	1,388	1,089	249	46	4,261	6.9
Professors[4]	10	17	0	1	14	418	3.6
male	9	16	0	1	13	360	3.9
female	1	1	0	0	1	58	1.7
Assistant professors	10	7	5	2	0	93	2.2
male	9	5	3	2	0	73	2.7
female	1	2	2	0	0	20	
Assistants	1,587	1,313	983	327	0	4,997	6.5
male	1,057	890	652	237	0	3,395	7.5
female	530	423	331	90	0	1,602	5.6
Senior assistants	39	119	76	42	0	458	9.2
male	29	91	54	36	0	348	10.3
female	10	28	22	6	0	110	5.5
Scientific staff	47	98	72	24	2	287	9.1
male	28	63	46	16	1	193	8.8
female	19	35	26	8	1	94	9.6
Senior scientists and scientific staff on permanent contracts	2	12	0	4	8	279	4.3
male	2	9	0	1	8	233	3.9
female	0	3	0	3	0	46	6.5
Scientific staff on hourly wages	2,861	1,824	1,739	85	0	1,987	4.3
male	1,956	1,198	1,145	53	0	1,326	4.0
female	905	626	594	32	0	661	4.8
Technical and IT staff	268	252	119	82	44	1,841	6.8
male	187	175	84	53	31	1,432	5.9
female	81	77	35	29	13	409	10.3
Administrative staff	356	279	127	107	41	1,791	8.3
male	110	86	48	26	10	530	6.8
female	246	193	79	81	31	1,291	8.9

1 including deaths and dismissals
2 by employee
3 excluding contractual expiration
4 does not include externally employed dual professors

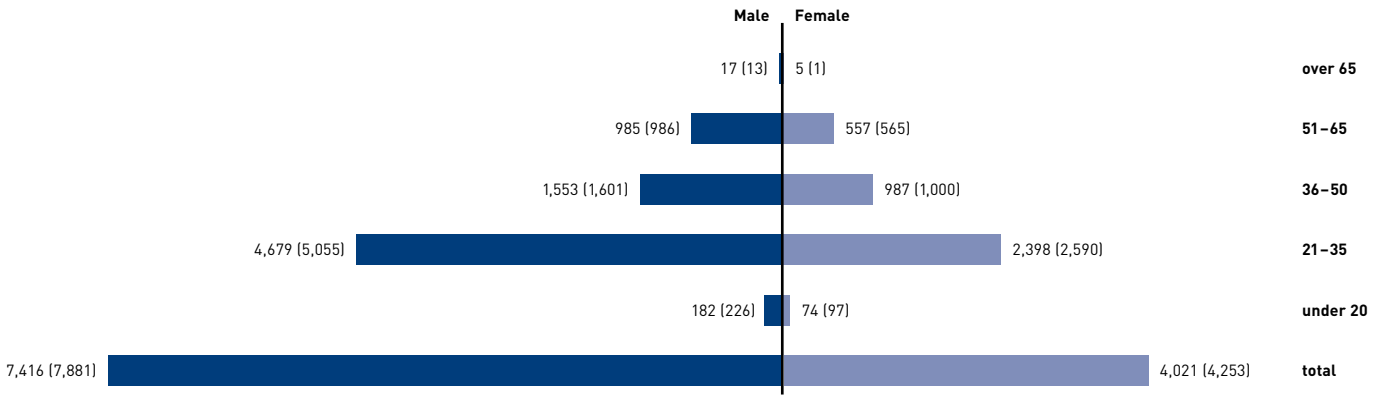
Promising perspectives for partners

ETH Zurich's ability to recruit leading researchers as professors is not just a matter of providing generous resources for research and teaching. The university also devotes attention to partners, children, and support with integration in general (i.e., housing, schooling, childcare). Of the 56 professors appointed in the reporting period 2017/2018, 37 came from abroad (66 percent). Of all new professors, 49 (88 percent) moved to Zurich with a partner and 35 with children (63 percent). Especially for those coming from abroad, ETH Zurich's Dual Career Advice provided support for the professional integration of the partners, helping a total of 22 partners enter the Swiss job market. To increase the network and the range of opportunities beyond academia, ETH Zurich joined the International Dual Career Network (IDCN) in 2014.

FURTHER INFORMATION

Dual Career Advice Office
Human Resources

Employee age pyramid for 2017 and (2018) – headcount[1]



1 The number of employees in the employee age pyramid differs slightly from the overview of employment contracts (see page 48). The deviations are due to the fact that employees with multiple employment contracts at ETH Zurich are included here with a single entry.

Diversity

The wide array of people from diverse backgrounds makes ETH Zurich a unique place for working and studying. Where people of different ages, genders, cultures, or religions come together, the result is not just a collection of individuals, but much more – a setting rich in perspectives and opinions. While this is beneficial in general, diversity can also evoke challenges, tensions, and even conflicts. As an employer and institution of higher education, ETH Zurich emphasises that any form of discrimination will not be tolerated. Even though the university fosters an environment in which mutual coexistence brings added value for all, it operates a number of services, helplines, and offices that serve as contact points in case of threats and violence, sexual harassment, bullying, or other misconduct. With regard to diversity, Equal!, the Office of Equal Opportunities, is the central point of contact at ETH Zurich. Directly reporting to the President of ETH Zurich, it collaborates with other institutions for the promotion of equal opportunities for women and men within national and international networks. The annual Gender Monitoring is an important basis to monitor developments in this context and to launch appropriate initiatives.

STAKEHOLDER PERSPECTIVES Diversity among the faculty of ETH Zurich – whether in terms of culture, race, religion, or gender – can send an important message to the students: A message of inclusion. It encourages members of minority groups to thrive in an academic environment and it teaches us to embrace the enrichment of our community through this beautiful mosaic of people.

Prof. Dr. Rima Alaifari
Assistant Professor for Applied Mathematics

National roots, global outlook

As a technical university in a small country, ETH Zurich can only compete with the world's best by establishing international links, by recruiting its researchers worldwide, and by remaining attractive to students from abroad. In 2017, Times Higher Education (THE) ranked ETH Zurich the most international university of the world. Among its students and employees are citizens of more than 120 countries. In 2017 and 2018, 56 percent of all employees and 65 percent of all professors (and 79 percent of all assistant professors) at ETH Zurich came from outside of Switzerland. The share of foreigners among all employees increased by over 12 percent over the past decade. Around 40 percent of all students were from abroad in 2017 and 2018. Roughly 80 percent of the Bachelor students in the reporting period were Swiss, underscoring the university's national integration and the knowledge transfer to Swiss society and industry (all numbers in headcount).

In 2017, Times Higher Education (THE) ranked ETH Zurich the most international university of the world.

Women still underrepresented at ETH Zurich

In addition to embracing the international diversity represented at ETH Zurich, a great deal of attention is devoted to finding a more equal balance of genders among students and at all levels of employment. One measure was the definition of targets for female representation in the Objective Agreement between ETH Zurich and the ETH Board for 2013–2016. However, the target figures for women at the level of professors (15 percent), scientific staff (30 percent), doctoral candidates (35 percent), students (35 percent), and technical and administrative personnel at a function level of 11 or above (25 percent) had not been met by the end of 2016, nor by the end of 2018.

Student diversity

Headcount	2000	2015	2016	2017	2018
Total number of students	**10,693**	**19,233**	**19,815**	**20,607**	**21,397**
Percentage women	25.1%	30.5%	31.1%	31.8%	32.3%
Percentage foreigners	20.3%	37.6%	38.2%	38.7%	39.4%
Bachelor		**8,704**	**8,934**	**9,262**	**9,517**
Percentage women		30.0%	30.7%	31.2%	32.7%
Percentage foreigners		19.0%	19.3%	19.9%	20.4%
Master		**5,447**	**5,836**	**6,158**	**6,590**
Percentage women		29.9%	30.5%	31.6%	31.0%
Percentage foreigners		38.9%	40.6%	40.7%	41.6%
Doctoral students		**4,026**	**4,010**	**4,092**	**4,175**
Percentage women		30.7%	31.2%	31.7%	32.1%
Percentage foreigners		69.6%	70.8%	71.4%	72.9%
MAS/MBA Students		**640**	**635**	**646**	**635**
Percentage women		40.3%	40.3%	41.0%	43.1%
Percentage foreigners		40.5%	40.9%	41.8%	40.6%
Visiting/Exchange		**416**	**400**	**449**	**480**
Percentage women		32.9%	34.3%	36.1%	30.8%
Percentage foreigners		94.0%	93.8%	94.7%	93.5%

Fixing the leaky pipeline

The ETH Domain recognises the historical underrepresentation of women and is actively addressing the need for a more balanced ratio between males and females. Since 2007, the ETH Domain's programme Fix the leaky pipeline! has organised events, courses, coaching groups, and mentoring schemes to give young female academic professionals the opportunity to reflect on their professional situations, to develop a strategy for embarking on or continuing a career path, to receive targeted further training, and to extend their personal and scientific networks.

Employee diversity

Employee headcount	2017	2018
Total employees	**11,445**	**12,151**
Men	7,419	7,890
Women	4,026	4,261
Percentage women	35%	35%
Permanent contract (all)	3,400	3,474
Permanent contract (men)	2,040	2,070
Permanent contract (women)	1,360	1,404
Part-time employment (all)	4,188	4,675
Part-time employment (men)	2,136	2,503
Part-time employment (women)	2,052	2,172
Professors[1]	**420**	**418**
Men	365	360
Women	55	58
Percentage women	13%	14%
Assistant professors	**94**	**93**
Men	74	73
Women	20	20
Percentage women	21%	22%
Assistants	**4,951**	**4,997**
Men	3,380	3,395
Women	1,571	1,602
Percentage women	32%	32%
Senior assistants	**447**	**458**
Men	355	348
Women	92	110
Percentage women	21%	24%

Employee headcount	2017	2018
Scientific staff	**289**	**287**
Men	195	193
Women	94	94
Percentage women	33%	33%
Senior scientists and scientific staff on permanent contracts	**278**	**279**
Men	231	223
Women	47	46
Percentage women	17%	16%
Scientific staff on hourly wages	**1,472**	**1,987**
Men	925	1,326
Women	547	661
Percentage women	37%	33%
Technical and IT staff	**1,785**	**1,841**
Men	1,394	1,432
Women	391	409
Percentage women	22%	22%
Administrative staff	**1,709**	**1,791**
Men	500	530
Women	1,209	1,261
Percentage women	71%	70%

1 Does not include dual professors, externally employed professors within the ETH Domain, or part-time employed professors

4 QUALITY EDUCATION
5 GENDER EQUALITY

HIGHLIGHT

Representation matters: Visibility is key to improving gender equality

Since the 1990s, more and more women have been studying at ETH Zurich, currently accounting for almost a third of the total number of students. Among these, female doctoral students are the fastest growing segment. However, the proportion of female professors at ETH Zurich is still at only around 14 percent. "Clearly, the pipeline is still leaking", says **Renate Schubert**, the Associate Vice President for Equal Opportunities. "Female role models need to become even more prominent in order to encourage more young women to follow in their footsteps." This is why the Gender Monitoring Report 2017/18 focuses on the visibility of women at ETH Zurich. The university is pursuing the UN Sustainable Development Goals of gender equality (SDG5) while providing quality education (SDG4) with a multi-pronged approach, Schubert explains. ETH Zurich is appointing more female professors and offers workshops for female researchers on how to apply for funding and tenured positions. Various programmes are designed to spark girls' interest in STEM subjects as early as possible. There are also ten women's associations dedicated to making women and their interests and needs more visible. ETH Zurich is committed to enabling a work-life balance that lets women combine academic work with family responsibilities. "The growing number of female researchers at ETH Zurich being awarded important academic prizes is a promising sign that this approach is bearing fruit", says Schubert. However, advancing gender equality through programmes and services remains a strategic concern for the coming years.

More information: Gender Monitoring

Status of the Gender Action Plan

Another strategic initiative that addresses the underrepresentation of women at ETH Zurich is the Gender Action Plan (GAP), which the Executive Board adopted in 2014. With the GAP, ETH Zurich focused on four areas of action: (1) careers and career development within academia, (2) integration of gender-specific aspects in research and education, (3) reconciliation of studies, work, and family, and (4) prevention of and combat against sexual harassment and discrimination on the basis of gender. The implementation of the GAP aims to achieve higher proportions of women at all levels of the academic career ladder. Furthermore, it intends to create a culture at ETH Zurich that enables women and men to unfold their full potential in equal measure. After a first evaluation in 2016, Equal!, the Office for Equal Opportunities at ETH Zurich, compiled a second assessment report in 2018 to evaluate the status of the GAP implementation. The evaluation showed that the number of departments taking active measures has increased since 2016. In 2018, the majority of the departments had active associations for female students and staff, some of which receive financial support from their respective departments. The latest report also finds that additional departments have established contact points and contact persons for counselling in cases of discrimination or sexual harassment since 2016.

ETH Zurich has been publishing comprehensive Gender Monitoring reports for almost a decade, both at the level of the individual departments as well as at the level of the whole university.

Gender Monitoring

On behalf of the Executive Board of ETH Zurich, the Office for Equal Opportunities of ETH Zurich has been documenting developments in gender representation for almost ten years, both at the level of the individual departments and for ETH Zurich as a whole. The Gender Monitoring reports contain precise breakdowns by position, and each focuses on a specific theme, such as "Women as Role Models" (2017/2018) or "The visibility of women in scientific research at ETH Zurich" (2016/2017).

FURTHER INFORMATION

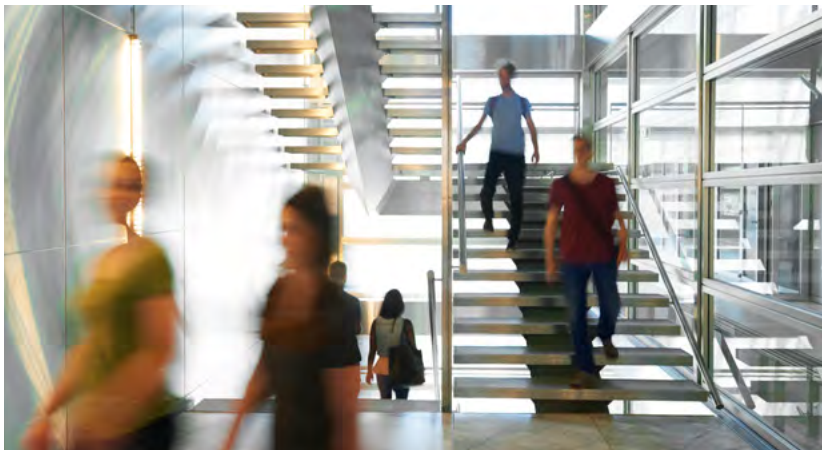
- ETH Women Professors Forum
- Facts and Figures about ETH Zurich
- ETH Globe Magazine (3/2017)
- Gender Attainment Gaps Report (ETH Zurich and IARU)

Goals **Diversity**

		STATUS
Preserve diversity among students and staff of ETH Zurich	In 2017 and 2018, 56 percent of employees at ETH Zurich came from foreign countries. Among all employees, the share of women stood at 35 percent in 2017 and 2018. Within the student body, which comprises more than 120 nationalities, foreigners accounted for 39 percent in 2017 and 2018, which is slightly (1 percent) higher than in the previous reporting period. The share of female students in 2017 and 2018 was at 32 percent (all numbers in headcount, rounded).	↻
Increase gender balance on all levels of the academic career ladder	The targets for female representation as defined in the Objective Agreement and the ETH Board for 2013–2016 were not met. With the Gender Action Plan, ETH Zurich is addressing the issue of gender balance in a systematic manner.	↻

Attractive employment conditions

With more than 12,000 employees, ETH Zurich is one of the biggest employers in the Zurich area. The university provides attractive jobs involving interesting activities in education, research, and various other functions. As a modern employer, ETH Zurich wants to provide a stimulating working environment and progressive employment conditions. After all, without the full commitment of its employees, ETH Zurich would not rank among the world's leading universities. In addition to concrete working conditions such regulated working hours, insurance, or pension provision, this also concerns the working environment, health, or the compatibility of family and career. ETH Zurich offers its employees a range of offers and benefits, including childcare. By conducting comprehensive employee surveys, the Human Resources department invites feedback regarding employment conditions and the working climate at ETH Zurich.



