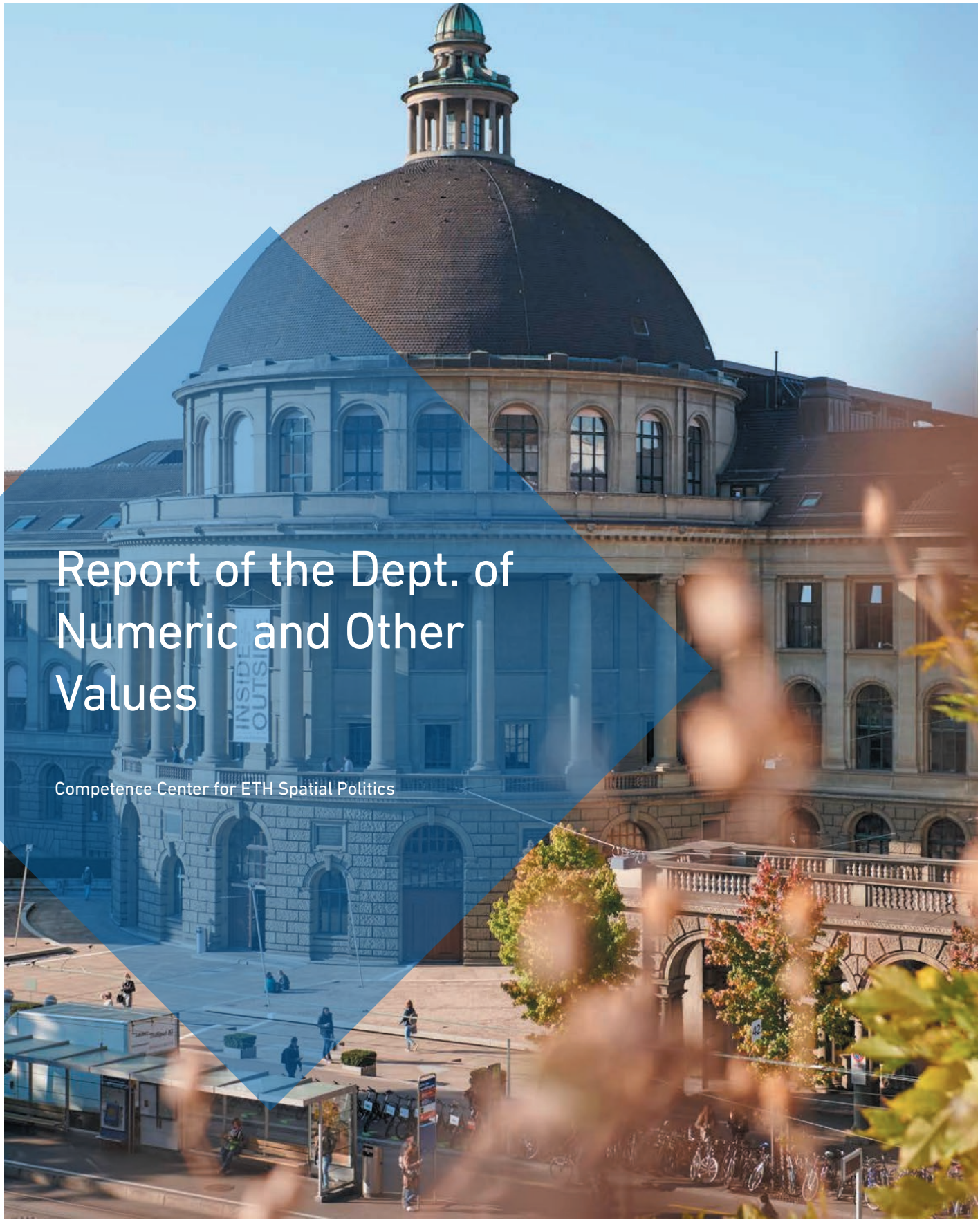
ETH zürich

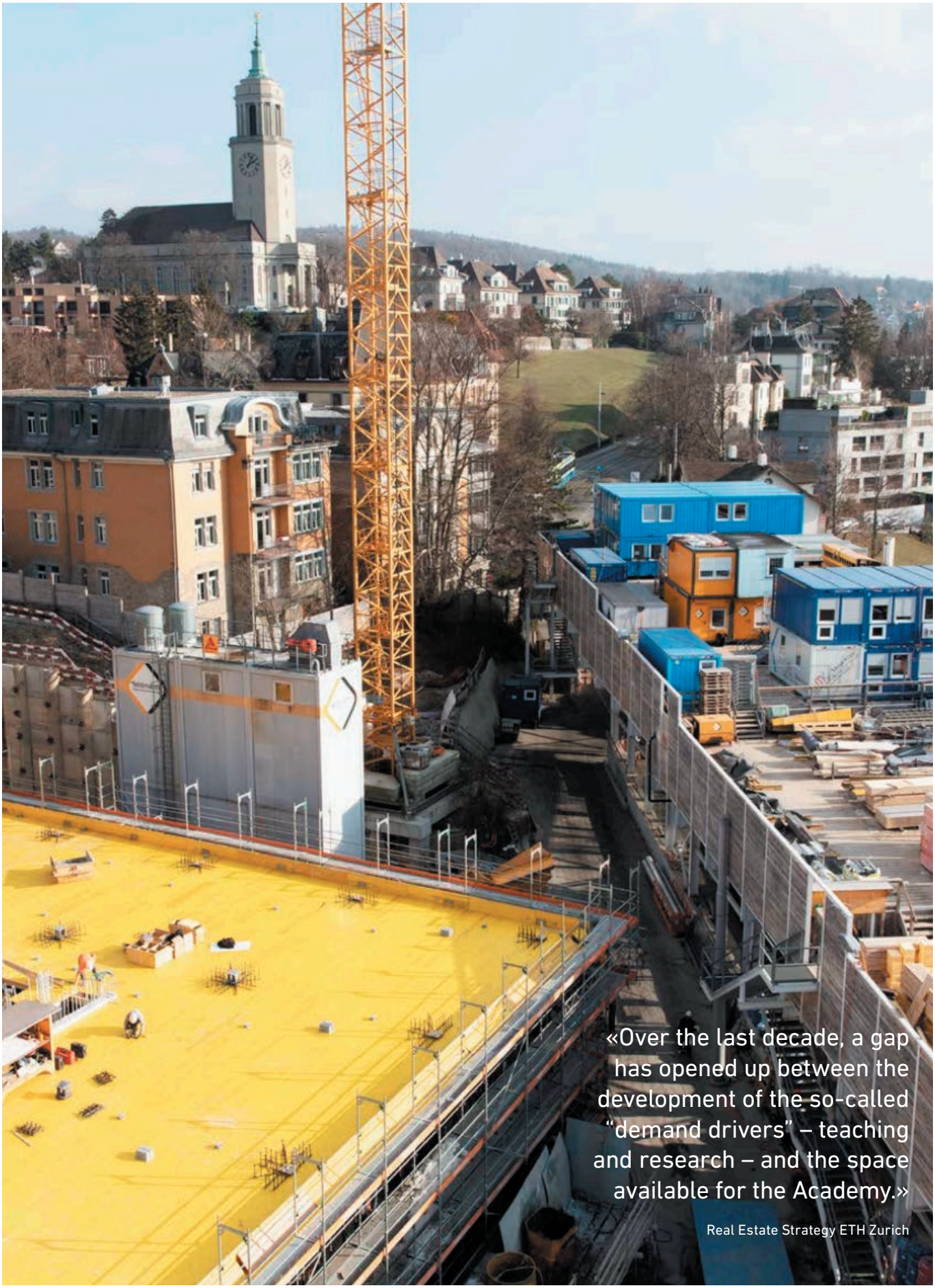
Competence Center for
ETH Spatial Politics



Report of the Dept. of Numeric and Other Values

Competence Center for ETH Spatial Politics

Competence Center for
ETH Zurich Spatial Politics


«Over the last decade, a gap has opened up between the development of the so-called “demand drivers” – teaching and research – and the space available for the Academy.»
Real Estate Strategy ETH Zurich

Introduction

The First Chapter will talk about ETH Zurichs current growth restriction, marking a unique development in its history. This stands in contrast to the institution's projected expansion in student enrollment and professorship positions in the near future.

We conduct a detailed analysis of the numerical trends at ETH Zurich and aim to highlight various correlations. These shifts represent ETH Zurich's endeavor to navigate within its established framework.

Both ETH Zurich and the Swiss Federal Council concur that ETH must increasingly depend on third-party funding. This financial shift inherently entails a transformation in ETH's financing and operational approach. In this chapter, we will also explain how this shift impacts ETH's other values.

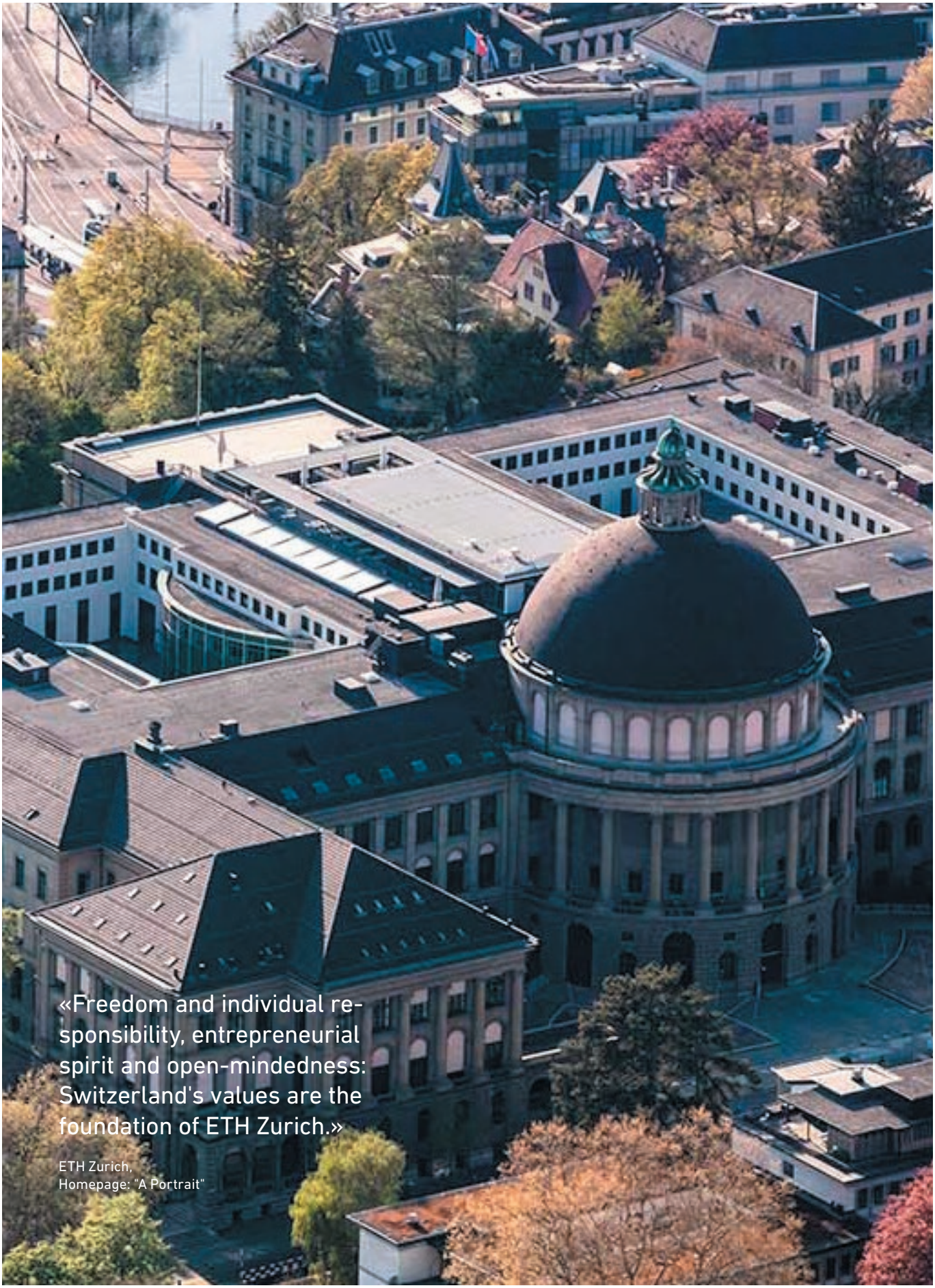
The Second Chapter discusses the prominent position of sustainability within the ETH Portfolio, as it aligns with the goal of mitigating our environmental footprint. This endeavor not only benefits our institution but also contributes to creating a safer and more pleasant environment for future generations.

Nevertheless, the pursuit of sustainability comes with its fair share of challenges, some more significant than others. Furthermore, these challenges are often intricately linked with the economic conditions of our surroundings, shaping our ability to make a positive impact.

The Third Chapter sheds some light on who makes up the decisive fabric of the ETH and how they are represented. Focus is especially laid upon the ratios of women in various departments of ETH as well as the ratio of international students and employees. These numbers build a base for various

Also focusing more on the case study of the HIC Building competition, the chain of command and flow of information within an internal competition is shown.

ETH’s link to the federal state and the council are shown and its transparency as an institution is explored.


«Freedom and individual responsibility, entrepreneurial spirit and open-mindedness: Switzerland's values are the foundation of ETH Zurich.»
ETH Zurich,
Homepage: "A Portrait"

Habit of Growth

ETH Zurich is experiencing a restriction on growth for the first time in its history. This does not correlate with the self-proclaimed growth in student bodies and professorships that it envisages in the coming years. In response, it initiates a shift to survive within this logic.

Switzerland and ETH Zurich - a story of growth

Growth on all levels

ETH Zurich, originally established in 1855 as the "Eidgenössisches Polytechnikum," has been intimately tied to the formation of modern Switzerland from its inception. This connection is underscored in ETH Zurich's self-description: "Freedom and personal responsibility, entrepreneurial spirit and openness to the world: Switzerland's values are the foundation of ETH Zurich.

The growth of ETH Zurich has mirrored that of the Swiss economy, thanks to funding from the federal government. By examining consolidated annual reports from corresponding years, this expansion can be tracked over recent decades. For instance, federal contributions to ETH were CHF 977 million in 2005, surging to CHF 1,331 million by 2022. This represents an average annual growth rate of approximately 2.74%. This growth can be compared to Switzerland's GDP growth, which averaged 3.46% annually during the same period.

Parallel to this economic expansion, total government expenditure at federal, cantonal, and municipal levels has also risen in recent decades, reaching approximately CHF 268 billion in 2021. Of this, education and research account for 16.0%. Consequently, ETH Zurich constitutes 0.49% of Switzerland's overall state expenditure.

Regarding the annual operating revenues for ETH in 2022, Swiss federal investments constitute the majority at 71%. The remaining 29% primarily stem from research contributions, mandates, and scientific services (CHF 372 million, 20%), donations and bequests (CHF 105 million, 5%), with tuition fees and other revenue sources collectively contributing a smaller portion (CHF 72 million, 9%) (see Fig. 1).

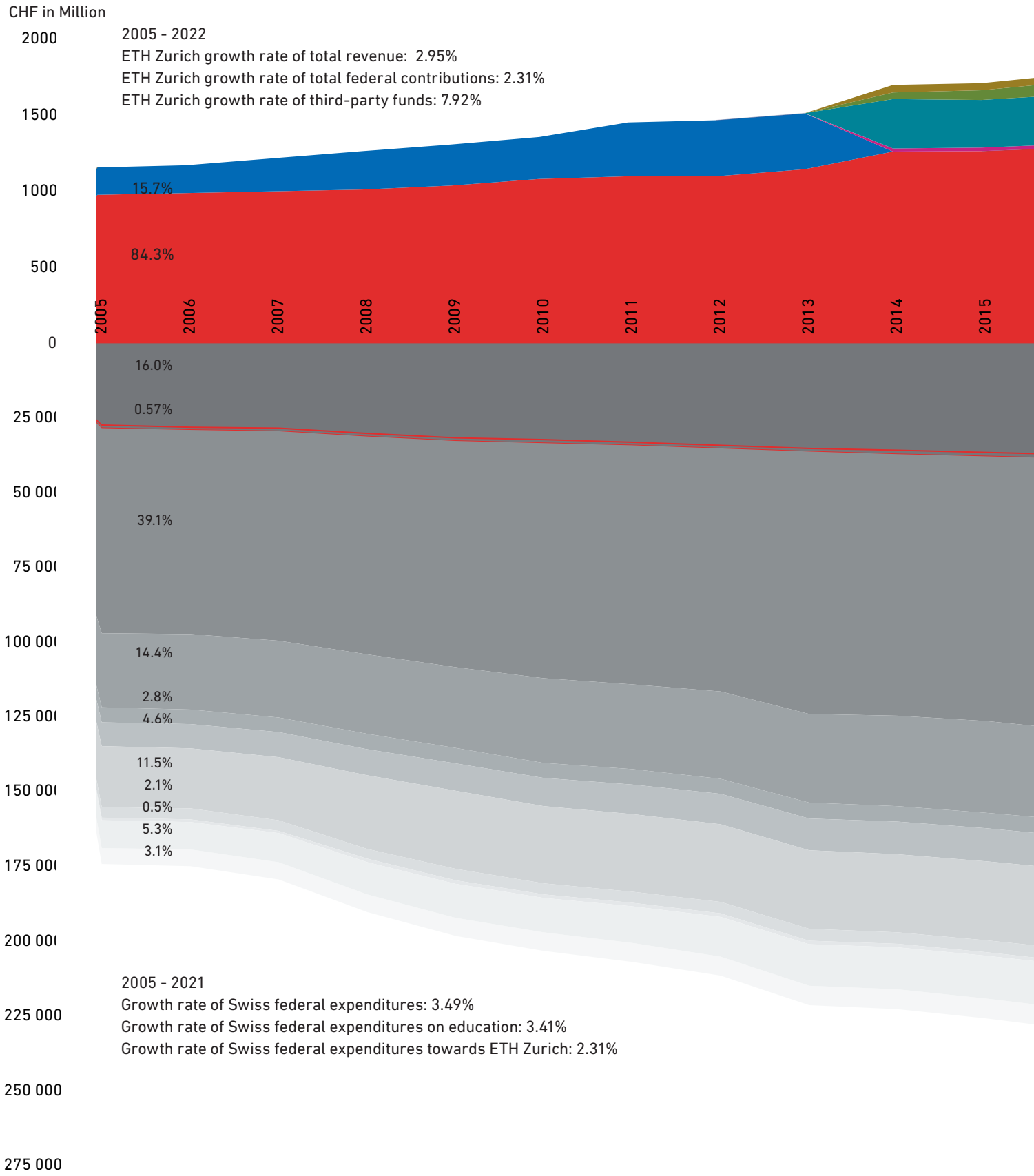
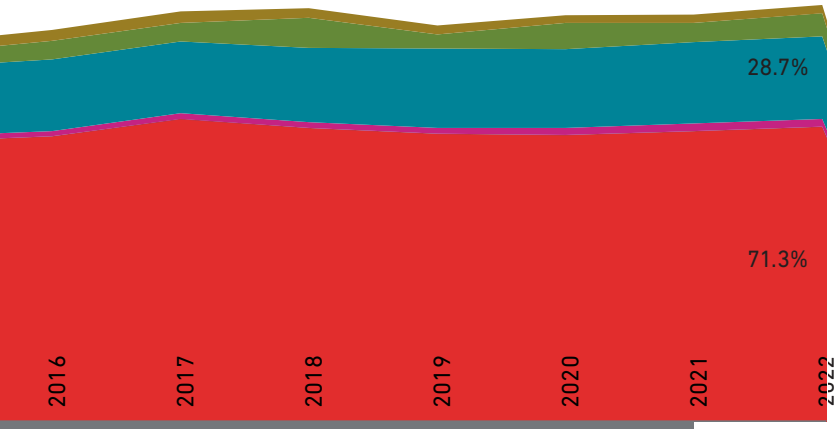


Figure 1
Below the timeline, the Swiss public expenditure trends over the past two decades are displayed. Among all functions, funding for education and the allocation to ETH have experienced a reduced growth rate.
Above the timeline, the graph illustrates ETH Zurich's total income during the same timeframe. The increase in ETH Zurich's income lagged behind that of education expenditure. Furthermore, the proportion of federal contributions diminished.



2% Other revenues
6% Donations and bequests
20% Research contributions, mandates and scientific services
2% Tuition fees, continuing education

Total federal contribution

ETH Zurich total revenue

16.0% Education

0.49% ETH Zurich contribution

39.2% Social protection

11.8% General public services

2.2% Defence

4.6% Public order and safety

13.4% Economic affairs

1.5% Environmental protection

0.6% Housing and community amenities

7.7% Health

3.0% Recreation, culture and religion

Total federal public expenditure by functions

Source
Swiss public expenditure by functions 1995-2021: Federal Statistical Office
ETH Zurich total revenues: Annual Reports 2006 - 2022

The deal: a concept of success

ETH Zurich is dedicated to excellence at all levels. This is described as follows: "We serve society by educating the next generations of critical and creative thinkers and doers. Through our research, we create knowledge and develop technologies to address the global challenges of our time. We convey a future-oriented and innovative image of Switzerland to the world and network our country with the global community. Together with our partners from science, business, politics and society, we rely on the power of teamwork and strive for excellence - in everything we do."

A 2018 study conducted by the ETH Domain in collaboration with the independent consulting firm BiGGAR Economics from the UK highlights that every franc invested in the ETH Domain generates five times the value in Switzerland and every job generates around five additional jobs. The authors attribute this success to the training of specialists, investments in research infrastructure, collaborations with SMEs and industry, as well as the establishment of spin-offs. The global gross value added is estimated to be even higher, with foreign companies being notably attracted to the environment. Notable examples in Zurich include Google and Disney. Presently, over 2,000 individuals are employed by Google in Zurich, and this figure is anticipated to rise to 5,000 in the future (see Fig. 2).

It is important to note that institutions within the ETH Domain also contribute significantly to job creation. A new spin-off emerges within the ETH Domain on a weekly basis. Furthermore, every seventh new highly innovative company in Switzerland is a spin-off from the ETH Domain, and over half of the venture capital in Switzerland is directed towards them.

The growth experienced in recent decades has led to a robust equity ratio within ETH Zurich. This has been primarily driven by profits derived from licenses of spin-offs originating within ETH Zurich.

According to a study published by the ETH Board, each franc invested in the ETH Domain generates more than five times its value in Switzerland, and each job creates another five jobs.

BiGGAR Study: "The Economic Contribution of the Institutions ofthe ETH Domain - A report to ETH Board.". November 2017

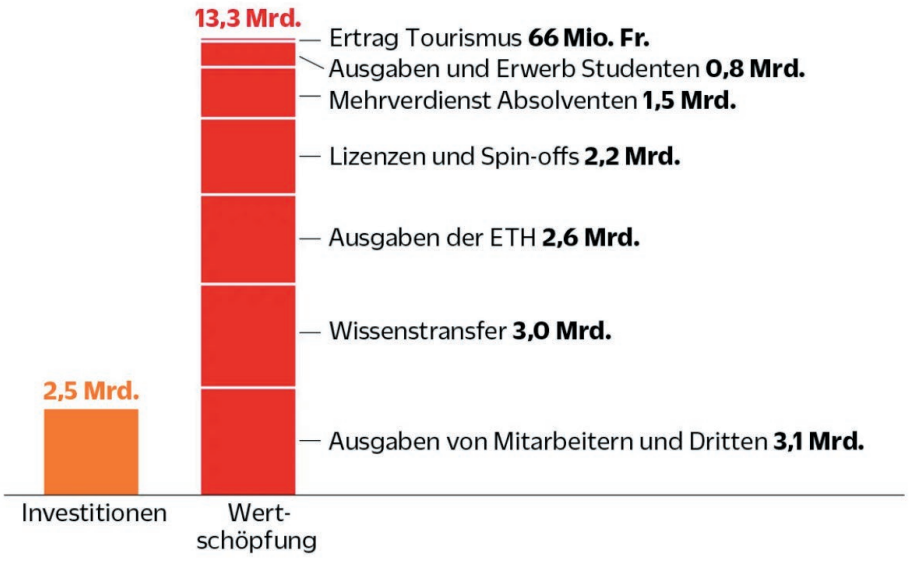


Figure 2
Investments by the federal government and value added by the ETH Domain
NZZ magazin. January 2018

Source
BiGGAR Study 2017

(The first) signs of change

Its not easy anymore

ETH Zurich has experienced continuous growth in recent decades. In 2007, the student population was approximately 13,200, and by 2022, it had risen to 25,000. Consequently, annual expenditure has also seen an uptick. Total expenditure was CHF 1002 million in 2007, increasing to CHF 1877 million in 2022. The apparatus of ETH Zurich expanded significantly.

