ARCHITECTURE OF
TERRITORY
Power to the People
Fall 2025

Semester
Programme

The Production of Cloud

Investigating Swiss
Data Infrastructures

Colophon

Studio Series
POWER TO THE PEOPLE

Fall Semester 2025

THE PRODUCTION OF CLOUD
Investigating Swiss Data Infrastructures

POWER TO THE PEOPLE
is a studio series at Architecture of Territory dedicated to improving the social and environmental outcomes of sustainability transitions. The studio is affiliated with the Swiss Network for International Studies (SNIS) through the research grant: “The Production of Cloud”.

ARCHITECTURE OF TERRITORY
Professor Milica Topalović

Teaching Team:
Martin Kohlberger
Yiqiu Liu
Jakob Walter
Jan Westerheide

Student Assistants:
Leon Schade

ETH Zurich D-ARCH
ONA G41
Neunbrunnenstrasse 50
8050 Zurich, Switzerland

aot@arch.ethz.ch
architectureofterritory.com

THE PRODUCTION OF CLOUD
Investigating Swiss Data infrastructures

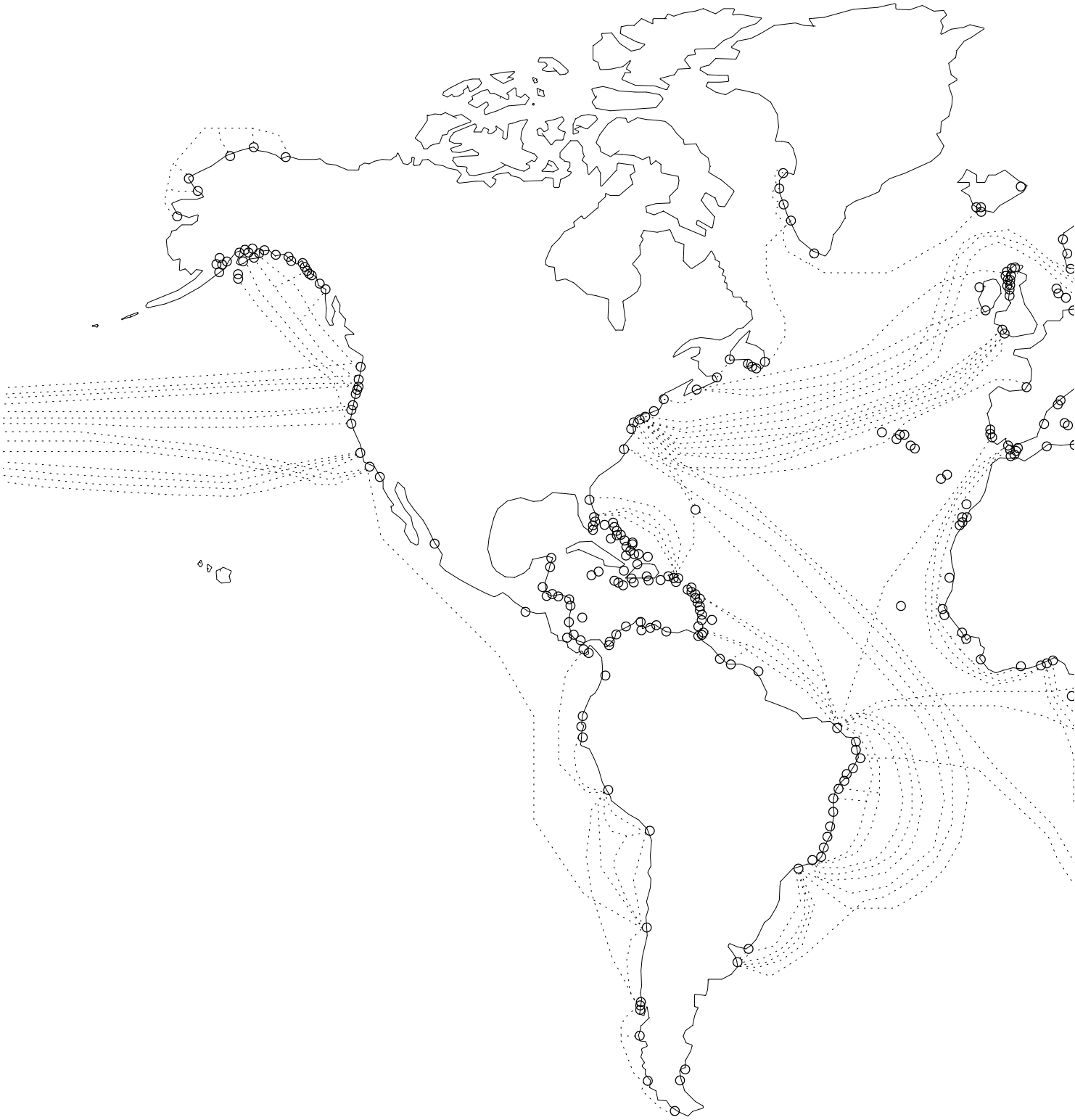
Your TikTok scroll, a robotaxi's U-turn, a question to ChatGPT—every byte lives somewhere in the cloud, consuming megawatts, and silently redrawing the space around us. Public discourse, however, surrounds us with cloud-like images against bright blue skies. Artificial Intelligence—the latest and most attention-hungry use of cloud computing—has been adopted by more than half the world's population.
Yet, the production of the cloud relies on material processes—a planetary metabolism of mineral extraction, water depletion, e-waste, and often exploitative labour practices in remote regions. Every click, search, or generated image drives the global AI race for better models, larger infrastructures, and tighter control over resources and data sources—so much so that AI is becoming an obstacle to energy transition.
Alongside concerns such as digital pollution and digital detox, a debate on data sovereignty has emerged—it's about the ability of nations, and thus institutions and individuals within their borders, to maintain local control over the data they produce, a form of power now increasingly concentrated in the hands of a few tech giants.

To understand AI's spatial impacts, we will look at Switzerland—a country where "data is the new gold", and where AI growth capitalises on political stability, good infrastructure and low taxes. New data centres are being built in tax havens, along infrastructure corridors, near tech headquarters, and Zurich and Geneva's financial hubs.
Though the first Swiss data centres were built in the 1960s and the '70s by public institutions including the Swiss Military (EMD) and ETH, they were rarely given a distinct architectural expression. The iconic building of the Swisscom data centre, designed by Theo Hotz and built in 1979 as a PTT telecommunications hub, has been repurposed several times following technological shifts. Originally, it had a canteen, a Hort, and tennis courts for employees — all of which are no longer in use, since operations now require fewer than ten staff across the entire site. The history of the data centre is thus entangled with automation and a certain dehumanisation.
As an architectural typology, data centres are often black boxes: hermetic, windowless, sometimes hidden in Alpine bunkers. Their architectural task is to maintain uninterrupted

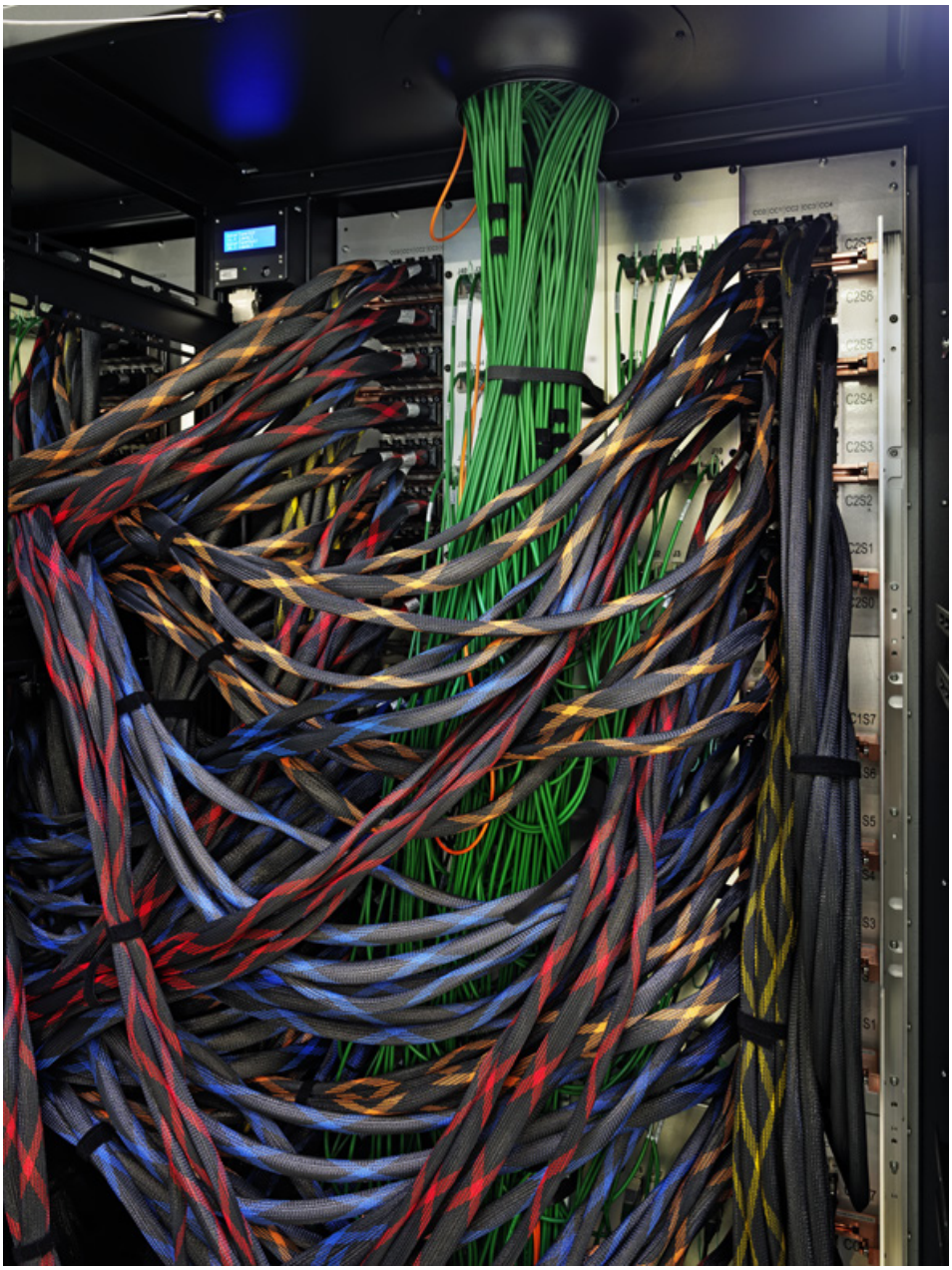
power supply, optimal humidity and temperature for server operations, and to articulate security barriers that restrict public access to both the facilities and information. These interiors are encased within defensive ensembles of fences, gates and security cameras—the amplified security aesthetics that arguably function as part of the business offering to private clients. In urban contexts, the location of a data centre is determined primarily by connectivity to the electrical grid and fibre-optic backbones. A recent study forecasts that by 2030, Swiss data centres will multiply and consume 15 percent of the nation's electricity. In contrast, they provide few jobs, limited public benefits, and attract little investment to local communes. Although the Canton Zurich requires all newly built data centres to channel their waste heat into district heating networks, these systems are often already supplied from other sources or would require costly expansion to store and transmit the additional energy.