As the university's main assets, excellent employees – from professor to administrative staff – are indispensable for the university to fulfil its mandate and achieve its strategic goals.

Working conditions inducing performance → 102-41

All employment contracts at ETH Zurich are subject to public law: the Federal Personnel Act, the Federal Act on the Federal Institutes of Technology (FIT Act), the Personnel Ordinance for the ETH Domain (PO), and the Ordinance on the Scientific Personnel of the Swiss Federal Institute of Technology in Zurich. 100 percent of ETH Zurich's employees are covered by these legal frameworks. ETH Zurich employees have individual employment contracts that are mostly permanent for technical, administrative, and IT employees and fixed-term for employees in research. Extra hours and overtime are compensated with equivalent time off. As a matter of principle, it is possible to take both paid and unpaid leave. Mothers are entitled to four months of paid maternity leave, irrespective of the time already worked at ETH Zurich. If both parents are employed at ETH Zurich, they can share the four months between each other. After several years of successful employment, employees in management, office, and support functions can be granted a sabbatical. Salaries are defined according to function level, experience, and performance. Extra premiums for service anniversaries can be granted. For employees with contracts over 50 percent, ETH Zurich covers family allowances in addition to the cantonal family allowances. Employees of ETH Zurich pay into the federal PUBLICA pension fund within the defined contribution plan. All employees with a minimum weekly working time of eight hours are insured against accidents both during and outside of work by the Swiss National Accident Insurance Fund (SUVA).

HIGHLIGHT

Commitment to diversity

When ETH Zurich was founded in 1855, women were expressly admitted as students, making the university a pioneer in gender equality. Today, more than ever, diversity is considered an asset. It is also, on occasion, a challenge, as might be expected in an international community of scholars from around the globe. The guidelines for appropriate behaviour at the university are summarised in the Respect Code of Conduct, published in 2018: ETH Zurich has a zero-tolerance policy towards discrimination, sexual harassment, bullying, or threats and violence. Further, it aims to foster a climate of respectful and responsible interaction regardless of origin, education, religion, beliefs, physical ability, gender, or sexual identity. To underscore its commitment to these values, including its openness towards lesbian, gay, bisexual, and transgender (LGBT) students, the university showed solidarity by flying a rainbow flag on the occasion of the 2018 Zurich Pride Festival. LGBT groups are well integrated into the VSETH Students Association. "ETH Zurich understands that staff and students of all persuasions and orientations need a welcoming atmosphere, and is working to develop a more inclusive culture", says **Sabine Python**, President of L-Punkt, a network for lesbian, bisexual, and queer women*. The university is a member of "trans welcome", a joint project of the Transgender Network Switzerland (TGNS) and the Swiss Federal Office for Gender Equality. ETH Zurich's support for UN Sustainable Development Goals SDG5 (Gender equality) and SDG10 (Reduced inequalities) is further embodied in the Office of Equal Opportunities for Women and Men, which ensures that all women and men enjoy the same opportunities to study, research, and work at the university.

More information: Respect
Trans Welcome
L-Punkt

The ASVZ offers all university members an attractive and varied sports programme, which includes plenty of opportunities to discover new activities, but also old favorites.

Additional services and benefits for employees

In addition to guaranteeing the best possible standard for general employment conditions, ETH Zurich is constantly developing its portfolio in terms of additional offers and benefits. Among other advantages, ETH Zurich's employees receive special conditions and discounts for the use of public transport (for people with more than 50 percent employment contracts of at least six months duration), childcare, continuing education and language courses, memberships in the Academic Sports Association (ASVZ), or car-sharing subscriptions.

Respect Code of Conduct and Respect Campaign

Diversity can only bear fruits when the working environment is based on mutual respect. During the reporting period, a few cases of personal misconducted were reported at ETH Zurich. These events, which the university takes very seriously, are an occasion to revise and improve existing processes and rules. In 2018, for example, the Executive Board of ETH Zurich adopted the new Respect Code of Conduct as a guideline for how members of the university community should treat each other according to the principles of: (1) respect and responsibility, (2) open and fair communication, (3) honesty and integrity. The new Code was introduced alongside a campaign around the slogan Respect. Full stop and a series of eye-catching phrases designed to encourage all members of the community to respect – and never overstep – personal boundaries. The campaign was inspired by the 2016 Employee Survey, which indicated that the working environment at ETH Zurich was mostly regarded as positive and respectful, but that problems needed to be dealt with more openly and solution strategies illustrated more clearly. In addition to the introduction of the Code of Conduct, various measures have been initiated to tackle these issues, such as workshops, videos, and a dedicated campaign website.

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For additional information, please refer to the chapter Human resources and infrastructure in the Annual Report.

FURTHER INFORMATION

ETH community magazine "life" (October 2017)

CAMPUS

ENVIRONMENT

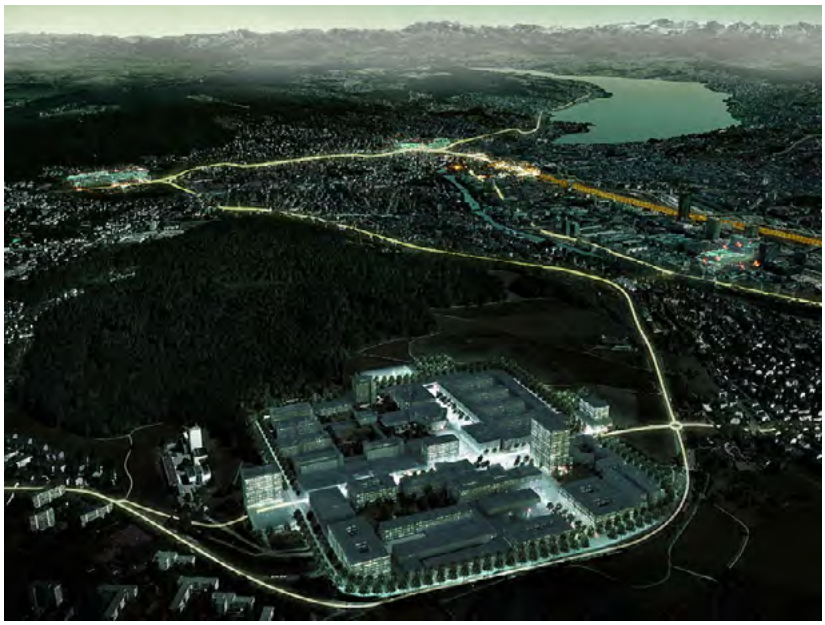
Sustainable campus development

At a vibrant university like ETH Zurich, demand for space is constantly changing. The growing number of students and employees is one driver of spatial development. Other requirements for teaching and research in light of new technologies, research foci, and teaching formats also shape ETH Zurich's long-term real estate planning and its need for new buildings. The university favours versatile buildings that can be readily adapted to new developments and changing requirements. Moreover, it is essential to safeguard the quality of the existing building stock and retain its value. At the end of 2018, ETH Zurich's real estate portfolio comprised a total of 206 properties and around 479,000 square metres of main usable space. The main locations, Campus Zentrum (98 buildings) and Campus Hönggerberg (53 buildings), account for almost 90 percent of this space. Overall, this amounts to a growth of approximately 4 percent compared to the last reporting period (2015/2016: 462,000 square metres). The university's spatial and structural development will be focused on the two main locations, both of which offer a full range of teaching, research, and service facilities and shared space for multiple departments (15 departments in Zurich and one in Basel). Since the historic structures of the city and district limit development opportunities on Campus Zentrum, ETH Zurich has earmarked Campus Hönggerberg to meet the bulk of its future spatial requirements. In addition to these two main campuses in Zurich, ETH Zurich operates various satellite facilities[1] in Switzerland and abroad.

1 In the Zurich region: Lindau-Eschikon, Rüschlikon, Schwerzenbach. Switzerland and other countries: Ascona, Basel, Castasegna, Chamau, Lugano, and Singapore.

Goals **Building efficiency**

		STATUS
Implement MINERGIE®-ECO standard (or similar) in new buildings and MINERGIE® standard (or similar) for renovations	In addition to the MINERGIE®-ECO and MINERGIE® standards, the SGNI sustainability standard is implemented for laboratory buildings.	
In major investment projects, assess costs, energy usage, and emissions over the entire life cycle of the investment. In newly constructed buildings, only state-of-the-art construction standards and energy-efficient construction types are used	Life-cycle costing analyses are conducted for larger projects (new buildings) already in the phase of the architecture competition, by analysing the different project proposals. Calculations are repeated and monitored during the project's realisation.	
Increase the use of rainwater in building projects	Rainwater use is now standard in new building projects on Campus Hönggerberg (e.g., HIF, HPQ). Further use of rainwater has been evaluated in 2018. New consumers of rainwater will be connected in 2019/2020.	



With a view to offering more areas for relaxation and recreation, the new master plan places increased emphasis on green spaces, while also maintaining the surrounding recreational area.

Master plan "Campus Hönggerberg 2040"

On Campus Hönggerberg, ETH Zurich is looking to build up its infrastructure more densely within the current boundaries to create an attractive multi-use campus for teaching, research, and leisure activities that does not extend into the surrounding landscape. Since 2015, ETH Zurich has been working with the City and Canton of Zurich along with external experts to update plans for the spatial development of the campus. The development works are based on the Campus Hönggerberg 2040 master plan, which explains the vision and fundamental spatial planning principles, including concepts for mobility and open and recreational spaces. The strategic placement of four high-rise buildings will provide sufficient green and open spaces, while a range of sustainable transport options and an extensive network of paths for pedestrians and cyclists will ensure good access to the campus.

Reducing the footprint of buildings

ETH Zurich has gone to great lengths to optimise the environmental efficiency of its buildings. As part of this effort, the MINERGIE®-ECO standard for energy-efficient and ecologically designed buildings was first applied to the Information and Science Laboratory at Campus Hönggerberg in 2008. Moving forward, ETH Zurich aims to meet the MINERGIE®-ECO certification standards in all new buildings and to gain MINERGIE® certification for its renovation projects. By the end of 2018, nine buildings had been completed in compliance with the MINERGIE® and MINERGIE®-ECO standards.

At AgroVet-Strickhof, higher education and research in agricultural and veterinary sciences are connected with the practical needs of the agricultural industry through the cooperation between Strickhof, ETH Zurich, and the University of Zurich.

During the reporting period, renovations and construction work on the HPM2 building and the AgroVet-Strickhof in Lindau ZH were completed. Both projects have already received the provisional MINERGIE®-ECO certificate, which will be followed by the regular certificate in 2019. The HPM2 was built at the end of the 1970s as a laboratory building on Campus Hönggerberg. Preserving its historical character, it was renovated and extended to meet new demands for research. The AgroVet-Strickhof, in turn, offers state-of-the-art facilities for researchers from ETH Zurich and the University of Zurich to conduct interdisciplinary research with direct links to agricultural practice.

The pre-certificate "Platinum" of the Swiss Sustainable Building Council (SGNI) was granted to the HFI building after its renovation. The NO, HPS, HPP, and HIT buildings were recertified according to GI (Gutes Innenraumklima, Good Indoor Climate) during the reporting period.

FURTHER INFORMATION

- Campus development
- Real Estate Management administrative department
- Construction and renovation projects
- ETH community magazine "life" (December 2015)

Energy

The increasing number of students and employees along with new infrastructure requirements for research and education are significant drivers of ETH Zurich's overall energy demand. Balancing this development with the increasing need for energy is a key challenge that ETH Zurich faces as an institution with a strong commitment to sustainability. Guided by the university's comprehensive Energy Concept ("Energieleitbild", adopted in 2013), ETH Zurich is constantly working to improve its energy efficiency. The Energy Officer supervises the strategy in close coordination between all relevant units and decision-making bodies. The university's energy-related flagship project is the Anergy Grid at Campus Hönggerberg, which is working on ways to revolutionise the heating and cooling system on the campus in the medium and long term.

STAKEHOLDER PERSPECTIVES We want to exceed Switzerland's CO_2 targets with innovative energy strategies. Our infrastructure should be energy-efficient and powered by a high proportion of renewable energies.

Dr. Wolfgang Seifert
Energy Officer of ETH Zurich

Goals **Energy**

		STATUS
Continue to encourage energy-related dialogs with employees, students, and the public	During the reporting period, no large-scale information campaigns were launched to encourage this dialog. Plans for new initiatives are currently being elaborated.	
For operation of the energy supply system at Campus Hönggerberg (Anergy Grid), ETH Zurich will use energy from sources that comply with high ecological standards	The Anergy net on Campus Hönggerberg was further expanded by the construction of the new HI-central, ensuring the connection of HIB/HIF/etc. to the Anergy Grid. Currently, 8.5 GWh of heating and 10.4 GWh of cooling is supplied from the Anergy Grid. At its current status, it needs 2.9 GWh for operation of the pumps and other auxiliary systems. A collaboration with the ETH Zurich Professorship of Process Engineering (D-MAVT) has been established for the continuous simulation and modelling of the energy flows in the system, with the aim of optimising its operation and future expansion. The strategy for perspective development of the Anergy Grid was remodelled and new targets were set for 2026/2030.	
By 2025, 50 percent of the total heating requirements on Campus Zentrum (incl. external consumers) will be covered by waste heat	In 2017 and 2018, 13.1 percent (6,362 GWh of 48,532 GWh) and 11.5 percent (5,471 GWh of 47,621 GWh) of the total heating requirements on Campus Zentrum were covered by waste heat (6,362 GWh of 48,532 GWh).	
Implement first phase of "Masterplan Energy" at Campus Zentrum	The implementation of the Masterplan Energy at Campus Zentrum was initiated in 2017. In this process, the Walche heat pump was shut down and dismantled due to inefficiency. Currently, heating demand is primarily covered by district heating (from incineration plant). Between 2017 and 2022, over CHF 16 million will be invested for the first two stages of the new cooling network that connects all five cooling plants on Campus Zentrum. The cooling network, which will be finalised by 2022, is a basic prerequisite for the connection of ETH Zurich to a possible lake water supply system for cooling and heating.	