However, a notable contrast emerges when comparing the total expenditure of ETH Zurich with the number of students in 2022. This yields costs of approximately CHF 75,000 per year, down from about CHF 92,000 per year in 2007. This represents an annual decrease of roughly 1.65%. This suggests an improvement in efficiency rather than an increase in costs.

The ETH Real Estate Department formulates a spatial and financial concept for real estate every four years. In this plan, a fundamentally restrained growth in the financial resources of ETH Zurich for the upcoming years is projected. This is attributed to lower tax revenues stemming from the Corona pandemic. Essentially, as debt accumulates, cuts are made in the education and research sectors, as these do not have allocated credits, unlike other sectors such as the military. Notably, during the Corona pandemic, while most functions experienced increased expenditure, spending on education remained consistent (see Fig. 1).

For the real estate department specifically, this will have drastic consequences for planned real estate investments. According to the strategy, various projects will be subject to closer reviews, and several major initiatives may be scaled back, postponed, or abandoned altogether.

In contrast, four major drivers for spatial development at ETH Zurich are identified. These include an increase in the number of professorships, evolving requirements for research infrastructures, including the necessity for close proximity to collaborative partners and technology platforms. Additionally, the surge in student numbers and a fresh role for ETH Zurich as a catalyst for "innovation and entrepreneurship" are highlighted, providing platforms for collaboration and informal networking between the university, business, and society.

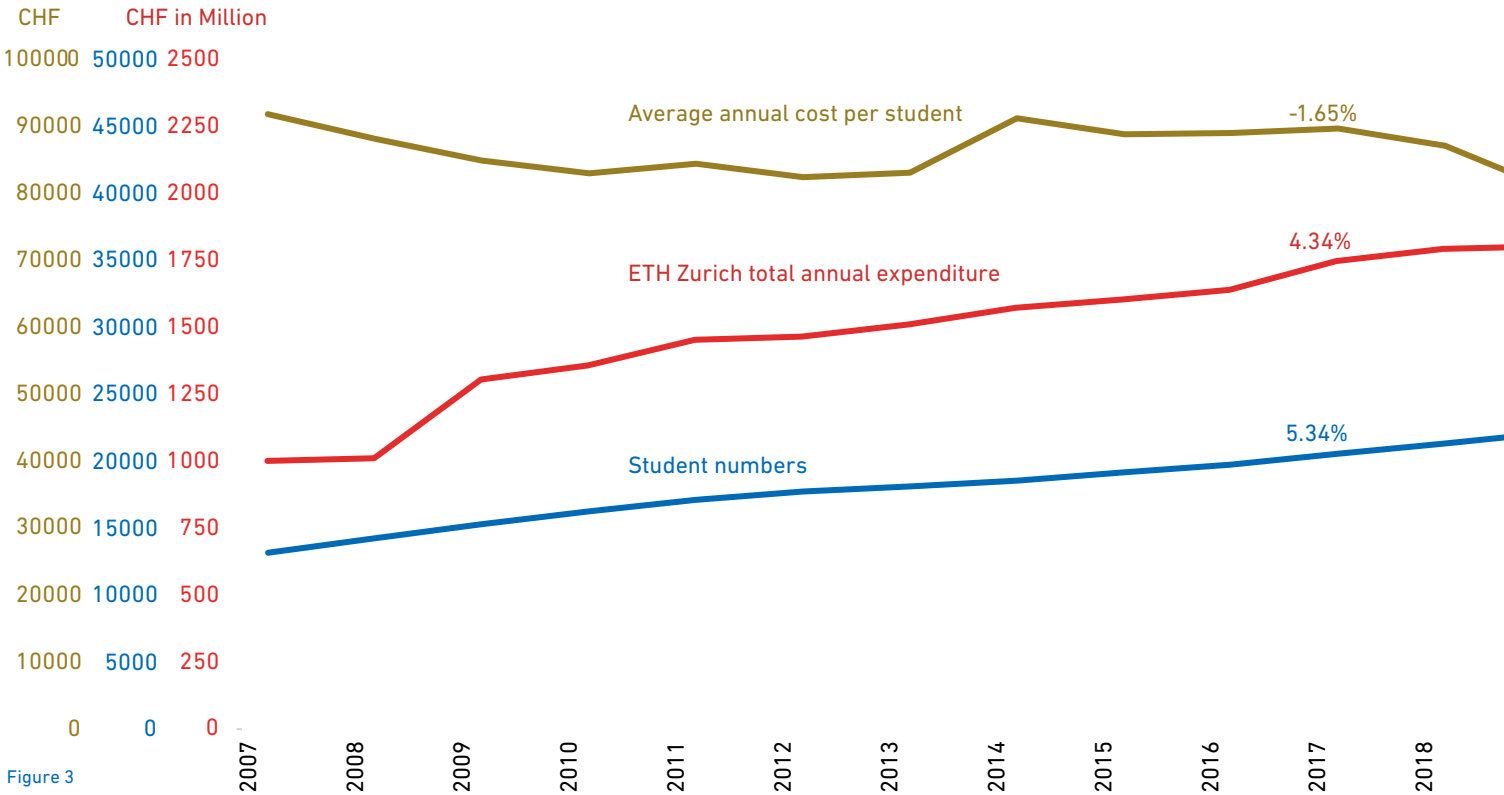
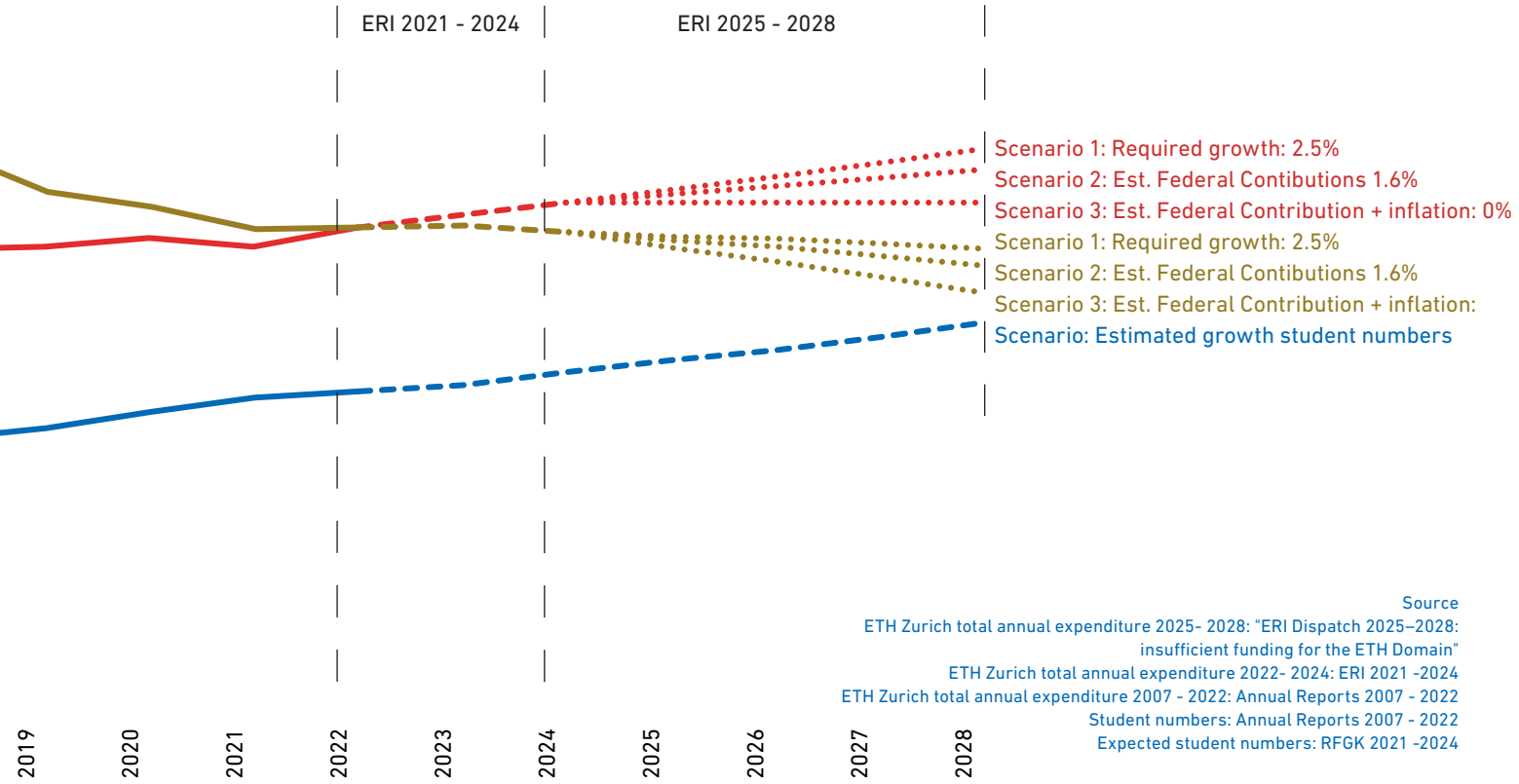


Figure 3

«ETH Zurich is assuming a negative economic and financial development. Tax revenues will be lower for years and the corona measures and effects will cause additional expenditure. This will lead to reduced growth in ETH Zurich's financial resources for the coming planning periods.»

RFGK 2021 - 2024

Projections Dept. of Numeric and Other Values



Source
ETH Zurich total annual expenditure 2025- 2028: "ERI Dispatch 2025–2028: insufficient funding for the ETH Domain"
ETH Zurich total annual expenditure 2022- 2024: ERI 2021 -2024
ETH Zurich total annual expenditure 2007 - 2022: Annual Reports 2007 - 2022
Student numbers: Annual Reports 2007 - 2022
Expected student numbers: RFGK 2021 -2024

«ETH and UBS launch partnership to promote innovation and entrepreneurship»

Press release, 25.08.2022

A successful trade involves the transfer of goods or services from one party to another, in exchange for money. Therefore, whenever money leaves one hand for another, we need to ask ourselves, what goods or services are they expecting in return?

A Shift in Decision Making

The Swiss Federal Council has implemented a yearly funding cap of CHF 180 million for value-adding and value-enhancing building projects at ETH Zurich. This decision has prompted ETH Zurich to reevaluate its real estate strategy and imposing constraints on its overall growth trajectory. Notably, this is transpiring amid expectations of growth in the number of students and professors. Consequently, an asymmetry arises between the available and needed space.

Furthermore, both ETH Zurich and the Swiss Federal Council agree that the ETH must increasingly rely on third party fundings to realise its ambitious objectives. How does this influence the decision-making process of ETH Zurich and what other implications does this have?

We argue that this manifests itself through three shifts and three identities.

Sabine Keller-Busse, President UBS Switzerland, and Joël Mesot, President ETH, sign the contracts for the strategic partnership

With the following three shifts and three identities, the Department of Numeric and Other Values defines the occuring changes in decision making and operating methodology due to federal budget cuts amid times of growth.

They are derived, on the one hand, from the observation and analysis of ETH Zurich's operating model, and from projecting the research data onto various scenarios.

The three by three shifts are not listed in any particular order; nor do they reflect a specific prioritisation. The three shifts are based on the imminent changes occuring in financing, operating and decision making. The three corresponding identities are direct consequences of the three shifts and represent a translation of the economic changes affecting ETH Zurich's identity.

First shift

ETH Zurich is shifting from a value preserving to a value enhancing methodology.

	Fields of action
Z/N value	The biggest driver is the ambitious goal of achieving a Z/N value of 0.8 and above for the entire ETH Zurich portfolio. This value is set by the federal government and collected by the STRATUS program.
Selling off low value property	Low-valued properties are thus sold and new buildings like the HIC building are constructed. Since many apartments and several properties at the other locations (outside the Campus Zentrum and Hönggerberg) have a condition value below the average value, their sale is specifically defined as a measure in the spatial and financial strategy of 2021-2024.
Higher operating and rental costs	To accommodate the growing university, extensions and renovations will not be sufficient for the required space. ETH Zurich will therefore switch to building new and use the available space more efficient. This will lead to an increase of operating and rental costs. The goal of a good average Z/N value and the new space requirements lead to a shift in investments.

Annual financial needs ETH Immobilien
CHF in millions

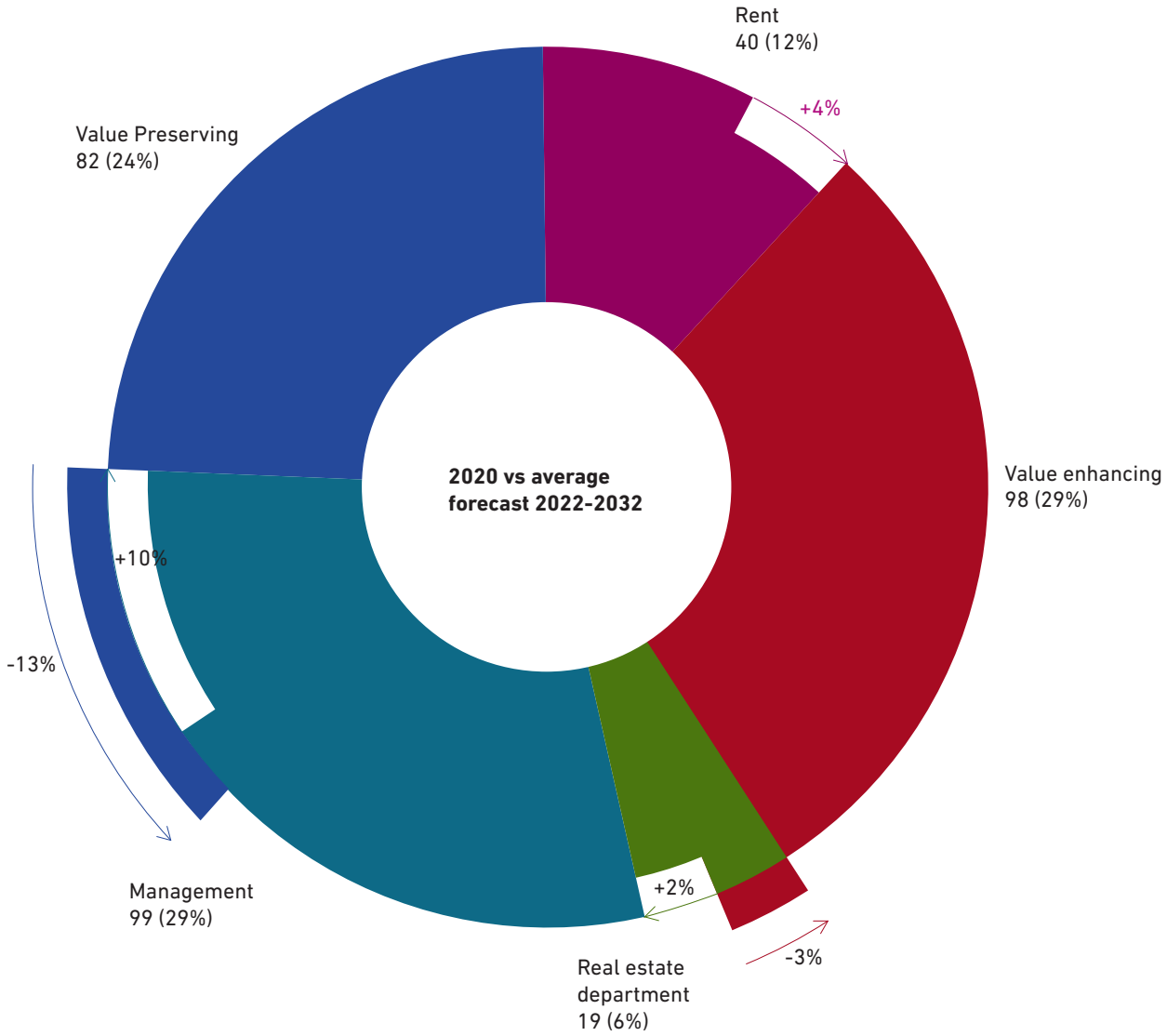
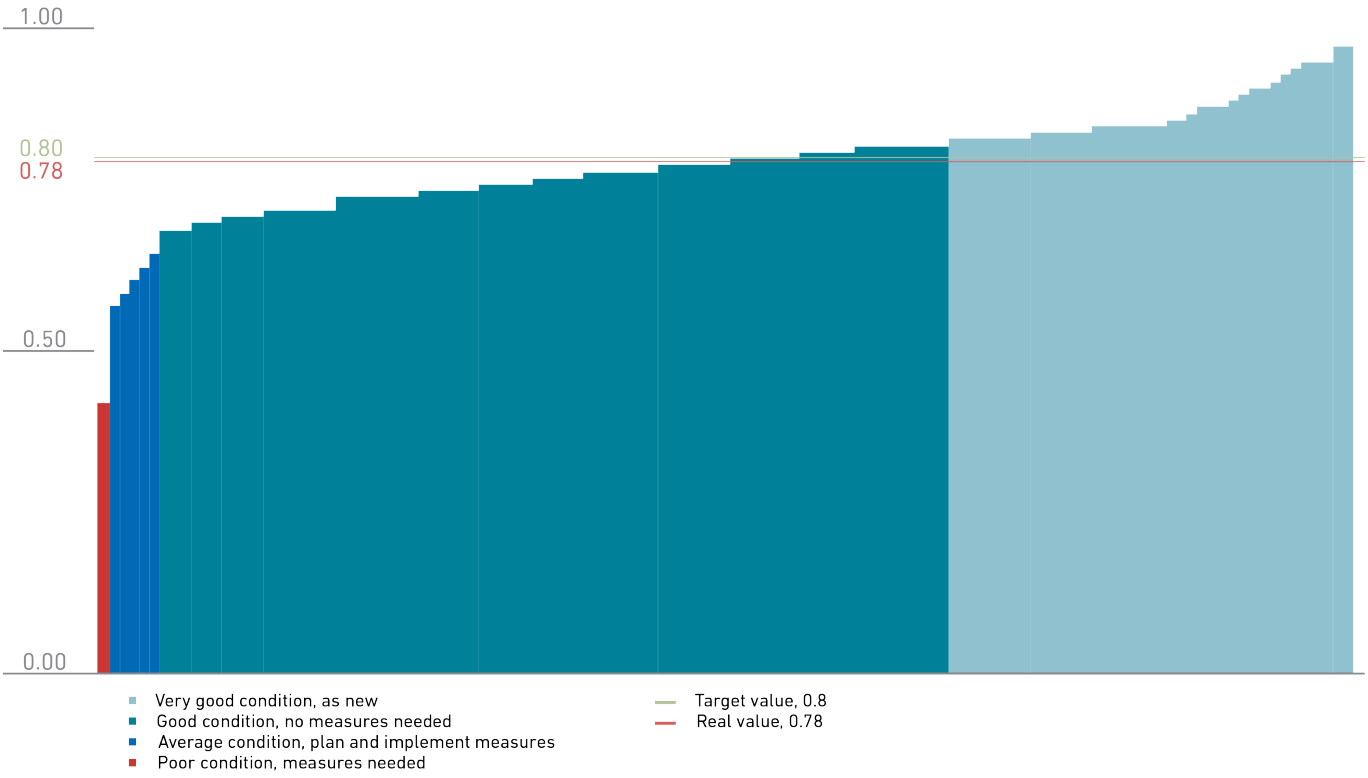


Figure 4
Annual financial needs ETH Immobilien
Source:
Dept. of Numeric and Other Values
ETH Annual Financial Report 2022

Condition value



The ageing process between 1 and 0 is not linear for all components. A typical component initially loses value rapidly. In the following years, it ages only very slowly. However, the ageing process accelerates with increasing age.

ETH Immobilien has been given the target Z/N value of 0.8 by the Swiss federal government. The real value of 0.78 does not include the most recent changes and may therefore be misleading.

Figure 5
Condition value of ETH buildings
Source:
Dept. of Numeric and Other Values

Second shift

To offset the funding shortfall, ETH Zurich is obtaining capital for its targeted growth from third-party investors.

	Fields of action
Third-party investors	In order to compensate for the lack of funds, ETH Zurich is trying to obtain the missing capital for the targeted growth through third-party investors. The seventh chapter of the Federal Council's Strategic Goals for the ETH Domain for the years 2021-2024 states that the share of third-party funding within the ETH Domain will be increased, taking care that its basic mission and its sustainable development are not jeopardised by indirect costs that are not covered. Furthermore, in the case of third-party funded projects, donations must respect the freedom of teaching and research.
HIC competition	According to published figures, the costs of the HIC building total CHF 70 million. Of this, the Swiss Confederation will pay around CHF 30 million. For the remaining 40 million CHF, ETH Zurich is dependent on third-party investors. A milestone is a donation of 20 million CHF from UBS AG acquired by the Immobilien ETHZ Foundation AG. According to the press release, it is part of a new partnership between the organisations to promote innovation and entrepreneurship. The remaining CHF 5 million will be provided by private donations. To make the start of construction possible, ETHZF AG is trying to raise the remaining 15 million CHF in a large-scale crowdfunding campaign.

«The light pergola structure provides good shade with mobile canvas and climbing plants and promises a diverse garden atmosphere and high utility value for informal encounters and participatory urban gardening.»

Top: The new HPQ physics building will be built on the Höngger-berg campus from 2022 to 2029.

Bottom: Visualisation of the Hönggerberg Mas-terplan 2040.

Third shift

ETH Zurich is shifting towards large-scale projects.

	Fields of action
Efficiency and densification	A transition towards large-scale projects is evident, which imposes greater demands on building performance and entails a high concentration of diverse functions within efficiently designed compact spaces. This trend is also noticeable in the HIC building.
Ecology of renovations and expansions	In recent years, numerous large-scale construction projects have led to record investments. Under the new circumstances, the ETH Immobilien has been granted an annual budget of CHF 180 - 200 million. Furthermore, the renovation and expansion of the MM building, along with the project on the Polyterrasse, have been suspended. To attain growth goals despite this situation and to execute the planned expansion of the building portfolio, the Executive Board has sanctioned a one-time supplementary real estate budget of CHF 25 million, in addition to an extra funding of CHF 8.5 million. Moreover, all departments have committed to an initial solidarity contribution amounting to CHF 15 million for the current year.