This semester, we invite you to explore the environmental and social impact of the Swiss data cloud. How can we study securitized spaces of minimal human presence? What kind of buildings and infrastructures underpin the cloud? What externalities does it produce and how might they be minimised? What forms of cloud expansion are expected in Switzerland? Who controls the use of data? We also want to speculate about a design of future data centres that are not merely black boxes but can serve as public assets. How might designing data centres contribute better to a just transition and to urban life? Each student team will be assigned a specific data centre in Switzerland as a study site to investigate through fieldwork and interviews. You will work across scales and media: from visualising Switzerland's cloud infrastructures through narrative cartographies, to analysing urban impact of data centres through drawings and video and exploring their architecture through models. For your final project, you will build an interpretative architectural model of a data centre that expresses your design hypothesis. How can we make the invisible visible—and design a better data centre?

Content



Schematic map of worldwide submarine cable distribution.
"Storage of Basically Everything", Lukas Graf and Seliena Sigg, Free Diploma 2019, Prof. Arno Brandlhuber, ETH Zürich



Left: Cables connecting the supercomputer Alps at CSCS in Lugano. Image: Andrea Helbling
Right: A China Mobile cloud service advertisement at Nanjing train station


中国移动 China Mobile
移动云
移动云
一朵算力在线的云
算网大脑智能调度全国算力，赋能千行百业
服 务 热 线
4001-10086-8
CATL宁德时代
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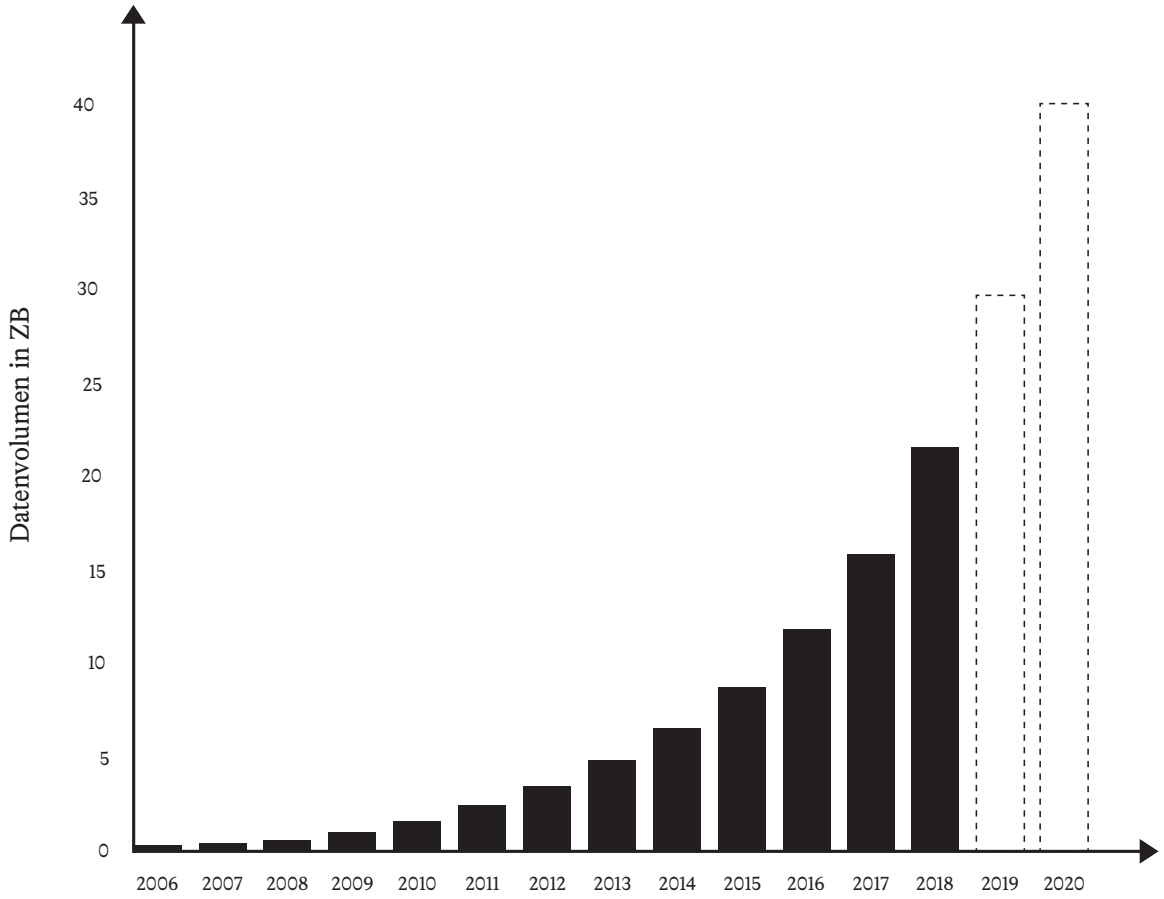
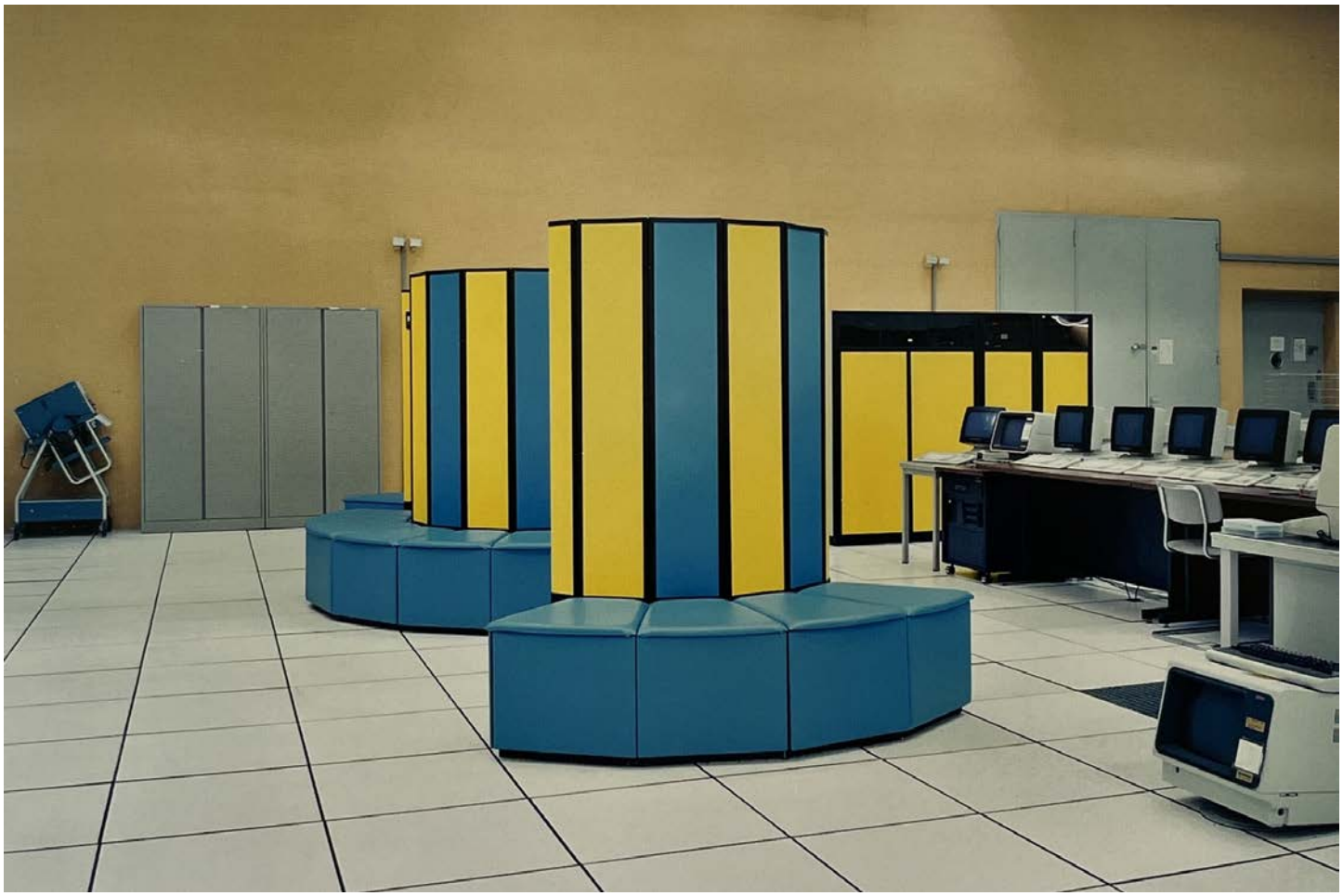
检票口 R4-R7

Data centres of TikTok and Tencent in Zhangjiakou, China.