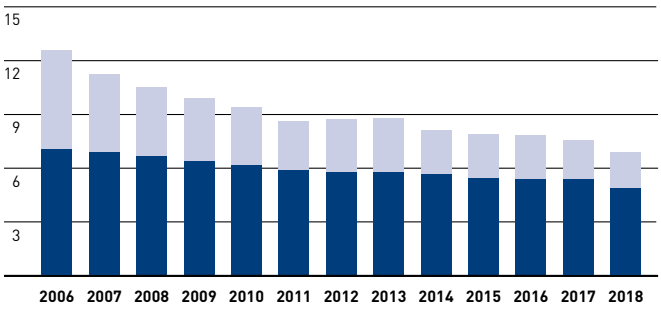
Energy demand

Direct energy used by ETH Zurich (defined as fuels like natural gas, oil, and woodchips burned in own facilities) was 33.1 GWh in 2017 and 32.5 GWh in 2018. Compared to the last reporting period (2015: 30.0 GWh), this amounts to an increase of roughly 9 percent. Indirect energy use (defined as electricity and district heating purchased from outside providers) was 143.8 GWh in 2017 and 145.5 GWh in 2018, which is around 7 percent higher than indirect energy use in the last reporting period (2015: 135.5 GWh). By switching off the Walche heat pump, electricity demand in Campus Zentrum was reduced by around 10 GWh in 2018. At the same time, the missing heat had to be compensated with a higher supply of district heating. District heating purchases rose from 20.9 GWh to 42.2 GWh. This ultimately led to an increase of 10 GWh in direct energy consumption compared with 2015.

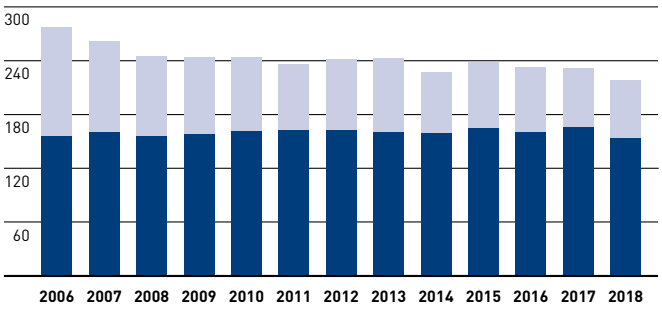
The total energy (electricity and heating) used by ETH Zurich was 159.6 GWh in 2017 and 147.3 GWh in 2018. Between 2015 and 2018, the total energy demand decreased by almost 10 percent. Furthermore, 26.6 GWh in 2017 and 24.1 GWh in 2018 were sold as heating energy to third parties. According to the Swiss Federal Office of Energy (SFOE), the heating energy sold in both years is equivalent to the annual energy consumption of almost 17,000 households in Switzerland. The normalised energy demand (by energy-consuming area) was 231 kWh/m^2 in 2017 and 218 kWh/m^2 in 2018 (rounded). Per fulltime equivalent of employees and students, it was 7,596 kWh in 2017 and 6,885 kWh in 2018 (rounded). While normalised energy demand by energy-consuming area has remained stable over the past decade, a significant improvement can be identified at the level of the normalised energy demand by fulltime equivalent: between 2006 and 2018, there was a decrease of roughly 45 percent.

All of ETH Zurich's electricity consumption has been covered by renewable energy sources since 2016, with steady increases since 2011 (23 percent). Besides increasing the share of electricity from renewable sources, ETH Zurich purchases guarantees of origin indicating the energy source used to generate the electricity. The share of heating demand covered from renewable sources ranged between 42 percent in 2012 and 59 percent in 2014. It stood at 52 percent in 2017 and 45 percent in 2018. The Walche heat pump was taken out of service in 2017. This has reduced the proportion of renewable heat in the overall balance. The installation of new chillers with waste heat recovery in 2021 will increase the renewable portion again.

Total energy demand per FTE (final energy)
in MWh per FTE



Total energy demand per energy-consuming-area (final energy)
in kWh per m^2



Environmental statistics

Electricity (in GWh)	2012	2013	2014	2015	2016	2017	2018
Total electricity demand	**111.8**	**113.0**	**111.9**	**114.6**	**115.7**	**113.7**	**103.5**
Share from renewable sources (in %)	**24**	**62**	**95**	**98**	**100**	**100**	**100**
Total produced on site	0.2	0.2	0.3	0.2	0.2	0.2	0.2
Production from photovoltaic cells	0.2	0.2	0.3	0.2	0.2	0.2	0.2
Total electricity purchased (ewz/ekz)	**111.6**	**112.8**	**111.6**	**114.4**	**115.5**	**113.5**	**103.3**
Electricity purchased for buildings	101.5	103.2	104.8	107.2	106.0	108.9	103.3
Electricity purchased for Walche heat pump	10.1	9.6	6.8	7.2	9.5	4.6	0.0

Heating (in GWh)							
Total heat demand of ETH Zurich (net energy)	**50.7**	**53.9**	**45.5**	**48.9**	**49.0**	**45.9**	**43.8**
Share from renewable sources (in %)	**42**	**55**	**59**	**56**	**55**	**52**	**45**
Total heat produced (net energy)	77.9	83.1	68.5	74.0	75.8	72.5	67.9
Sold heat to third parties (net energy)	-27.2	-29.2	-23.0	-25.1	-26.8	-26.6	-24.1
Total heat produced (net energy incl. external purchasers)	**77.9**	**83.1**	**68.5**	**74.0**	**75.8**	**72.5**	**67.9**
District heating	21.6	21.8	17.8	20.9	19.2	30.3	42.2
Walche heat pump	27.3	26.3	19.4	20.2	24.8	11.9	0.0
Fossil fuels							
Gas (excluding gas for CHP electricity)	25.5	31.2	27.4	29.4	33.7	32.2	30.4
Oil	5.9	0.0	0.0	0.0	0.6	0.0	1.3
Non-fossil fuels							
Woodchips	0.5	0.5	0.5	0.6	0.0	0.9	0.8
From heat recovery	8.9	11.8	11.9	10.0	7.5	9.8	8.9
Losses during conversion	-11.8	-8.5	-8.6	-7.1	-10.0	-12.5	-15.7

Relative amounts							
Electricity demand (kWh/FTE[1]), excl. power for heat pump	5,826.2	5,780.7	5,712.3	5,431.4	5,353.2	5,345.5	4,838.7
Heat demand/energy-consuming area (kWh/m^2)	80.2	83.1	68.5	74.6	73.7	68.5	64.9
Total energy demand/FTE (kWh/FTE)	8,732.5	8,789.4	8,186.6	7,901.9	7,823.4	7,596.3	6,885.4
Total energy demand/energy-consuming area (kWh/m^2)	241.1	242.7	226.8	238.5	233.5	231.1	218.3

CO_2 emissions (in t CO_2eq)							
Total CO_2eq emissions	**28,623**	**26,458**	**27,344**	**29,111**	**27,215**	**28,302**	**29,049**
Direct CO_2eq emissions (Scope 1)							
Gas and district heating	4,655	5,620	5,521	6,656	6,899	6,155	6,212
Oil	2,088	11	5	0.5	161.7	4.8	382.6
Coolants (adjusted in 2014)	62	62	517	517	517	517	517
Indirect CO_2eq emissions (Scope 2)							
Purchased electricity (ewz/ekz)	1,606	1,585	1,471	1,555	1,563	1,526	1,384
Other indirect CO_2eq emissions (Scope 3)							
Commuter traffic (recorded in 2008)	1,714	1,714	1,714	1,714	1,714	1,714	1,714
Business travel (adjusted; see note on page 66)	18,498	17,466	17,826	18,378	16,070	18,385	18,322
Printing (recorded in 2014)[2]			290	290	290		

1 Students count as 0.68 FTE
2 Emissions associated with printing are not disclosed in this report due to a lack of available data.

Rented smaller premises and premises outside the Canton of Zurich are not included in the multi-year comparisons.

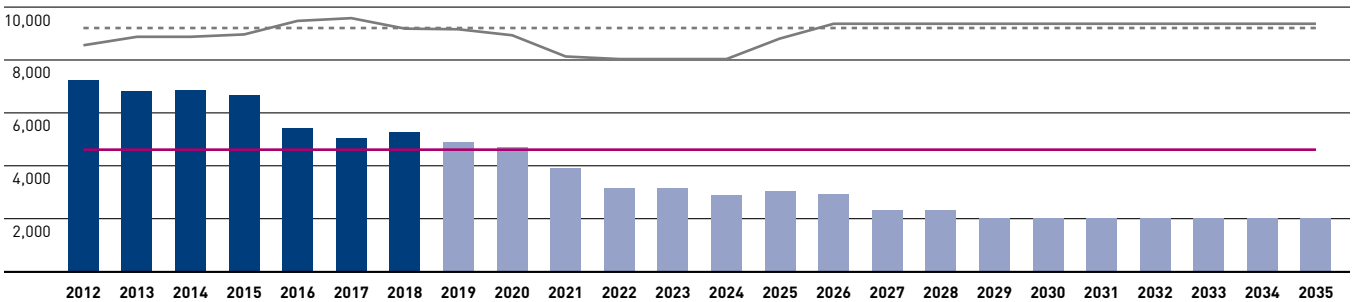
Anergy Grid at Campus Hönggerberg

With the Anergy Grid, ETH Zurich is building a dynamic underground storage system in an effort to significantly reduce CO_2 emissions from heating and cooling at Campus Hönggerberg. While the technology used is by no means new, the size and complexity of this project are unparalleled. The first phase of construction began in 2003 and was completed in 2012. The project aims to decrease the CO_2 emissions from an initial value of 9,200 t CO_2eq per year (baseline 2006) to 4,600 t CO_2eq per year (50 percent of 2006). In 2017, they stood at 5,010 t CO_2eq, and at 5,246 t CO_2eq in 2018. The slight increase in 2018 is due to the use of oil during a short peak season for heating purposes, instead of natural gas. The target value of 4,600 t CO_2eq will most probably be achieved by 2020. The figure below vividly contrasts the impact of the Anergy Grid with a "business as usual" forecast, accounting for planned renovations and infrastructural developments on Campus Hönggerberg.

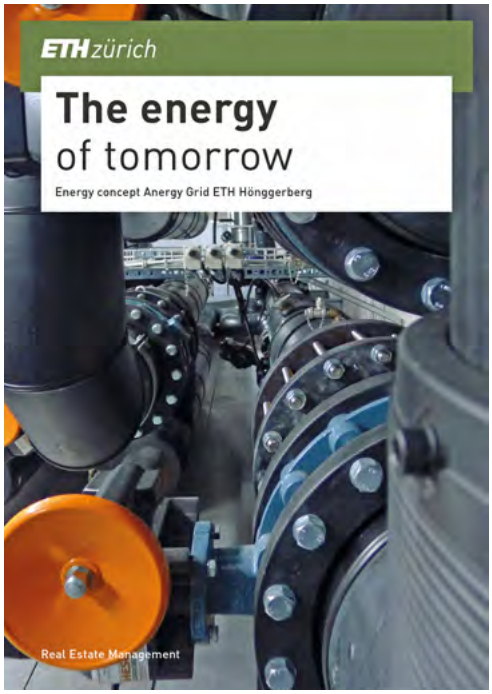
FURTHER INFORMATION

- Operational environmental management at ETH Zurich
- Swiss Confederation: Exemplary in energy (ETH Domain)
- Energy Concept
- The Anergy Grid in brief

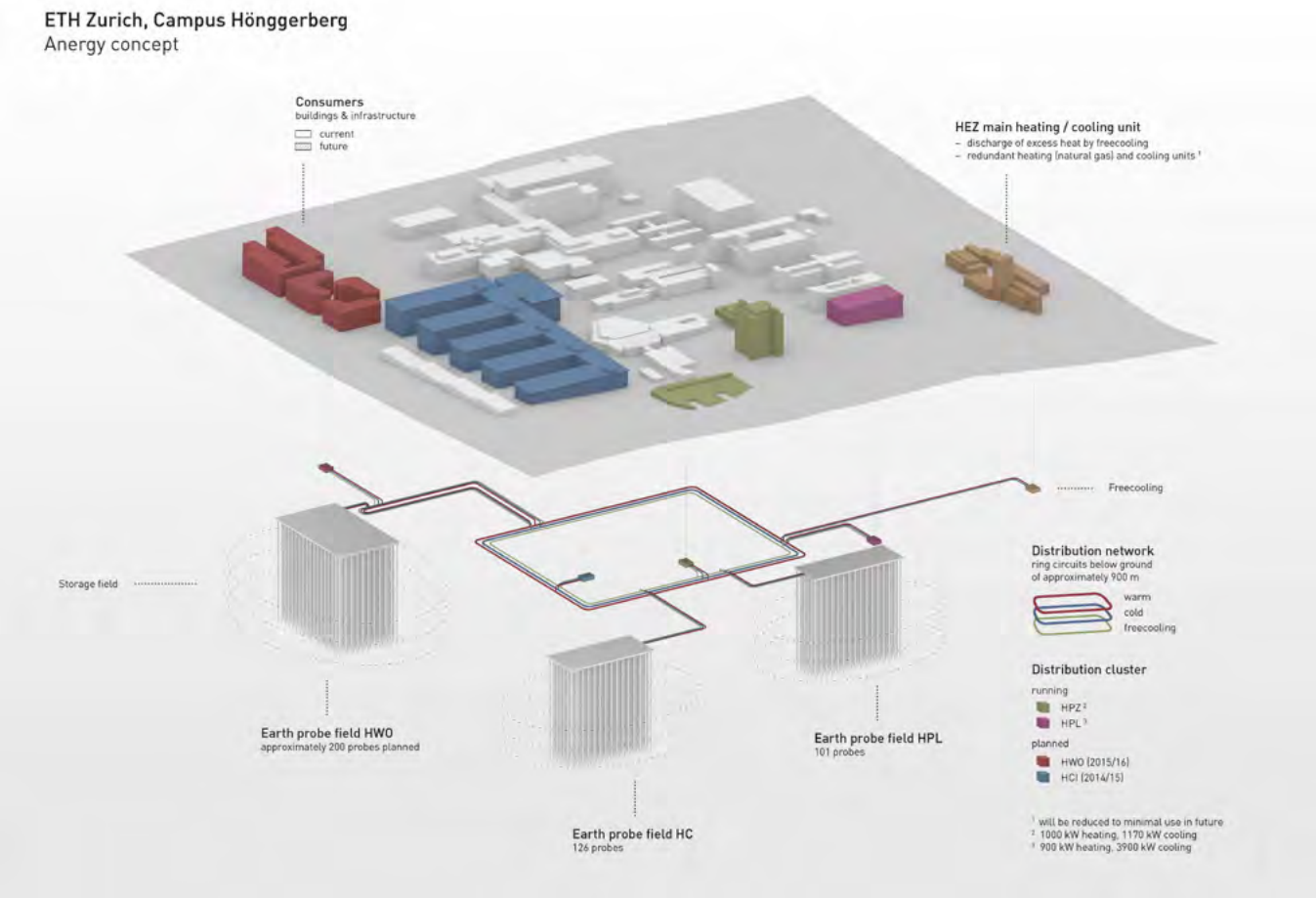
CO_2 emissions from heating and cooling at Campus Hönggerberg
in metric tonnes CO_2eq per year



with Anergy Grid and renovations (measured data)
with Anergy Grid and renovations (forecast)
baseline value (2006)
without Anergy Grid and renovations (business-as-usual)
target value (50 percent of 2006)



In 2017, the Anergy Grid system consisted of three underground storages and four substations, which supply four building clusters with heat and cold. Two additional underground storages and substations are planned to assure supply for new and renovated buildings.