Identity of Excellence

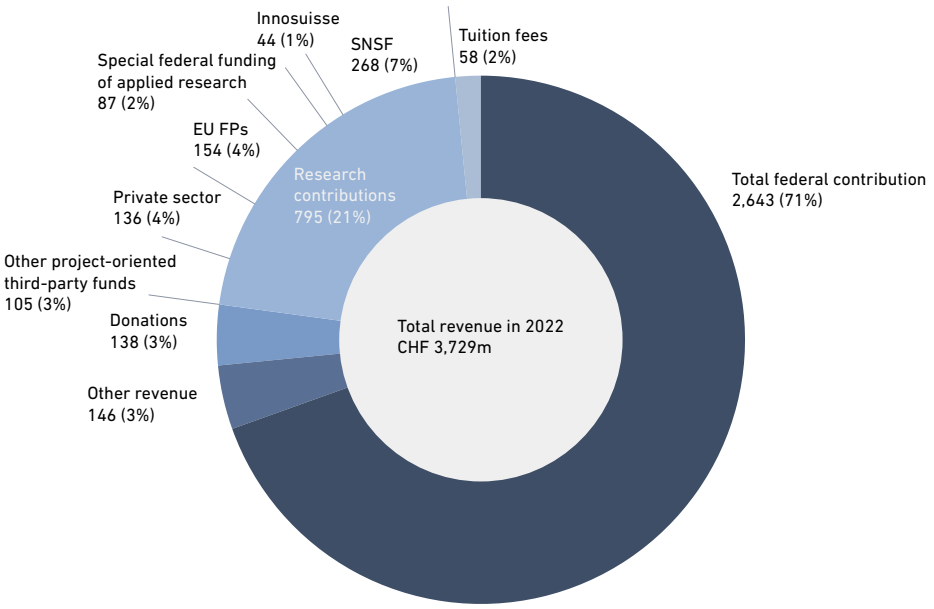
ETH Zurich provides excellent working infrastructure to attract the best qualified staff and highly motivated talented students.

	Fields of action
Kaderschmiede	One of the key tasks of the ETH is to not only attract high qualified staff but to train a future high qualified workforce. In 2022, 5765 students graduated from the ETH (Bachelor: 1934, Master: 2546, Doctorat: 1005, Other: 280). 97% of Master's and PhD graduates are employed a year after graduation and more than half are working in the private sector. Furthermore, most graduates stay and work in Switzerland. The ETH can be described as a company that is producing high qualified workers on the conveyor belt. Former president of ETH Zurich, Prof. Ralph Eichler, referred to the ETH to as a 'Kaderschmiede'.
Networking with industry	One of the key purposes of the HIC building was to give student organisations and associations a space. Not only to interact among students but also to network with industry. As most students will follow their studies with a commercial career, it is also in their interest to be in contact with the commercial world early on. ETH providing these spaces may be an incentive for students or parents considering a university to study.

«Together with our partners from science, business, politics and society, we rely on the power of teamwork and strive for excellence - in everything we do.»

ETH Zurich Homepage: "A Portrait"

ETH Zurich



Massachusetts Institute of Technology (MIT)

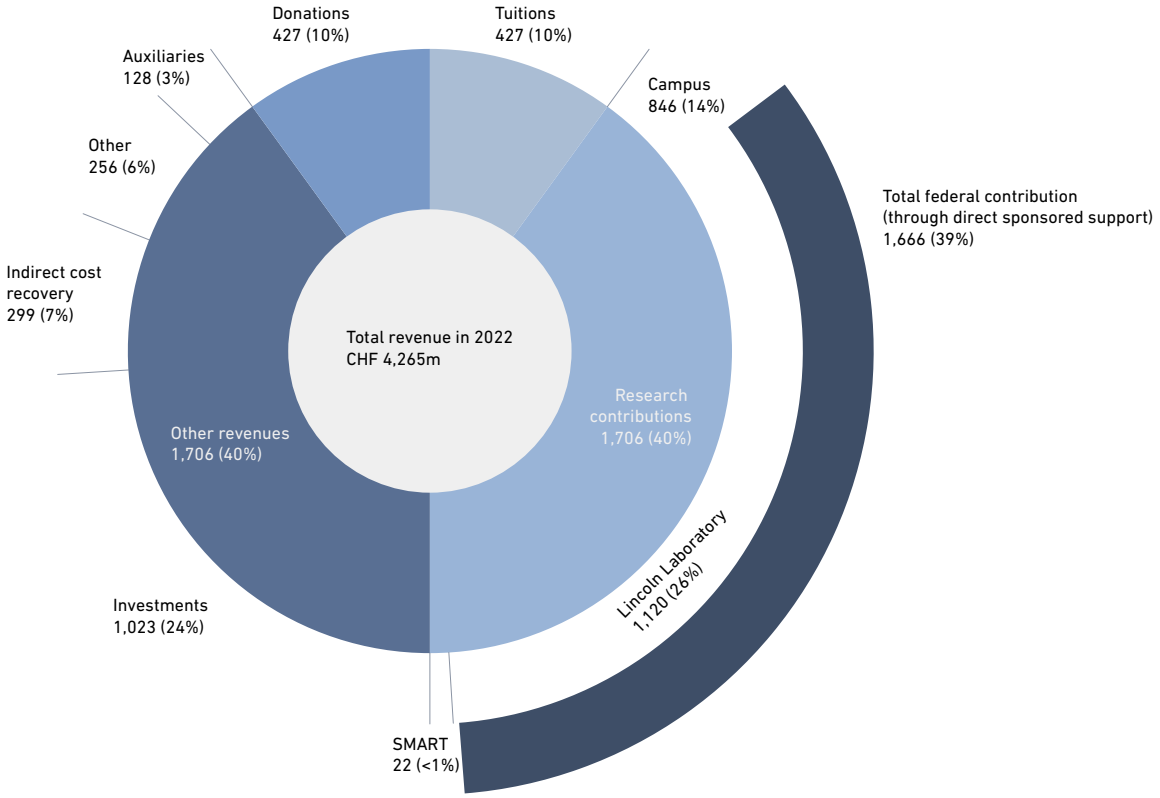


Figure 6

Annual total revenue comparison of ETH Zurich and MIT

Source:

Dept. of Numeric and Other Values

ETH Annual Financial Report 2022

MIT Report of the Treasurer 2022

Identity of Commerce

Real estate management helps to develop and consolidate common sites, clusters and platforms, interdepartment and interdisciplinary exchange and exchange with public and industry.

	Fields of action
ETH Spin-offs	Many large industries have settled in Switzerland and many Swiss companies have established themselves as international acting firms. Many commercial parties have therefore an interest in a steadily available, high qualified workforce. Furthermore are they (commercially) interested in the research and innovation happening at ETH. Between 1973 - 2018, 429 ETH Zurich spin-offs generated an equity value of CHF 4.8 billion.
Becoming a company	While ETH Zurich receives nearly 75% of its funding from the federal government, its American counterpart is funded to a lesser extent by the state, with just under 40%. However, MIT stands out as a financial powerhouse, generating 24% of its annual revenue from investments and an additional 7% through indirect cost recovery and 3% through Auxiliaries. Tuition also plays a bigger role at MIT, contributing 10% of it's revenue, where tuition is a mere 2% at ETH Zurich. If the federal contribution to ETH Zurich remains unchanged or decreases even further, and the university aims to sustain its growth, it will need to rely on research contributions and donations, much like MIT already does. With an increase in private funding, ETH Zurich's interests are likely to become more commercial and closely aligned with the private sector. Consequently, embracing entrepreneurship and blurring the lines between education, research, and industry.

Identity of Representation

ETH Zurich is committed to the careful use of natural resources and to reducing environmental pollution.

	Fields of action
Values of representation	While it can be argued that the core values of ETH have remained consistent since its inception, various socio-political factors have significantly influenced the third other values - the values of representation. For example, the establishment of ETH is directly linked to the birth of the Swiss federal state in the 19th century. The newly formed democratic nation-states sought ways to express their identity and values, one of which was the creation of universities. When Semper constructed the ETH Hauptgebäude, the principles of democracy were reflected in its architectural design. Although these values are often associated with Swiss culture, they are, in fact, commonly adopted by other Western nations. This trend is evident in all the university's buildings and decisions.
Swiss-made internationalism	The construction of Campus Hönggerberg took place after the student revolts in the 1960s, a period when many countries were also establishing new university campuses on the outskirts of cities. Even architectural elements, such as the HPH building, constructed during the space age, incorporated this international design language. Additionally, the high-tech architectural style of the 1970s, exemplified by structures like the Norman Foster-designed IBM offices and Grossraumbüros, greatly influenced the design of the HIL building at Hönggerberg. As ETH strives to maintain its position as a leading and globally recognized university, it actively incorporates contemporary architectural movements and design languages.

	Fields of action
Sustainability as identity	The contemporary concern for the environment has resulted in the term sustainability being appropriated for all kinds of things and all types of green washing. Being green or being sustainable is not clearly defined and can therefore be used fluidly. As a leading industry responsible for CO2 emissions and pollution, the building sector, including the architectural practice, are undoubtedly facing an existential crisis. Balancing the need to reduce emissions with accommodating an ever-growing population's demand for more and bigger individualised spaces presents an especially challenging task. Furthermore, the use of materials that are most durable and cost-effective result in higher emissions compared to more sustainable alternatives. Architects, and even more so clients, strive to build new buildings that 'look sustainable'. The first instinct is not to be more conscious of the environment, e.g. asking oneself if a new building is really necessary or a more environment responsible solution, e.g. re-use, is adequate, it is about representing a 'green' architecture and being perceived as 'green' from the outside. This can clearly be seen in the language used in the HIC competition paper, but also by looking at the winning project. ETHs environmental concern is not only through doing research but also through the appearance of its buildings and making 'sustainability' a visible value.

Limits to Growth

Habit of Growth

The Swiss federal council's recent adjustments to the federal budget have brought about a notable change for ETH Zurich: a decrease in federal funding, a first in its extensive history of receiving large governmental support. In response, ETH Zurich's President, Joël Mesot, emphasised in a media release that this reduction doesn't mandate immediate budget cuts or organisational downsizing. Rather, it calls for a comprehensive reevaluation of priorities and a purposeful moderation of growth momentum. Despite Mesot's assertions, a closer examination of ETH Zurich's real estate development plans suggests an unprecedented projected increase in square metres. This seemingly contradicts Mesot's stance, indicating that the institution may not be inclined to curb its growth in the near future. Furthermore, ETH Zurich is presently channelling substantial resources into new investments and depleting its own reserves at record levels.

«I am confident these savings will actually make ETH more competitive. Let's make this a wake-up call to become more efficient and to focus on our core business: teaching, research and knowledge transfer should emerge from this process even stronger»

ETH Zurich President Joël Mesot

Media Release ETH Zurich: "Savings through focusing on our core business". 12.05.2023

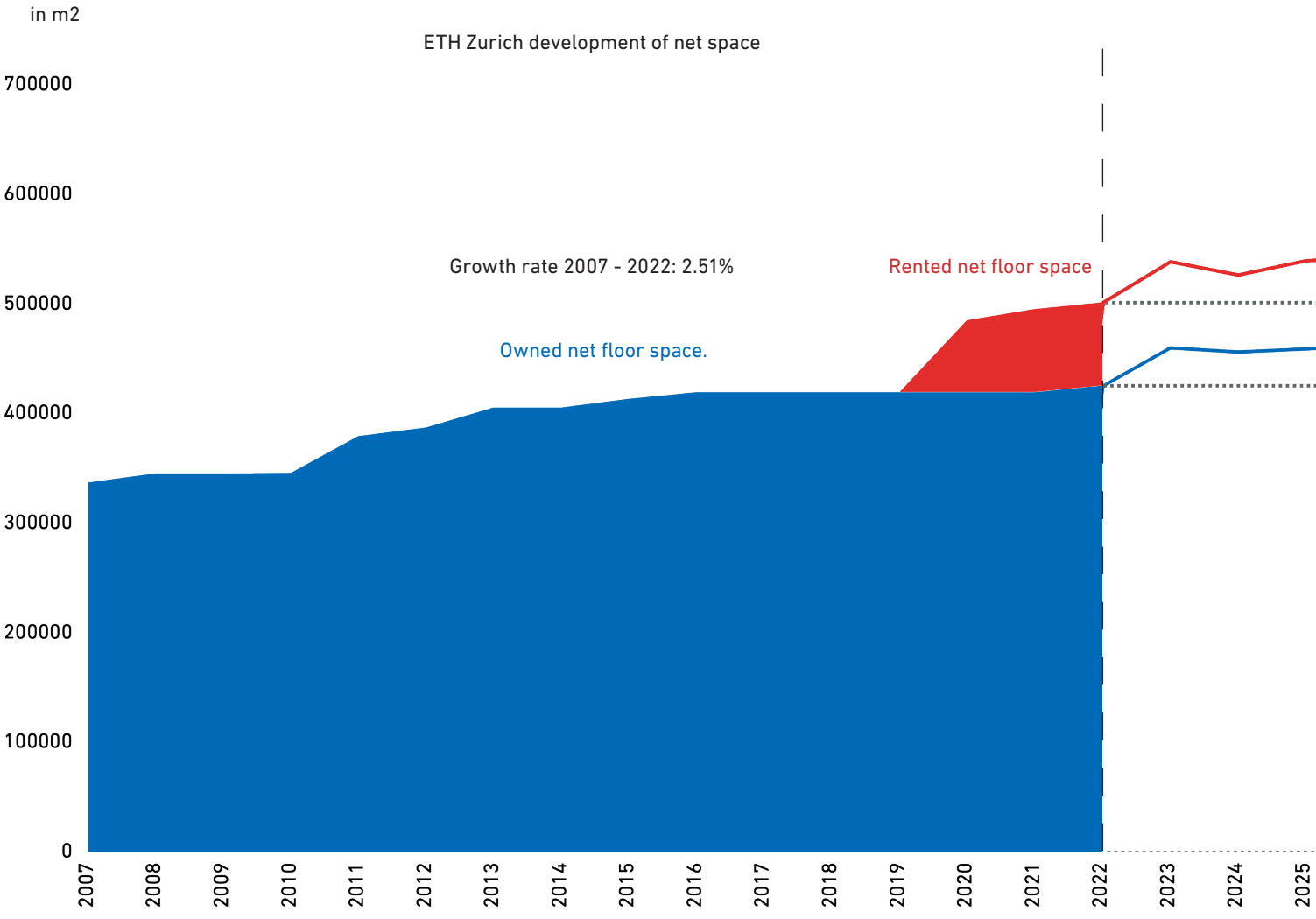
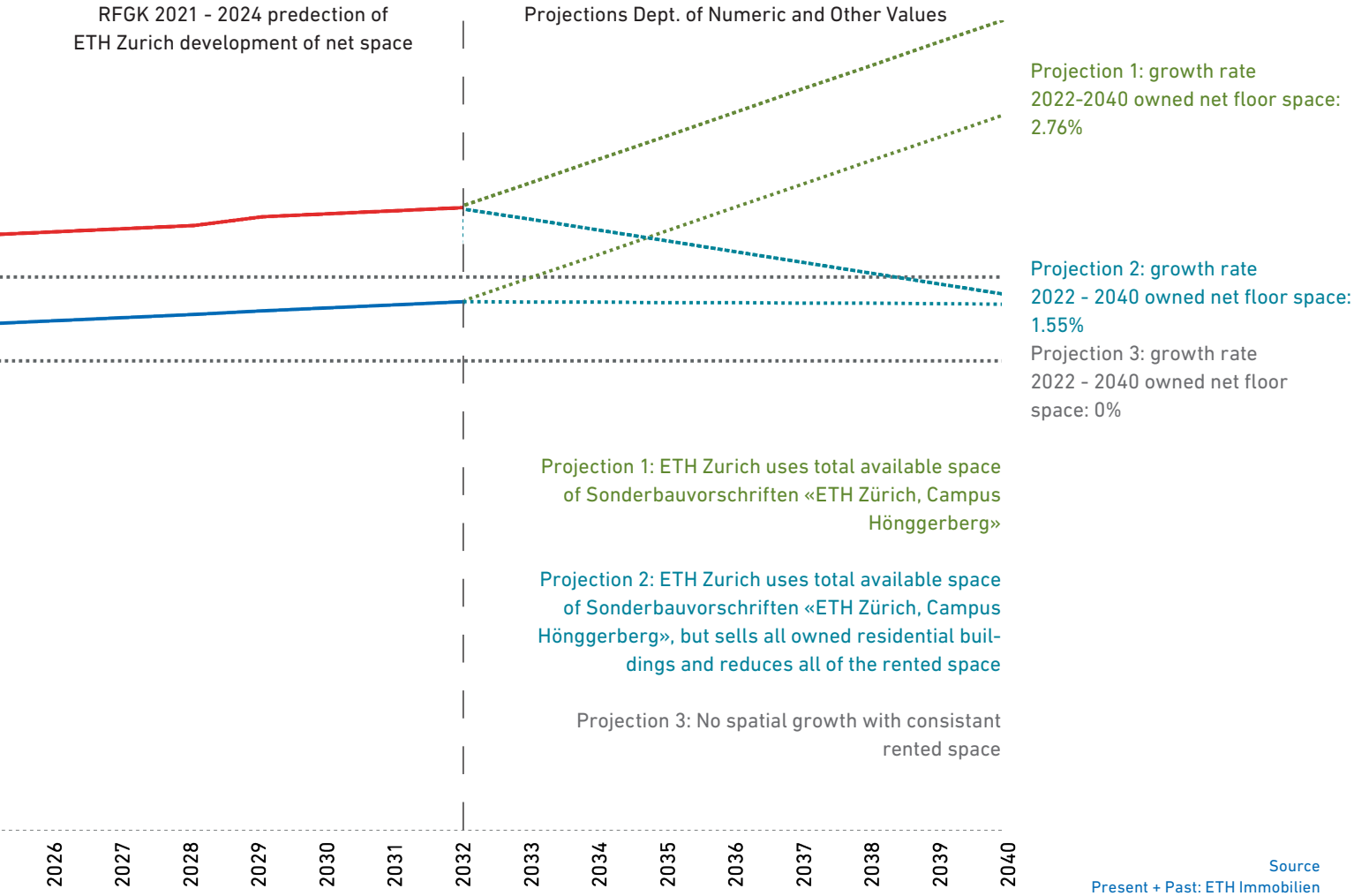


Figure 7
Development of ETH Zurich Real Estate Portfolio

Limits to Growth

In Figure 7, we illustrate the progression of net floor space from 2007 to 2022, exhibiting a growth rate of 2.51%. Subsequently, we present the projected net growth figures for space consumption from 2022 to 2032 as per ETH Zurich's forecasts outlined in the RFGK 2021-2024. Looking ahead to the timeframe spanning 2032 to 2040, we generated projections for three scenarios. In the first scenario, we maximize the use of space designated for "ETH Zurich, Hönggerberg Campus" under the "Sonderbauvorschriften" of the City of Zurich, integrating it seamlessly into the existing net area. The rented space is maintained at the 2032 level, resulting in an augmented growth rate of 2.76%. In this context, ETH Zurich expands its net space portfolio, diverging from the anticipated budget cuts by the Swiss federal government. The second projection adheres to the same scenario, but introduces the sale of ETH Zurich's entire residential building stock in the Zentrum Campus and all rented spaces. This strategic shift reduces the growth rate to 1.55%.

The projections outlined in the first two projections are rooted in a growth-oriented paradigm that ETH Zurich has adhered to in recent decades. They presume that forthcoming challenges can be addressed through an expansion of usable floor space. In challenging this approach, the Department of Numeric and Other Values introduces a scenario in the third projection where ETH Zurich is constrained to its presently available space. This prompts an inquiry into the untapped potential within the existing space. ETH Zurich envisions constraining itself to its core functions of teaching, research, and knowledge transfer in the future, viewing these as instruments for fostering excellence and prosperity. This shift prompts contemplation on the potential outcome if ETH Zurich prioritizes social prosperity and places inclusivity above an exclusive emphasis on economic gains. Such a focus encompasses initiatives aimed at promoting social cohesion, diversity, and inclusive learning environments. Additionally, we want to explore the role that architecture can play in addressing these multifaceted issues.



Source
Present + Past: ETH Immobilien
Predicted spatial development: RFGK 2021 - 2024
Sonderbauvorschriften « ETH Zürich, Campus Hönggerberg»

Increasing the Sustainability

Part 1 – Operation

ETH Zurich aims to establish a uniform and standardized dataset for monitoring and reporting purposes. To achieve this, the institution aligns its classification of emission types with the Greenhouse Gas Protocol.

Classification of Emission through 3 Scopes:

Scope 1

It involves **Gas usage** at **Campus Hönggerberg**, as well as **Oil** and **Coolants** and **Internal transportation** with the institution's **Vehicles**.

Scope 2

It involves **Electric power** and **District heating** that ETH Zurich **purchases** from **EWZ** and **ERZ**.

Scope 3

It is associated with **12 groups** of goods: **Supply Media**, Information Media, Other good and services, Work-related expenses and personnel requirements, **Building operation and maintenance**, ICT Hardware and Software, Scientific apparatus, Laboratory equipment, **Real estate and infrastructure**, **Business Travel**, Catering, Commuting.

Measures already implemented to reduce emissions:

Measures to control scope 1

- Photovoltaic Installations
- eLink fully electrified since 2021
- Realization of the Anergy Grid at the Hönggerberg Campus
- Heating/Cooling lake water pipeline for Super computer in Lugano

Measures to control scope 2

Target Agreement with the Energy Agency for industry **(EnAW)**

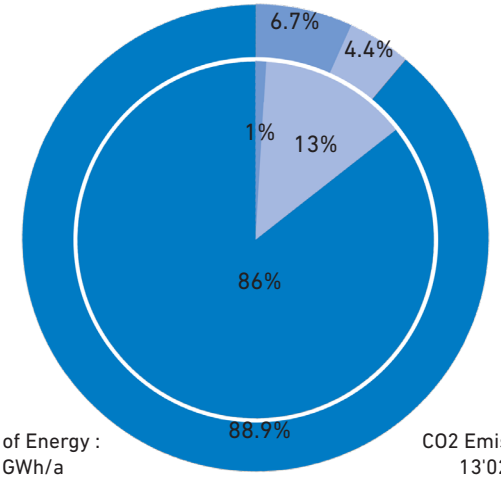
Measures to control scope 3

Change of Behaviour regarding: **Sustainable procurement**, **life-cycles for equipment use** (e.g., for scientific apparatus), **sharing and virtualization**, **construction**, **waste disposal**, **recycling** and **Business Travel**

Source(s)
"ETH Zurich strives for Net Zero by 2030", Zurich, 2022.

Estimated Energy Consumption & CO2 Emissions for Scope 1:

2006:

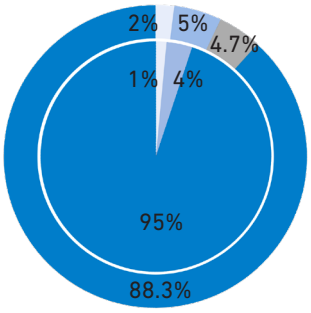


Quantity of Energy : 62.3 GWh/a

CO2 Emissions: 13'025t

Natural Gas/Bio Gas:	53.3 GWh/a	Natural Gas/Bio Gas:	11'578t
Woodchip:	0.6 GWh/a	Woodchip:	871t
Oil (Incl. vehicles)	8.5 GWh/a	Oil (Incl. vehicles):	576t

2022:



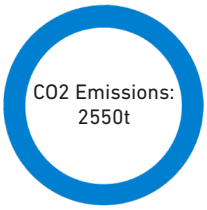
Quantity of Energy : 41.8 GWh/a

CO2 Emissions: 6'935t

Natural Gas/Bio Gas:	39.7 GWh/a	Natural Gas/Bio Gas:	6126t
Fuels (vehicles):	0.6 GWh/a	Fuels (vehicles):	140t
Oil:	1.5 GWh/a	Oil:	344t
		Others:	325t

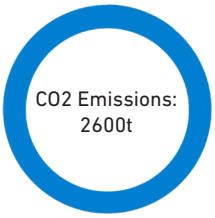
Estimated emissions from Electric Power and District Heating purchased for Scope 2:

2006:



Emissions due to purchase of Electricity

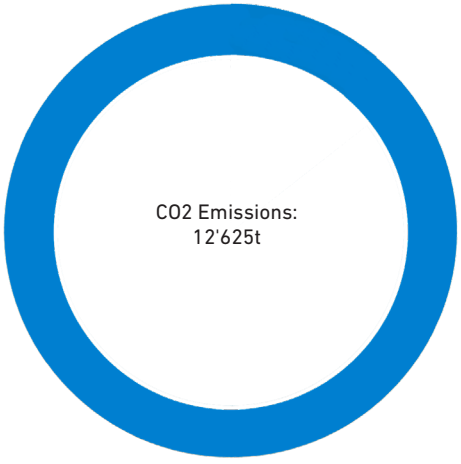
2022:



Emissions due to purchase of Electricity

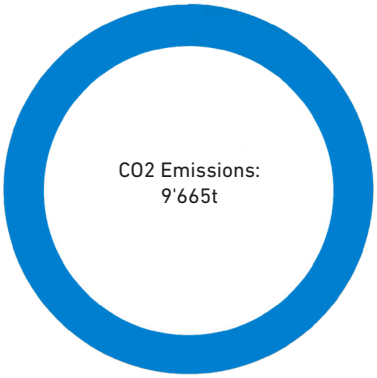
Estimated emissions for Business Travel in Scope 3:

2006:



Emissions due to Business Travel

2022:



Emissions due to Business Travel

Source(s)
Charts drawn by Dept. of Numeric and Other Values.
"ETH Zurich strives for Net Zero by 2030", Zurich, 2022.