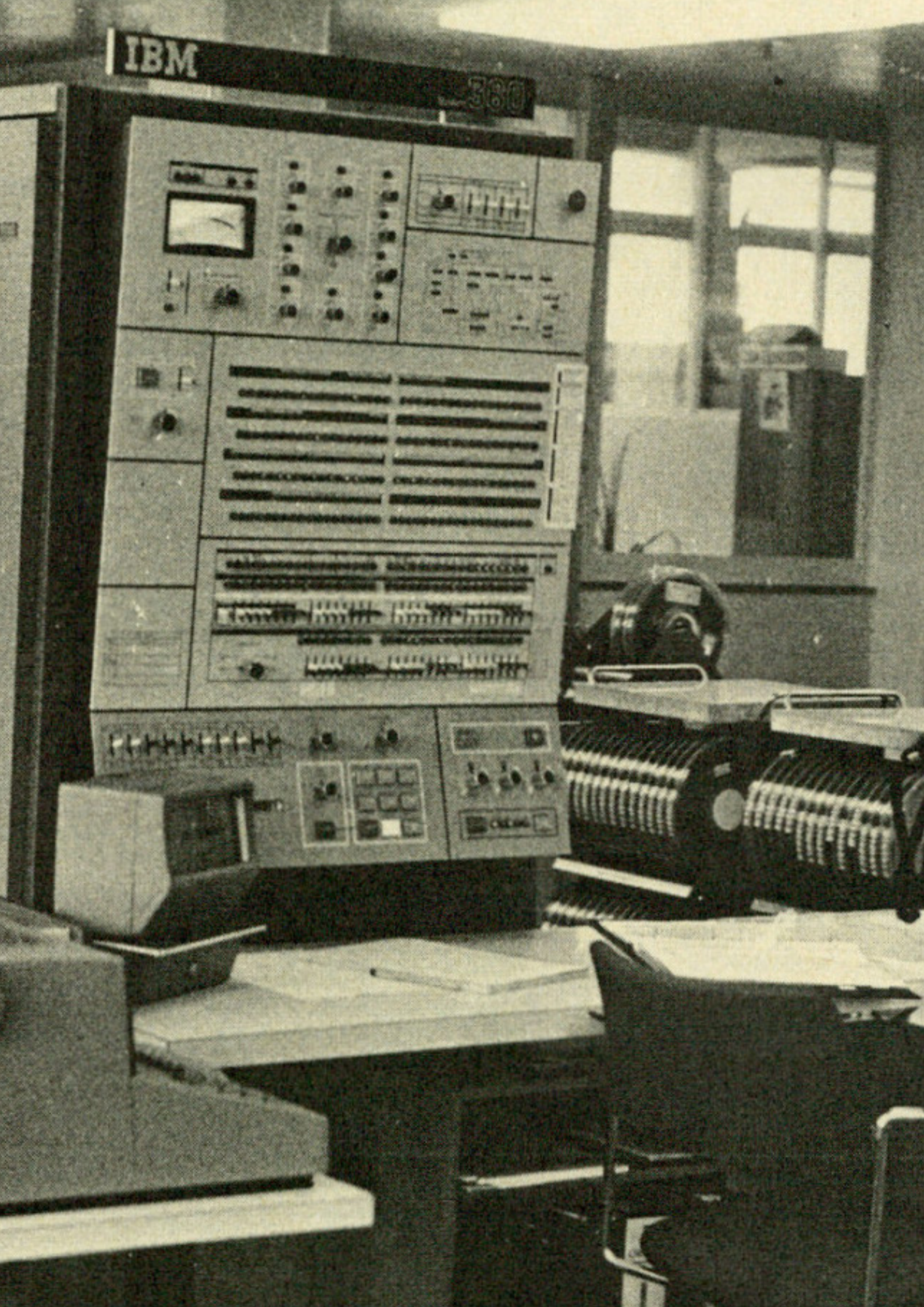


Growth of worldwide data volume
"Storage of Basically Everything", Lukas Graf and Seliena Sigg, Free Diploma 2019, Prof. Arno Brandlhuber, ETH Zürich

CERN Geneva Switzerland, Sites of Technology, Lewis Baltz, 1989.



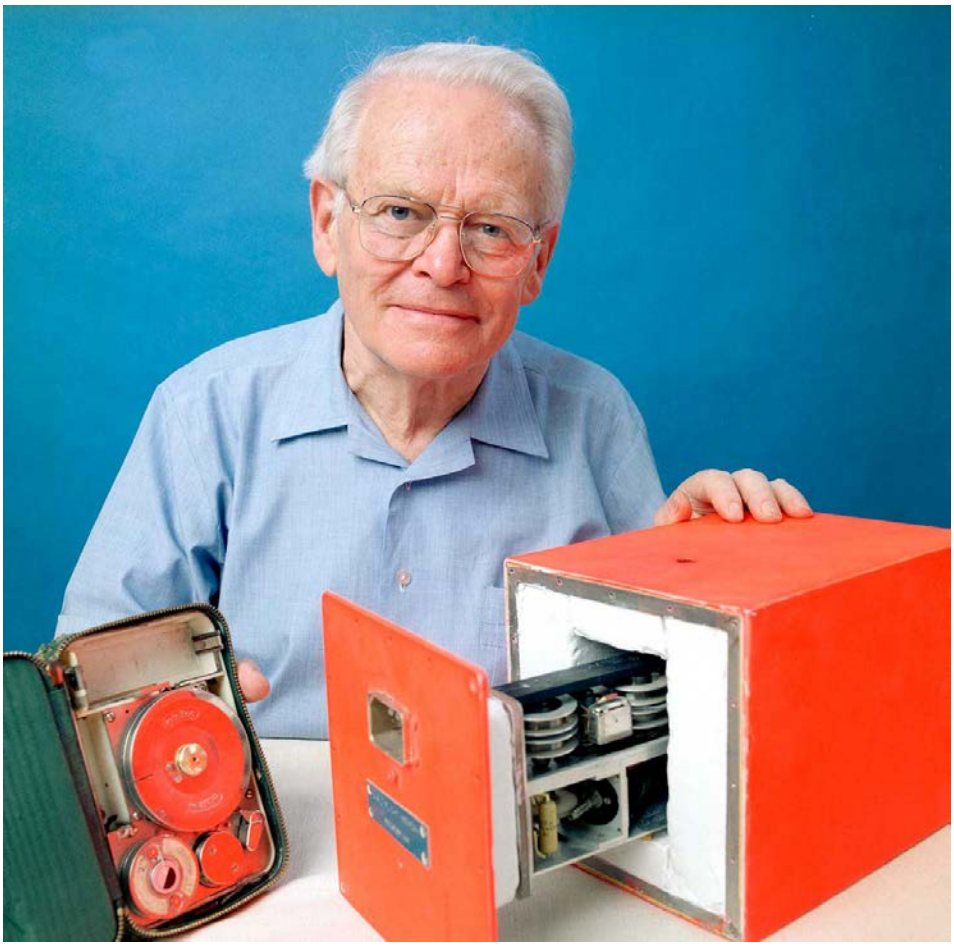
Cray supercomputer, CERN Geneva Switzerland, Sites of Technology, Lewis Baltz, 1989.


IBM
360

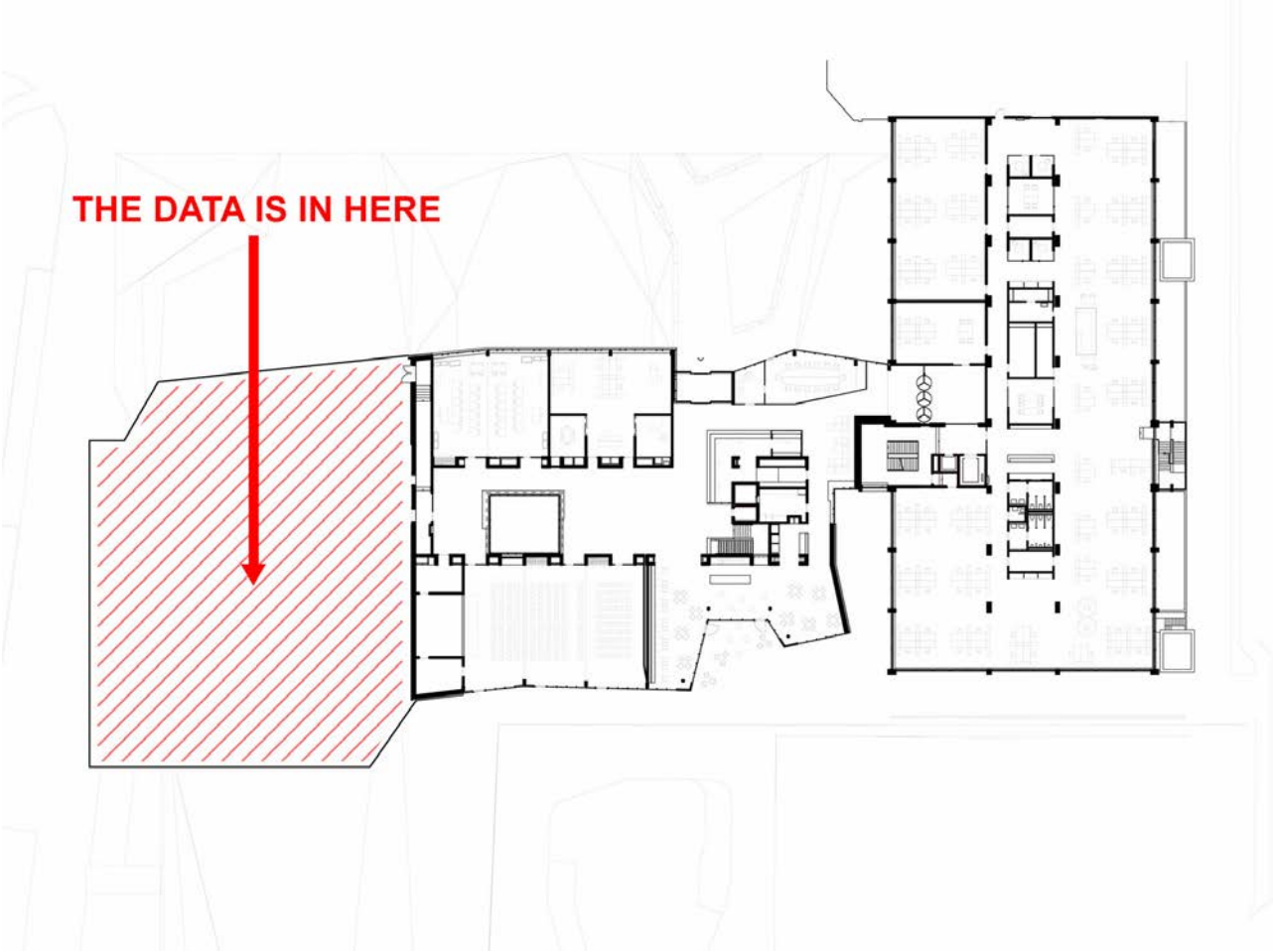
Left: The IBM 360/50 at the computer centre of the Federal Military Department, Swiss Federal Archives, 1969.
Top: Computer room in the first data centre of ETH Zürich at Clausiusstrasse 55, Wolf Bender, 1970.
Bottom: A worker operating with punch cards at the IBM centre of PTT in Zürich–Wiedikon, 1966.

Left: The Fernmeldebetriebszentrum 3 in Zürich-Herdern, seen from the street, Theo Hotz, 1978.
Right: View from Aargauerstrasse as seen today.