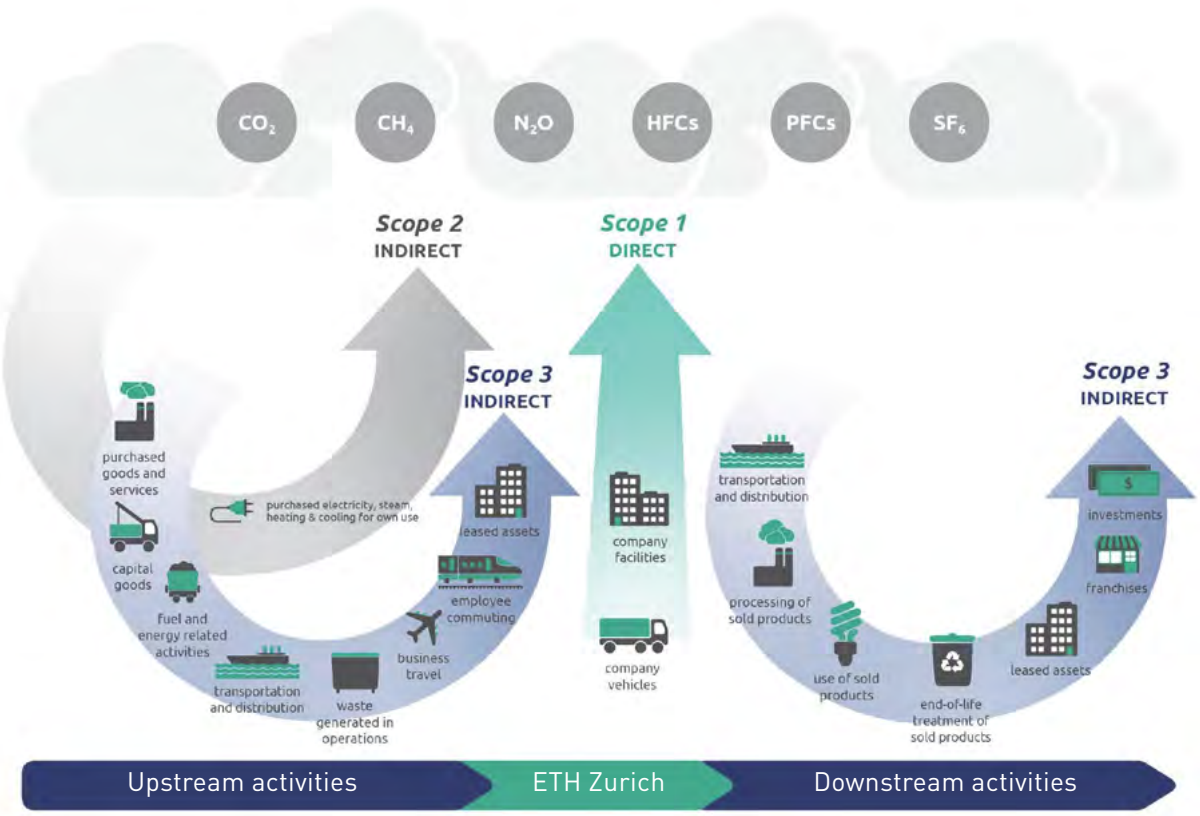
Greenhouse gas emissions

Global warming is one of the most pressing challenges of sustainable development. Living up to the priority given to climate change in its research, ETH Zurich critically monitors its own carbon footprint. For reasons of transparency and comparability, ETH Zurich bases its monitoring on the guidelines of the Greenhouse Gas Protocol (GHG Protocol), including emissions from own operations, purchased electricity, or business travel. As the university is making great efforts to reduce its footprint, the spatial developments and the ongoing increase in student and employee numbers over the past decade remain major challenges for absolute emissions reduction.

Greenhouse gas accounting

As part of its environmental management, ETH Zurich collects information on its carbon footprint on an annual basis.[1] Following the categories of the GHG Protocol, ETH Zurich reports direct and indirect emissions clustered into three Scopes: Scope 1 emissions refer to direct greenhouse gas emissions from owned or controlled sources. Scope 2 emissions are indirect greenhouse gas emissions from the generation of purchased energy. Scope 3 includes all other indirect greenhouse gas emissions that are generated in the value chain, including both upstream and downstream emissions.[2]

1 Previous reports included the emissions of volatile organic compounds (VOC) caused by ETH Zurich's laboratory activities (2015: 52.7 t CO_2eq), solvents (2015: 92.1 t CO_2eq), as well as printing (2014: 290 t CO_2eq). These are not disclosed in this report due to a lack of available data.
2 Scope 1 emissions were documented and verified with SILOVEDA software. Scope 2 emissions from purchased electricity were assessed based on documentation provided by the supplier.

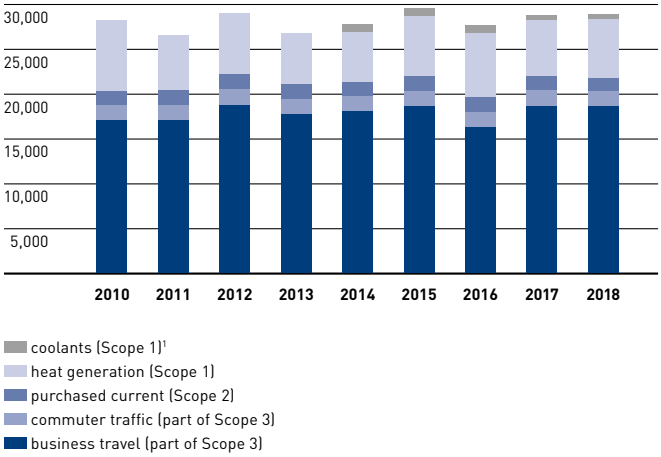


Scope 1: Direct greenhouse gas emissions
In 2017 and 2018, Scope 1 emissions (mainly from fossil fuels like natural gas burned in own facilities) were 6,677 and 6,212 t CO_2eq, respectively. Compared to the previous reporting period (2015: 7,174 t CO_2eq and 2016: 7,578 t CO_2eq), the total Scope 1 emissions decreased by almost 13 percent.

Scope 2: Indirect greenhouse gas emissions
In 2017 and 2018, Scope 2 emissions (mainly from purchased electricity) were 1,526 and 1,384 t CO_2eq, respectively. Compared to the previous reporting period (2015: 1,555 t CO_2eq and 2016: 1,563 t CO_2eq), the total Scope 2 emissions decreased by almost 7 percent.

Scope 3: Other indirect greenhouse gas emissions (incomplete)
According to the GHG Protocol standard, Scope 3 comprises 15 categories of activities, both upstream and downstream. Given the data availability, ETH Zurich only reports part of these emissions in this report. These include emissions from business travel and commuter traffic (recorded in 2008). In 2017 and 2018, these emissions amounted to 20,999 and 20,036 t CO_2eq, respectively.

CO_2 emissions
in metric tonnes of CO_2 equivalent per year



1 The values between 2014 and 2016 included 290 t CO_2eq associated with printing.

Goal **Emissions**

		STATUS
Reduce direct CO_2 emissions on Campus Hönggerberg by 50 percent by 2020 (4,600 t CO_2eq per year) through the implementation of the "Energy Concept Campus Hönggerberg" based on geothermal storage systems (base year 2006)	Direct CO_2 emissions on Campus Hönggerberg have continuously decreased since 2012, with 7,231 t CO_2eq in 2012 (corrected), 6,823 t CO_2eq in 2013 (corrected), 6,849 t CO_2eq in 2014 (corrected), 6,683 t CO_2eq in 2015, 5,425 t CO_2eq in 2016, 5,010 t CO_2eq in 2017, and 5,246 t CO_2eq in 2018. The slight increase in 2018 is due to the use of oil during a short peak season for heating purpose, instead of natural gas (see figure on page 60).	

Mobility

Greenhouse gas emissions and mobility are closely interlinked as long as transport is based on fossil fuels. For a sustainable, future-oriented mobility, it is crucial to make use of the opportunities offered by technological and societal innovations and by digitalisation. ETH Zurich is committed to sustainable mobility in research, education, and campus operations. The Mobility Platform, launched in 2016 by the Vice President for Human Resources and Infrastructure, sets clear priorities, particularly with regard to reducing emissions. Major projects with this aim include the Air Travel Project, but also active support for public transport, bike-sharing offers, and E-mobility.

The Mobility Platform is striding ahead with the Air Travel Project. In order to reduce greenhouse gas emissions, ETH Zurich departments have set targets and defined the measures to meet them.

Air Travel Project

Business travel accounts for more than half of the greenhouse gas emissions produced by ETH Zurich. Approximately 93 percent of these are caused by air travel. Seeking to reduce flight-related emissions, in April 2017 the ETH Zurich Executive Board launched the Air Travel Project. It is led by the Vice President for Human Resources and Infrastructure and managed by the Mobility Platform. The aim is to embark on a real reduction path that is compatible with maintaining excellence in science and the best possible career opportunities for researchers. In a participatory process, the departments, the Executive Board, and the administrative units of ETH Zurich committed themselves to a per capita reduction of approximately 11 percent between 2019 and 2025, relative to the average for 2016–2018. The reduction goal includes flights by employees, students as part of their curriculum, and invited guests. An interim evaluation is scheduled for 2022.

HIGHLIGHT

Sustainable and smart on the road: E-mobility at ETH Zurich

"The shift towards a climate-friendly mobility system requires a drastic reduction in the use of fossil fuels", says **Urs Nussbaum**, co-lead of ETH Zurich's Mobility Platform. Therefore, switching to electric vehicles can make transportation significantly more energy-efficient, pursuant to UN Sustainability Goals SDG11 (Sustainable Cities and Communities) and SDG13 (Climate Action). In order to promote sustainable mobility at ETH Zurich, the Mobility Platform has driven the process of electrification by launching a series of new offerings, such as enabling members of ETH Zurich to test and use electric vehicles at attractive conditions. The measures cover ETH Zurich's existing vehicle fleet, a range of sharing options, and the strategic expansion of charging stations. The share of hybrid and electric vehicles in the university's vehicle fleet is now around 25 percent.
In cooperation with Europcar, a pilot operation with e-Golf rental cars was launched. In the area of electric bikes (E-bikes), the Mobility Platform negotiated a number of options: after a pilot phase with 100 test users, members of ETH Zurich currently benefit from a reduced annual flat rate for the free-floating bike sharing provider smide. On Campus Hönggerberg, one of 22 cargo e-bikes has been available for rent since summer 2017, as part of the carvelo2go initiative.
In spring 2018, ETH Zurich participated in the launch of the municipal rental network Züri Velo, operated by PubliBike, by financing a charging station on its Campus Hönggerberg. In return for sponsoring the station, members of ETH Zurich benefit from an attractive annual subscription. At the same time, the ETH team e-bike service was launched. Following the conclusion of the pilot phase, 30 team e-bikes are currently in use, including three cargo e-bikes.

More information: Sustainable Mobility

In addition, the majority of departments will offset flight emissions. Like other federal agencies, ETH Zurich will compensate them through the Federal Office for the Environment (FOEN). This compensation is not a substitute for direct reduction, but an additional measure and a temporary solution. Six departments have also decided to introduce an internal "carbon tax". The revenue will be invested in teaching, research, or the promotion of young researchers, with a focus on themes that lead to a reduction in CO_2. All departments are in favour of using and organising video conferencing more frequently.

From 2019 onwards, a new monitoring system that records flight numbers, travel class, and dates will allow for a more accurate calculation of CO_2 emissions than the previous, cost-based system. Each unit will receive a monthly summary of its flight-related CO_2 emissions.

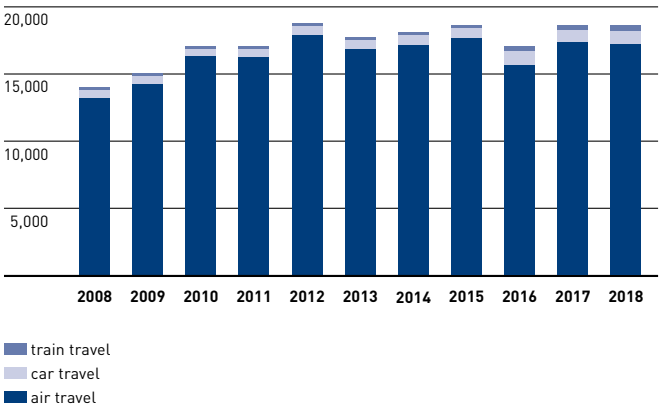
Business travel: Absolute increase, relative decrease

Much as in previous years, 93 percent of all business travel emissions were caused by air travel in both 2017 and 2018. Of the remainder, 5 percent were caused by car travel and 2 percent by train travel. Over the course of the last ten years, absolute CO_2 emissions caused by car and train travel have remained relatively stable. Absolute CO_2 emissions caused by air travel, in turn, have increased between 2006 (12,704 t CO_2eq) and 2012 (17,624 t CO_2eq) and then stabilised at a high level of about 17,000 t CO_2eq. CO_2 emissions per fulltime equivalent (FTE) associated with air travel increased from 2006 to 2012 and decreased thereafter. Averaged over the last three years (2016–2018), the emissions per FTE amount to roughly 1.8 t CO_2eq.

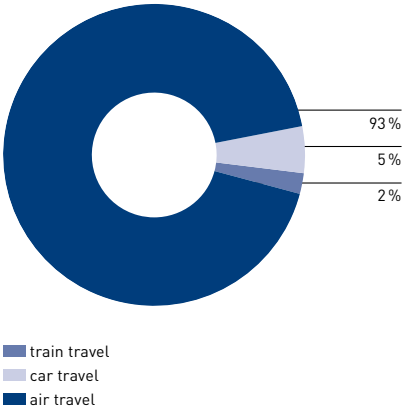
NOTE Around 20 percent of all flights associated with ETH Zurich's employees and invited guests are documented in the AirPlus tool. The calculation of ETH Zurich's overall air travel related CO_2 emissions is thus based on an extrapolation of the documented 2,000 annual flights (on average). Emission factors for train travel and car travel have been adjusted since the last report. Until 2013, the emission factor for air travel was assessed as 230 g CO_2eq per person kilometre (pkm). As the air travel data provided through the AirPlus tool and Mobitool allows for a more precise estimation that accounts for travel distance, destination, and varying Radiative Force Indices (RFI), an ETH Zurich-specific emission factor of 272 g CO_2eq/pkm was defined for 2014 to 2016. For 2017 and 2018, the average factor was 277 g CO_2eq/pkm. Note that the factors are variable as they depend on the distance-class distributions of the flights. On the basis of an estimate of the Swiss Federal Railways (SBB), emission factors for international train travel have been adjusted from 25.4 to 63.6 g CO_2eq/pkm while national train travel remained at 25.4 g CO_2eq/pkm. Since car travel was reported in vehicle kilometres (vkm), but the emission factor used referred to pkm, the emission factor for car travel has been adjusted from 197 g CO_2eq per pkm to 315.6 g CO_2eq per vkm.[1] As a consequence of the above changes, numbers provided here differ from those in earlier reports, but are consistent across the years within this report.

1 Greenhouse gas accounting for business travel and the respective emission factors were calculated by an external consultancy.