Figure 8: Emissions for Business Travels [2016 – 2022]:

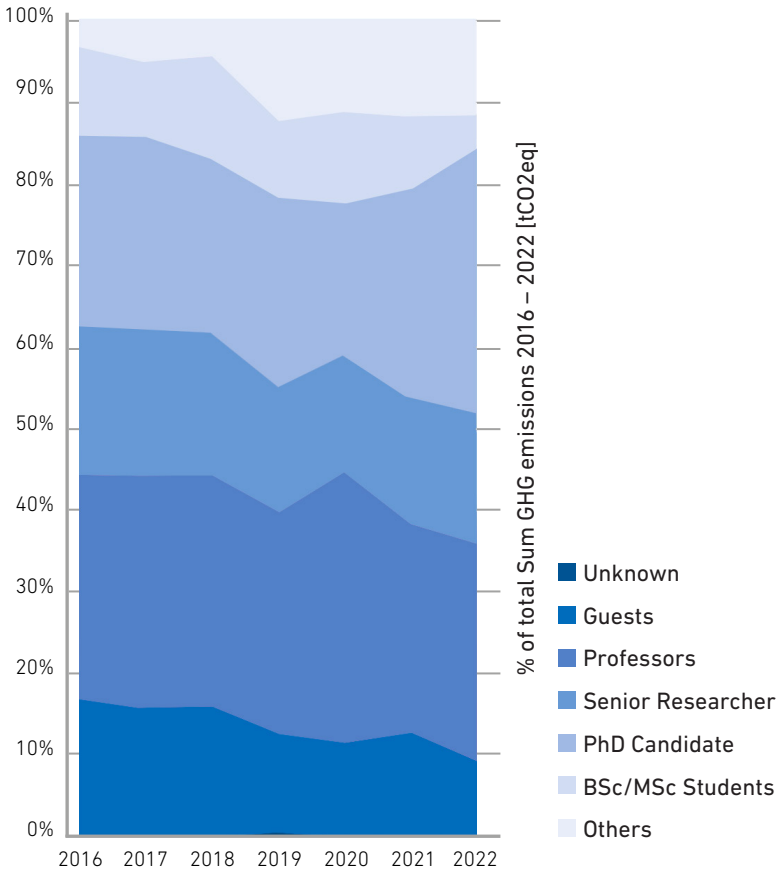


Figure 9: Global Number of Students [BSc, MSc, Dok]:

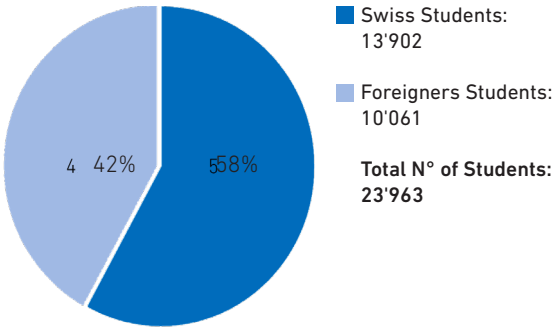


Fig.10: Global Number of Professorship [CH, EU, Others]:

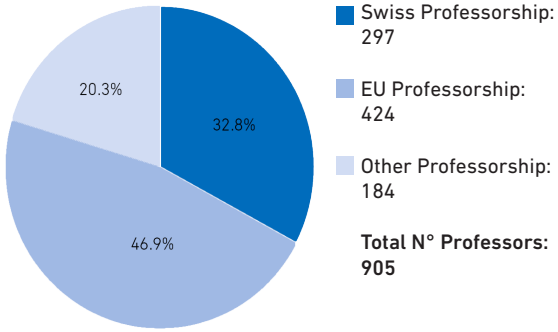
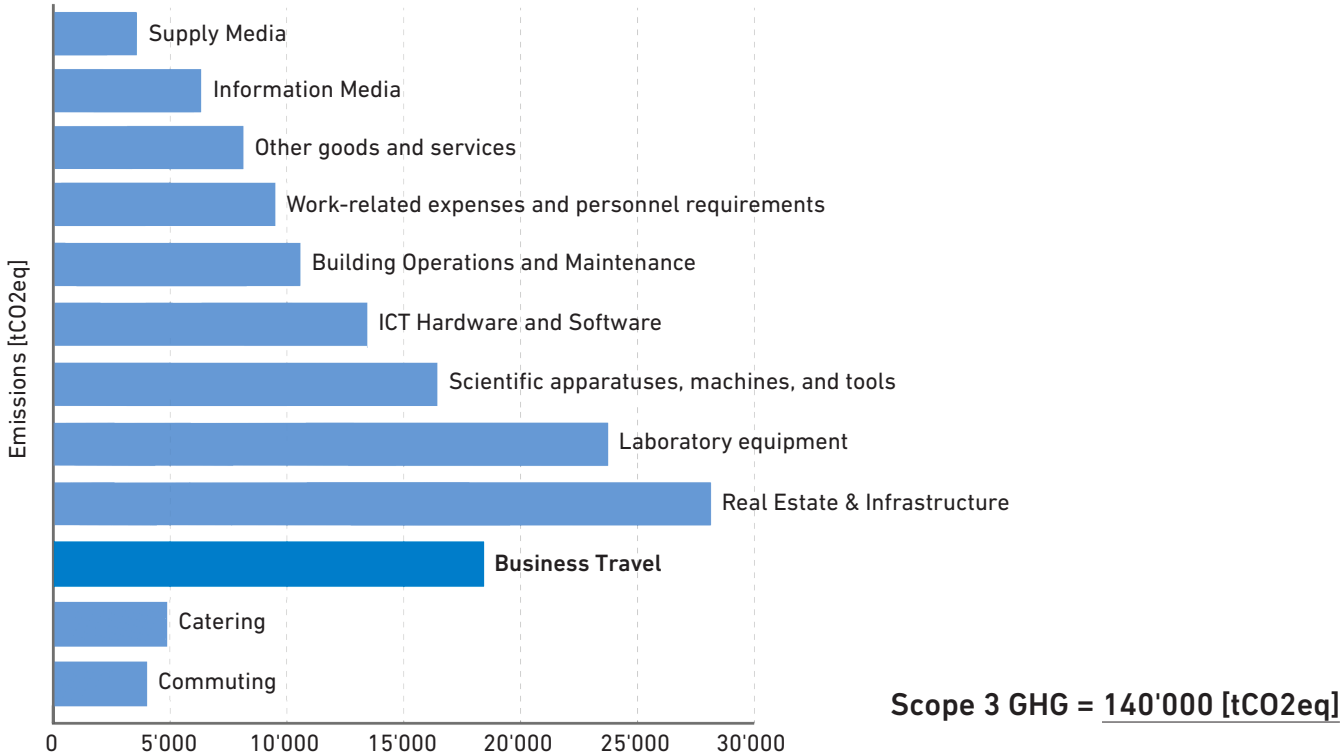


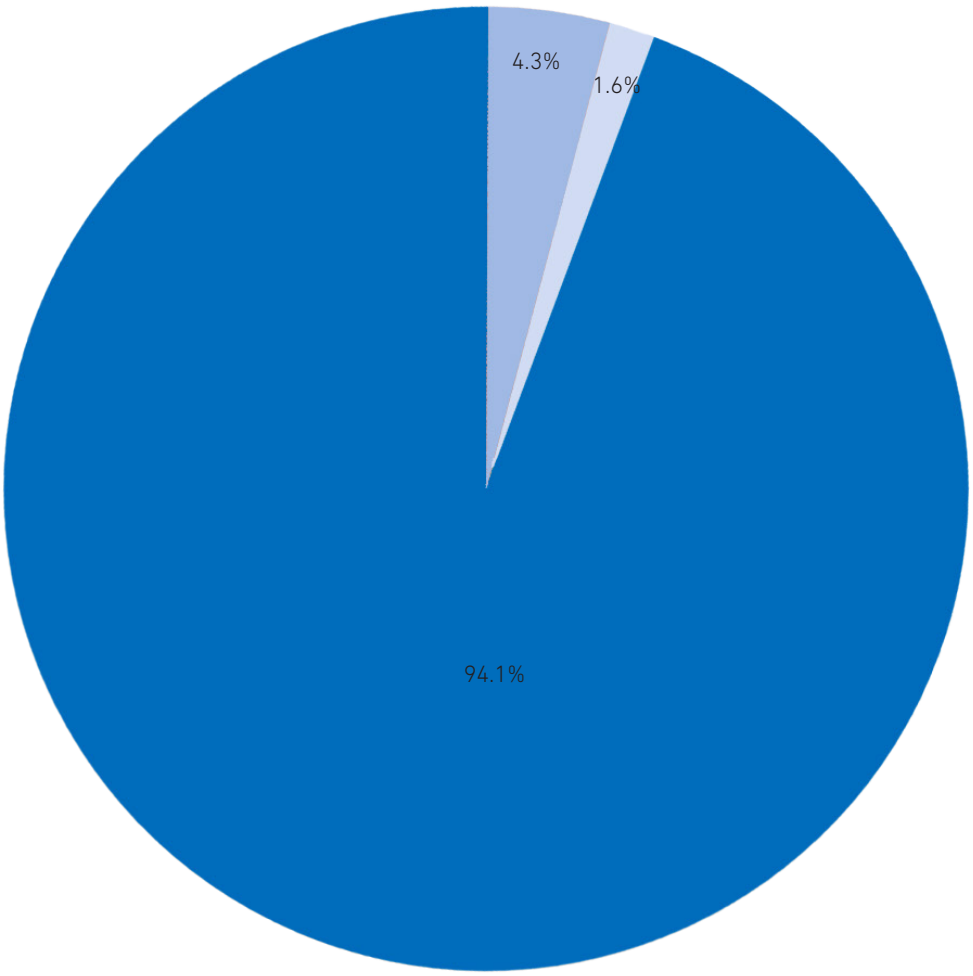
Figure 11: Global Emission for Scope 3 measured in 2017 :



Scope 3 GHG = 140'000 [tCO2eq]

Source(s)
Figure 8: www.ethz.ch/en/the-eth-zurich/sustainability/net-zero/air-travel/data-stewardship/air-travel-emissions-dashboard.html
Figure 9-10: "ETH Board – Annual Report", Zurich. 2022
Figure 11: "ETH Zurich strives for Net Zero by 2030", Zurich, 2022.

Projection of Emissions concerning Scope 3, Construction Branche [Comparison ETH-Zurich – Switzerland]:



Drawn by Dept. of Numeric and Other Values.

- Swiss Construction & Industrial Machinery: 650'000t eq CO2 (2021)
- ETH Zurich Real Estate & Infrastructure: 28'000t eq CO2 (2017)
- ETH Zurich Building operations & Maintenance: 10'500t eq CO2 (2017)

Source(s)
"ETH Zurich strives for Net Zero by 2030", Zurich, 2022.
www.bafu.admin.ch/greenhouse-gas-inventory

Swiss Climate Protection Act

The Swiss Climate Protection Act, which was endorsed by the Swiss population on June 18, 2023, includes the following requirement on the Swiss federal administration in Article 10 «Exemplary function of the Confederation and the cantons»: «The central federal administration must achieve at least net-zero emissions by the year 2040. In addition to direct and indirect emissions, this also takes into account emissions caused upstream and downstream by third parties.»

"All for Zero 2030"

The scope of the minimum emissions reduction target for 2030 only encompasses approximately 15% of ETH Zurich's total emissions, on average. This target does not currently account for the indirect emissions associated with supply chains in both upstream and downstream activities (excluding business travel) until 2030. Despite this, meeting the minimum target is considered a great challenge. It involves both technical and infrastructural changes, as well as behavioral adjustments. Achieving this minimum target will pave the way for the ETH community to establish additional targets for reducing emissions across all scopes. This knowledge, in conjunction with concurrent processes and pilot projects, can serve as a foundation for addressing the indirect emissions in Scope 3.

Business Travel

ETH Zurich has been at the forefront of initiatives to minimize the environmental impact of business travel. In 2018, they played a significant role in establishing the Roundtable of Sustainable Academic Travel, aimed at decreasing emissions resulting from business trips. In 2019, the university was a key contributor to the formation of the Swiss Network for Sustainable University Business Travel. Additionally, ETH Zurich's air travel project, titled "Stay grounded, keep connected," involves more than 70 partners from various universities and industries. Even before the COVID-19 pandemic, members of the ETH Community had already pledged to reduce air travel by 15% by 2025. This shift in behavior is further supported by ongoing discussions within and between organizational units, the introduction of decision-making tools for business travel, the use of CO2 calculators, and adjustments to travel expense and other related regulations

Data Development

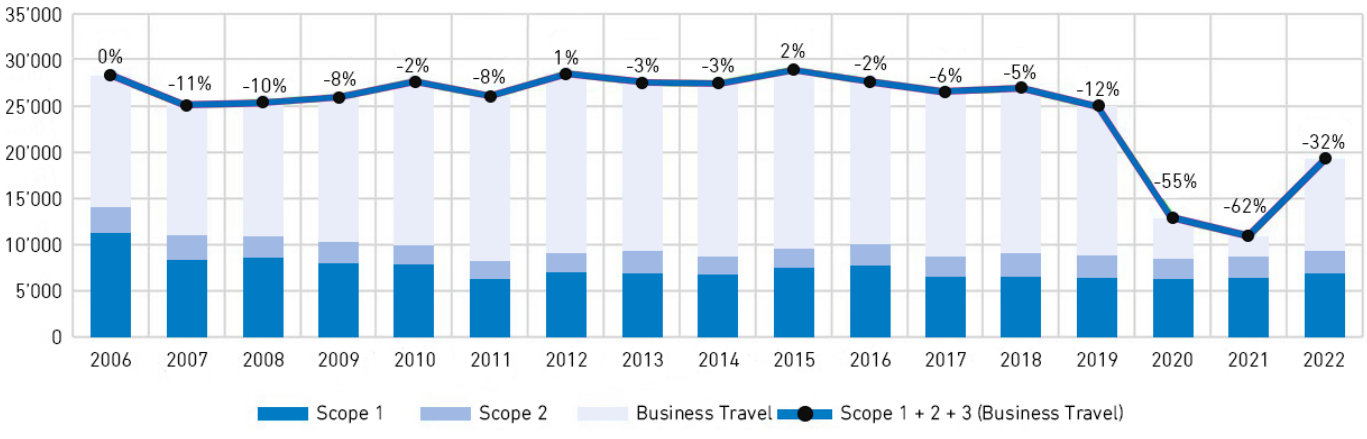
Under the mandatory minimum emissions reduction system, ETH Zurich has seen a decline in its greenhouse gas emissions since 2006. In 2019, just before the pandemic, they achieved a reduction of approximately 12%. During the two years of the Covid-19 pandemic, when global activities were severely affected, they experienced their most significant reductions, reaching 55% and 62%. However, it's important to note that these figures may not accurately represent their long-term progress. In 2022, the year following the pandemic, they recorded a reduction of about 32%. These figures are based on environmental indicators for emissions from Scope 1 and 2, as well as activity data related to business trips by plane.

Emission values are calculated using factors provided by the Federal Office for the Environment (FOEN) and the Swiss Federal Office of Energy (SFOE), as well as data from electricity and district heating suppliers. Additionally, ETH Zurich's air travel emissions are calculated in detail by the company atmosfair GmbH as part of the ETH Air Travel Project.

In 2019, ETH Zurich conducted an analysis of its overall carbon dioxide (CO2) emissions, including what are known as Scope 3 emissions. The university's construction activities play a significant role in generating Scope 3 CO2 emissions. To address this, they have implemented measures to improve the accuracy of measuring and reporting Scope 3 emissions associated with construction activities. This involves tracking emissions more precisely to better understand and manage their environmental impact.

Additionally, ETH Zurich is collaborating with the Chair of Sustainable Building within the Department of Civil, Environmental and Geomatic Engineering (D-BAUG) to identify practical recommendations and solutions for reducing these emissions related to construction activities.

Figure 10: Emissions (2006-2022) Scopes 1, 2 & Business Travels [tC02eq]:



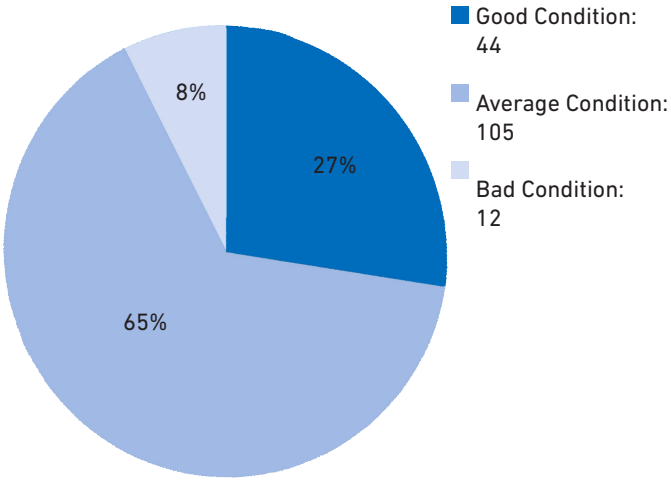
Source(s)
"RFGK 2021 - 2024", Zurich, 2020.
Figure 10: www.ethz.ch/en/the-eth-zurich/sustainability/net-zero

Increasing the Sustainability

Part 2 – Maintenance

The Z/N metric serves as a measure of the relationship between the present value and the initial value of a property. In recent years, ETH Zurich has commendably met its commitment to sustain and enhance the value of its real estate portfolio, consistently aiming for a Z/N value higher than 0.80.

Figure 12: Building conditions according to STRATUS:



Pie Chart of Building Conditions according to STRATUS, reported in the RFGK 2021–2024, ETH Zurich, 2020. Drawn by Dept. of Numeric and Other Values.

RFGK 2021–2024
As of the reporting date on December 31, 2019, the property portfolio had an average Z/N value of 0.82. The Z/N value represents the ratio of a property's current condition to its new value. The objective was to maintain a Z/N value of at least 0.80, and ETH Zurich successfully achieved this goal, preserving the value of the real estate portfolio in recent years.
The STRATUS database contains records for 161 properties (compared to 133 on December 31, 2015). Notably, properties owned by third parties, amounting to 68,000 square meters as of January 1, 2020, are not included in these records. This implies that the status assessment using STRATUS is nearly comprehensive for properties owned by both the Confederation and ETH Zurich.
However, it's worth highlighting that within the entire portfolio, the condition value for all flats and numerous properties at different locations falls below the overall portfolio's average value of 0.82.

Building Site at ETH Hauptgebäude, Zurich, 2022.

Figure 13: Energy Class of considered Buildings ownership ETH

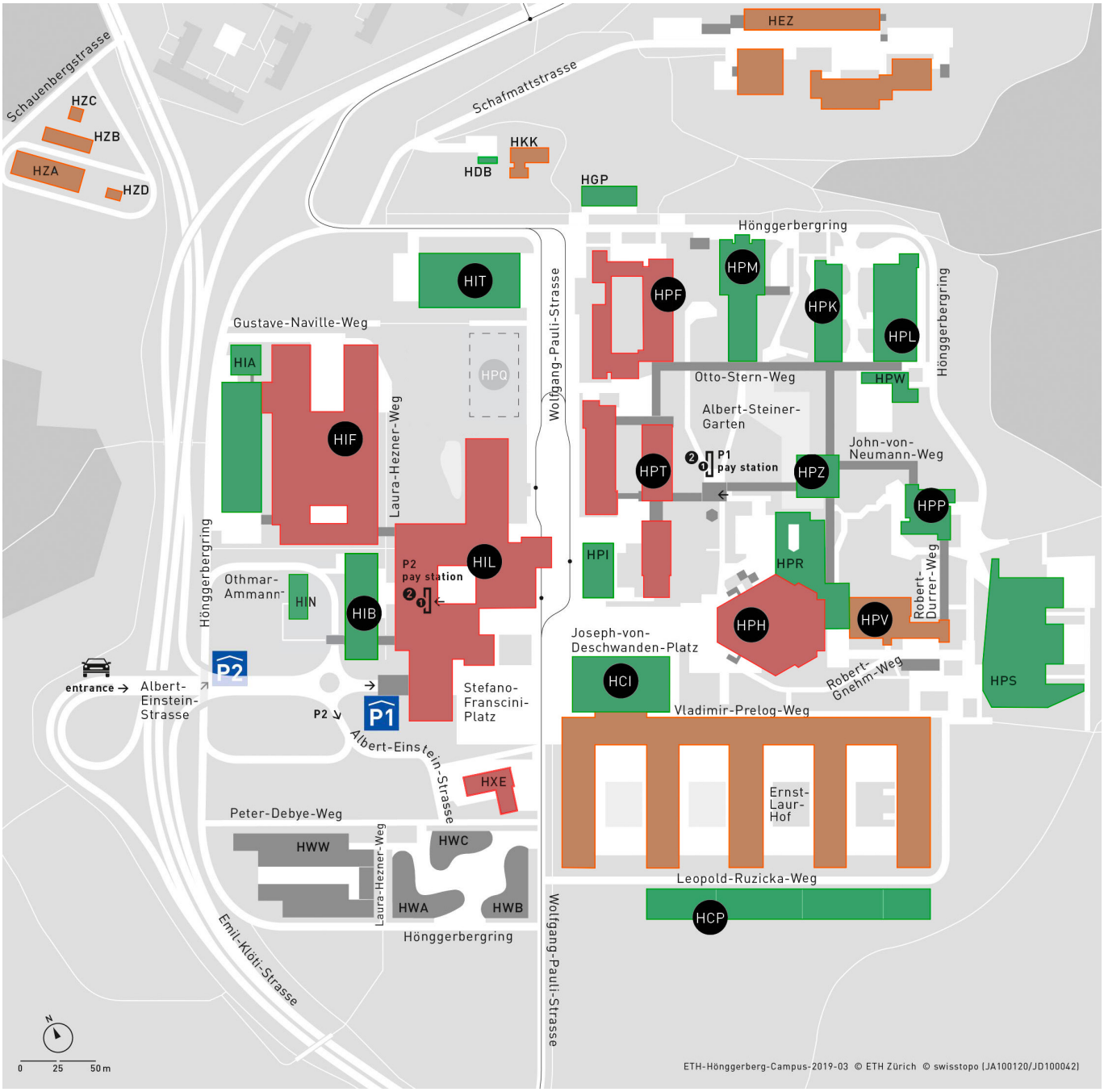
<10	A++	Passivhäuser Neubau	0
<15	A+	Passivhäuser Neubau	0
<25	A	Niedrigenergiehaus mit Komfortlüftung Neubau	2
<50	B	Energiesparhaus Neubau	5
<100	C	Niedrigenergiehäuser Saniert	47
<150	D	Alte unsanierte Häuser	14
<200	E	Alte unsanierte Häuser	4
<250	F	Alte, unsanierte Gebäude mit hohem Wärmeverlust	0
>250	G	Alte, unsanierte Gebäude mit extremen Wärmeverlust	6
		Keine Energieklasse Abgebrochen oder Privathäuser	9
		Anzahl Häuser	87

Energy Class according to Energieausweiklasse 2022.