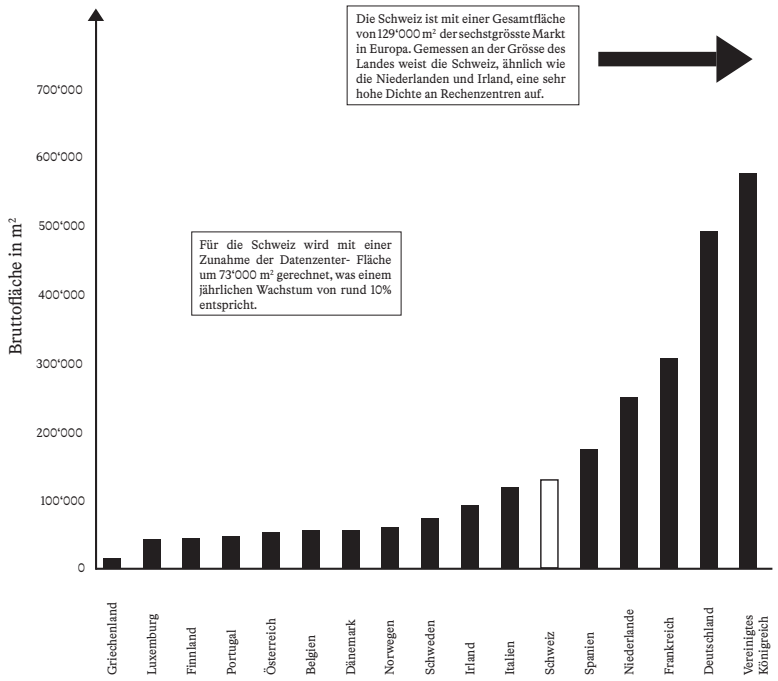

swisscom
Besucher

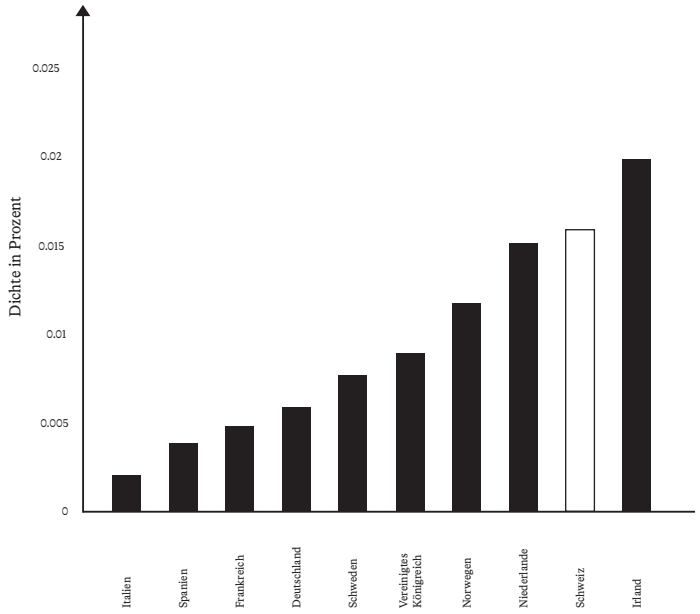


The inventor of the black box used in aviation David Warren with a first prototype, 2004.



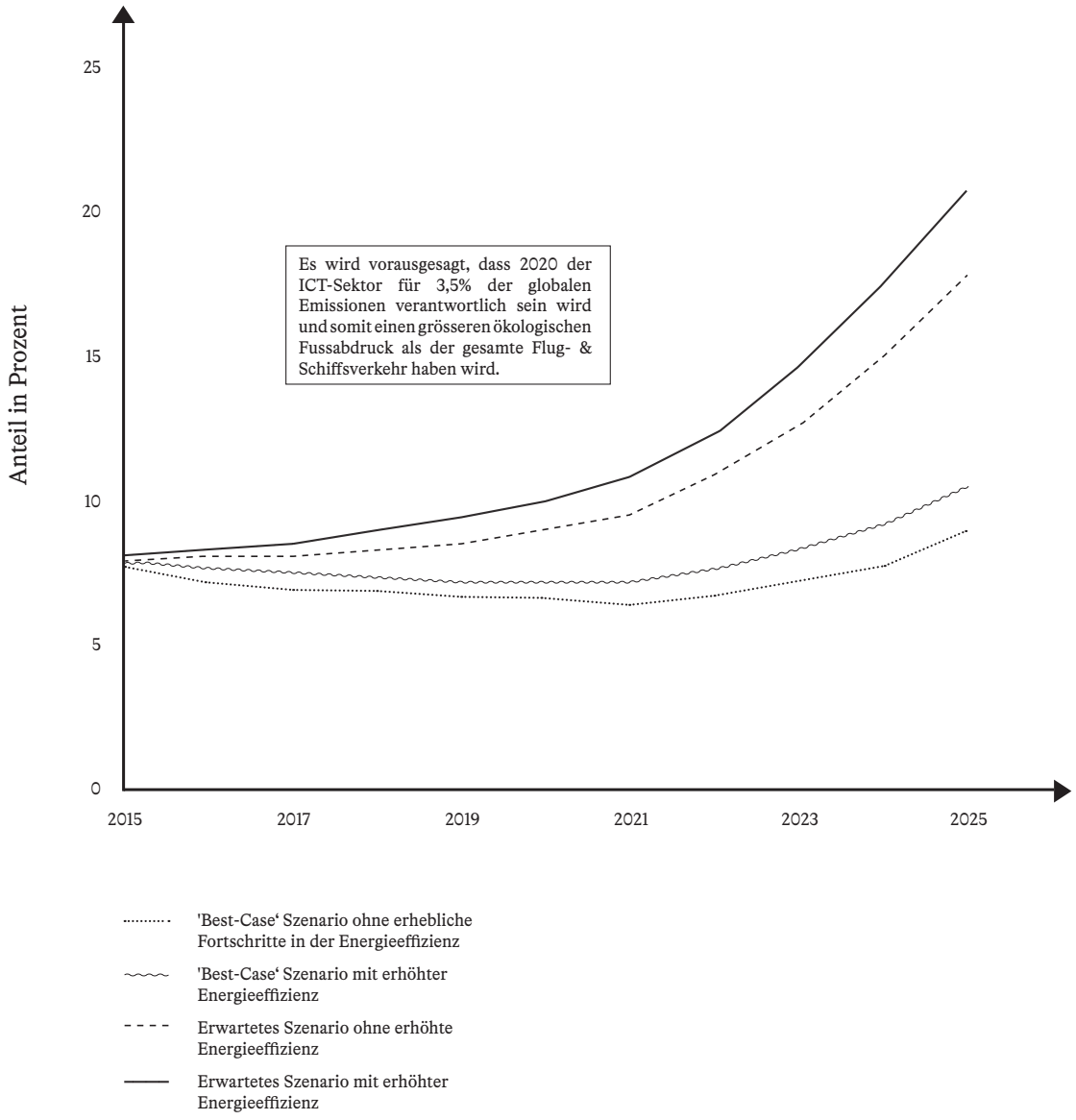
Top: Plan, communal data centre, city of Zurich, OIZ, Ballmoos Krucker Architekten, 2012.
Bottom: Communal Data Centre, City of Zurich, Ballmoos Krucker Architekten, 2012.