CO_2 emissions caused by business travel
in metric tonnes of CO_2 equivalent per year



CO_2 emissions caused by business travel in 2018 (by category)



STAKEHOLDER PERSPECTIVES By reducing air travel, we can make a significant contribution towards bringing down our CO_2 footprint. As successful science is perceived to be closely linked to flying, the Air Travel Project is both a challenge and an opportunity. In particular, the participatory process through which the departments worked out their goals and measures has triggered a dynamic development that is also attracting the attention of other universities.

Dr. Susann Görlinger
Co-Lead Mobility Platform

FURTHER INFORMATION

- The Mobility Platform in a nutshell
- ETH Link shuttle bus

Goals **Mobility**

		STATUS
Limit air travel	Over the last ten years, there has been an increase in emissions due to flights taken by employees (mainly due to the growth of ETH Zurich). In order to reduce flight emissions, the ETH Zurich Executive Board launched a participatory project in 2017 in which the departments, Executive Board, and administrative units at ETH Zurich committed themselves to a per-capita reduction of approximately 11 percent between 2019 and 2025, as measured against the average for 2016–2018. In addition, the majority of departments will offset flight emissions.	
Increase number of students travelling between the two campus sites using non-motorised traffic	Over the course of the reporting period, several bike-sharing systems were introduced, with 1,500 registered users and up to 350 trips per day. Employees and students of ETH Zurich can use the bikes at a reduced rate to commute between Campus Zentrum and Campus Hönggerberg.	
Optimise public transportation between Campus Zentrum and Campus Hönggerberg	With the new student residence at Campus Hönggerberg now occupied, a more concentrated schedule for the ETH Link shuttle bus was tested. Four buses per hour commuted between Campus Zentrum and Campus Hönggerberg during the semester starting in 2017. In 2018, the ETH Link transported almost 1 million passengers, which amounts to a 12 percent growth compared to the year before (2017: 855,000 passengers; 2018: 980,000 passengers).	
Reduce fuel consumption at ETH Zurich continuously	Fuel consumption has decreased by 23 percent since the last reporting period, from 98,417 litres in 2016 to 76,100 litres in 2018. The decrease is the result of the substitution of combustion engine driven cars by electric cars, as well as the sale of the Chamau site to the Canton of Zug, which reduced ETH Zurich's fleet by several agricultural vehicles.	

Paper consumption

Despite the ongoing process of digitalisation, the consumption of large quantities of paper remains common practice at universities. To mitigate the environmental impact, ETH Zurich focuses both on reducing the quantity of paper consumed and on lowering the environmental impact of the paper that is used. Where possible, ETH Zurich encourages the use of electronic documents.

Cutting use of paper

In 2018, 35.9 million A4 sheets were delivered on campus by the ETH Office Supplies Shop[1]. That amounts to a decrease of 29 percent since 2016 (50.4 million pages). Per fulltime equivalent, the decrease between 2016 and 2018 stood at 34 percent. In the same period, the amount of recycled paper increased from 11.3 million A4 sheets in 2016 to 29.5 million A4 sheets in 2018. The downward trend of total paper consumption in the course of the reporting period is partly related to the increased external procurement of print services by the Print + Publish section. Further possible explanations for the reduction include an increased environmental awareness (e.g., double-sided printing) and the greater use of (mobile) electronic devices.

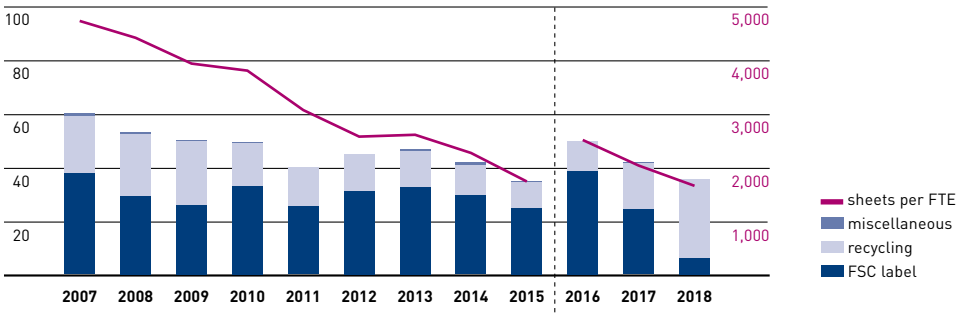
1 The delivery volume of the ETH Office Supplies Shop covers an estimated 98 percent of ETH Zurich's total paper requirements. The remaining 2 percent are directly procured from external suppliers.

FURTHER INFORMATION

Print + Publish section
Office supplies

NOTE Since 2016, the paper procurement process and internal responsibilities of paper supply have been reorganised. Data from 2007 to 2015 include delivery volume of ETH Office Supplies Shop. Data since 2016 include both delivery volume of ETH Office Supplies Shop and the data from the IT Services printing volume.

Paper consumption
in millions of A4 sheets of paper per year



Goals **Paper consumption**

		STATUS
Reduce paper consumption continuously	The absolute use of paper has decreased by almost 30 percent since 2016. Per fulltime equivalent, it has decreased by 34 percent in the same period.	
Increase the proportion of recycled paper	Starting from 2018, ETH Zurich switched completely to white recycled paper. For the invitation to tender for the new paper supplier contract, the university adhered to the recommendation of the Federal Office for Buildings and Logistics to offer exclusively white, particularly environmentally and climate-friendly paper under the "Balance Classic" brand.	

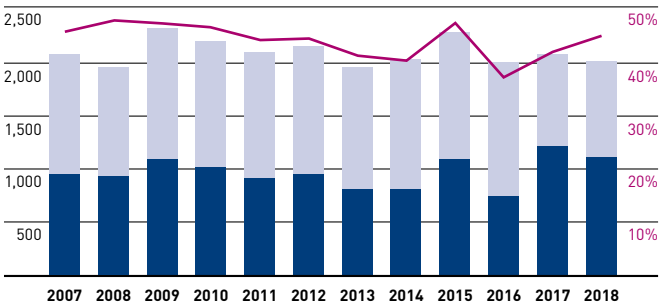
Recycling and waste

Within its various facilities and diverse activities, ETH Zurich generates a significant volume of waste. Considering the environmental impact associated with waste, ETH Zurich is committed to developing holistic waste management solutions. The university aims to avoid waste, wherever feasible, or divert as much as possible of the waste away from mainstream disposal into recycling streams. The operational environmental and waste management comprises a series of mission statements, fact sheets, and guidelines, such as the Disposal Guideline of the Safety, Security, Health and Environment (SSHE) department. The Facility Management department leads the development of new solutions for the waste situation by continuously keeping statistics and trying to optimise existing processes. The main challenge in this regard remains the continuous increase in the number of ETH Zurich members.

STAKEHOLDER PERSPECTIVES The greatest challenge is to raise awareness among our colleagues that saving resources represents value. This value is largely ignored in today's society. The task of reducing waste, or of systematically returning it to the value chain, is a question of personal commitment.

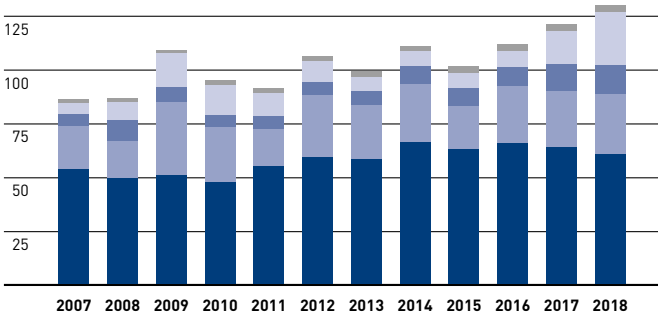
Beat Baltensperger
Facility Management, Consulting

Waste
in metric tonnes



recycling quota
operational waste
recyclable waste

Hazardous waste
in metric tonnes



cadaver
other hazardous waste
lab chemicals
aqueous wastes (acids, etc.)
solvents

Redirecting waste stream

As in the previous reporting period (2015/2016), the overall goal of directing 50 percent of the waste volume into recycling streams had not been achieved by the end of 2018. Depending on the building area and the corresponding material consumption requirements, the recycling quote varied between 17 and 100 percent. Considering the total waste volume of 2084 t in 2017 and 2019 t in 2018, university-wide recycling quotas of 42 percent (868 t) and 45 percent (906 t) were reported. The remaining non-recyclable operational waste (1,216 t in 2017 and 1,113 t in 2018) was combusted. The waste volume generated at ETH Zurich has been slowly increasing over the past years due to the steady growth in student and employee numbers.

Disposing of hazardous waste

In dealing with hazardous waste, ETH Zurich takes strict safety precautions. Special training is given to ensure that employees and students have a clear understanding of disposal practices and can implement them safely. In 2017 and 2018, ETH Zurich disposed of 123.0 t and 130.9 t of hazardous waste. Of this total volume, 64.7 t and 61.6 t were solvents.

FURTHER INFORMATION

- Safety, Security, Health and Environment (SSHE) administrative department
- Facility Management administrative department
- Hazardous waste disposal
- Powernewz blog on biogenic waste initiative

Goals **Waste**

		STATUS
Host "Recycling Days" on campus	ETH Zurich's Facility Management administrative department hosted "Recycling Days" on campus in both 2017 and 2018.	→
Direct 50 percent of total waste material to a recycling stream	The target of 50 percent for ETH Zurich as a whole had not been achieved by the end of 2018. Within the reporting period, the recycling quota varied between 17 and 100 percent – depending on the building area – resulting in overall quotas of 42 percent in 2017 and 45 percent in 2018.	✕
Provide infrastructure for disposing of biogenic waste	Inspired by an award-winning idea submitted for a competition, ETH Zurich has installed 60 collection boxes for biogenic waste on its Campus Hönggerberg. Since 2015, around 3,000 kg of biogenic waste have been collected annually and used for energy generation.	→

Food

While the implications of nutrition on individual health are taken for granted, there is less awareness of the effect that food has on the environment. As the production and consumption of food is an essential contributor to the global greenhouse gas footprint, it plays an increasingly important role in ETH Zurich's approach to sustainability. With 1.7 million menus consumed on campus in 2018, CO_2 emissions associated with food represent a considerable share of ETH Zurich's overall greenhouse gas emissions. In close exchange with the catering companies on campus, the university's Catering Commission, ETH Sustainability, and the World Food Systems Center are developing solutions backed by the university's core competencies in education and research.

As part of their final theses, students collected food waste in the university's canteen and classified it according to menu components. An experimental design setup allowed them to measure how targeted interventions, such as a communication campaign on avoiding food waste, affect consumer behaviour.

Towards a sustainability programme for catering

As part of its general sustainability strategy, ETH Zurich decided in 2013 to study the extent to which catering companies could contribute to meeting ETH Zurich's sustainability goals and to identify the most important determinants of sustainable catering. To this end, the Catering Commission launched a project coordinated by the ETH Sustainability staff unit and the World Food System Center at ETH Zurich. For the first time, a comprehensive "living lab" approach was applied within the framework of the project. Specifically, the project comprised four phases, which lasted until the end of 2016: (1) Climate impact and taste, (2) food waste, (3) health and climate impact, and (4) development of options for a programme in gastronomy and elaboration of an implementation concept. The final report was published in July 2017. Based on the results, an implementation concept for the catering companies was developed, which ultimately provided the basis for the ETH Zurich ETH Climate Programme for Gastronomy (see highlight). Launched in January 2018, it motivated catering companies to take a series of measures with the aim to reduce their greenhouse gas emissions by 10 percent within three years as compared against the average footprint in 2015/2016. From the outset, the programme was designed in a way that would form part of a more comprehensive "ETH Sustainability Programme". Additional indicators and possible goals for the catering sector are currently being assessed, including animal welfare, health, food waste, and biodiversity.

HIGHLIGHT

On the menu today: Climate-friendly nutrition

Thousands of students, staff, and visitors eat at ETH Zurich facilities every day. The 1.7 million menus that were consumed on campus in 2018 have a considerable impact on the CO_2 emissions of ETH Zurich. This is why the "Climate Programme for Gastronomy" was launched in January 2018. Catering partners on campus, namely SV Group and Compass Group, have committed themselves to reducing their greenhouse gas emissions by 10 percent over the next three years. Those who meet a set of sustainability criteria may use the label "ETH Climate Programme Participant". The foundation for this programme was a three-year project entitled "Factors of sustainable gastronomy at ETH Zurich". It was launched by the Gastronomy Commission and jointly implemented by ETH Sustainability and the World Food System Center at ETH Zurich. While carbon efficiency is a core factor of the "ETH Climate Programme for Gastronomy", other aspects of the food chain, such as animal welfare, food waste, fair pay and working conditions, or the nutritional value of dishes on the menu will also be taken into consideration in future steps. "There is still not enough awareness of how our nutrition choices affect the environment, or of their overall impact on sustainability", says **Isabelle Castagna**, Project Manager at ETH Sustainability. By taking into account factors such as food production, distribution, or waste, ETH Zurich contributes to the UN Sustainability Goals of responsible consumption and production (SDG12) and climate action (SDG13).

More information: Climate Programe

Reusable dishes on campus

Some of the catering companies' action plans are already pursuing a number of goals that go beyond mere climate targets. In 2018, for example, the SV Group carried out two pilot projects on food waste and reusable dishes in the take-away segment. ETH Sustainability is currently taking stock of the types and quantities of packaging as well as the logistical aspects of catering on campus. Recommendations for action on the basis of the analysis and will be available in mid-2019. A special focus is on replacing disposable dishes with reusable ones.

FURTHER INFORMATION

- Sustainable Catering Project at ETH Zurich
- Gastronomy at ETH Zurich
- Guidelines for sustainable catering

Goal **Food**

		STATUS
Development of a general set of criteria for assessing the climate-friendliness of offerings in the catering industry	During the fourth phase of the "Sustainable Catering" project, recommendations on how to measure the CO_2 equivalent footprint of menus were elaborated. These recommendations are part of a systemic framework to reduce emissions caused by the catering industry.	✓
Development of recommendations for catering companies to reduce packaging and advance the substitution of disposable dishes with reusable dishes	ETH Sustainability has already collected the raw data (packaging volumes, packaging types, logistic framework conditions) and will develop a set of recommendations based on this information.	↻

CAMPUS

GOVERNANCE AND FINANCE

Finances

ETH Zurich pursues a long-term, sustainable financial policy: This is based on a financial plan covering a period of several years and a long-term approach to balance sheet management. Selective diversification of its sources of funding also helps to keep the university on a sustainable track. The increasing share of third-party funding that the university attracts allows it to implement its strategy more quickly, expand its research activities, or expedite planned investments and research projects. In doing so, ETH Zurich safeguards its independence in teaching and research as well as the strategic and financial scope it has within the limits of the federal financial contribution (global budget). The ETH Domain is managed in accordance with strategic targets set by the Swiss Federal Council, the terms and content of which are tailored to the funding approved by the Federal Government. The ETH Board allocates the funds to the two Federal Institutes of Technology in Zurich and Lausanne and the four research institutions under the Objective Agreements derived from the strategic targets. The share of the federal financial contribution (global budget) granted to ETH Zurich amounted to CHF 1,297 million (2017) and CHF 1,300 million (2018; thereof CHF 1,260 million part of total income in 2018). This amounts to 74 percent of the total income in 2017 (CHF 1,756 million) and 73 percent of the total income in 2018 (CHF 1,727 million). The share of third-party funding has risen in recent years from 15 percent (2000) to 27 percent (2018), illustrating its increasing importance. In view of the strong international competition among universities with technology-intensive cutting-edge research and a continuous increase in the number of students, deliberately diversifying the funding base is both a necessity and an increasing challenge for ETH Zurich.