Energy Performance Certificate Class ETH Building 2022
If we take a look at the figures for the Energieausweisklasse ETH Gebäude 2022. It can be seen that there is clearly no direct connection between buildings in bad condition (with a low z/n) and buildings with a low energy class. Especially for buildings used for education or services, most of which were built around the 1970s, we find a proportion of these with a value of just under 0.8, but often with an unsatisfactory energy class, which can nevertheless be worked on in order to make these buildings more energy sustainable and to reduce emissions within the Scope 2. If, on the other hand, we look at the ETH properties used for residential purposes, among them we find many dated buildings, often dating back to before the 1970s, they not only have a Z/N value well below 0.8, but are also accompanied by a disappointing energy class.

Source(s)
Figure 12: "RFGK 2021 - 2024", Zurich, 2020.
Figure 13: Energieausweisklasse, ETH Zürich, Zurich, 2022.
www.ethz.ch

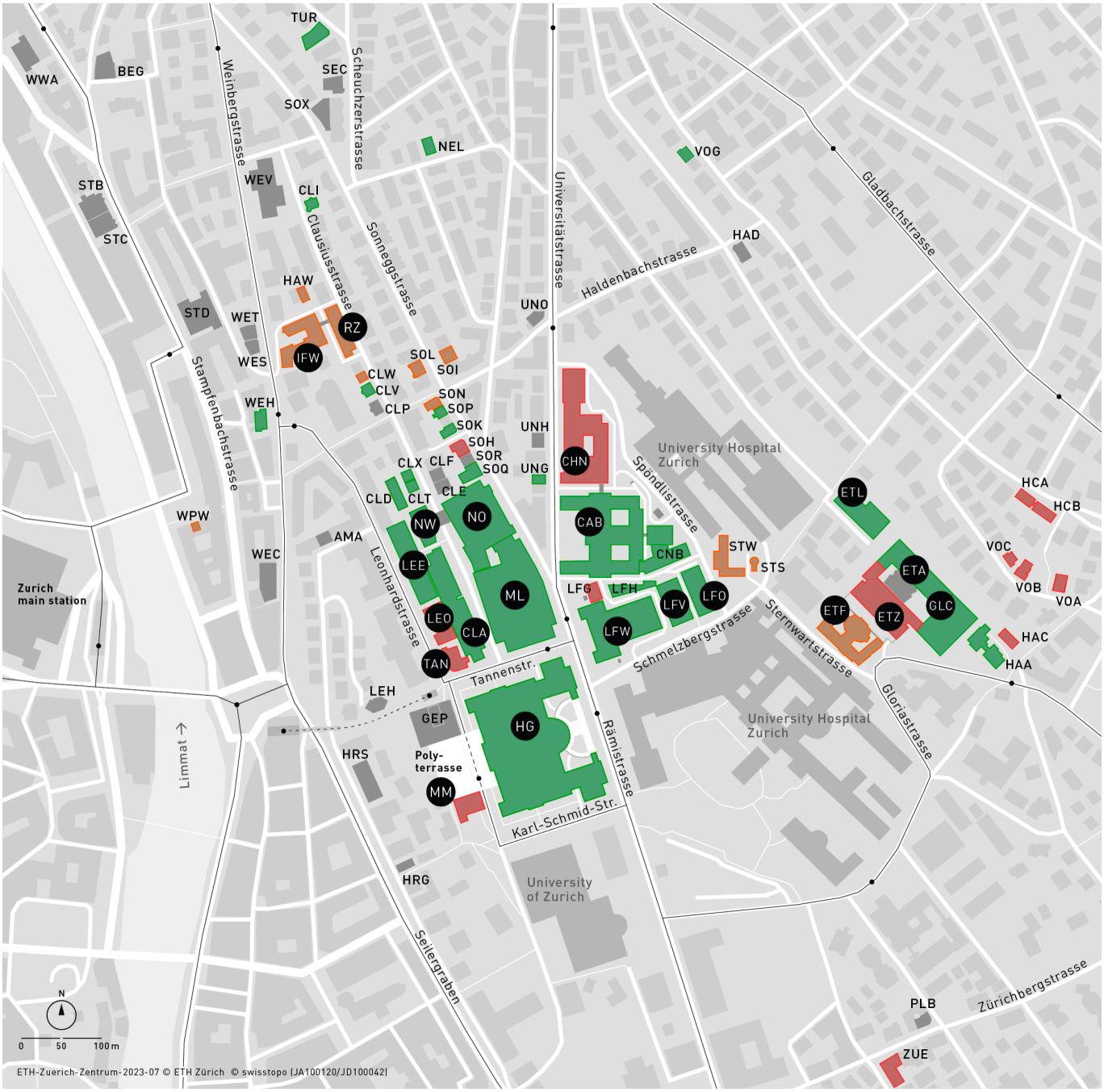
Figure 14: Campus Hönggerberg – General Analysis based on Z/N value



Z/N > 0.8	HCI = C	HPP = C	HIL = D
0.75 > Z/N < 0.8	HCP = Not Available	HPR = G	HPF = D
Z/N < 0.8	HDB = A	HPZ = C	HPH = A
Not Classified	HGB = C	HCI = C	HPT = E
	HIA = Not Available	HEZ = E	HXE = C
	HIB = Not Available	HKK = C	
Energy Classes:	HIN = Not Available	HPV = Not Available	
A++ / A+ / A	HIT = B	HZA = Not Available	
B / C / D	HPI = D	HZB = G	
E / F / G	HPK = C	HZC = G	
	HPL = C	HZD = G	
	HPM = B	HIF = B	

Source(s
Energieausweisklasse, ETH Zürich, Zurich, 2022.
Figure 14: www./ethz.ch/en/campus/access/hoenggerberg

Figure 15: Campus Zentrum – General Analysis based on Z/N value



Z/N > 0.8
0.75 > Z/N < 0.8
Z/N < 0.8
Not Classified

Energy Classes:
A++ / A+ / A
B / C / D
E / F / G

CAB = C
CLA = D
CLD = C
CLI = C
CLT = B
CLV = C
CLX = C
CNB = C
ETA = E
ETL = C
GLC = Not Available
HAA = C
HG = C/D
LEE = C
LFV = C
LFH = D
LFO = C
LFW = C
ML = C
NEL = C
NO = C
NW = C
SOK = C
SOP = C
SOQ = Not Available
TUR = Not Available
UNG = C
VOG = Not Available
WEH = C
CLW = C
ETF = C
HAW = C
IFW = B
RZ = C/G
SOI = G
SOL = C
WPW = C
SON = Not Available
STS = Not Available
STW = C
CHN = B
ETZ = C
HAC = G
HCA = C
HCB = C
LEO = C
LFG = G
MM = D
SOH = N.A
TAN = D
VOA = D
VOB = D
VOC = D

Source(s)
Energieausweisklasse, ETH Zürich, Zurich, 2022.
Figure 15: https://ethz.ch/en/campus/access/zentrum

The importance of Mapping

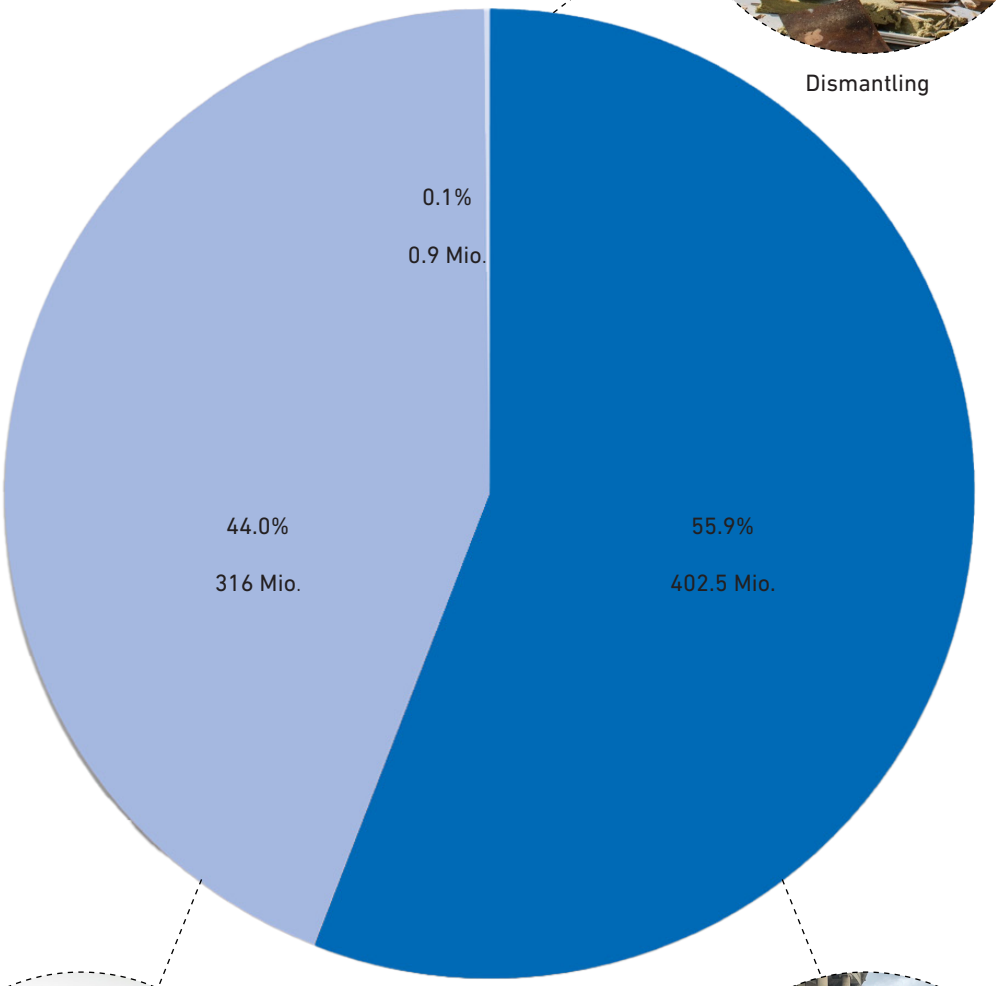
The following mappings of the two ETH Zurich campuses, namely Campus Hönggerberg and Campus Zentrum, establish a correlation between the Zustand/Neuwert value and the respective energy efficiency classes published by the university itself.
The primary objective is to delineate and comprehend the overall picture in a more detailed manner for both campuses. Delving into specifics, the additional goals encompass understanding the relationships between a building's conditions and its energy consumption. Furthermore, it aims to provide a somewhat abstract idea of the investments required to bring about improvements to the buildings. These improvements may not only pertain to routine maintenance but also involve adaptation and a significant energy-related upgrade, leading to higher renovation expenses.

From the analysis, it has been determined that, overall, both campuses are in good condition, and the necessary improvements to the buildings have already been noted and scheduled in the ETH calendar, including significant sustainable enhancements. Regarding the buildings that have yielded notably poor results, it is essential to highlight that, in such cases, these are pavilions and greenhouses. Given their utility not directly tied to daily learning activities, they are to be optimized without the integration of expensive energy systems.

Figure 16: Budget for Investments, Construction activity, Target values

Budget allocated for the four-year period: **720'000'000 CHF**

Dismantling



New Constructions

Functional value maintenance, renovation

Source(s)
Figure 16: "RFGK 2021 - 2024", Zurich, 2020.
www.ethz.ch
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021.

Guidelines for the Future of the Portfolio.
The ETH Zurich has a comprehensive set of guidelines for construction and renovation projects, especially those related to building technology (referred to as "Gebäudetechnik 17"). These guidelines ensure that the highest standards of safety, sustainability, and cost-effective operation are maintained. .
One of the key priorities in the ETH Zurich's real estate investment strategy is to examine measures aimed at reducing costs in the basic infrastructure standards for upcoming new construction, renovations, and refurbishments in the coming years."
ETH Zurich plans to significantly increase the production of electrical energy through photovoltaic systems in its building portfolio in the coming years. This will be achieved through various measures:

1. Mandatory installation of photovoltaic systems on the roofs and, where feasible, on the facades of new buildings (e.g., HIC) and during major cyclic renovations (e.g., HIF).

2. Retrofitting existing roofs (e.g., HCI, HIA, HPL) to accommodate photovoltaic installations.

3. The establishment of demonstrative installations in collaboration with ETH Zurich scientists (e.g., ETL) to test and showcase innovative solutions in the field of solar energy.

The effective allocation of available funds is of utmost importance for the maintenance and preservation of core assets. In line with this, ETH Zurich has outlined plans to divest a substantial number of residential buildings that do not fall within the category of core assets. These divestments include the GGA to GGP properties in 2021 and the LHT to LHZ and Lärchenhalde properties in 2023.

The inflation problematic
In the current economic climate, the ongoing financial crisis has had a significant impact on daily life. Switzerland is experiencing an inflation rate of approximately 1.7%, although this data has been showing a decreasing trend in recent months. During crisis times like these, long-term projects can encounter difficulties, and it's often necessary to reevaluate them to safeguard the financial portfolio of investments.

To provide a brief overview of the impact of inflation on investments, let's consider this example.

Future Value = Present Value x (1 + Inflation Rate)^N°of Years

Where:

Present Value is the initial budget of 720 million.
Inflation Rate is 1.7% or 0.017 as a decimal.
Number of Years is 4.

Future Value = 720,000,000 CHF x (1 + 0.017)^4
Future Value = 720,000,000 CHF x 1.06852841
Future Value ≈ 769,337,827 CHF

So, with an inflation rate of 1.7% per year, your real estate investment budget of 720 million after 4 years will be approximately 769,337,827 CHF in real terms. A higher inflation rate will erode the purchasing power of your budget over time, so it's important to consider this effect in investment planning and be scrupulous in term of rethinking.

Source(s)
"RFGK 2021 - 2024", Zurich, 2020.
https://ethz.ch/en/campus/development/construction-projects/hif-projekt
www.tradingeconomics.com/switzerland/inflation-cpi


«ETH Zurich plans to significantly increase the production of electrical energy through photovoltaic systems in its building portfolio in the coming years. This will be achieved through various measures.»

Increasing the Sustainability

Part 3 – New Constructions

In the coming years, HIC building will be realized, aimed at groups of students
Let us analyze the principles of project implementation and through estimating
the emissions produced, assess the environmental impact

Initial situation
ETH Zurich is planning to construct a new building on the Hönggerberg campus with the aim of providing adequate space for various user groups. It will be designed to accommodate student organizations and entrepreneurial initiatives, with the overarching goal of fostering collaboration and cooperation between these.

Urban Development
The realisation of the HIC projects represents an interim use with a long-term useful life (40 - 60 years). After the expiry of the technical service life of the HIG underground car park, the realisation of a new building is planned at its location. A replacement for the parking spaces of the HIG is planned in the new HWN building.

Architecture
The building should reflect the spirit of the idea and the innovations that take place inside the building to the outside and create identity." [...] Flexibility is among the most crucial criteria in this context. Given the ever-changing requirements of users, the facilities must be adaptable, allowing for easy expansion or reduction as needed.

Task
The general planning teams were tasked with developing a project proposal for the construction of the HIC Building on the Hönggerberg campus. This collaborative project aims to address the diverse needs of various user groups by providing a versatile space that includes offices, multi-purpose rooms, and workshops for students. The new building's primary purpose is to serve as an interdisciplinary meeting and training hub on the Hönggerberg campus, fostering collaboration and knowledge exchange. This construction is envisioned as a central meeting point, encouraging synergy among different groups. It is intended to be a vibrant space for interaction, where the emphasis is on generating and implementing new ideas and projects. The innovation occurring within the building will be evident in its external appearance, reflecting the dynamic and forward-thinking nature of the activities happening within.

Building technology
The foremost requirements for the HIC Building are adaptability and streamlined building services. It's essential that the facility can be easily adjusted to meet changing needs. Additionally, HIC is connected to the Anergy Net on the Campus, ensuring that the heating and cooling requirements are effectively met, thus contributing to energy efficiency and sustainability.

Source(s)
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021.

Sustainability
ETH Zurich's Real Estate Department has established stringent sustainability standards for the new HIC building. In the competition process, the focus is on showcasing solutions that prioritize resource conservation, climate-friendliness, and construction that is both user-friendly and socially compatible. Implementing these standards necessitates structural, spatial, and technical solutions that view the building as part of a larger system, harmonizing it with the overall context of the Hönggerberg campus. There are five key goals for this building:

Goal 1:
The design of the building should make the content / use of the building readable to the outside.
Goal 2:
Flexibly usable and adaptable spaces.
Goal 3:
Creation of areas / spaces for informal exchange
Goal 4:
Visual and spatial connection of the building with the Hönggerberg campus
Goal 5:
The building structure and technology should be designed for a high level of resource efficiency and climate protection.

The building aims to showcase sustainable construction on the Hönggerberg campus, emphasizing the importance of eco-friendly and energy-efficient construction practices. The design should visually express its purpose to the outside world. The goal is to explore how construction methods can best fulfill ecological and energy-related criteria. Simultaneously, these methods should offer solutions for adaptable spaces and facilities, with a focus on extension possibilities, system separation, and structural and technical equipment adaptability. The building is expected to have a high degree of compactness, which is a cost-effective way to optimize energy and resource use.

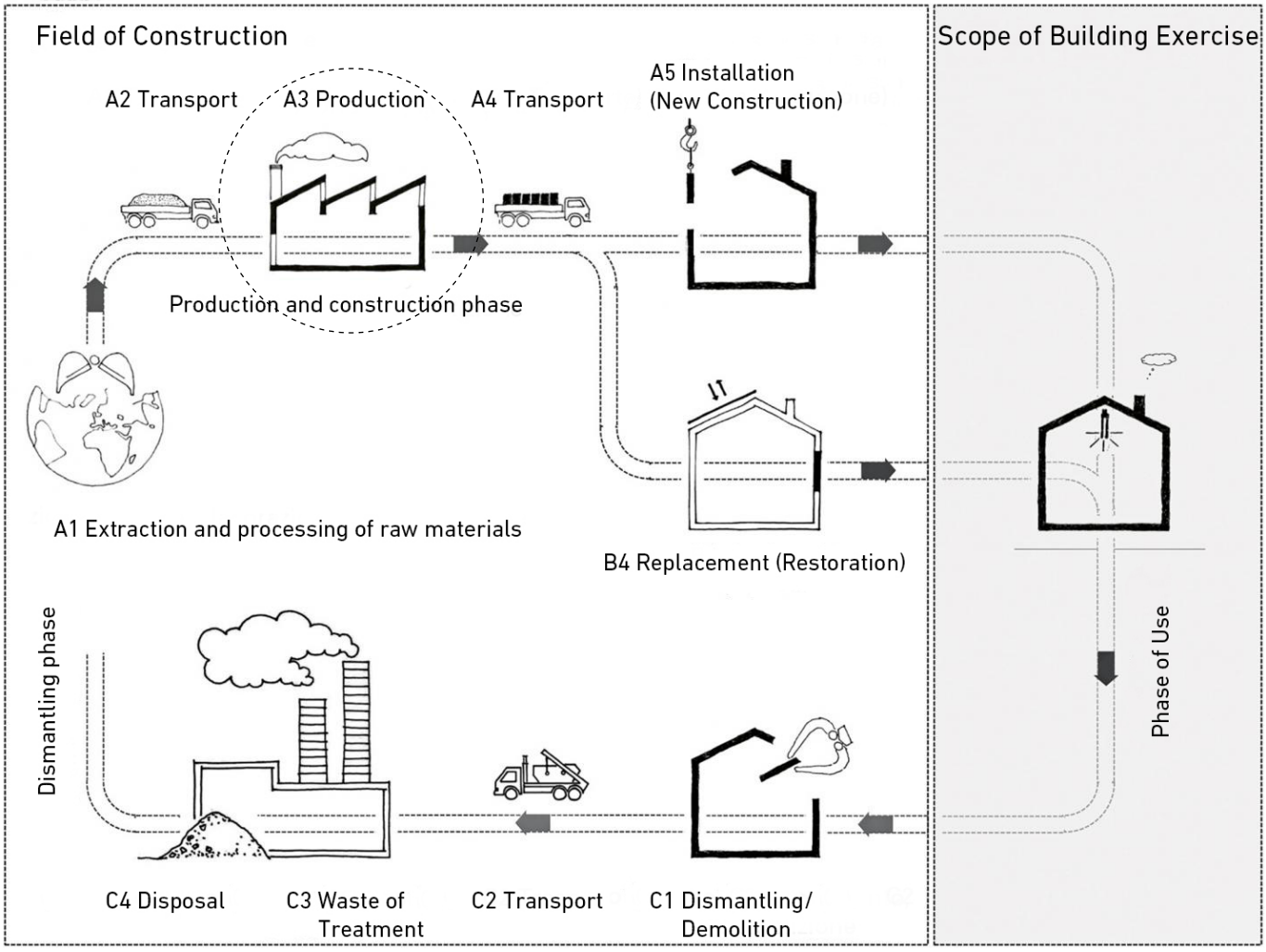
Photovoltaics
For the Building, ETH Zürich is looking to install roof and facade systems. Furthermore the ETH is seeking structurally integrated solutions for the entire building envelope, particularly in relation to photovoltaic systems. A proposed concept should visually demonstrate how the PV system fits into the overall external envelope design, considering factors like green roofs, roof terraces, facade aesthetics, shading, and the utilization of self-generated electricity.

Wo Zukunft entsteht
Neubau HIC
Campus Hönggerberg

Anonymer Preiswettbewerb im selektiven Verfahren
Bericht des Preisgerichts

Source(s)
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021.

Figure 17: Life-Cycle assesment of a Building – SIA 2032 (2020)

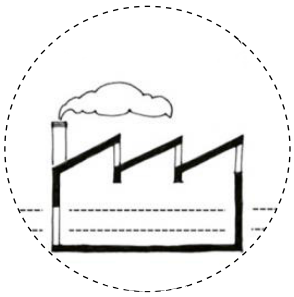


Life-Cycle Assesment of a Building according to SIA 2032, 2020.

SIA 2032

In the technical notebook, the term "construction" is explicitly defined for the first time, used in the same sense as in the SIA 2040 technical notebook "The SIA Path to Energy Efficiency." The scope of "construction," according to the SIA 2032 technical notebook, encompasses the entire flow of material and energy: from the extraction of raw materials to the production of construction materials, from their installation to measures for their replacement on the construction site, up to the demolition of the building and the disposal of various construction elements. In addition to the building's operation – an aspect not thoroughly explored – the entire life cycle is taken into account. The building balance presented in the notebook follows the terminology and modular structure of the European standard on which the Environmental Product Declaration is based. Although this approach may seem somewhat schematic, a division into modules is chosen, namely: five modules in the production (A1-A3) and construction phases (A4 and A5), one module B4 in the use phase, and four modules (C1-C4) in the disposal phase, to avoid misunderstandings and contradictions.

A3 Production Emissions:



The emissions generated throughout the life cycle of a new building are numerous and vary case by case. They depend on various factors, such as transportation, construction, energy use, demolition, and the production of materials. These factors typically account for a value ranging between 30-40% of the total emissions. In our case study, these are the emissions we will specifically estimate. As other branches are influenced by different factors, such as the distance from contracting firms and the quality of on-site installations."