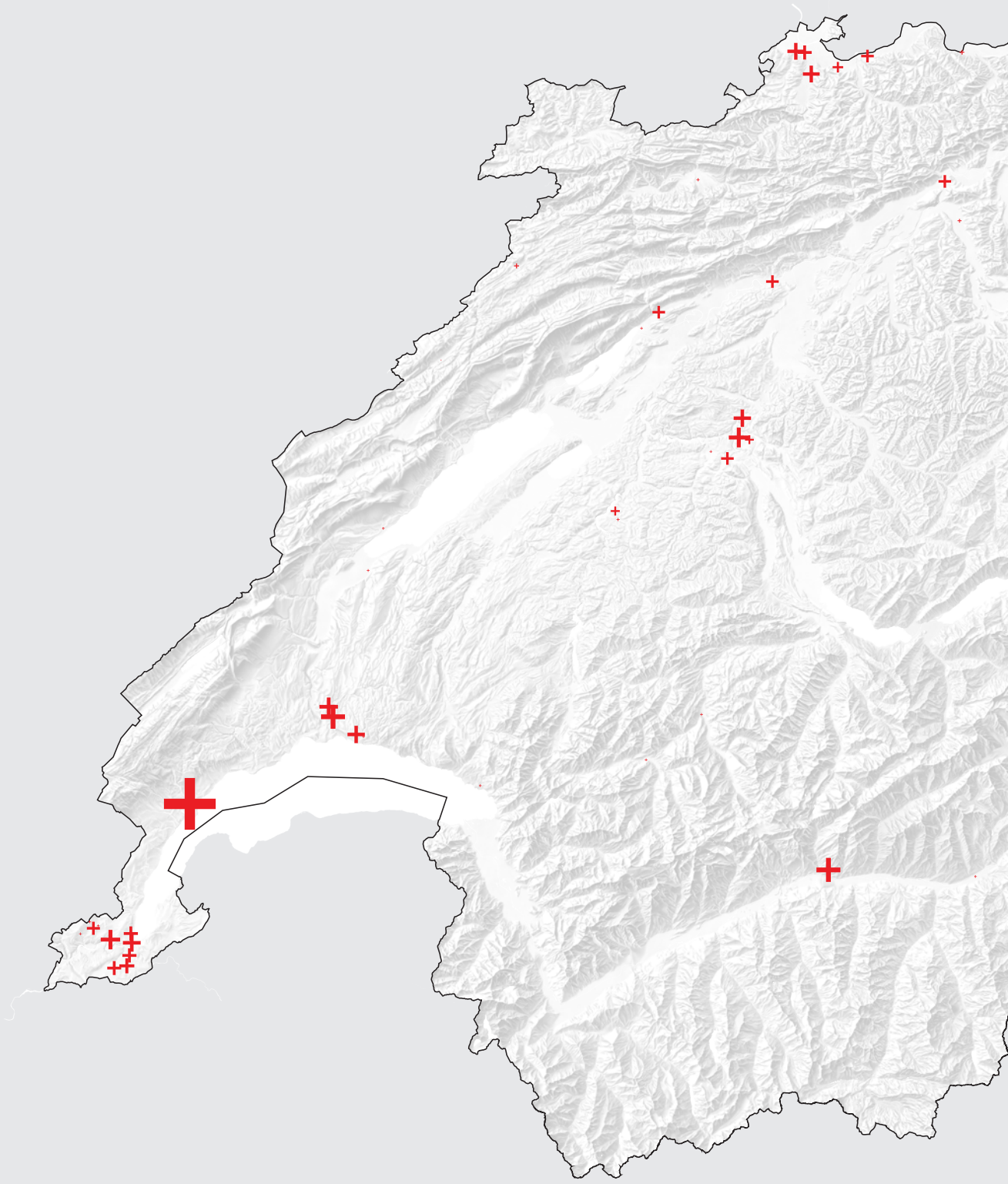


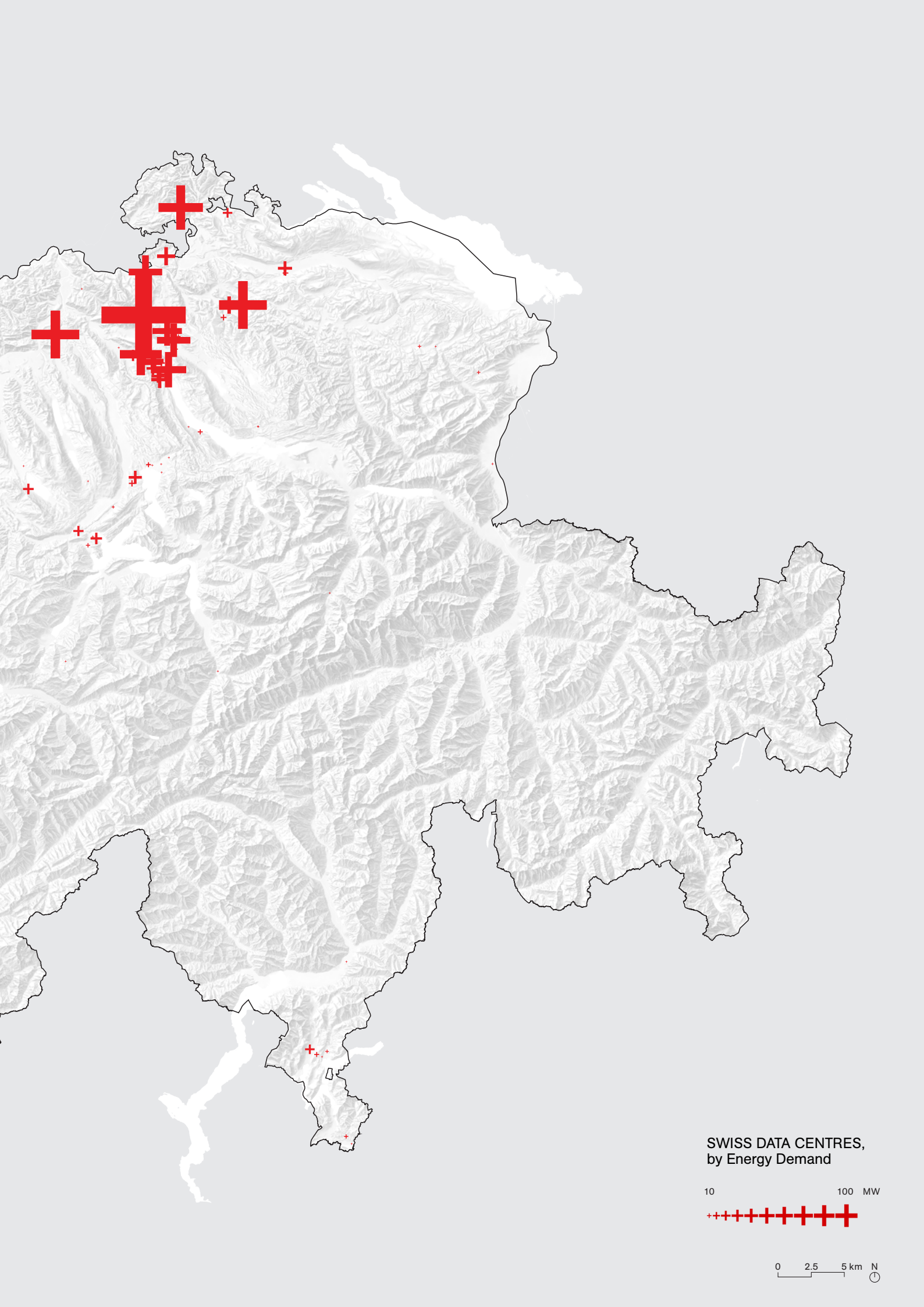
Top: Gross floor area of data centres in Western European countries, 2019.
Bottom: Floor area of data centres by inhabitant, 2019.
"Storage of Basically Everything", Lukas Graf and Selena Sigg, Free Diploma 2019, Prof. Arno Brandlhuber, ETH Zürich.

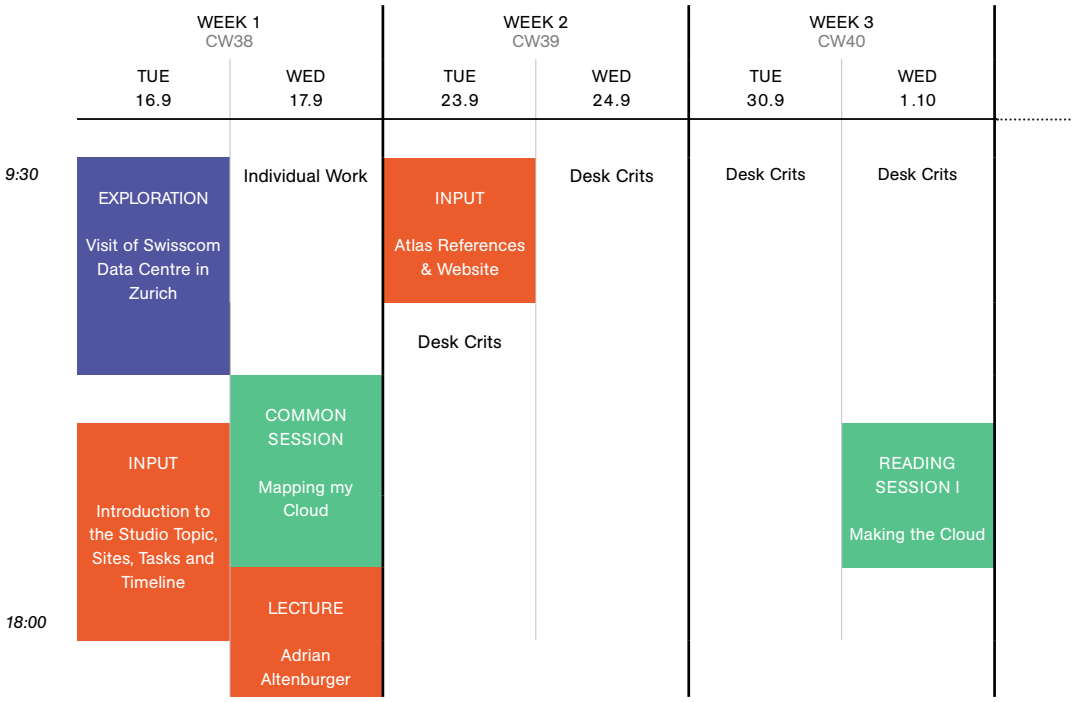
Super computer Alps at the Swiss National Supercomputing Centre, CSCS of ETH Zürich in Lugano, 2023.

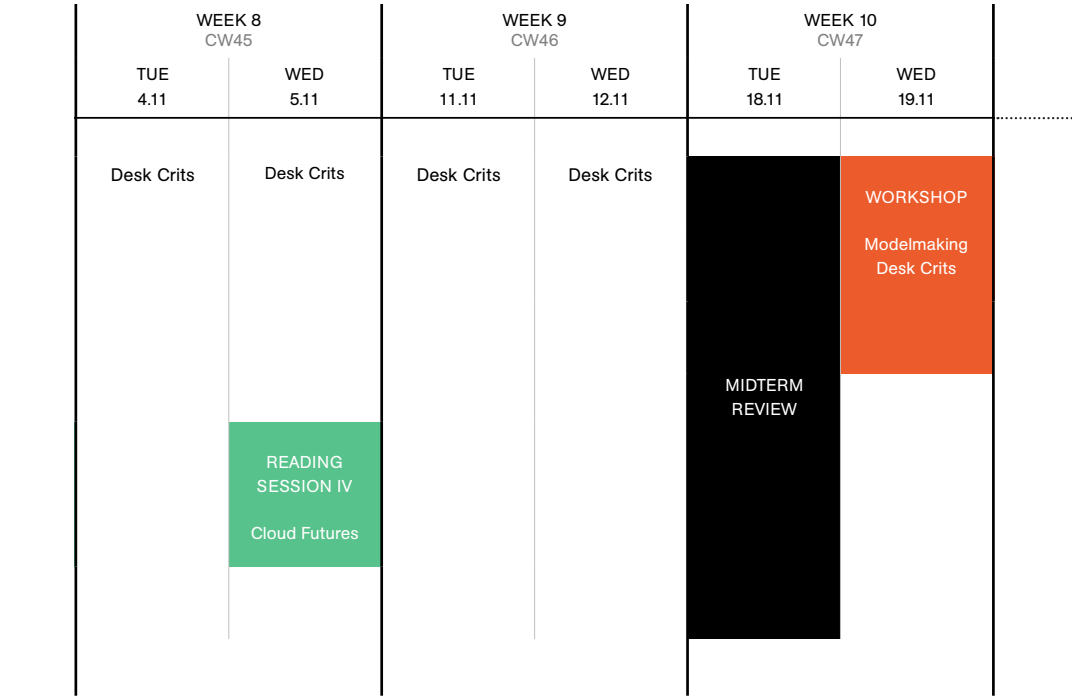


Left: Share of communication technology in global energy consumption,
"Storage of Basically Everything", Lukas Graf and Selena Sigg, Free Diploma 2019, Prof. Arno Brandlhuber, ETH Zürich
Right: Windmills are seen at SwissWinds farm, Europe's highest wind farm at 2500m, Gries, 2022.