STAKEHOLDER PERSPECTIVES To keep ETH Zurich on a sustainable path, it is vital to diversify its funding base. Going forward, it is also essential that funding approved by the Federal Government remains on a stable footing. Responsible and transparent management of funding is crucial for us. The recent renewal of ETH Zurich's resource and finance platform is one example of how we are continuously developing governance as it relates to our funding base.

Dr. Claudia Riegler
Accounting department, Reporting specialist

Asset management

With a budget that is publicly funded by the Federal Government, the Swiss National Science Foundation, and the European Union, ETH Zurich's financing model differs significantly from the Anglo-Saxon "private university" model. None of the public funds ETH Zurich is entrusted with are invested on the market. Financial assets are obtained in particular by funds collected from third parties that will not be used immediately. Based on the applicable treasury agreement and the investment guidelines stipulated by the ETH Board, these funds are placed in the market or with the Federal Government. The third-party funds placed in the market are managed by Swiss banks under asset management mandates. The net revenues from these investments amount to less than one percent of the university's total annual revenue.

ETH Zurich's Vice President for Finance and Controlling (VPFC) oversees the asset management process and regularly consults with the university's Investment Commission (IC) on the investment strategy and on matters related to third-party funds managed under asset management mandates. Chaired by the VPFC, the IC consists of professors and other executive staff of ETH Zurich. In asset management decisions, the IC considers primarily four elements: return, risk, volatility, and sustainability.

In 2017, ETH Zurich implemented important milestones with regard to sustainable investments: Since then, the passively managed asset management mandate has complied with the exclusion list of SVVK ASIR (Swiss Association for Responsible Investments). This ensures that third-party funds are not invested in companies that act irresponsiby towards the environment, the economy, or society, according to the screening and monitoring of the SVVK ASIR. The actively managed asset management mandate has followed Environmental, Social, Governance (ESG) criteria since 2017. Investment decisions pursue financial objectives while at the same time explicitly integrating environmental, social, and governance aspects.

In 2019, the IC will examine and consider additional investments in a passively managed asset management mandate focusing on sustainable investment products.

For additional information, please refer to the chapters Governance and sustainability, Finance and Consolidated financial statements in the Annual Report.

FURTHER INFORMATION

Finance and Controlling
Administrative departments
Risk management
ETH Zurich Code of Conduct for Scientific Cooperation
Code of Conduct for Handling Donations
ETH Zurich Foundation Code of Conduct

At the Laboratory of Ion Beam Physics at ETH Zurich, a high-energy proton beam was used to establish the composition of patina on a Greek bronze statuette and to determine the technique used to manufacture its surfaces.

INSIGHT

A treasury of knowledge and a resource for research:

Cultural heritage in the ETH collections

The archives and collections of ETH Zurich form a vast repository of cultural heritage that serves not just as a resource for learning and research, but also as a link connecting the past with the future. Preserving, developing, and making these holdings digitally accessible is part of the university's core mission.

From entomological specimens and taxidermy mounts to geological samples, maps, and literary bequests, ETH Zurich has assembled and acquired significant collections and archives on a broad variety of topics during its long history. Preserving and developing this unique cultural heritage is a fundamental element of the university's mission and advances the UN Sustainable Development Goal of building sustainable cities and communities (SDG11). While the artefacts included in the holdings are used to enrich teaching and serve as references for practical research, the collections and archives themselves are also objects of research and historical interest.

The responsibility for preserving knowledge and handing it on to future generations is a matter of great importance that transcends national boundaries, as the European Commission acknowledged when it declared 2018 the European Year of Cultural Heritage. As one of Switzerland's major repositories of information, much of it consisting of artefacts and books in the university's vast holdings, ETH Zurich contributed to the national umbrella campaign chaired by Federal Councillor Alain Berset with a selection of exhibits that illustrated the European Year's theme: the significance of our shared heritage – including tangible, intangible, and digital assets – in building the future.

On 3 June 2018, visitors participated in more than 50 events including workshops, guided tours, exhibitions, and lectures that showcased the ETH archives, collections, and libraries, underscoring the motto that "Today's cutting-edge research is tomorrow's cultural heritage". For example, those interested in the natural sciences could take part in a botanical field trip to Valais, organised by mycology experts from the herbaria that are jointly administered by ETH and the University of Zurich; they could experience a simulated earthquake and view an exhibition on the solar system at the focusTerra geoscience centre, or hear a presentation on medicinal plants and herbs contributed by the curator of the chemistry and pharmacognosy collections of the Department of Chemistry and Applied Biosciences.

History buffs had the chance to see papers from the ETH Library, including original documents relating to luminaries such as Albert Einstein and Wolfgang Pauli, while the Thomas Mann and Max Frisch Archives showcased letters, notebooks, and video footage about these eminent writers. Other examples of cultural heritage covered topics such as microelectronics, astronomy, radiocarbon dating, river engineering, and many other aspects of art, science, and technology.

"The ETH collections and archives – about 20 in total – offer a unique perspective on the history of art, science, and culture dating back to the early days of the university's founding", says Stefan Wiederkehr, Head of Collections and Archives at ETH Library. "A considerable part of our holdings are of international importance. For Switzerland, they are part of the nation's collective inheritance in the fields of natural history and culture."

However, he and the collection staff are by no means focused exclusively on the past. Their work consists not only of preserving the university's archives and artefacts, but also of developing these cultural assets as integral parts of ETH Zurich's infrastructure and identity for the coming decades and centuries. "ETH Zurich invests a great deal of effort as well as human and financial resources in managing, conserving, and presenting our holdings and making them accessible, in order to ensure that current and future generations of researchers can make the best possible use of these tremendous resources", says Wiederkehr.

In the digital age, the concepts of museums, archives, and libraries are converging. Strategic planning therefore focuses on advancing the process of digitising the collections and archives and making as many of their holdings as possible accessible in digital format according to the relevant standards, together with web-searchable and machine-readable metadata. This information will also be integrated with the ETH Library's search portal. All digital artefacts are currently being tagged with persistent identifiers, and the structure of the metadata in conjunction with the available interfaces will make it possible to set dynamic links between external offerings and the digital holdings of ETH Zurich. Internationally standardised data formats are used to describe all objects, many of which are also georeferenced.

Making this heritage available digitally will be a fitting way of doing justice to the importance that the reference collections have for the global scientific community. This expansion of access in the virtual space will also have an effect in the physical realm as curation and conservation, but also the management, administration, and further development of the collections are continuously optimised, even as exhibitions by ETH Zurich are set to increase as a way of raising awareness and visibility.

www.kulturerbe2018.ch
www.kulturerbe.ethz.ch
www.ethz.ch/collections-and-archives

On 3 June 2018, visitors at "Cultural Heritage at ETH Zurich" experienced tours, exhibitions, workshops, discussions, and lectures in the fields of science, history, technology, literature, research, and art.

DIALOG

In 2017, ETH Zurich celebrated the publication of the 87th volume of "Globi", one of the best-known comic books in Switzerland. The plot takes place at ETH Zurich. On the occasion of the publication of "Globi and the Crazy Machine", ETH Zurich opened its doors to a group of children and media representatives. The university also informed the participants about some of the latest developments of its research. The photo shows Globi on a power wheel chair developed by the ETH spin-off "Scewo".The model can overcome not only stairs, but also frequent obstacles like kerbs, tram tracks, grass, mud, or stones.

Informing the interested public

Beyond research and education, the transfer of knowledge for the benefit of the wider society is one of ETH Zurich's core mandates as defined in the Federal Act on the Federal Institutes of Technology. As a publicly funded university, ETH Zurich actively fulfils its responsibility to inform the public about its research and the findings it generates. According to the "Wissenschaftsbarometer Schweiz", researchers at universities in Switzerland enjoy high levels of trust among the population. In order to maintain this positive climate, ETH Zurich is continuously developing its portfolio of channels and dialog formats to provide information in an objective, attractive, and comprehensible way. The formats are developed in close coordination with the members of the Executive Board and often originate from bottom-up initiatives of individuals or groups of researchers. Newly developed formats like the Cybathlon, the award-winning Zukunftsblog, or the established Treffpunkt Science City are very well received and provide a valuable platform for the enrichment of the wider public and researchers alike. However, the free public tours in the footsteps of Albert Einstein, or of the pioneering Arch_Tec_Lab on Campus Hönggerberg have also captured the public's interest.

Visitors of Treffpunkt Science City can find out which themes are currently being studied at ETH Zurich. Practical demonstrations, such as the "Rotondum" chair, allow visitors to immerse themselves in the world of research for a moment.

Public outreach with a long tradition

With data being one of ETH Zurich's strategic research areas, both the 2017 edition of the Scientifica: Zurich Science Days and the spring edition of Treffpunkt Science City in 2017 focused on matters related to data science and digitalisation. Over 30,000 visitors attended Scientifica to discover more about what data can reveal. Around 300 researchers from ETH Zurich and the University of Zurich were on hand to give talks and answer questions. In presentations, workshops, and short lectures, they explained how digitalisation is transforming not only areas such as robotics and climate science, but also linguistic and cultural studies. Ten spin-offs from ETH Zurich and the University of Zurich showed how new scientific findings can be transformed into practical business ideas. Treffpunkt Science City is a public science programme with lectures, demonstrations, and experiments for young and old. Each of the programmes, which run for five weeks in spring and autumn, tackles a different theme and offers something of interest

HIGHLIGHT

Scientists and citizens team up to do research

In times when strategic misinformation is not only propagated on social media, but also seeping into the public and political discourse, it seems that public access to excellent research and sound scientific data has never been needed more. It also seems timely to breach the barrier between academia and the public, and to actively engage interested citizens in academic research.
The Citizen Science Center Zurich, a joint initiative of the University of Zurich and ETH Zurich, does both. "The Center aims at engaging academic scientists and the public in next-generation citizen science projects, where high participatory projects tackle problems from fundamental physics to linguistics to human health", explains Managing Director **Rosy Mondardini**. Citizens are especially encouraged to participate in all phases of research projects, and engage in the tackling (documenting and measuring) of progress on the UN Sustainable Development Goals. This participatory approach to science presents everyone with the opportunity to address SDG issues that directly affect them and to bring their own perspectives and expertise to the table.
The Center provides researchers with the necessary resources, expertise, and technical know-how to develop, set up, and run citizen science projects, which produce excellent science while while maintaining the highest standards of data security.

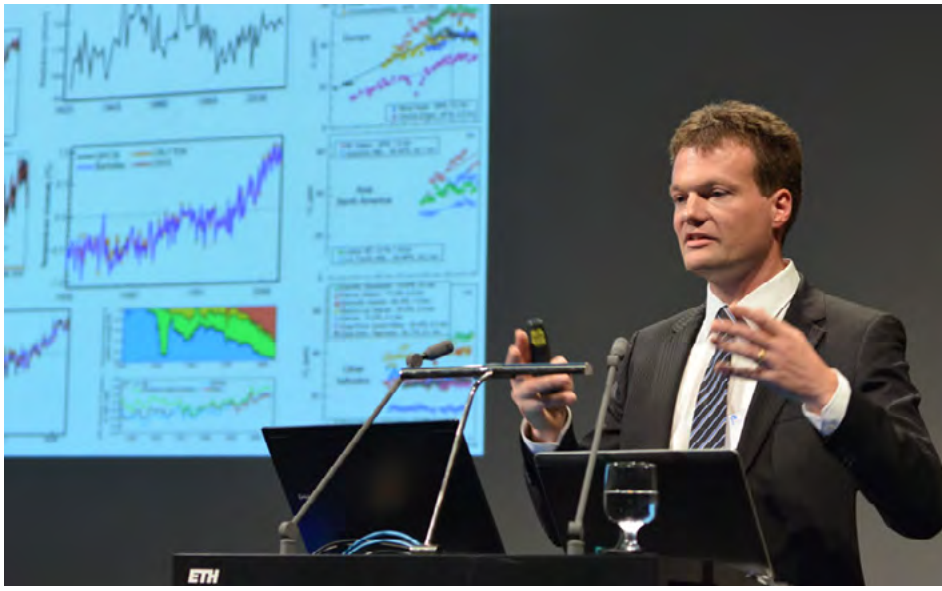
More information: Citizen Science

for adults, young people, and children. The theme of the 2017 spring edition was "Working in the World 4.0". The events dealt with the future of work in light of technological developments and the ongoing process of digitalisation. Every year, more than 20,000 people visit the programme on Campus Hönggerberg. Recordings of the presentations and panel discussions get up to 10,000 views.

Zukunftsblog: Leading the digital debate
With almost 50 contributing authors, the Zukunftsblog has become a highly recognised online resource for the broad communication of research findings on the university's core research themes in the field of sustainable development. The blog provides a forum for ETH Zurich's experts to write about socially relevant research topics and sketch their ideas about the future. At the beginning of 2018, after more than five years of galvanising the digital debate, the Zukunftsblog was revamped to cover covering three focus areas: digitalisation, health, and sustainability. In 2018, the Zukunftsblog won second place in the Science Blog of the Year competition.

HIGHLIGHT

Award for climate researcher and climate ambassador



What will the world's climate be like two or three decades from now? How can we raise awareness of the risks of climate change? How can we create political and societal acceptance of the incontrovertible facts of climate research? These are the questions to which **Reto Knutti**, Associate Vice President for Sustainability and head of the climate physics group at the Center for Climate Systems Modeling (C2SM), has dedicated his career. In addition to his work at ETH Zurich, he is one of the primary authors of the Assessment Reports prepared by the UN Intergovernmental Panel on Climate Change (IPCC). These reports study the causes and potential impacts of global climate change, as well as mitigation measures. For excellence in climate change research, but notably also for his work in communicating research results to the general public, Reto Knutti was awarded the 2018 Prize of the Dr. J.E. Brandenberger Foundation, which honours individuals who have made special contributions to the welfare of humanity or achieved exceptional results in scientific research. Delivering the laudatory speech, then ETH president Lino Guzzella noted: "On the one hand, this prize is a recognition of the excellent work Reto Knutti is doing. On the other hand, it is proof that ETH Zurich is researching subjects that have major societal relevance, developing solutions in this area and contributing to public debate". World-class climate research and public information for sustainable climate action at ETH Zurich substantially advance the causes of UN SDG13 (Climate action) and SDG16 (Peace, justice and strong institutions).

More information: Stiftung Dr. J.E. Brandenberger
ProClim

Goals **Dialog**

		STATUS
By maintaining various channels of dialog, strengthen public understanding of the importance of fundamental and engineering sciences for politics, business, and society	Various formats are in place and under development to support the dialog with decision-makers, the interested public, and other stakeholders inside and outside of ETH Zurich (see table on pages 82–84).	
Provide services for the benefit of the whole country by fulfilling diverse national tasks	ETH Zurich applies its scientific and technical expertise to public service tasks on behalf of the Federal Government, including the Swiss Seismological Service (SED), the Swiss Economic Institute (KOF), the Center for Security Studies (CSS), the Centro Svizzero di Calcolo Scientifico (CSCS), the ETH Library, the Centro Stefano Franscini, Atlas der Schweiz, Schweizer Weltatlas, and the National Center for Climate Services (NCCS), and contributes to the maintenance of Swiss cultural goods, including the Collection of Prints and Drawings, the Archives of Contemporary History, the gta Archive, the Werner Oechslin Library Foundation, and the Thomas Mann and Max Frisch Archives.	