Source(s)
Figure 17: SIA 2032, 2020.
https://www.espazium.ch/it/node/23060

Projection of emissions through production of used material:

Emission Factor	* Activity Level	=	Emissions
1tCO2/t	* 750t	=	750'000kgCO2
		=	**750 tCO2**

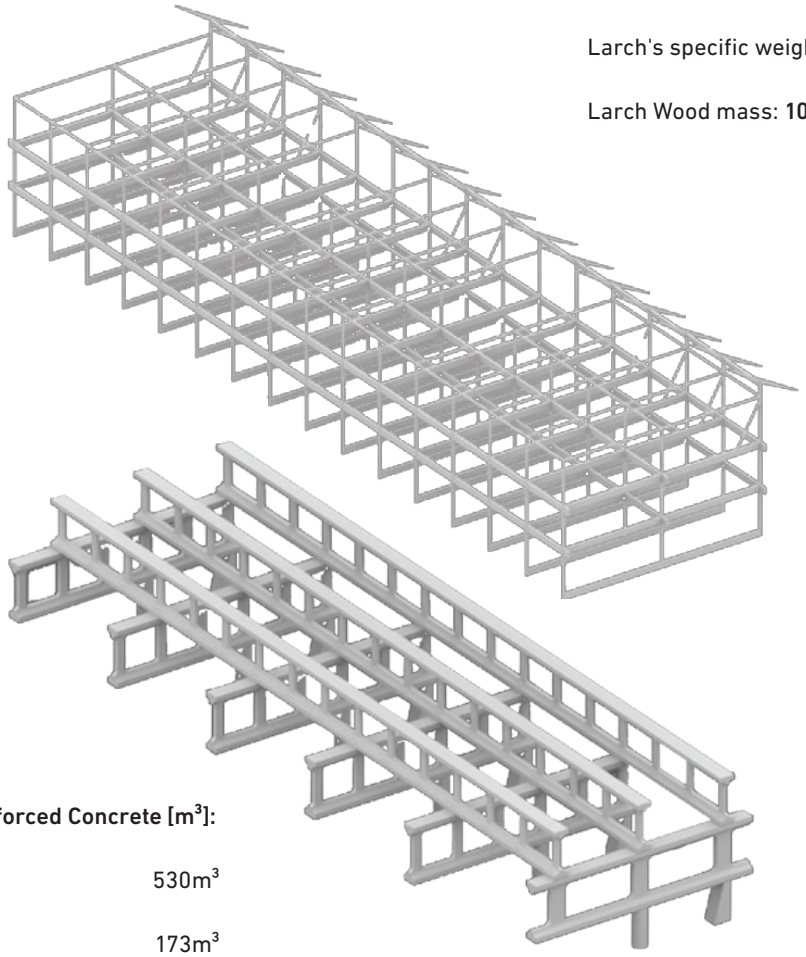
1. Projected Laminated Wood (Larch) [m^3]:

Architraves/Structure:	738m^3
Columns:	28m^3
Pavements:	234m^3
Total:	**1'000m^3**
Larch's specific weight:	**750kg/m^3**

Larch Wood mass: **1000kg/m^3 * 750m^3 = 750t**

1.

2.



2. Projected Structural reinforced Concrete [m^3]:

Beams:	530m^3
Columns:	173m^3
Structural Walls:	333m^3
Slabs:	708m^3
Total:	**1'750m^3**
Concrete's specific weight:	**2'300kg/m^3**

Reinforced Concrete mass: **2'300kg/m^3 * 1'750m^3 = 4'025t**

Emission Factor	* Activity Level	=	Emissions
80.9kgCO2/t	* 4'025t	=	325'623 kgCO2
		=	**326 tCO2**

Source(s)
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021.
www.ediltool.com/main/tabelle-dei-materiali/peso-specifico-legno/
www.farinaezio.it/calcolare-peso-del-calcestruzzo-peso-1m^3-cemento
www.sustainableconcrete.org.uk/Sustainable-Concrete/Performance-Indicators/CO2-Emissions-Production

Projection of emissions through production of used material:

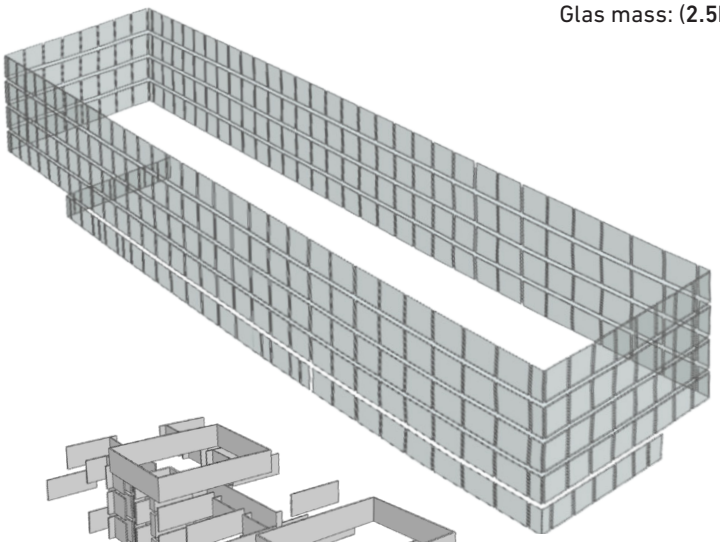
Emission Factor	* Activity Level	=	Emissions
98kgCO2/m²	* 4'000m²		392'000kgCO2
	=		**392 tCO2**

3. Projected Use of Glas [m2]:

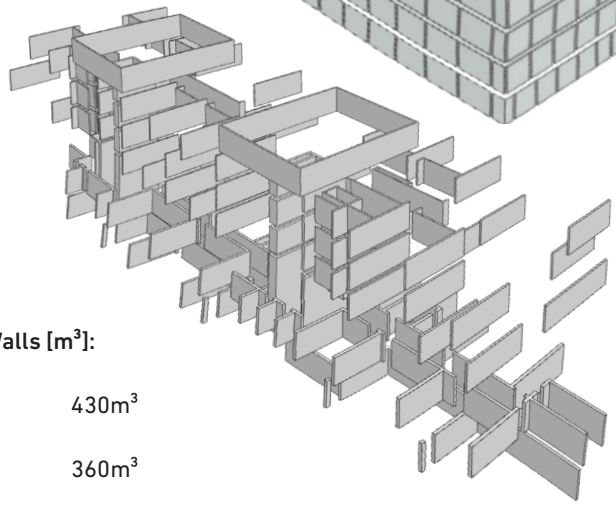
Glazed Longitudinal Façade:	3'200m²
Glazed Transversal Façade:	800m²
Total:	**4'000m²**
Glas specific weight:	**2.5kgm²/mm**

Glas mass: **(2.5kgm²/mm * 16mm) * 4'000m² = 160t**

3.



4.



Drawn by Dept. of Numeric and Other Values.

4. Projected non-structural Walls [m³]:

Concrete Walls:	430m³
Concrete Stairs:	360m³
Drywall:	85.2m³
Total Concrete :	**790m³**
Total Drywall:	**320m³**

Non-reinforced Concrete mass: **1'400kg/m³ * 790m³ = 1100t**

Drywall mass: **1000kg/m³ * 85.2m³ = 85.2t**

Drawn by Dept. of Numeric and Other Values.

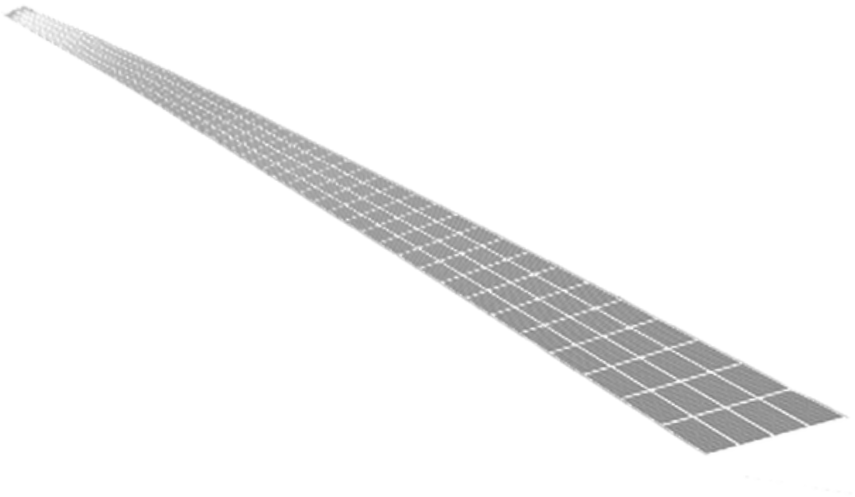
Emission Factor	* Activity Level	=	Emissions
80.9kgCO2/t	* 1'100t	=	88'900kgCO2
Concrete Structures		=	**88.9tCO2**

Emission Factor	* Activity Level	=	Emissions
180kgCO2/t	* 85.2t	=	15'336kgCO2
Drywall Structures		=	**15.3tCO2**

Source(s)
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021
https://climate.ec.europa.eu/system/files/2016-11/bm_study-gypsum_en.pdf.
www.farinaezio.it/calcolare-peso-del-calcestruzzo-peso-1m³-cemento
www.saint-gobain-glass.com/sites/saint-gobain-glass.com

Projection of emissions through production of used material:

5.



Drawn by Dept. of Numeric and Other Values.

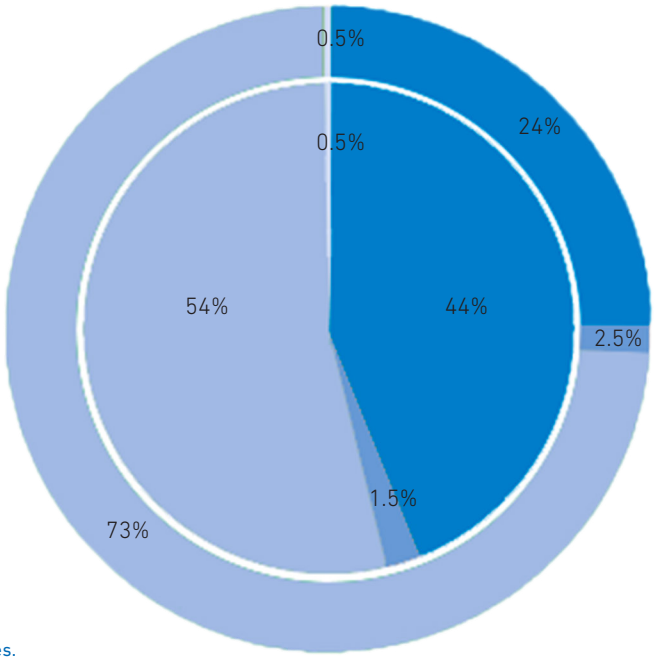
5. Projected use of Photovoltaic Panels [m^3]:		Emission Factor	* Activity Level	=	Emissions
Area of Panels:	$624m^2$	$17kgCO2/m^2$	* $624m^2$	=	10'600kgCO2
					10,6 tCO2
Total area of Panels	$624m^2$				

Projected & Calculated emissions – Production of Materials:

1. Wood:	750tCO2
2. Reinforced Concrete:	326tCO2
3. Glas:	392tCO2
4. Non Structural Concrete:	88.9tCO2
Drywall:	15.3tCO2
5. Photovoltaic Panels:	10.6tCO2
Total Material Emissions:	**1582.8tCO2**

Source(s)
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021.
www.dynamoenergies.com
www.solarisrenewables.com/blog/what-is-the-carbon-footprint-of-solar-panel-manufacturing

Projecton of HIC Life-Cycle Assesment:



Drawn by Dept. of Numeric and Other Values.

- Material Production & Transportation branche [24 – 44% of Emissions]
- Operation branche [54 – 73% of Emissions]
- Construction branche [1.5 – 2.5%] of Emissions]
- Demolition branche [0.5% of Emissions]

Projected Emissions of HIC during its Life-Cycle:

Projected Material Production Emissions:

1582.8tCO2	:	44%	=	**3598tCO2**
1582.8tCO2	:	24%	=	**6595tCO2**

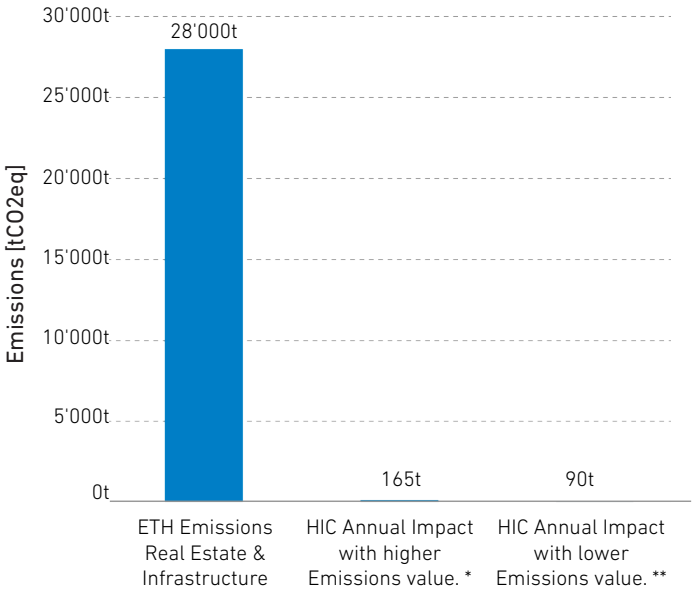
Projected Final range of Emissions:

3600tCO2 – 6600tCO2

Projected Yearly Impact on Scope 3 [for 40 years]:

90tCO2/a* – 165tCO2/a**

Annual Impact of HIC on Scope 3 [Real Estate & Infrastructure]



Drawn by Dept. of Numeric and Other Values.

Source(s)
"Wo Zukunft Entsteht – Neubau HIC", Zurich, 2021.
www.mdpi.com/2071-1050/9/6/922
www.sciencedirect.com/science/article/pii/S2210537920301323

Increasing the Sustainability

General Outlook

Sustainability values are a crucial part of today's society, and purposeful design, combined with major innovations in building technologies, can produce remarkable architecture that future generations will be able to enjoy, without impacting on their quality of life.

Thoughts

What is being addressed is one of the "other values," whose relevance is among the most significant but, at the same time, depends heavily on various types of numerical and decisional values. The project laid out on paper can always reflect the cutting edge of technologies and sustainable construction. However, facts change and can be heavily influenced when approaching the concrete realization of a tangible project.

The first factor influencing sustainability is undoubtedly the economy. In fact, without money, nothing can be realized. Money brings with it a lot of problems related to implementation, primarily tied to construction costs. Aiming for the best compromise in economic terms is not often favorable to sustainability; on the contrary, it does not mean that if a project has extremely high implementation costs, it guarantees low emissions and energy efficiency.

The second influential factor of relevance is certainly the decision-making factor. Such decisions always occur after careful consideration and the meticulous examination of master plans specifically developed for the future. One must always act in the best interest of the represented institution, with an eye on its investment power and spatial needs. In October of this year, in fact, ETH Zurich expressed itself in this way regarding the realization of the HIC building: "In accordance with an Executive Board decision of 26 Octber 2023, ETH Zurich has stopped the previously planned project and has decided to launch a new project. «In the previous project, we were confronted with cost increases that led to a price per square metre that could not be justified for an ETH Zurich building with the intended use,» says Ulrich Weidmann, Vice President for Infrastructure, who is in charge for construction, summarising the situation that led to the Executive Board's decision. With this in mind, the Executive Board has decided to stop the current project and has commissioned Weidmann to conduct a concept study to relaunch the endeavour. This will delay the project by about two years. The building is expected to be ready in 2030."

The third factor is related to the energy supply that buildings have. The more sustainable technologies are implemented within the buildings, the greater the economic savings over the long term, and the lower the emissions produced from energy consumption will be.

The fourth and final factor emerged during this investigation is related to the choices made in the implementation of the project. Materials, transportation, the distance of contracting firms, on-site technologies, maintenance, energy consumption throughout the lifecycle, and dismantling are all elements that significantly influence the "sustainable" impact of a building. For this reason, it is always challenging to definitively determine how sustainable a building is, as it may be sustainable during its operational period but not throughout its subsequent lifecycle phases. Even worse, the building might deviate abnormally from its energy standards and prove to be more environmentally impactful than anticipated. Therefore, meticulous tracking of emissions during the execution process is an important and challenging task.

Questions

However, there remain open questions for the future, which come to the surface in the course of the chapter. How can an institution such as the Swiss Federal Institute of Technology Zurich continue its policy of growth, which involves an increasing number of people, achieve its net-zero goals without intervening in the movement of its members? Is it sufficient to get rid of the minority of residential buildings in order to protect the z/n value? How can a building like the HIC, born with an assumption of sustainability, fully comply with its good premises without being just an example of green washing, given the many variables?

Source(s)
"RFGK 2021 - 2024", Zurich, 2020.
https://ethz.ch/en/campus/development/construction-projects/hif-projekt
www.tradingeconomics.com/switzerland/inflation-cpi

Who runs the show?

An analysis of information flow, delegations, decision-making and the people of ETH Zurich.

Made in Switzerland

The Swiss Federal Polytechnic School was founded by the Swiss federal government in 1854. Today the Federal Government operates the Federal Institutes of Technology in accordance with the Federal Constitution. Collaboration and partnerships with government bodies and agencies ensure alignment with national goals, and ETH Zurich receives substantial research funding through federal agencies. This partnership has shaped Switzerland's educational and research landscape.

The federal council oversees the Bau und Liegenschaftsorgan (BLO) , which is subdivided into three offices, the armasuisse, the Bundesamt für Bau und Logistik (BBL) and the ETH Board.

The ETH Act – which is the Federal Act of 4 October 1991 on the Federal Institutes of Technology - forms the legal foundation for operating the four research institutes of the ETH Domain (PSI, WSL, Eawag, EMPA), the two Federal Institutes of Technology (ETHZ and EPFL) and for the ETH Board - the strategic governing and supervisory body of the ETH Domain. It defines its status, structure and mission.

The ETH Board is autonomous within the framework of the legal requirements and is assigned to the Department of Economics, Buildings and Research (WBF), which Guy Parmelin, member of the federal council oversees, and council member Karin Keller Suter from the Finance Department.

The ETH Board serves as the primary management body of the ETH Domain, and submits annual reports to the Federal Council that specifically detail the extent to which strategic objectives have been achieved and how the total federal contribution has been utilized. The self-evaluation report created by the ETH Board is then utilized as the foundation for external assessments of the ETH Domain, which are conducted by the WBF under the guidance of independent experts to review the institution's progress towards achieving its strategic aims.

ETH Zurich enjoys strong ties with Swiss industries, with numerous companies actively partnering with the university on research initiatives. This collaboration offers valuable prospects for technology transfer, commercialization of research outcomes, and promotes innovation and entrepreneurship. As noted in the chapter on Habits of Growth, ETH Zurich receives significant funding from Switzerland through research funding agencies of the Swiss government, private foundations, and industry-sponsored research projects. These external funds are vital for the institution.

The Industry Relations Team at ETH Zurich, headed by Dr. Urs Zuber, serves as the point of contact for industry-related matters and matches interested companies with available research expertise at ETH Zurich. The team operates within the Office of the ETH Vice President for Research and Corporate Relations. Its responsibility lies in facilitating interactions between companies and research groups at ETH by coordinating meetings, workshops, and laboratory visits. The team's focus areas include Knowledge transfer, Network promotion & support, Research collaboration, and Technology transfer.

Source
ETH Domain Annual Report 2022
https://ethz.ch/en/the-eth-zurich/organisation/staff-units/stab-ww/industry-relations.html,
https://ethrat.ch/, https://ethz.ch/en/the-eth-zurich/portrait/history.html
https://ethrat.ch/wp-content/uploads/2021/09/selbstevaluation-eth-rat_e.pdf

Structure of the ETH Domain

* Employment contracts incl. doctoral students, as of: 31 December 2022.

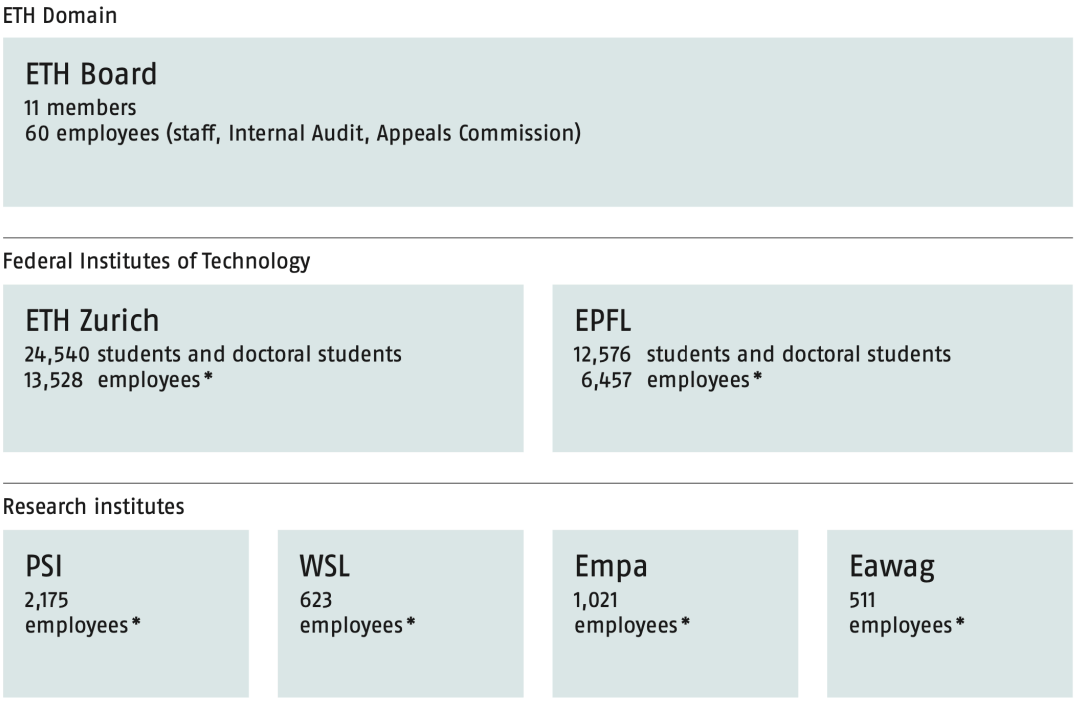


Figure 1: People in the ETH Domain

Purpose

According to Article 2 of the ETH Act the ETH Domain's values and purpose are:

1. The two federal institutes of technology and the four research institutes within the ETH Domain shall:

a) educate students and specialists in scientific and technical fields and ensure continuing education and training
b) expand scientific knowledge through research;
c) support junior scientific staff;
d) provide scientific and technical services;
e) ensure a dialogue with the public;
f) exploit their research findings.

2. They shall take account of Switzerland's needs.

3. They shall discharge their remit at an internationally recognised level and encourage international cooperation.

4. The guiding principles for teaching and research are respect for human dignity, responsibility in the use of natural resources and the environment together with an evaluation of the consequences of technological applications.

Figure 1: People in the ETH Domain
Source
ETH Domain Annual Report 2022

Article 2 of the ETH Act the ETH Domain
Source
https://www.fedlex.admin.ch/eli/cc/1993/210_210_210/en

"The leaky pipeline metaphor describes the way in which women become underrespresented minorities in the STEM fields. In mathematics and engineering the disequilibrium starts before undergrad, with fewer women choosing to major in these fields. Conversely, women in the biological and life sciences represent more than half of the students earning PhDs, yet most fail to achieve tenure track faculty positions in academia."

Source:
Amber Mueller, "The Leaky Pipeline: Women in Life Sciences",
https://www.graduate.umaryland.edu/gsa/gazette/February-2015/The-Leaky-Pipeline-Women-in-Life-Sciences/

Women at ETH Zurich

Over time, there has been a gradual rise in the number of women represented in academic roles, such as professorships. This progression can be credited to increased access to education, changing societal attitudes, and initiatives aimed at promoting gender equality within academia.

However, it is crucial to acknowledge that despite some progress, challenges and disparities still persist. Women in academia face various challenges, including unequal pay, limited representation in leadership roles, and the difficulty of balancing work and family responsibilities. In order to support the progress of female professors in universities, ongoing efforts are required. A priority must be to eliminate systemic barriers and biases, and to implement proactive measures to ensure equal opportunities for women across all aspects of academic life. Developing inclusive environments that cultivate mentorship, support networks, and initiatives to support work-life balance can effectively empower women in academia. Moreover, offering resources and training to tackle implicit biases and nurture gender-sensitive approaches can foster a more equitable academic environment.