SWISS DATA CENTRES,
by Energy Demand
10
100 MW
0
2.5
5 km
N





Inputs

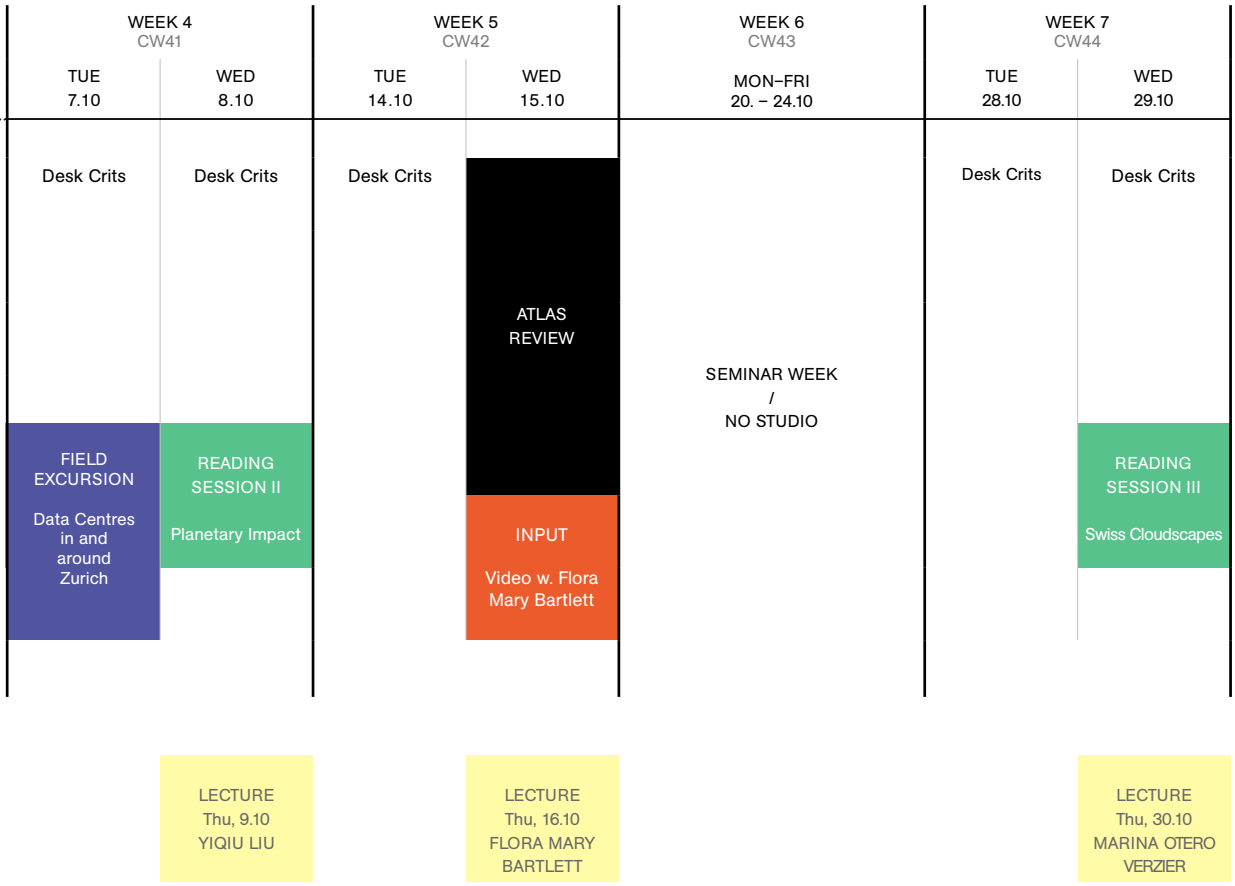
Common Sessions

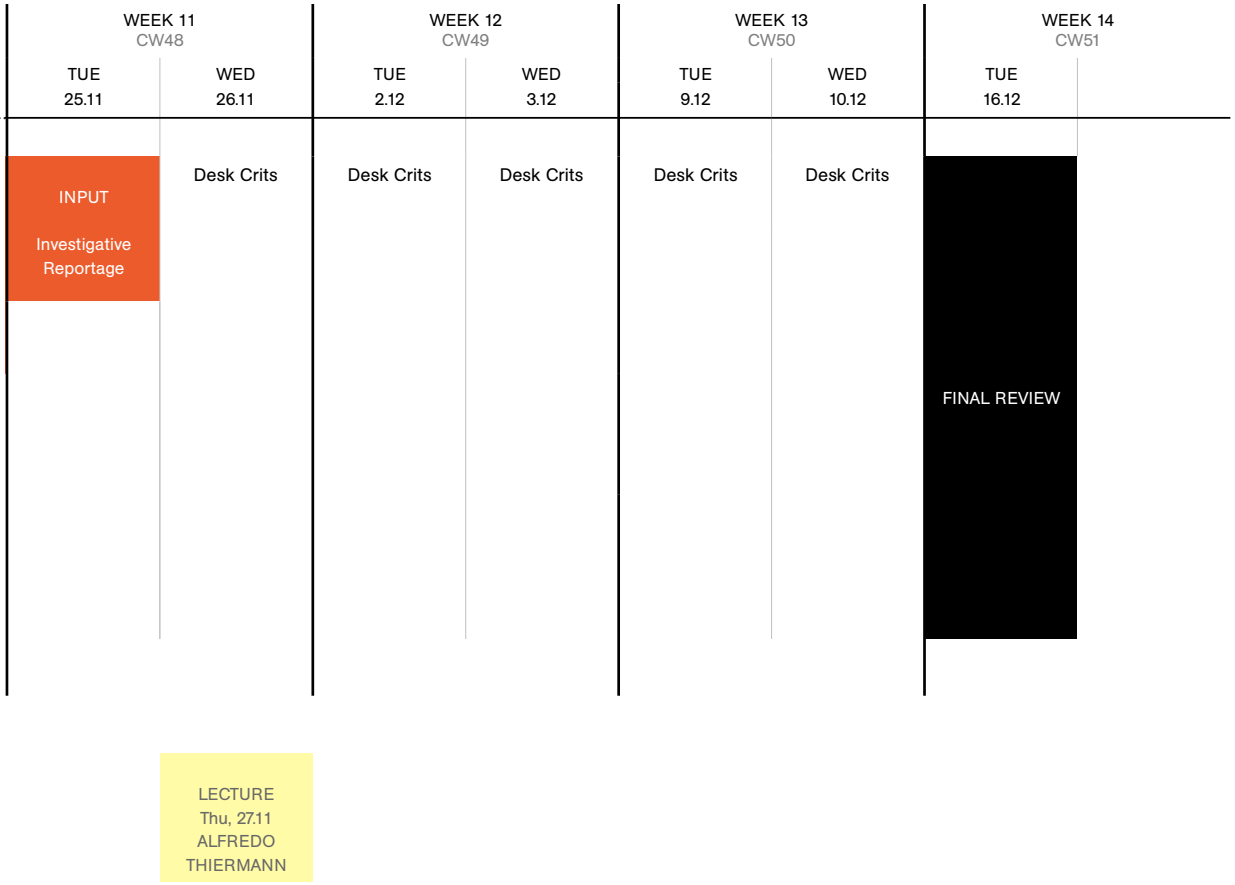
Field Trips

Reviews

Guest Lectures
Core Course: MY CLOUD

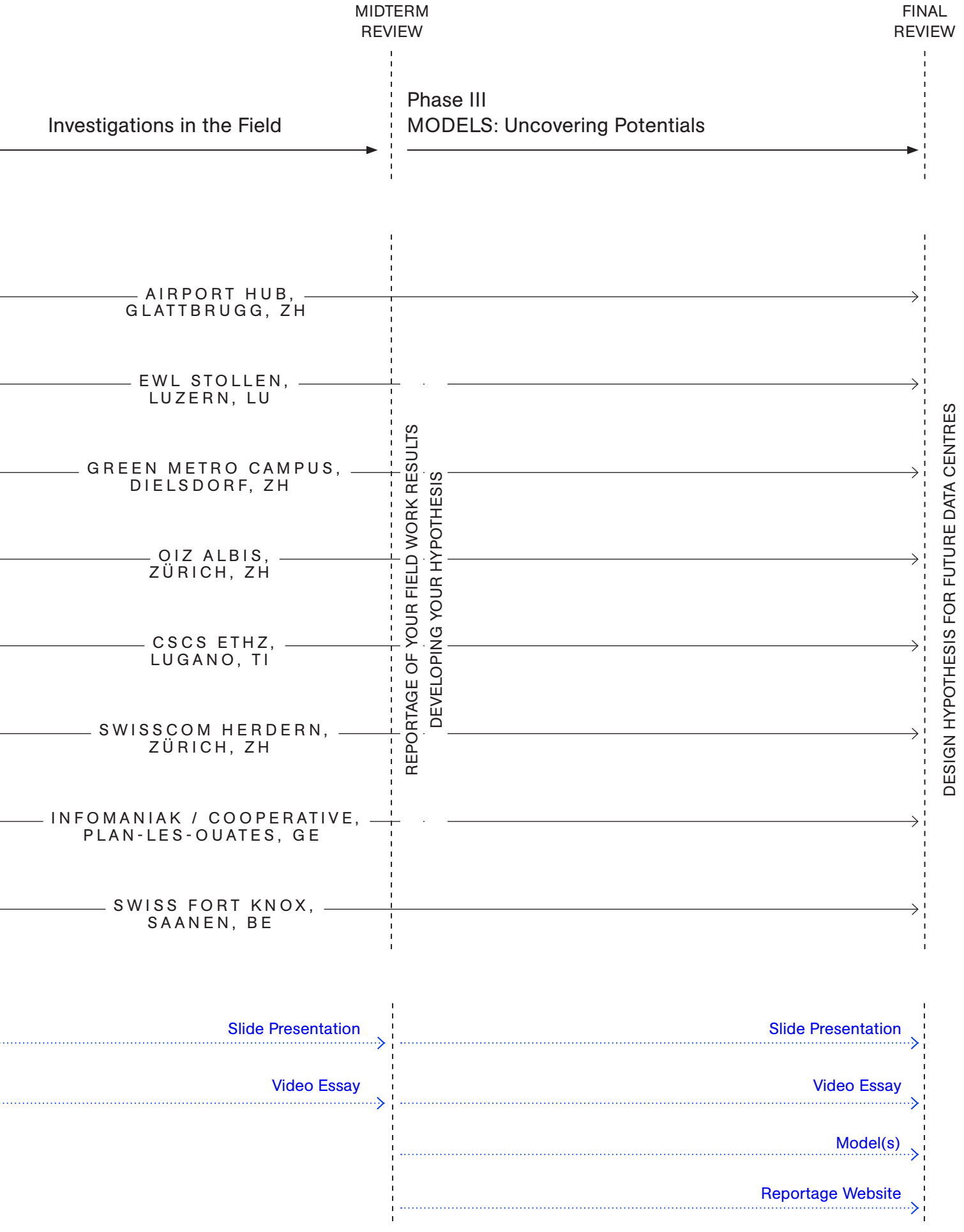
Semester Timeline

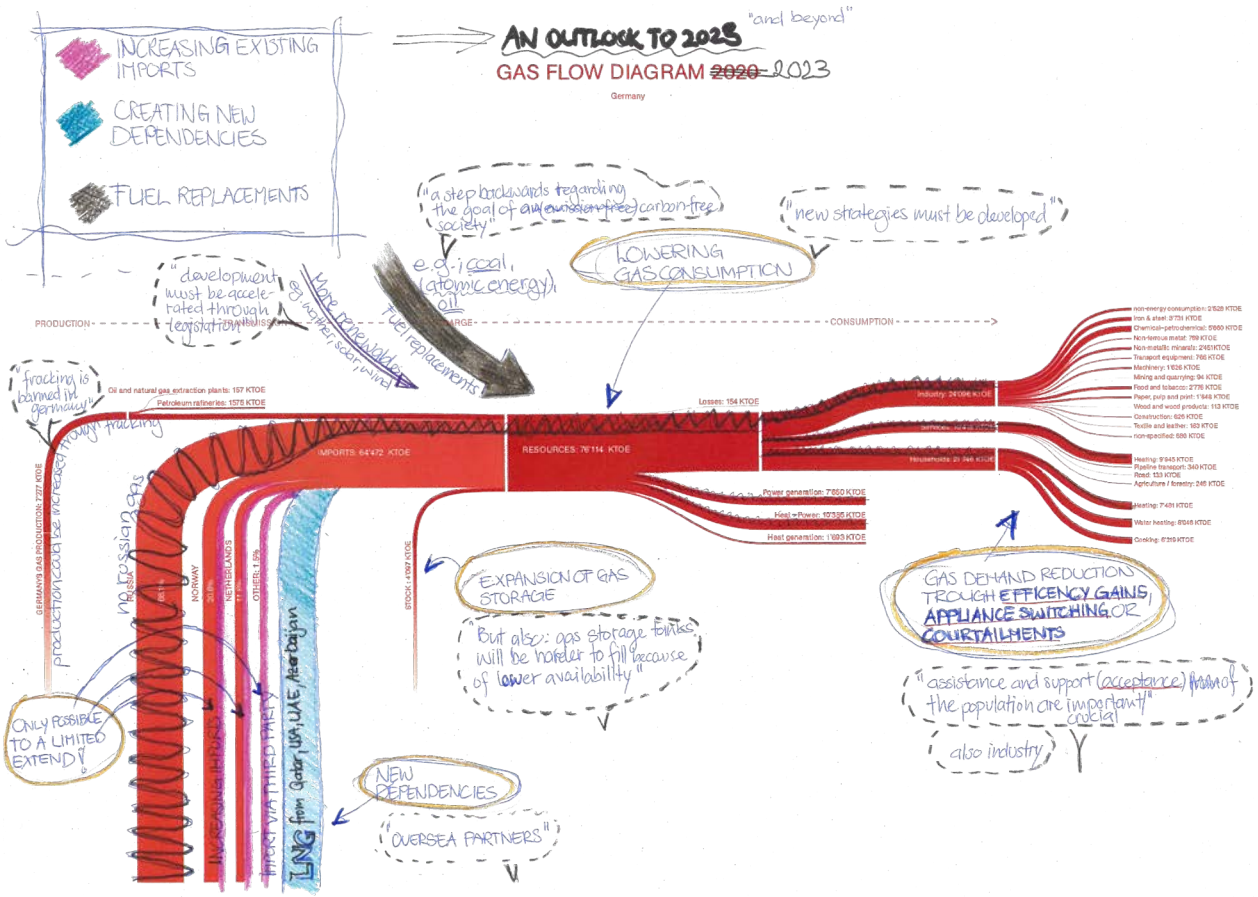





ATLAS
REVIEW
Phase
Phase I
ATLAS: Mapping the Cloud
Phase II
REPORTAGE:
Atlas Topic
STUDY SITE
1
Heating and Cooling
2
Water Use
3
Energy Demand
4
Networks: Storing and Processing
5
Networks: Data Backbones
6
Architectural Adaptation to Technological Change
7
Location Factors
8
Data Sovereignty
ATLAS AS A COMMON KNOWLEDGE POOL
YOUR RESEARCH BRIEF
Slide Presentation
Deliverables
Atlas Website

Semester Structure





Speculative gas flows 2023 and beyond.
Filippo Biasca-Caroni, Martin Kohlberger, and Isidor Gonzalez Escobar. Energy Atlas Rheinland, Studio *Power to the People*, HS22.

Phase I ATLAS
Local to Planetary: Mapping the Cloud

Task

In the first phase of the semester, you will research the Swiss Cloud—uncovering how its data infrastructure, networks, and policies shape both society and the territory. You'll trace connections between physical spaces and digital flows, capturing not only what you have discovered, but also what remained hidden. How can we make the invisible visible?

In the beginning of the semester, you'll choose a package of 1) an Atlas topic, and 2) a data centre.

1) Atlas Topic Research
Each Atlas topic comes with its own set of research questions and requires a tailored approach. At the same time, all Atlas topics share the trans-scalar approach: investigating across multiple levels—from the planetary and European, to the national, local, and urban, down to the architectural and even technical scale. Your goal is to transform your findings into a compelling Atlas of the Swiss Cloud. It will conclude in the Atlas review and then serve as a common pool of knowledge for the studio throughout the rest of the semester.

2) Data Centre Urban Analysis
Parallely you will start the investigations on your data centre and analyse its urban context. This work will continue to work on until the end of the semester. You will start by looking at your data centre from the perspective of your Atlas topic. Gather all available information, contact the operators, and organise an initial site visit. In the Atlas review you will present your findings and a first draft of research questions and a research brief for your study site.

Working Tools

To illustrate your findings, you will produce various drawings and maps, from hand sketches to technical axonometries, architectural plans and sections, to territorial maps, network diagrams, and other forms of data visualisation. Historical documents, photographs, and text will be used as supporting evidence. We will introduce you to QGIS and Adobe Software to help you create beautiful, meaningful drawings. The results of your first field work (site visits and interviews) should be documented and displayed using photography, video and audio recordings. We can provide you the necessary audio and video recording equipment.

Your work will be presented in the form of an oral presentation with slides during the Atlas Review, as well as online on our website. Your work should always contain qualitative titles, subtitles, and have a clear, well-crafted structure. This will help you create a compelling narrative. The template for the slide presentation can be found on the student server.

Deliverables

ATLAS REVIEW
Wed, 15 October