Summary of channels for internal and external dialog → 102-43 → 102-44

Dialog mechanisms on the level of the institution[1] (not public)

Dialog mechanism (frequency)	Stakeholder groups	Topics addressed
ETH-Ratssitzungen – ETH Board Meetings (according to defined schedule and based on demand)	Members of the ETH Board, Federal Council, Federal Parliament	The ETH Board is the strategic and supervisory body of the ETH Domain and responsible for implementing and fulfilling the performance mandate set by the Federal Council and the Federal Parliament and for the four-year strategy of the ETH Domain
ETH-Rat Dialog-Meetings – ETH Board Dialog Meetings (annually)	Members of the ETH Board, Executive Board of ETH Zurich	Dialog between the ETH Board and the Executive Board of ETH Zurich on strategic planning
Dialog between Executive Board of ETH Zurich and departments (16 meetings per year)	Heads and delegates of all 16 departments	Strategic planning and strategy implementation
Hochschulversammlung (HV) – University Assembly (at least five plenary meetings per year)	Members of the Lecturer's Conference (KdL), the Academic Association of Scientific Staff (AVETH), the Association of ETH Students (VSETH), and the Staff Commission (PeKo)	The University Assembly provides advice to the Executive Board of ETH Zurich and advisory opinions to the ETH Board
Gesamtkonferenz des Lehrkörpers – General Faculty Conference (annually) **Gesamtprofessorenkonferenz – Professors' Conference** (annually) **Konferenz des Lehrkörpers incl. Ausschuss der Konferenz des Lehrkörpers (KdL) – Lecturers' Conference** (annual meetings and based on demand)	All lecturers of ETH Zurich	Advising the Executive Board of ETH Zurich with regards to educational matters, strategic issues, or organisational decisions
Studienkonferenz – Conference of the Directors of Study (three meetings per semester and based on demand)	Directors of Studies of all study programmes	Exchange about study programmes, curricula, and exam regulations. Advising the Rector of ETH Zurich
Expert commissions • Strategy Commission • Teaching Commission • Research Commission • ICT Commission • Risk Management Commission • Investment Commission • Ethics Commission • Commission for Good Scientific Practice • Catering Commission • Environmental Commission (various frequencies)	Experts from respective units of ETH Zurich	Various experts commissions giving advice to the Executive Board of ETH Zurich

1 In addition to the dialog mechanisms on the level of the institution, departments maintain their own dialog mechanisms on matters such as teaching or grading.

Dialog mechanisms for selected stakeholders

Dialog mechanism (frequency)	Main stakeholder groups	Topics addressed
Industry Day (annually)	Industry representatives	Topics of common interest for ETH Zurich and industry
Partnership Councils (based on demand)	Decision-makers from public and private sector	Supporting some of ETH Zurich's competence centres by integrating practitioner perspectives and ensuring the dissemination of research findings
ETH-Tag (annually)	Selected decision-makers from public and private sector	Recognition of outstanding services and achievements and presentation of awards
Diverse alumni specific activities and events (based on demand)	Alumni	Networking and career support

Major public event formats

Dialog mechanism (frequency)	Main stakeholder groups	Topics addressed
Treffpunkt Science City (twice per year)	Public	Selected focus topics of public interest
Scientifica (biannually)	Public	Selected focus topics of public interest
Cybathlon (once in four years)	Public	Demonstration of latest assistive technology to support people with disabilities

Online communication[2]

Dialog mechanism (frequency)	Main stakeholder groups	Topics addressed
ETH-News (daily)	Public, media, employees, students, decision-makers from public and private sector	Research highlights, campus news, events
ETH Zurich on social media (daily): • www.twitter.com/eth • www.youtube.com/ethzurich • www.facebook.com/eth • https://www.linkedin.com/company/eth-zurich_4923 • www.google.com/+ethzurich • www.xing.com/companies/ethzürich • https://www.instagram.com/ethzurich	Public, media	Research highlights, news and events of public interest
Zukunftsblog (twice per week)	Public, media, decision-makers from public and private sector	Research findings about topics related to digitalisation, health, and sustainability
Sustainability Report of ETH Zurich (biannually)	Public, decision-makers from public and private sector, employees, students	Overview of the progress that ETH Zurich has made with regards to its contribution to sustainable development in the previous two years
Podcast (monthly)	Public, media, decision-makers from public and private sector	Background reports and expert talks on various themes from research, education, and knowledge transfer
Ökonomenstimme – Voice of Economists (several publications per month)	Public, economists (German-speaking)	Topics of economic interest
Technology Alert e-mails (two times per month)	Industry representatives	Regular information on latest technologies developed at ETH Zurich
Various newsletters of competence centres and institutes (individual)	Specific interest groups	Regular updates on research results, teaching activities, or events

2 In addition to the online communication on the level of the institution, other units of ETH Zurich maintain their own channels.

Printed communication

Dialog mechanism (frequency)	Main stakeholder groups	Topics addressed
Annual Report of ETH Zurich (annually)	Public, decision-makers from public and private sector, employees, students	Overview of the most important achievements and events of the previous year and financial statement according to IPSAS standard
Globe magazine (quarterly)	Public, employees, students, alumni, decision-makers from public and private sector	Selected focus topics, latest research findings, and events
life magazine (quarterly)	Employees, students	Information about campus life and latest developments
Polykum magazine of the VSETH (nine times per year)	Students	Selected focus topics of interest for students

Informing decision-makers

ETH Zurich is a crucial partner for decision-makers from the public and private sectors in Switzerland and beyond. In this role, the university acts as a highly esteemed partner, but also bears great responsibility. Contributions to public debates or recommendations to inform decision-making must meet the highest standards of scientific rigor and must be independent of political circumstances. ETH Zurich regularly organises events aimed at decision-makers and maintains various channels of exchange. The number of requests for scientific expertise, especially in fields related to sustainable development, is testimony to the high reputation that ETH Zurich and its members enjoy.

Active participation in major events such as the World Economic Forum in Davos offers all those involved a unique opportunity for exchanging ideas.

ETH Zurich in Davos
In 2017 and 2018, ETH Zurich was represented with its own pavilion at the annual meeting of the World Economic Forum (WEF) in Davos. This provided an opportunity to build and intensify contacts with global partners, as well as with public authorities and business representatives from the Canton of Graubünden. In addition to official appearances at closed WEF receptions and workshops, ETH Zurich also presented its latest research findings in a public exhibition entitled "Magic through Technology" (2017). In 2018, the motto was "rETHinking Intelligence", providing a platform to present the latest findings in the field of artificial intelligence.

Connecting with the industry
Since 2013, the annual Industry Day has showcased the research activities of ETH Zurich and offered a platform for industry representatives to engage with the university's leading researchers. During the event, industry representatives are briefed on the university's latest research projects that have potential commercial applications. The prospect of gaining first-hand information on future research directions and innovation on topics like mobility and energy, construction and production, information and communication, as well as health, nutrition, and the environment attracted a broad range of industry experts, with a record high of 600 guests in 2017.

AR

For additional information, please refer to the chapter Industry and society in the Annual Report.

FURTHER INFORMATION

Industry Relations

INSIGHT

Charting the winds of change:

CH2018 scenarios model effects of shifting climate

At the Center for Climate Systems Modelling (C2SM), ETH climate scientists work with MeteoSwiss to model the effects of climate change on Switzerland as a basis for decisionmaking and future planning.

"You don't need a weatherman to know which way the wind blows" – when Bob Dylan sang those words in his 1965 single "Subterranean Homesick Blues", concerns about the human impact on the global climate were only just beginning to gain traction. Today, as humanity prepares for more extreme weather patterns, researchers at ETH Zurich's Center for Climate Systems Modelling (C2SM) are working with the Federal Office of Meteorology and Climatology (MeteoSwiss), Empa, Agroscope, and WSL to model the effects of climate change on Switzerland. In doing so, ETH Zurich supports the UN Sustainable Development Goals of climate action (SDG13) and entering into partnerships in furtherance of that goal (SDG17).

The CH2018 Swiss Climate Scenarios, presented in November 2018 as a product of the the National Centre for Climate Services (NCCS), were generated by combining simulations and models with datasets on current trends, and the accompanying technical report consolidates accurate and current figures to support assessments of climate change impacts and decisions about adaptation and mitigation in Switzerland. Written for political, administrative, and corporate decisionmakers, the CH2018 scenarios describe the outlook for Switzerland over the next century and will underpin the federal government's planning. Adapting to climate change will be crucial, since extreme weather will bring hazards and damage as well as associated costs.

In brief, climate change in Switzerland means that summers will become hotter with longer dry spells; when it does rain, researchers expect more violent precipitation all year round, but especially in winter; extreme temperature peaks will rise even faster than average temperatures, with heat waves both at day and during night-time; and warmer winters will see less snowfall, with particularly severe consequences in high-altitude alpine and glacier regions and predictable effects for tourism, the economy, and related areas such as hydropower or transport. Conversely, the scenarios also illustrate how global climate measures can help mitigate climate change in Switzerland.

The ETH team collaborates with the federal authorities and experts from MeteoSwiss, some of them being part of the Weather and Climate Risks (WCR) Group. This newly established ETH chair at the Institute for Environmental Decisions (IED) studies which sort of decision environment improves the translation of existing knowledge into application. While the ETH experts provide basic research and academic foundations, the meteorologists are in charge of the operative aspects, developing and disseminating this know-how as a hands-on service for the public.

Climate issues affect teaching at many ETH departments, says Reto Knutti of the ETH C2SM: "For example, our engineering students will build water supply systems that are able to manage and withstand torrential rains. We need to ensure that our knowledge about the climate is translated into practice-oriented training, including interfaces with farmers, architects, or municipal authorities, and prepare those communities for future developments. After all, the infrastructure projects that we are planning today need to be climate-resistant for 30 years to come".

While he praises the collaboration with MeteoSwiss and the federal authorities in Berne, Reto Knutti is not so optimistic when it comes to the larger trends that shape the global climate. He sees little indication of humankind's ability to manage responsibly the limited "budget" of allowable emissions that remains if the planet is to remain habitable: "Despite efficiency gains, emissions continue to rise in most countries. In Switzerland, the amount of CO_2 emitted by new vehicles has once more increased, and heavier vehicles are gaining popularity. At this rate, our remaining global emissions budget will be used up in about 20 years' time".

Regulatory levers such as cap-and-trade, CO_2 taxes and carbon offsets need to be deployed efficiently if they are to become game-changers, while technical solutions, such as the carbon-sequestering project developed by an ETH spin-off company in Zurich, have yet to become market-ready, says Reto Knutti: "We need to bring down the cost of capturing a ton of CO_2 down to about CHF 100 to develop capture and storage assets at the economies of scale needed to make a real change." Reforestation would be useful as long as the biomass is allowed to remain standing, and as long as such projects do not compete with agriculture for food supply in the areas in question, he adds.

Reto Knutti can confirm that climate issues are very much on the mind of the general public, who frequently ask experts like himself and the "weathermen" (and women) at the WCR Group how the blowing winds of climate change will affect their lives. "Public information and outreach is a significant part of my work", he notes. "It remains to be seen whether increased awareness and concern will translate into action".

https://www.nccs.admin.ch/nccs/de/home/klimawandel-und-auswirkungen/schweizer-klimaszenarien.html
http://www.wcr.ethz.ch/

ABOUT THIS REPORT

Methodology and scope of reporting

The ETH Zurich Sustainability Report 2017/2018 is ETH Zurich's fifth comprehensive Sustainability Report. This report has been prepared in accordance with the GRI Standards: Core option and the ISCN Sustainable Campus Charter. The topics outlined in the GRI reporting framework cover a broad range of sustainability metrics related to economic, environmental, and social performance, which is applicable to various industry sectors. Conversely, the ISCN Sustainable Campus Charter outlines the joint vision of the ISCN network, including five calls to action regarding (a) institutional leadership and (b) network collaboration.
Unless stated otherwise, information disclosed in this report refers to the two main locations of ETH Zurich in the city of Zurich: Campus Zentrum and Campus Hönggerberg.

Preparation and methodology
Designed to integrate stakeholder views from all areas relevant to ETH Zurich, the reporting process is an opportunity for critical reflection on the reporting focus while at the same time refining and validating the reporting emphasis, ultimately resulting in an account on the topics that are considered most relevant. This report builds primarily on the methodological basis of the ETH Zurich Sustainability Report 2013/2014. The preparation of the report was preceded by three steps, which have been reviewed and updated accordingly over the years:

1. **Mapping stakeholder groups**
2. **Stakeholder interviews**
3. **Defining the content and scope of the report**

1 Mapping stakeholder groups

ETH Zurich is more than an institution for higher education and research. It is also one of the biggest employers in the Zurich area, a place for dialog and exchange, and a growing system of campuses shaped by complex and highly specialised infrastructure. Accordingly, ETH Zurich has a large spectrum of stakeholders both within the university and beyond.

An internal workshop yielded and consolidated a detailed stakeholder map for ETH Zurich (see page 90). → 102-42 Stakeholder groups were primarily categorised by position (internal or external) and then according to ETH Zurich's four strategic fields of action in sustainability: (1) Research, (2) Education, (3) Campus, and (4) Dialog. Two additional categories were defined to capture stakeholder groups beyond the four fields of action: (5) Finances and (6) Others.