Since the onset of the pandemic, the percentage of female employees has remained static. D-Arch, the Department of Architecture at ETH Zurich, has seen a 2% increase in the number of female staff, bringing the total to 42%.

Appointments

85

Professors, 17 of whom were women and 25 men at ETH Zurich, as well as 15 women and 26 men at EPFL and one woman and one man at both ETH Zurich and EPFL

Proportion of women

41.7%

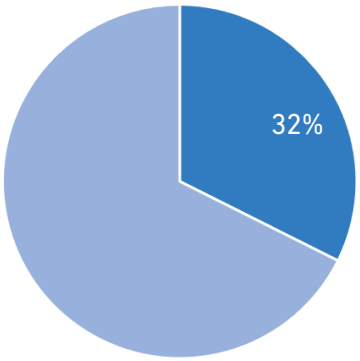
of newly appointed persons

The total 85 appointments included:

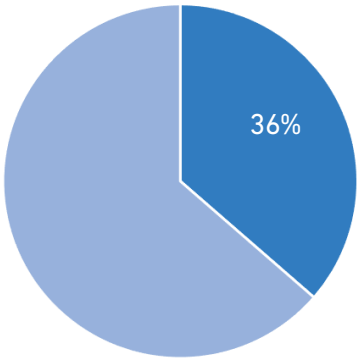
full professors	associate professors	assistant professors with tenure track	assistant professors without tenure track
30	**18**	**26**	**11**
15 of whom were women	4 of whom were women	12 of whom were women	2 of whom were women

Figure 2: New professors at ETH 2022
Source
ETH Domain Annual Report 2022

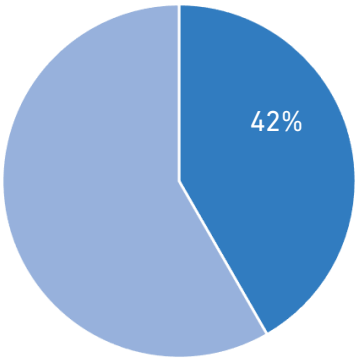
Students



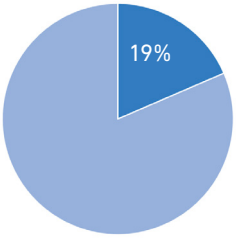
Employees



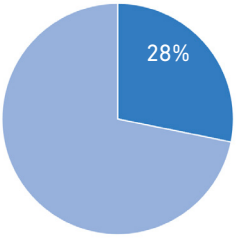
Professors



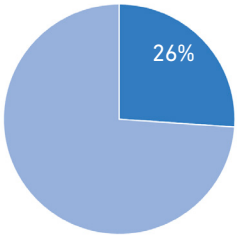
Percentage male and female professors (CH)



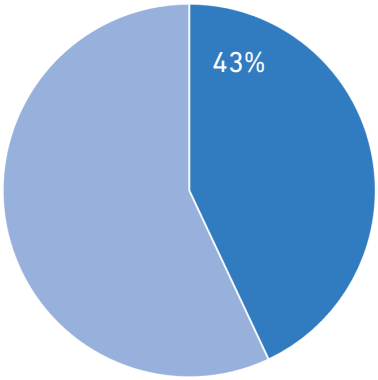
Percentage male and female professors (EU)

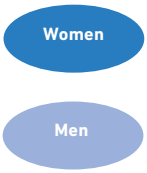


Percentage male and female professors (Other)

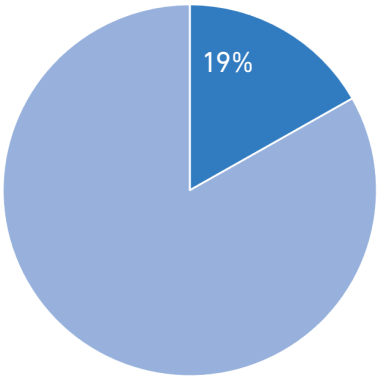


Percentage of male and female students in D-Arch

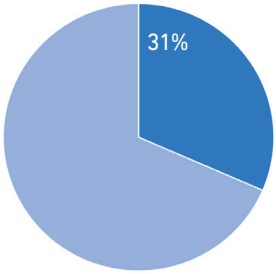




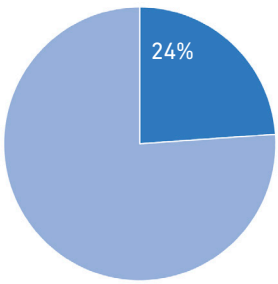
Percentage of male and female students in Engineering ETH



Percentage of women in apprenticeships



Percentage of women in management positions



Source
ETH Domain Annual Report 2022
Graphs from the Dept. of Numeric and Other Values

Non-Swiss Students at ETH Zurich

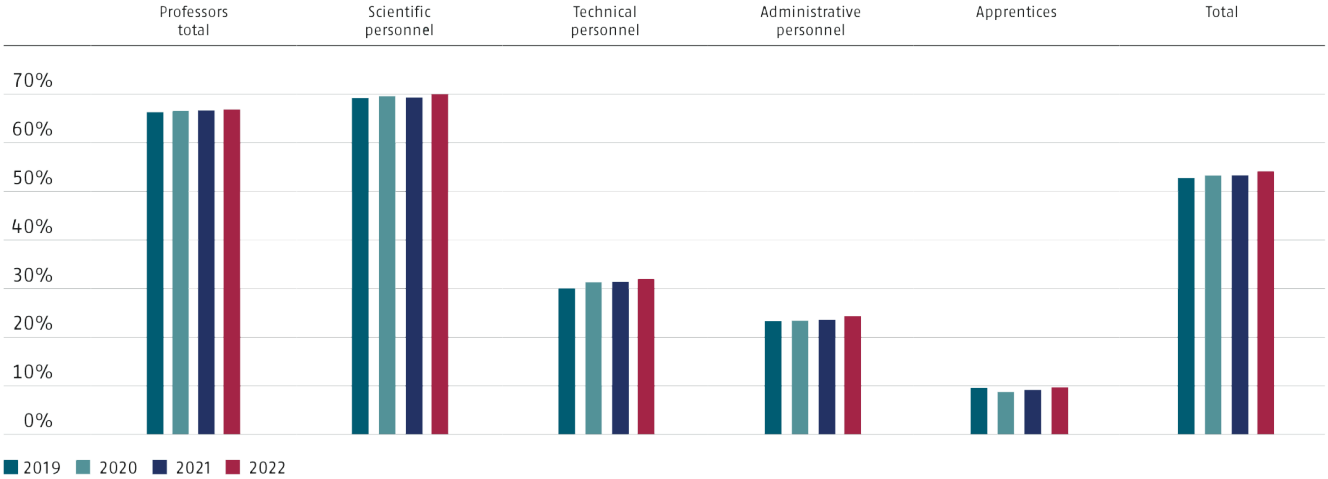
The rise of diverse nationalities participating in Swiss higher education is a significant development in recent times. Switzerland holds appeal as an attractive destination for those seeking top-notch education and culturally diverse experiences.

The increase in international student enrollment has multiple underlying reasons. Firstly, Swiss universities are renowned for their academic excellence and research prospects, which appeal to learners from different countries seeking specialized education. Secondly, Switzerland's multicultural and multilingual setting fosters an inclusive environment that welcomes learners from diverse backgrounds.

The nation's dedication to inclusivity and internationalisation has led to the creation of numerous support services and bespoke programmes catering to the educational and personal integration of foreign scholars. Non-Swiss nationals enrich Swiss higher education by contributing to the academic environment and fostering cultural exchange and international collaboration. Presently, non-Swiss professors constitute 68% of ETH's faculty.

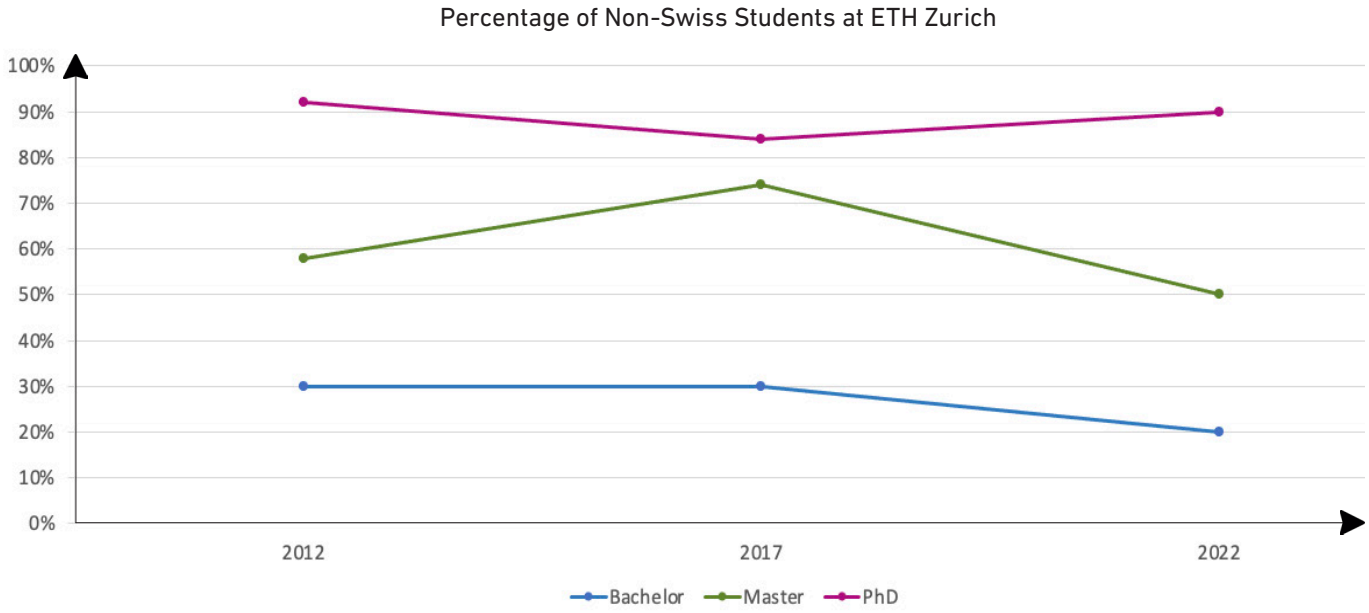
International students provide various advantages to universities, such as financial contributions, diverse cultural experiences, academic exchange opportunities, improved reputation, global connections and rankings, contributions to the workforce, and research collaborations. Their presence fosters a dynamic and inclusive learning atmosphere with a global focus.

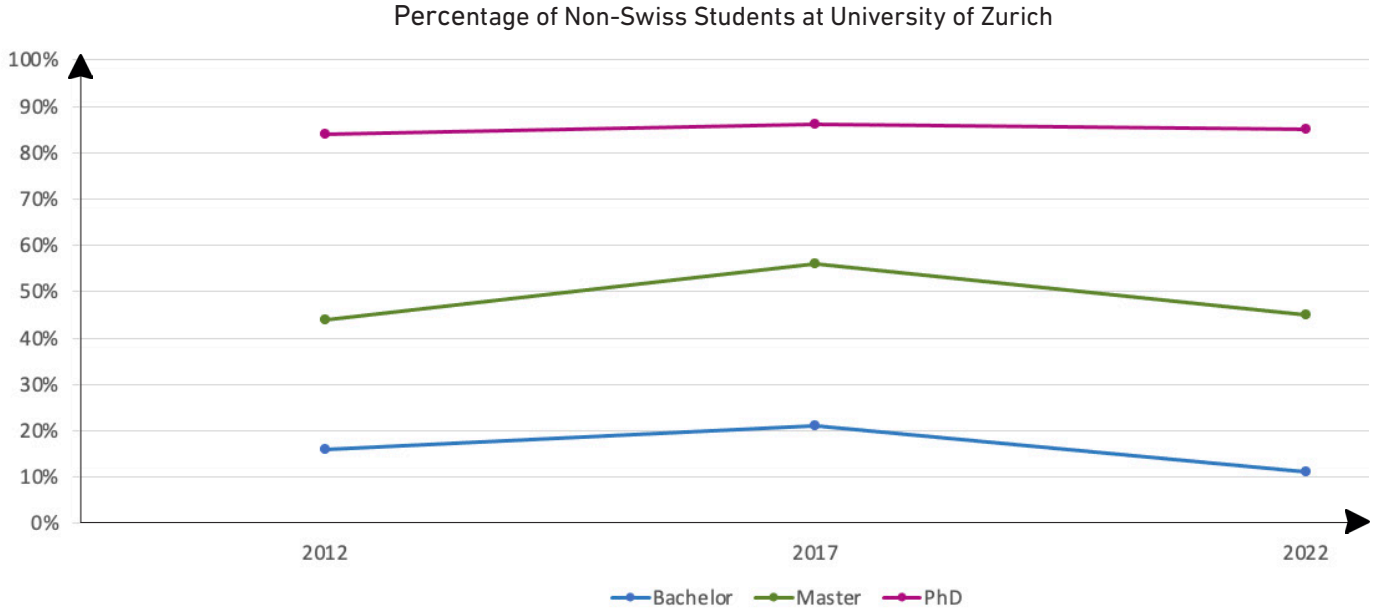
To examine ETH Zurich's non-Swiss students and their proportion to Swiss students, we refer to the 2022 Annual Report of both the ETH Zurich and the University of Zurich. A comparative analysis reveals analogous trends between the two institutions. Both institutions experienced a surge just prior to the onset of the Covid-19 pandemic, and presently, the trend appears to be levelling off, except for the non-Swiss PhD scholars hailing from ETH Zurich, who constitute the vast majority of PhD candidates. It is evident that ETH Zurich has approximately 10% more international students in both Bachelor's and Master's programmes compared to the University of Zurich. This disparity can be attributed to various factors, including ETH Zurich's academic prestige, its specialised programmes - many of which are taught in English - its outstanding research facilities and infrastructure, its funding opportunities, as well as its international network and connections. Our findings strongly suggest that ETH Zurich's academic reputation is closely linked to its student body, thus making it heavily dependent on non-Swiss students, who are in turn dependent on ETH Zurich's infrastructure and global presence.



Development in the proportions of foreign employees in the ETH Domain by function group (in relation to the number of employment contracts, EC).

Figure 3: Development in the proportions of non-Swiss employees in the ETH Domain by function group
Source
ETH Domain Annual Report 2022





Source
ETH and UZH Annual Report 2022
Graphs drawn by the Dept. of Numeric and Other Values


«ETH pursues its real estate management transparently»
Sixth Principle,
Real Estate Strategy 2020

Who consults who?

«Social policies, particularly those of wide social significance, are in one form or another the outcome of multiple meaning creation processes, reflecting their multiple spheres of influence, from the local to the global, from the disciplinary to the multi- and transdisciplinary. Each of these processes requires transparency.»

Clas-Otto Wene, Chalmers University of Technology, Sweden, 1999

Transparency in decision making

" A meaning for transparency in decision process", by Clas-Otto Wene, of the Chalmers University of Technology, Sweden, written in 1999, and J. Habermas' (1981), "Theorie des kommunikativen Handelns", have allowed us to comprehend the significance of transparency in decision-making.

According to Wene, achieving transparency requires facilitating and maintaining open dialogues and communication channels among all stakeholders influenced by social policies. This entails the decision-makers and the actors or experts responsible for shaping these policies.

Social policies are government or institutional measures and actions that seek to tackle social issues and enhance the well-being and welfare of individuals and communities. Concerning real estate and construction, these policies impact aspects such as student housing, subsidies, infrastructure development, and environmentally-friendly building practices. Real estate developers and investors must be aware of and adhere to these policies during project planning and implementation. Effective communication maintains transparency throughout the decision-making process, ensuring that all involved parties are engaged, and their perspectives are considered.

To ensure effective communication the three roots of Communicative Action in Habermas' theory of communications must be considered. According to this theory, any competent speaker makes three validity claims:

1. what he says is true (truth)
2. what he says is normatively correct (legitimacy)
3. he is truthful (authenticity).

It is important to know that the validity of one claim cannot be inferred from another. While it is important to distinguish the three claims, judging someone's actions should consider all three claims together. Communicative competence is expected from someone we seek understanding with, as they should be able to provide grounds for the truth, legitimacy, and authenticity of their statements. Failure to validate a contested claim can hinder communication and understanding, regardless of the validity of other claims.

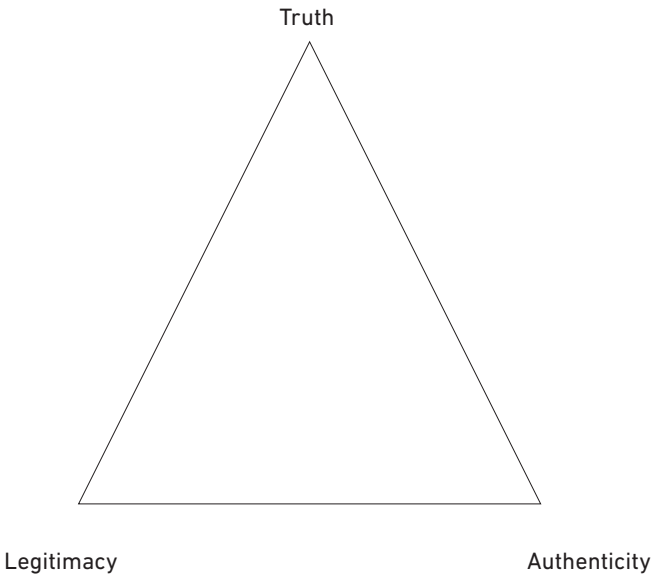


Figure 4: The three roots of Communicative Action
Source
Graph made by Dept. of Numeric and Other Values

Inspired from J. Habermas (1981), "Theorie des kommunikativen Handelns"
https://inis.iaea.org/collection/NCLCollectionStore/_Public/31/016/31016492.pdf


ETH zürich

Transparency as a social responsibility

Furthermore transparency also carries social responsibilities. Individuals and organisations have a social responsibility to promote transparency in order to enhance the welfare and efficient functioning of society. This is known as Corporate Social Responsibility (CSR), which imposes an ethical and socially responsible obligation on companies. The integration of ethical, environmental, and social concerns into a company's business operations and their interactions with various stakeholders are the fundamental constituents of CSR.

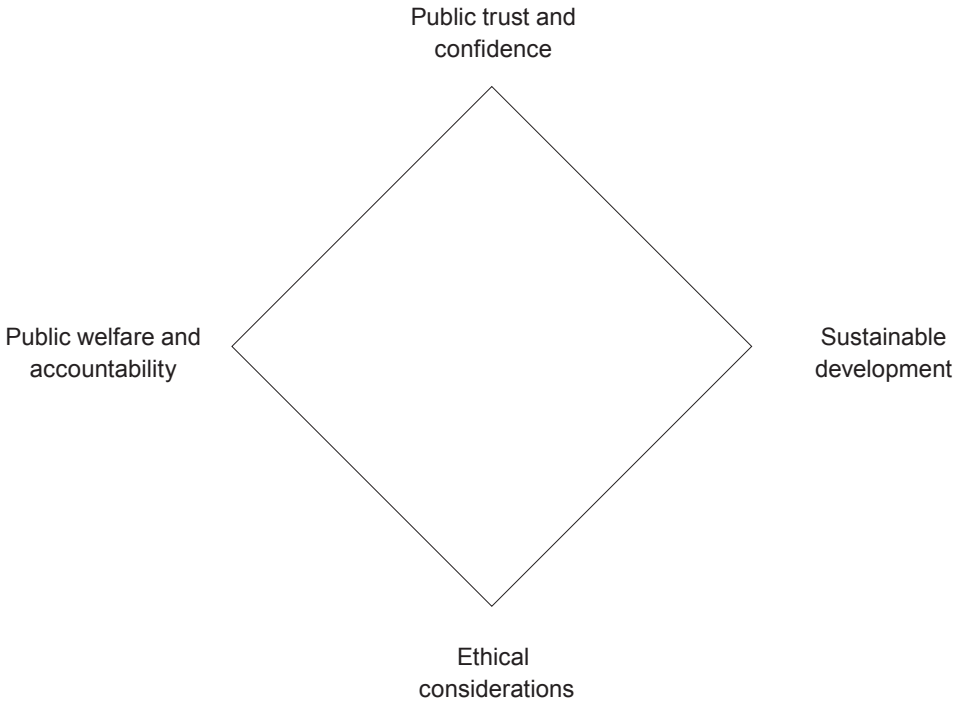
Inspired by the four main types of CSR the Dept. of Numeric and Other Values has reevaluated and recategorized them broadly as follows:

Public welfare and accountability: Transparency allows individuals or organizations to be held accountable for their decisions. It promotes openness and honesty in explaining the reasoning behind decisions, ensuring that decision makers cannot hide behind opaque processes.

Sustainable development: By openly sharing information about decision-making processes, resource allocation, and environmental impact, individuals or organizations can ensure that decisions are made with the long-term well-being of society and the planet in mind.

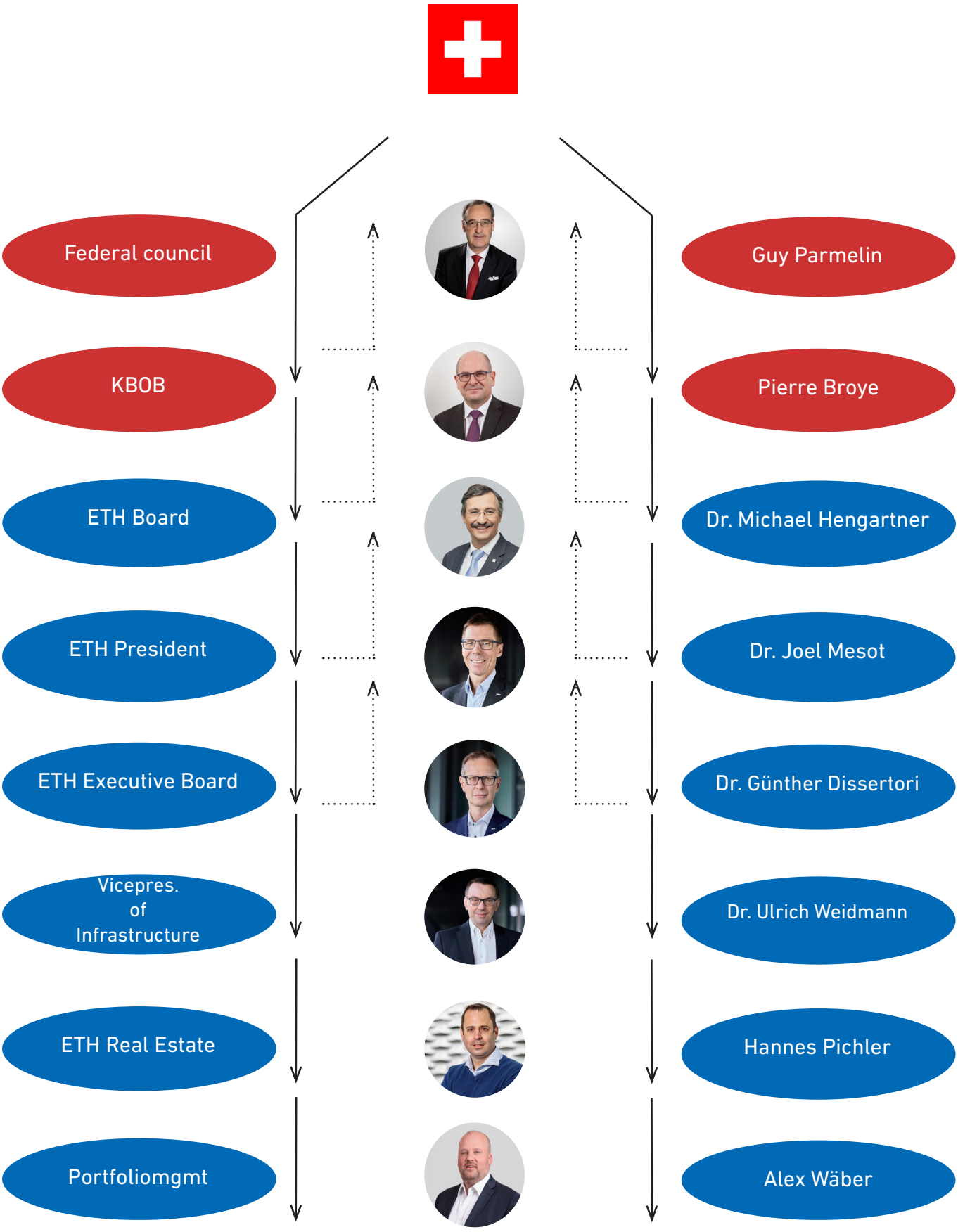
Ethical considerations: Transparency upholds ethical standards by preventing corruption, favoritism, or nepotism in decision making. It creates an environment of fairness and integrity, as decision makers are more likely to consider the wider impact of their decisions and avoid any potential conflicts of interest.