— Slide presentation (15min)
— Atlas website

Audio recording equipment. AOT, 2025.

Phase II REPORTAGE
Investigations in the Field

Task

In the second phase of the semester, you will engage closely with your study site and its data centre. Site visits and interviews will be at the core of this phase.

We ask you to investigate the data centre in all its dimensions and externalities: What is its urban and socio-economic context? How can we study securitised spaces with minimal human presence? Who are the protagonists—the commune, the neighbours, the owners, the clients? Since data centres are often hermetic, windowless black boxes with strong security barriers, you will need to look beyond the object itself. Where does the heat go? Where can you find traces of the fibre-optic backbone or energy grid? What about noise pollution or the impact on local tax revenues? Which conflicts, contradictions, and potentials can you identify?

Working Tools

Thorough preparation for your fieldwork is essential. Arrange guided tours that may provide additional access to materials and experts. Contact people in advance to set up interviews, and organise transportation as well as your video equipment. We will provide sound recording equipment.

A short video essay will be the main format for this phase—a conceptual video typically narrated by its authors. The video essay has a strong conceptual dimension and can be very artistic in its approach. You are encouraged to experiment with form and style to best communicate your insights. You will tell the story of how you experienced the study site, what you have learnt, the surprising characters you encountered, and the hidden stories you uncovered on site. It is therefore crucial that you document everything you see, hear, and encounter during your fieldwork and interviews—using photography, audio, and video recordings. You will introduce the protagonists and guide your audience through the territory by combining video footage and photographs with interview recordings, offering your own perspective on the topic. Editing is recommended in Adobe Premiere Pro. No prior experience is required, and support will be available as needed.

Deliverables

Your video essay will be presented as part of your slide presentation. To support your new findings, refine and expand the research material gathered during the Atlas phase—by selecting and improving existing drawings and maps, and producing new ones as needed. The video essay will be embedded in your presentation and separately uploaded to our website.

MIDTERM REVIEW
Tue, 18 November
— Slide presentation (15min), incl. your video essay
— Video essay upload

Model of the Kaufhaus des Westens (KaDeWe), Berlin.
OMA (Office for Metropolitan Architecture), 2015.

Phase III MODELS
Uncovering Urban and Architectural Potentials

Task

In the final phase of the semester, we will turn our attention to the urban and architectural potentials of data centres. Through the Atlas and your field investigations, you have already gathered extensive knowledge and data about the Swiss cloud and your specific study site. Now we want you to find your position as a group and craft a design hypothesis: What should the future of data centres in Switzerland—and your case study in particular—look like? Can data centres facilitate connections between technology, architecture, urban life, and the territory? What if data centres were no longer black boxes, but reimagined as public assets? How might their design contribute to a just transition and to urban life?