Stakeholder groups → 102-40

Field of action	Internal stakeholder group	External stakeholder group
RESEARCH	Vice Presidency for Research and Corporate Relations*[1]	Industry*
	Faculty (Professors)*	Federal Parliament*
	Departments	ETH Domain*
	Competence Centres	Swiss universities*
	Scientific staff*	International universities
		Funding agencies and organisations (Swiss National Science Foundation, innosuisse, European Union, etc.)
EDUCATION	Rector*	High schools
	Academic Services	
	Student Services	
	Study Commissions	
	Directors of Study	
	Students*	
CAMPUS	Vice Presidency for Human Resources and Infrastructure	Local neighbourhoods of ETH Zurich at Campus Zentrum and Campus Hönggerberg*
	ETH Zurich Executive Board and Delegates**	Local neighbourhood of ETH Zurich in other locations in Switzerland and abroad
	Secretary General	
	Staff Units***	
	Administrative departments**	
	Administrative and technical staff	
	Student organisations	
	Sports facilities	
	Catering facilities	
DIALOG	ETH Global*	Public administration
	Corporate Communications	Public authorities
		NGOs*
		Media
FINANCES	Vice Presidency for Finance and Controlling	Tax payer
	Financial Services*	Donors
	Accounting	Foundations*
	Controlling	Other third-party funding
OTHERS		Alumni of ETH Zurich

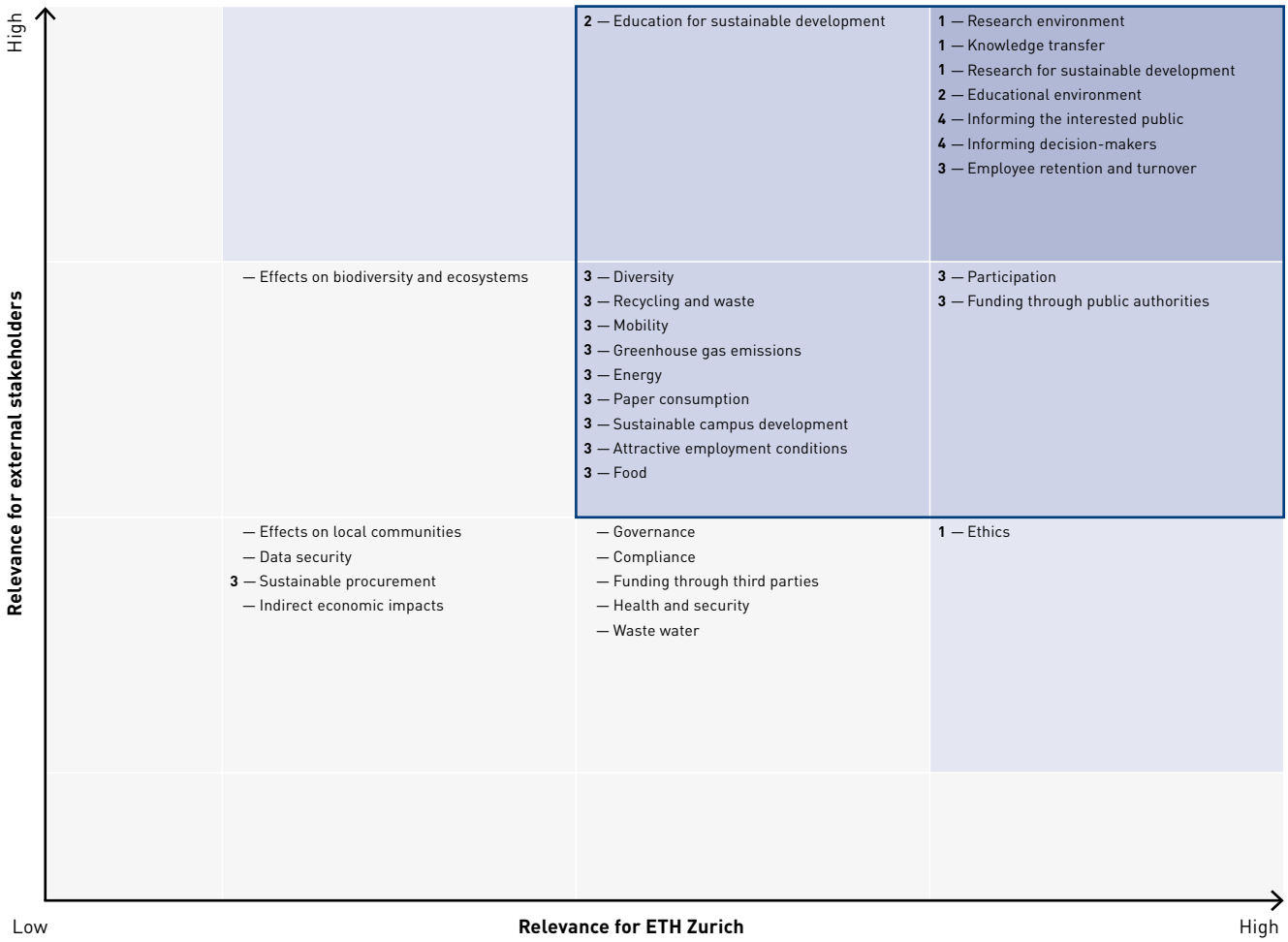
1 Every star (*) in the table indicates one person that was interviewed on behalf of the respective stakeholder group.

2 Stakeholder interviews

Overall, 21 representatives of stakeholder groups were interviewed to capture and integrate internal and external stakeholder positions into the "materiality analysis". Interview partners were selected based on their familiarity or acquaintance with ETH Zurich (for example, graduates of ETH Zurich as external stakeholder representatives) or for having a professional or academic background related to sustainability (in the case of internal stakeholder representatives). → 102-42

Inviting stakeholders to express their expectations created an opportunity for open reflection on the comparative relevance of various aspects of ETH Zurich's sustainability-related issues. It also gave an indication as to how the content of the report would be defined, allowing for a critical discussion and fresh feedback on the university's existing sustainability strategy, its previous achievements, and its sustainability goals. While not fully reflecting a representative sample of stakeholders, the reporting process can still be regarded as an important aspect of stakeholder interaction on sustainability, bringing momentum for mutual learning, and a point of departure for future developments in the field.

Materiality matrix → 102-47



3 Defining the content and scope of the report

The materiality matrix indicates which topics the interview partners assessed as relevant for ETH Zurich from an internal (x-axis) and an external viewpoint (y-axis). Topics located in the four upper right fields of the matrix were identified as the most material ones and were indicative for the structure of the report at hand. They were clustered to constitute the scope of the chapters, as is shown in the matrix. Those topics situated at the bottom left were considered for the report. Progress on these topics is accounted for and communicated elsewhere by the respective units of ETH Zurich. → 102-46

Changes since the last report → 102-48 → 102-49
Overall, the ETH Zurich Sustainability Report 2017/2018 adheres to the scope and structure of the previous report. The former chapter "Mobility and emissions" is now divided into two chapters: "Greenhouse gas emissions" and "Mobility". The calculations for emissions from business travel were slightly adjusted (see note on page 66). Furthermore, the goal categories were adjusted from five categories (permanent goals: on track, not on track; time-constrained goals: achieved, in progress, not achieved) to four categories (see page 8). The ISCN/GULF Sustainable Campus Charter, which served as an orientation for reporting in addition to the GRI standards, has since been replaced by the ISCN Sustainable Campus Charter 2018. Other new features are the explicit disclosure of the contributions made by ETH Zurich to the achievement of the SDGs, as well as the inclusion of the Sustainability Week Demand Reference.

CONTENT INDICES

GRI Content Index

This GRI Content Index provides an overview of ETH Zurich's Sustainability Report 2017/2018 and the GRI disclosure items addressed. It serves as a compass and helps finding relevant information.

Annex to the Sustainability Report 2017/2018 and reference documents
ETH Zurich's Sustainability Reporting consists of two documents: the ETH Zurich Sustainability Report 2017/2018 and the Annex document (references indicated with "Annex" in the table below). Further information can also be found in the Annual Report 2018 (references indicated with "Annual Report" in the table below). All documents can be found online under www.ethz.ch/sustainability-report and www.ethz.ch/annual-report.

This report has been prepared in accordance with the GRI Standards: Core option. For the Materiality Disclosures Service, GRI Services reviewed that the GRI content index included in the ETH Zurich Sustainability Report 2017/2018 (pages 94 to 97) is clearly presented and the references for Disclosures 102-40 to 102-49 align with appropriate sections in the body of the report.

The service was performed on the English version of the report.

GRI 101: Foundation 2016

General Disclosures		
GRI Standard	**Disclosure**	**Page number**
GRI 102: General Disclosures 2016	**Organisational profile**	
	102-1	Cover
	102-2	Inside cover
	102-3	Annex p. 3
	102-4	pp. 54, 89
	102-5	see Annual Report 2018: p. 66-69
	102-6	p. 54
	102-7	pp. 31, 45, 62, see Annual Report 2018: p. 77-121
	102-8	p. 45, Annex p. 3
	102-9	Annex p. 3
	102-10	Annex p. 4
	102-11	Annual Report 2018: p. 72-73
	102-12	Annex p. 4
	102-13	Annex p. 4
	Strategy	
	102-14	p. 4
	Ethics and integrity	
	102-16	p. 19
	Governance	
	102-18	see Annual Report 2018: p. 66-71
	Stakeholder engagement	
	102-40	p. 90
	102-41	p. 51, Annex p. 5
	102-42	pp. 89, 91
	102-43	p. 82
	102-44	pp. 82, 99
	Reporting practice	
	102-45	Annex p. 5
	102-46	p. 92
	102-47	p. 91
	102-48	p. 92
	102-49	p. 92
	102-50	p. 89
	102-51	p. 92
	102-52	p. 84
	102-53	p. 100
	102-54	p. 94
	102-55	pp. 94-97, Annex pp. 3-12
	102-56	Annex p. 6

Material Topics			
GRI Standard	**Disclosure**	**Page number**	**Omissions**
Research environment			
GRI 103: Management Approach 2016	103-1	p. 16	
	103-2	pp. 16-19	
	103-3	p. 16, pp. 18-19	
Research for sustainable development			
GRI 103: Management Approach 2016	103-1	p. 20	
	103-2	pp. 20-23	
	103-3	pp. 20-23	
Knowledge transfer			
GRI 103: Management Approach 2016	103-1	p. 24	
	103-2	pp. 24-26	
	103-3	p. 24	
(own ind.)	Number of Spin-off companies	p. 24	
Educational environment			
GRI 103: Management Approach 2016	103-1	p. 28	
	103-2	pp. 28-32	
	103-3	p. 32	
Education for sustainable development			
GRI 103: Management Approach 2016	103-1	p. 33	
	103-2	pp. 33-38	
	103-3	p. 36	
Participation			
GRI 103: Management Approach 2016	103-1	p. 40	
	103-2	pp. 40-41	
	103-3	pp. 40-41	
Employee retention and turnover			
GRI 103: Management Approach 2016	103-1	p. 42	
	103-2	p. 42, p. 45	
	103-3	p. 42	
GRI 401: Employment 2016	401-1	pp. 43-44	Annex p. 8
Diversity			
GRI 103: Management Approach 2016	103-1	p. 46	
	103-2	pp. 46-50	
	103-3	p. 50	
GRI 405: Diversity and Equal Opportunity 2016	405-1	pp. 47-48, Annex p.8	Annex p. 8
Attractive employment conditions			
GRI 103: Management Approach 2016	103-1	p. 51	
	103-2	pp. 51-53	
	103-3	pp. 51-53	
GRI 401: Employment 2016	401-2	p. 51	
Sustainable campus development			
GRI 103: Management Approach 2016	103-1	p. 54	
	103-2	pp. 54-56	
	103-3	pp. 54	

Material Topics			
GRI Standard	**Disclosure**	**Page number**	**Omissions**
Energy			
GRI 103: Management Approach 2016	103-1	p. 57	
	103-2	pp. 57-58, p. 60	
	103-3	p. 57	
GRI 302: Energy 2016	302-1	pp. 58-59	Annex p. 8
	302-3	p. 58	
Mobility and emissions			
GRI 103: Management Approach 2016	103-1	p. 62	
	103-2	pp. 62-67	
	103-3	p. 63, p. 67	
GRI 305: Emissions 2016	305-1	pp. 59-60, 63	Annex p. 9
	305-2	pp. 59, 63	Annex p. 9
	305-3	pp. 59, 63, 66	Annex p. 10
Paper consumption			
GRI 103: Management Approach 2016	103-1	p. 68	
	103-2	p. 68	
	103-3	p. 68	
GRI 301: Materials 2016	301-2	p. 68	
Recycling and waste			
GRI 103: Management Approach 2016	103-1	p. 69	
	103-2	pp. 69-70	
	103-3	p. 70	
GRI 306: Effluents and Waste 2016	306-2	p. 69-70	
Food			
GRI 103: Management Approach 2016	103-1	p. 71	
	103-2	pp. 71-73	
	103-3	p. 73	
Finances			
GRI 103: Management Approach 2016	103-1	p. 74	
	103-2	pp. 74-75	
	103-3	pp. 74-75	
GRI 201: Economic Performance 2016	201-4	Annual Report 2018: pp. 77-81	
Informing the interested public			
GRI 103: Management Approach 2016	103-1	p. 79	
	103-2	pp. 79-84	
	103-3	p. 81	
Informing decision-makers			
GRI 103: Management Approach 2016	103-1	p. 85	
	103-2	pp. 85-87	
	103-3	pp. 85	

SDG Content Index

ETH Zurich contributes in many ways to achieving the Sustainable Development Goals (SDGs) of the United Nations (UN). In this report, we present an exemplary overview of these contributions. This compilation does not claim to be complete – however, it illustrates the important role of universities in the implementation of the UN 2030 Agenda. This index serves as a guide to the relevant information presented in the report.

For more information, please visit: www.ethz.ch/sdg

	Brief description of SDG	Our contribution
1	End poverty in all its forms everywhere	p. 37
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	p. 22, p. 72
3	Ensure healthy lives and promote well-being for all at all ages	p. 25, p. 29
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	p. 34, p. 37, p. 49
5	Achieve gender equality and empower all women and girls	p. 49, p. 52
6	Ensure availability and sustainable management of water and sanitation for all	p. 35, p. 54
7	Ensure access to affordable, reliable, sustainable, and modern energy for all	p. 22, p. 34, p. 60
8	Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all	p. 24, p. 81
9	Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation	p. 18, p. 23
10	Reduce inequality within and among countries	p. 21, p. 37, p. 52
11	Make cities and human settlements inclusive, safe, resilient, and sustainable	p. 65, p. 76
12	Ensure sustainable consumption and production patterns	p. 72, p. 73
13	Take urgent action to combat climate change and its impacts	p. 18, p. 65, p. 72, p. 81, p. 86
14	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development	www.ethz.ch/sdg
15	Protect, restore, and promote sustainable use of terrestrial ecosystems	p. 55
16	Promote peaceful and inclusive societies for sustainable development	p. 21, p. 80, p. 81
17	Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development	p. 25, p. 29, p. 34, p. 37, p. 80, p. 86

Sustainability Week Demand Reference → 102-44

Nachhaltigkeits Woche Zürich

The student-run Sustainability Week is an internationally acclaimed showcase project of student engagement for sustainability. Students from all over Switzerland call on their universities to implement a series of measures related to sustainability. With this Sustainability Report and the Annual report, ETH Zurich discloses where it stands with regards to the students' demands. Wherever possible, the table below refers to corresponding passages in the report. The sustainability goals complement this assessment in that they point to successes and potential for improvement.

	Demand	Reference
Strategy and leadership	Integrate sustainability with regard to ecological, economic, and social aspects into the mission statement	p. 4, p. 5, p. 11–14, p. 20
	Establish a sustainability office	p. 13
	Establish a balanced gender distribution in decisionmaking bodies	Annual Report p. 69
Financial investments	Formulate concrete sustainability criteria for investments	p. 74–75
	Develop strategies for sustainable investments	p. 41, p. 74–75
Services	Publish a sustainability report that meets international standards	p. 94–98
	Identify student contact persons in the field of sustainability	p. 41
Teaching	Integrate sustainability into the teaching curriculum of all departments	p. 28–36
	Consider models other than the neoclassical model in research and teaching on economics and business	p. 28–36
Research	Promote sustainable innovations	p. 20–23, p. 24, p. 33–36
Catering	Promote a daily offer of vegan and vegetarian menus at reasonable prices	p. 71–73
	Avoid food waste	p. 71–73
	Strive for a waste-free catering operation	p. 71–73
Waste management	Strive for waste-free everyday operations in all aspects	p. 69–70
	Create the basis for paperless studies	p. 68
Mobility and transport	Develop a concept for the reduction of emissions from air travel	p. 64–67
	Enable and promote climate-friendly travel to all locations of the university	p. 64–67
Resources	Cover the entire energy demand with electricity from renewable sources (electricity, heating, mobility, etc.)	p. 57–61
	Encourage the economical use of water and energy	p. 54–56, p. 57–61
	Strive for the greatest possible CO_2 neutrality	p. 60, p. 62–63
Environment	Create a near-natural living space on campus	p. 55
	Create various recreational and learning areas in natural surroundings	p. 55

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