Overall, transparency in decision-making promotes fairness, accountability, trust, and inclusivity, leading to better outcomes and increased public confidence in the decision-making process.



Source
Graph made by Dept. of Numeric and Other Values

Inspired from J. Habermas (1981), "Theorie des kommunikativen Handelns"
https://inis.iaea.org/collection/NCLCollectionStore/_Public/31/016/31016492.pdf
https://ethz-foundation.ch/en/projects/how-to-support/csr/



Source
Decision Flow Organigram drawn by
the Dept. of Numeric and Other Values

The decision continuum

Guy Parmelin is a Swiss Federal Councillor and head of the Department of Economic Affairs, Education and Research since 2016 and 2019 respectively. He has been politically affiliated with the Swiss People's Party (SVP), a right-wing populist party, since 1991. He has held various positions within the party, including serving as the president of the SVP's cantonal section in Vaud. Parmelin held the presidency for the year 2021.

Pierre Broye is the chairman of the KBOB since December 2016. The "Koordinationskonferenz der Bau- und Liegenschaftsorgane der öffentlichen Bauherren" (KBOB) is a Swiss organization that coordinates public construction and property management agencies. It acts as a platform for networking and collaboration among public building authorities, with a focus on construction planning, procurement, and government-owned real estate management. KBOB develops guidelines and best practices to promote efficient and sustainable public construction projects. Its goal is to enhance the quality of construction, increase transparency in procurement, and work closely with federal, cantonal, and municipal authorities and industry stakeholders.

Prof. Dr. Michael Hengartner is President of the ETH Board, the strategic unit elected by the Swiss Federal Council to manage the ETH Domain, and Chairman of the Executive Committee of the ETH Domain. As President of the ETH Board he is responsible for supervising operations, developing policies, managing finances, promoting quality assurance and overseeing the strategic management of the ETH Domain. From 2014-2020 he was appointed as President of the University of Zurich.

Prof. Dr. Joel Mesot is President of ETH Zurich since January 2019. The main responsibilities of the President include providing leadership and strategic direction to the institution, key decision-making related to funding, budgeting and infrastructure management, representing ETH Zurich to external stakeholders, and promoting collaboration and partnerships with third-party institutions. He was the director of the Paul Scherrer Institute (PSI) from 2008-2018.

Prof. Dr. Günther Dissertori is Rector of ETH Zurich since 2022. In contrast to the President the Rector is the highest-ranking academic official at ETH Zurich. They focus primarily on academic matters, education quality, curriculum development, faculty affairs, research support, student affairs, and strategic planning. The Rector provides leadership to faculty, researchers, and students, ensuring the university's academic goals are met. In addition, the Rector is typically a member of the Executive Board, along with other key officials, thus facilitating coordination between academic matters and overall university governance.

The Executive Board plays a significant role in the governance and decision-making processes at ETH Zurich. Comprising of the Rector, the President, the Vice Presidents, and other senior executives, the Executive Board is responsible for the overall management and administration of the university. In addition, the Executive Board represents ETH Zurich in external negotiations and collaborations and advocates for the university's interests. They play a crucial role in shaping the overall vision and ensuring the smooth operation of the institution.

Prof. Dr. Ulrich Weidmann is the Vice President of Infrastructure at ETH Zurich and an expert in the fields of traffic planning and transport technology As Vice President he oversees planning, development, and management of the university's infrastructure. They develop infrastructure strategies, manage construction projects, maintain facilities, allocate resources, and promote sustainability. Their role is crucial in ensuring efficient and sustainable infrastructure development aligned with academic objectives.

Hannes Pichler is the director of ETH Real Estate. ETH Real Estate is responsible for managing and maintaining its owned properties and buildings. This includes the acquisition, renovation, and construction of university facilities, such as academic buildings, research laboratories, student accommodations, and administrative offices.

Alex Wäber is responsible for the portfolio management of ETH Real Estate. The portfolio management of ETH Real Estate includes activities such as acquiring, leasing, maintaining, renovating, and optimizing properties. The goals are to align the portfolio with strategic objectives, maximize space utilization, optimize financial performance, and mitigate ownership risks. Portfolio managers assess space requirements, evaluate properties, and make decisions about acquisitions and disposals. They also handle budgeting, lease monitoring, maintenance, and develop strategies to increase the value of assets. This management supports the university's mission by providing infrastructure necessary for academic and research activities.

This organigram provides an abstracted and simplified overview into the governance and decision-making structure within the ETH Zurich. It depicts the hierarchical flow of decision-making with the key stakeholders from the federal government to ETH Immobilien. There is evidence of underrepresentation of women and non-Swiss entities in the decision-making process. This system remains heavily patriarchal, with societal expectations and traditional gender roles serving as contributing factors to the formation of a "glass ceiling". Coined by Marilyn Loden in 1978, this metaphor symbolises the elusive barrier that thwarts marginalized genders from reaching senior management positions. Efforts to tackle this issue comprise promoting diversity and inclusivity, enacting policies that bolster women's career progression and challenging established gender norms and biases present within organisations.

Source
https://ethrat.ch/, https://ethz.ch/, https://ethz.ch/de/die-eth-zu-erich/organisation/abteilungen/immobilien.html, https://hbr.org/2000/01/a-modest-manifesto-for-shattering-the-glass-ceiling, https://ethz.ch/en/the-eth-zurich/organisation/executive-board.html, https://www.kbob.admin.ch/kbob/de/home.html

Who is ETH Real Estate?

Once the flow of decisions and delegations has passed from the federal state to the ETH Executive Board, where the President (Mesot), Rector (Dissertori) and Vicepresidents (Weidmann) acknowledge and accept the project, ETH Real Estate assumes full control and responsibility for all decisions regarding real estate.

The department relies on 8 key figures. The director is responsible for the operational management and representation of the real estate department and the portfolio manager primarily focuses on the long-term and needs-based development of ETH Zurich's real estate, its strategic demand and space planning, as well as the formulation, monitoring and implementation of the real estate strategy. Each campus of ETH Zurich, including Hönggerberg, Zentrum, and all remote infrastructure, has its own dedicated Asset Manager. The Federal Construction Projects is a team of seasoned project and construction managers. Finally the Business Development and Support branch serves as the administrative arm of ETH Real Estate, while Finances and Controlling are responsible for managing all financial and data-related matters.

While responsible for managing and maintaining ETH Zurichs owned properties and buildings, with a portfolio valued at 5 billion, ETH Real Estate also organize real estate competitions or participate in organizing collaborative competitions with other institutes and industry partners. These competitions can range from case study competitions to design or development projects.

Real estate competitions often involve industry professionals and judges who assess the participants' proposals or presentations. The real estate department can leverage its industry connections to invite professionals as judges or mentors.

To elaborate on the chain of command and demonstrate ETH Real Estate's social responsibility and control, we will use the HIC competition as a case study.

The management of the real estate department (from left): Michael Messerich, Alexander Wäber, Marino Küng, Birgitta Gertz, Andrei Koshelev, Constanze Weihs, Hans-Jörg Kast and director Hannes Pichler.
Source
https://ethz.ch/staffnet/de/organisation/abteilungen/immobilien.html
ETH Zurich, Photo von Beat Baschung

Case Study HIC: We decide who plays the game

ETH Zurich is developing a new *Centre for Students and Entrepreneurs* (HIC) on the north-west side of the Hönggerberg campus. The purpose of the centre is to provide students and entrepreneurial talent with the necessary space to develop and put their ideas into practice. Additionally, it aims to enhance interdisciplinary collaboration between student organisations and entrepreneurial initiatives.

In 2012, Buchner Bründler emerged as the winner of the competition. This chapter examines the selection procedure and the influential decision-makers who determine which constructions come to fruition whilst also tracing the complex pathways of delegation within this process.

A juried competition consists of specialist judges (Sachpreisrichter) as well as subject judges (Fachpreisrichter). The specialist judges are familiar with the technical qualifications, while subject judges are familiar with the local conditions and the task. Professionals must be in the majority. At least half of the experts must be independent of the client.

The specialist and subject judges possess the power to cast votes, whereas the committee of experts does not.

The subject judges are all well respected and experienced architects, landscape architects and urban designers. Meanwhile the specialist judges are all employed by and represent the interests of the ETH.

Meanwhile Dr. Judith Zimmerman represents the values and interests of the students.

Sachpreisrichterinnen & Sachpreisrichter
(stimmberechtigt)

Prof. Dr. Ulrich Weidmann
Vizepräsident für Infrastruktur
ETH Zürich (Vorsitz)

Prof. Dr. Sarah M. Springman
Rektorin
ETH Zürich

Prof. Dr. Detlef Günther
Vizepräsident Forschung &
Wirtschaftsbeziehungen
ETH Zürich

Daniel Bucheli
Direktor Abteilung Immobilien
ETH Zürich

Dr. Judith Zimmermann
Leiterin strategische Projekte
Stab Rektorin, ETH Zürich (Ersatz)

Fachpreisrichterinnen & Fachpreisrichter
(stimmberechtigt)

Mireille Blatter
Leiterin Bauberatung
Denkmalpflege
Amt für Städtebau, Stadt Zürich

Wim Eckert
E2A Architekten
Zürich

Matthias Krebs
Krebs und Herde
Landschaftsarchitekten
Winterthur

Bruno Krucker
Büro Krucker
Zürich

Anne-Marie Wagner
Bachelard Wagner Architekten
Basel

Sebastian Lippok
WALDRAP GmbH
Zürich (Ersatz)

Expertinnen & Experten
(nicht stimmberechtigt)

Nutzervertretung:
Dr. Philipp Bieri
Stab Rektorin
ETH Zürich

Gebäudetechnik:
Stefan Müller
Abteilung Immobilien
ETH Zürich

Brandschutz:
Andreas Sidler
SGU Brand-/Explosionsschutz
ETH Zürich

Betrieb:
Hans-Peter Schärer
Abteilung Betrieb
ETH Zürich

Kostenplanung:
Daniel Gerber
Metron AG
Brugg

Bauingenieurwesen:
Andreas Bärtsch
WMM Bauingenieure AG
Münchenstein

Nachhaltigkeit:
Dr. Dominik Brem
Abteilung Immobilien
ETH Zürich

Schattensimulation:
Marco Baur
Institut für Technologie
Architektur
ETH Zürich

Portfoliomanagement:
Christian Feghali
Abteilung Immobilien
ETH Zürich

Projektleiterin Bauherr
Susanne Mocek
Abteilung Immobilien
ETH Zürich

Moderation:
Regula Scheider
Metron AG
Brugg

The jury members of the HIC competition
Source
"Wo Zukunft Entsteht - Neubau HIC, Zurich, 2021
https://www.sia.ch/fileadmin/sia_142i-101d_Programme_2020.pdf

Specialist judges

Prof . Dr. Ulrich Weidmann,
Vicepresident for Infrastructure
ETH Zurich

Prof . Dr. Sarah Springman,
Rector ETH Zurich

Prof . Dr. Detlef Günther,
Vicepresident of Research and
Economical Relations ETH Zurich

Daniel Bucheli,
Director ETH Real Estate

Dr. Judith Zimmermann,
Leader of strategic projects, student
representation, ETH Zurich

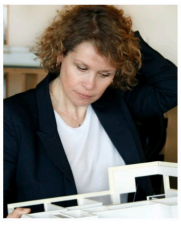
Subject judges

Mireille Blatter,
City planner, Manager Constriction
Consulting, Monument Preservation,

Wim Eckert,
Architect

Mattias Krebs,
Landscape Architect

Bruno Krucker,
Architect



Anne-Marie Wagner,
Architect

Sebastian Lippok,
Architect

The faces of the jury members of the HIC competition
Figure made by the Dept. of Numeric and Other Values

Specialist judges

Prof . Dr. Ulrich Weidmann,
Vicepresident for Infrastructure
ETH Zurich

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Rector ETH Zurich

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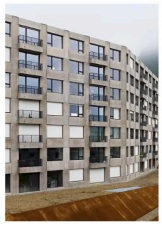
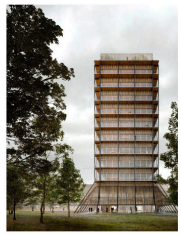


Mattias Krebs,
Landscape Architect

Bruno Krucker,
Architect



Anne-Marie Wagner,
Architect

Sebastian Lippok,
Architect

An abstracted visual representation of the jury members of the HIC competition
Source(s):
https://www.e2a.ch/, https://krebsundherde.ch/, https://ethz.ch/, https://www.buerokrucker.ch/, http://www.bachelard-wagner.ch/, https://www.waldrap.ch/, https://ethz.ch/, https://www.linkedin.com/
Figure made by the Dept. of Numeric and Other Values

This diagram is a representation of the jury's work - abstracted and iconized. The HIC's construction was ultimately decided by a panel of 11 individuals. We are very interested on how and by whom this jury is decided upon, and what values in relation to architecture but also ETH they may have.

By removing the individual identities of the jury members, the focus is shifted towards a representation of their work and the common elements that emerge. This visual translation helps to set a clear common denominator in the jury's architecture.

This architecture exudes a sense of grandeur and substantiality. Its themes may not overtly convey concerns about climate change or resource reuse, but rather emphasize the novelty of building. It reflects a corporate aesthetic that is characterized by a sterile, impersonal quality. While not here to pass judgment on this approach, it is evident to us that there is a cohesive visual language present in all their works, representing a new corporate identity.

This representation initiates a discourse surrounding the influence of collective decision-making processes and the establishment of more bodies actively representing the realm of architecture. But how can we make this collective more diverse and transparent? How come the students' voice is remotely represented through Dr. Judith Zimmermann and not by actual student bodies? Especially when deciding upon a building for students - The Centre for Students and Entrepreneurs...

Engaging in further exploration and analysis of this phenomenon fosters an understanding of the underlying dynamics shaping the architectural profession, its "behind-the-scenes", and the potential implications for diverse stakeholders and us - the ETH community.

An interior view of the HIC, won by Buchner Bründler and Rapp Architekten
Source: https://www.metalocus.es/en/news/centre-student-initiatives-and-talent-ethz-buchner-brundler-architekten-rapp-architekten

No closed doors

The days of closed doors are gone. In order to actively participate in our academic environment and understand the decision-making mechanisms that go on behind the scenes, we need to ensure maximum transparency and communication, and embrace diversity and representation. It is time to recognise how decisions can affect different groups and to push for the implementation of frameworks for equitable outcomes.

To fully implement the sixth principle of the Real Estate Strategy, which calls for transparent decision-making, ETH Zurich must actively solicit input from a wide range of stakeholders during the decision-making process. This encompasses all types of bodies associated with the ETH Zurich: students, faculty, staff, community members, and other relevant parties who could be impacted by the decision. To ensure inclusivity and representation in the decision-making process, ETH Zurich can create opportunities for open dialogue and solicit diverse perspectives.

By involving a diverse range of stakeholders in the decision-making process, ETH Zurich can gain insight into the distinct challenges and perspectives of these communities, thereby facilitating more equitable outcomes. Furthermore, the institution should consider the varying implications that decisions may have on different genders, social groups, and identities. A comprehensive evaluation of the outcomes of every decision must be carried out, taking into account the advantages and drawbacks for all groups involved.

Additionally, the institution should take into account the differential impact that decisions may have on different genders, social groups, and identities. This requires a thoughtful and comprehensive analysis of the potential consequences of each decision, considering the potential benefits and disadvantages for different groups. ETH Zurich can strive towards more fair and inclusive results by recognizing and addressing potential disparities.

To effectively implement this principle, ETH Zurich must lay down unambiguous guidelines and frameworks for decision-making that explicitly address diversity considerations. This may entail developing decision-making processes that actively seek various perspectives, including diverse representation on decision-making committees, and integrating tools and approaches to assess potential impacts on different groups. In general, transparent decision-making is crucial.

Overall, transparency alone is insufficient for effective decision-making. It is crucial to have an inclusive and representative process that prioritises real communication and considers the diverse experiences, needs, and perspectives of societal groups, in order to promote diversity, equity, and inclusivity at ETH Zurich. The current decision-making state in the chain of command at ETH Zurich, particularly with regards to real estate, lacks diversity and inclusivity. The concentration of decision-making power among white, middle-aged Swiss men is worrying with regard to representation and equitable participation. It is unfair and illogical to exclude key stakeholders, including Swiss students, non-Swiss students, staff, and other entities, from participating in shaping their surroundings. Diversity and inclusivity are crucial components of ethical and effective decision-making processes. Restricting decision-making power to a narrow group of individuals overlooks the perspectives, experiences, and needs of other groups. This perpetuates the marginalisation of certain voices, hinders the ability of ETH Zurich to make informed and well-rounded decisions, and limits accountability and legitimacy.

Therefore, incorporating diverse voices into decision-making is vital. When decision-making processes involve multiple stakeholders, a system of checks and balances is established, preventing decisions from being made in isolation or without transparency. This facilitates a more transparent and equitable decision-making policy, promoting trust and confidence among the broader ETH Zurich community.

The Very Federal Institute of Technology Zurich

A shift in perspectives is required when examining the connection between ETH Zurich and the federal government. Although recognizing the undeniable links between ETH and Switzerland, it is crucial to scrutinize the organization's function and the state's impact. Concerns emerge when a populist politician assumes a key position in the decision-making hierarchy at ETH Zurich. Populist ideologies can potentially impede the institution's capacity to realise its global potential by prioritising national interests.

The color choice of the logo's color, blue, which symbolizes water, connection, and the world, is an interesting point to consider. It reflects the vast reach and interconnectedness that ETH Zurich embraces. By adopting a colour associated with global context, the logo signifies the institution's dedication to promoting a wider world perspective. But is that really what ETH Zurich represents? Global interconnectedness and diverse interests? We don't think we're there yet - ETH Zurich is still very much influenced and shaped by the political landscape of Switzerland, whose political model predominantly relies on neutrality and stability. This system, while ensuring stability and widespread input, can sometimes slow down the pace of change and make it difficult to challenge established practices.

It implies a reluctance to embrace new approaches that could broaden Switzerland's perspectives and demonstrates a lack of courage and openness. It is crucial to move beyond path dependency, not only to consider other values and interests but also to allow for a fresh outlook. Similar to architecture, once initial decisions and concepts are decided upon, breaking away from them and reevaluating becomes challenging. In Swiss politics, the existing decision-making system has deep-rooted structures that make it difficult to break away from. Therefore, considerable effort is needed to depart from the status quo.

ETH Zurich is deeply embedded within Switzerland's political context, making it challenging to break free from established norms and ideologies. So maybe ETH logo shouldn't be the color blue, but one that truly represents its interests - Switzerland's interests ■

Suggestion for a new Swiss ETH logo drawn by the Dept. of Numeric and Other Values
Source
https://ethz.ch/

Conclusion

The Department of Numeric and Other Values operates within the Competence Center for ETH Zurich Spatial Politics. This research paper aimed to comprehend ETH Zurich's fundamental principles, exploring both numeric and other values while shedding light on its intricate bureaucratic structure.

Our investigation focused on the financial and operational methodology of the institution, scrutinising ETH Zurich's definition and implementation of sustainability and sustainable building practices. Additionally, we provided insights into people calling the shots and especially the process behind decision-making. Ultimately, our goal was to disclose how ETH Zurich operates, to reveal the numbers behind their actions and the other values that guide them.

The first chapter delves into the growth journey of ETH Zurich and the financial complexities it faces. Historically, ETH Zurich's growth aligned with Switzerland's economic progress, backed by substantial federal funding and a commitment to excellence. However, the institution is now encountering financial constraints due to reduced tax revenues amid the COVID-19 pandemic, impacting its expansion plans, particularly in real estate investments. Contradictorily, ETH Zurich wants to adress forthcoming challenges by an expansion of main usable area. The study highlights three significant shifts in ETH Zurich's strategies to navigate these limitations. Notably, the institution is moving towards value enhancement, seeking third-party investments, and embracing larger-scale projects with greater efficiency. These shifts underscore the challenges institutions face in balancing growth aspirations with financial constraints.

The second chapter delves into ETH Zurich's multifaceted approach to sustainability across operations, maintenance, and new constructions. They've meticulously aligned emission classifications, implemented reduction measures across three scopes, and embraced initiatives like the Swiss Climate Protection Act, aiming for net-zero emissions by 2040. The chapter highlights the institution's commitment to sustainability, reflecting in their systematic efforts across different facets of their operations, maintenance, and upcoming constructions. However, ETH Zurich's approach to sustainability is heavily reliant on costly technological systems, rather than the core principle of sustainable architecture: building less. The emphasis on high-tech solutions might overshadow the fundamental aspect of reducing environmental impact by minimising construction. It seems their priority could lean toward being labelled "green" rather than prioritising the reduction of construction and environmental footprint.

The third chapter provides insights into the governance structure and decision-making processes within the ETH Zurich. It illustrates a hierarchical flow of decision-making from the federal government to ETH Immobilien, the department responsible for real estate matters. This process involves multiple stages and individuals, eventually granting considerable control to ETH Immobilien in matters such as competitions, architect selection, jury formation, and financial management. Efforts are ongoing to enhance the representation of women in academic positions. This progress is attributed to various factors like increased access to education and changing societal attitudes, yet recent years have shown a slowdown in this development. There's a noticeable increase in the presence of international students and professors at ETH. This trend is attributed to the institution's teaching and research opportunities. In summary, the chapter underscores the complex governance system within ETH Zurich.

Through our research and the knowledge we've gathered, we have defined three principles that we strongly advocate for ETH Zurich to incorporate into its future endeavours. These principles encapsulate not just ideals but actionable pathways that can significantly enhance the institution's trajectory and impact.

No economy to grow for

The first principle emphasises prioritising societal growth and inclusivity over an exclusive focus on economic gains. It advocates for a shift towards horizontal learning, which involves promoting equal opportunities and fostering a collaborative environment where diverse perspectives and experiences contribute to the growth of the entire community. This principle encourages ETH Zurich to expand its focus beyond traditional measures of success, such as economic growth, and to actively invest in initiatives that foster social cohesion, diversity, and inclusive learning environments.

No emissions to compensate

The second principle highlights the importance of sustainability. Both present and future generations aspire for ETH Zurich to incorporate a sustainable building practice that prioritises immediate environmental impact over a techno optimistic dream scenario. This vision advocates for prioritising existing structures over building new, emphasising current emissions reduction rather than banking on prospective savings: although money is a fundamental part of this attention to be paid to the building portfolio. Our collective desire is for ETH Zurich to cultivate a genuine and earnest commitment to environmental stewardship.

No closed doors

The third principle advocates for a transparent decision-making policy that encompasses a multitude of perspectives and experiences. It stresses the importance of an inclusive process that considers input from diverse stakeholders, ensuring that decision-making is not only transparent but also representative of various societal realities and identities. Within this principle, ETH Zurich is encouraged to implement decision-making frameworks that explicitly account for the impact of choices on different genders, social groups, and identities. The institution should recognize the differential effects decisions can have and work towards equitable outcomes for all. This principle underscores the necessity of embracing diversity not only as a value but as an integral part of the institution's decision-making fabric.

ETH Zürich

Chair of Affective Architectures

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Competence Centre for
ETH Zurich Spatial Politics