Working Tools

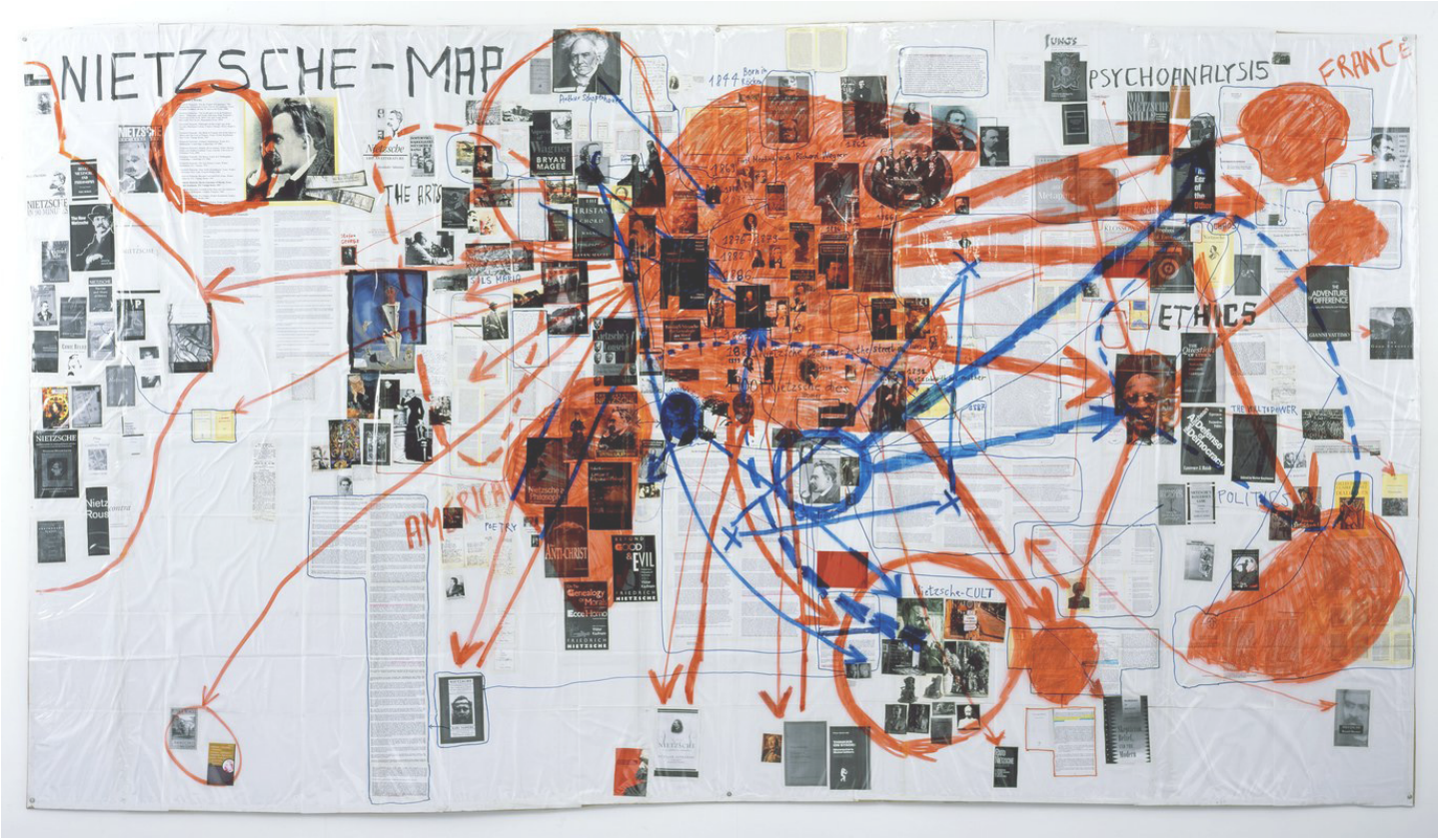
Model-making will be at the core of this phase. Across history, models have served to negotiate and represent future visions of space and social organisation. Intuitive and suggestive, they allow us to prefigure different realities and expand our imagination. You will work with diverse materials and techniques. You will craft interpretative models that can be artistic or technical, and their scale can range from architectural detail to territorial network. Sections, plans, photographs, and text can be used as supporting evidence.

Apart from model-making, you will continue to develop your slide presentation and video essay. To support your design ideas and arguments, you will refine your research material and strengthen your narrative structure—by selecting and improving existing drawings and maps, producing new ones where necessary, and continuing the exchange with experts and locals to fill knowledge gaps.

Your work will be presented during the Final Review in the form of an oral presentation with slides, accompanied by a showcase of your models and selected materials. At the end of the studio, it will also be made publicly accessible as an investigative reportage on our website.

Deliverables

FINAL REVIEW
Tue, 16 December
— Slide presentation (15min), incl. your video essay
— Showcase of models
— Reportage website



Thomas Hirschhorn, “Nietzsche-Map”, 2003.

READING SESSIONS
Discussing Key Concepts

Task

We will read and discuss texts to explore key concepts around the production of the cloud: data extraction and ownership, planetary costs, Swiss cloudscapes, and future of data governance. Four sessions, each anchored by 3 core readings.

Each text will be prepared and presented by one group of 3 students with a slide presentation (approx. 10 minutes). After the presentation, your group should lead a 20-minute discussion that actively involves the studio (poll, quick mapping, short debate).

Each group will produce an A2 poster to hang in the studio. The poster must include: 1) title of the session, 2) one concept sketch or diagram, 3) abstract and context (max. 250 words), and 4) four key concepts (with definitions). For the A2 poster you will use the provided template on the server.

Readings

1 | Making the Cloud, 1 October

1. Shoshana Zuboff, “The Discovery of Behavioral Surplus”, in *The Age of Surveillance Capitalism,* pp. 63–97
2. Louise Amoore, “Cloud Geographies: Computing, Data, Sovereignty”, in *Progress in Human Geography 42,* no. 1: 4–24.
3. Benjamin H. Bratton, “Introduction”, in *The Stack: On Software and Sovereignty*, pp. 3–28.

2 | Planetary Impacts, 8 October

1. Kate Crawford, “Introduction”, in *The Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence,* pp. 2–21.

   + Kate Crawford and Vladan Joler, "Anatomy of an AI System: The Amazon Echo as an Anatomical Map of Human, Data, and Planetary Resources", in *Anatomy of an AI System Project*, 2018. https://anatomyof.ai.
2. James Muldoon, Mark Graham and Callum Cant, “The Annotator”, in *Feeding the Machine: The Hidden Human Labour Powering AI,* pp. 21–42.
3. Jennifer Gabrys, “Media in the Dump: Salvage Stories and Spaces of Remainder,” in *Digital Rubbish: A Natural History of Electronics,* pp. 127–143.

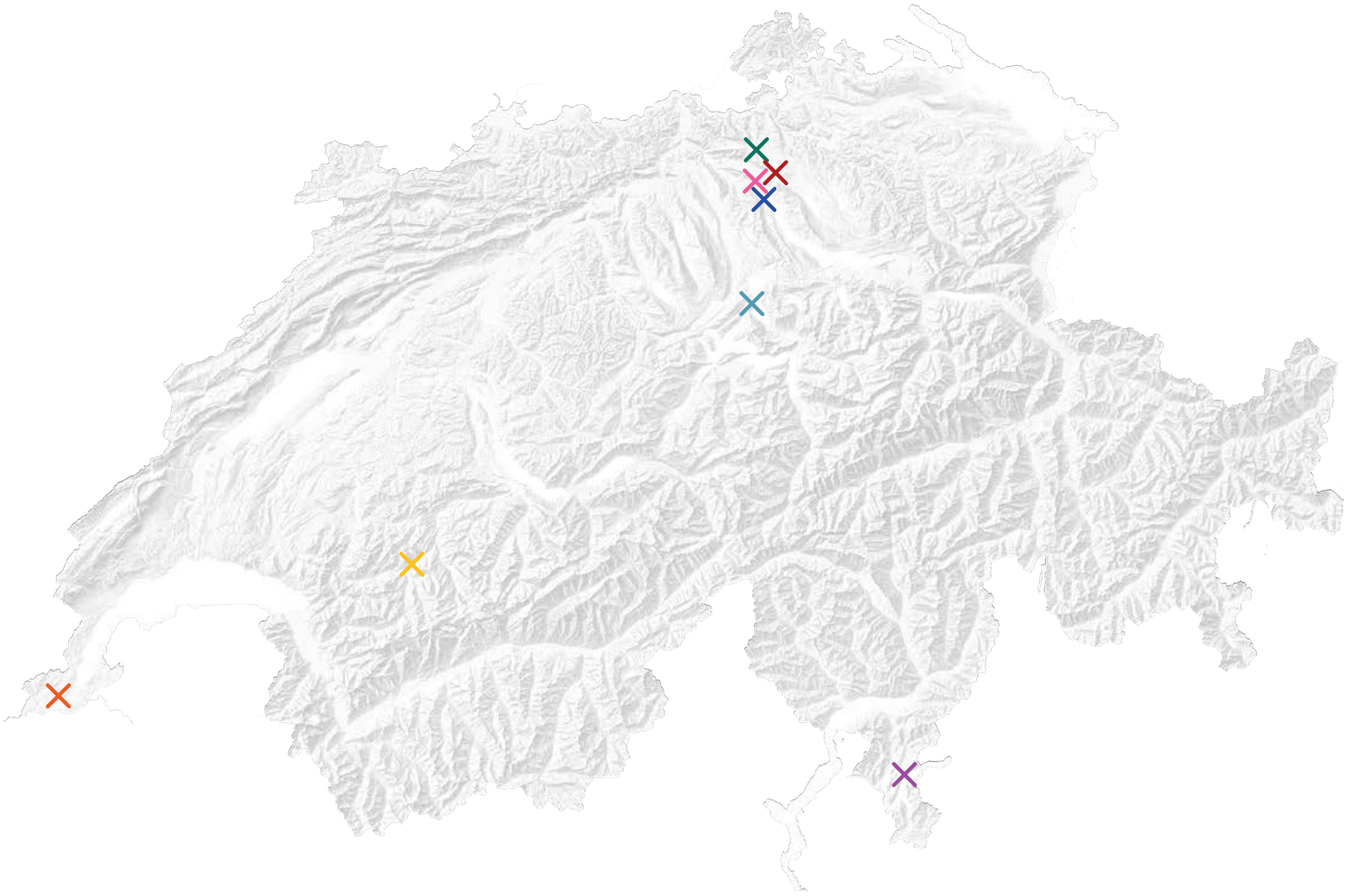
3 | Swiss Cloudscapes, 29 October

1. Monika Dommann and Max Stadler, “White Gold, CryptoGold: Alpine Hydropolitics”, in *Data Centers: Edges of a Wired Nation,* pp. 70–80.
2. Max Stadler, “Ruins of Post-Industry: The Rise and Fall of the ERZ/W”, in *Data Centers: Edges of a Wired Nation,* pp. 182–225.
3. A. R. E. Taylor, “Concrete Clouds: Bunkers, Data, Preparedness,” in *New Media & Society 25,* no. 2 (2023): 405–430.

4 | Cloud Futures, 5 November

1. Ben Tarnoff, “The People’s Pipes,” in *Internet for the People: The Fight for Our Digital Future*, pp. 38–57.
2. Niklas Maak, "VI. Architecture Has Become the Décorateur of Platform Capitalism," and "VIII. Cities Must Reconsider What Really Makes Them 'Smart'." In *Server Manifesto: Data Center Architecture and the Future of Democracy,* pp. 35–39, pp. 45–47.
3. Liam Young, “Neo-Machine: Architecture Without People”, in *Architectural Design 89*, pp. 6–13.

   + Rem Koolhaas, “Museum in the Countryside: Aesthetics of the Data Centre,” in *Architectural Design 89,* pp. 60–65.



Important sites related to the different studio topics.

Topics & Sites

1 Heating and Cooling
AIRPORT HUB
Glattbrugg, ZH

2 Water Use
EWL STOLLEN,
Luzern, LU

3 Energy Demand
GREEN METRO CAMPUS,
Dielsdorf, ZH

4 Networks: Storing and Processing
OIZ ALBIS,
Zürich, ZH

5 Networks: Data Backbones
CSCS ETHZ,
Lugano, TI

6 Architectural Adaptation to Technological Change
SWISSCOM HERDERN,
Zürich, ZH

7 Location Factors
INFOMANIAK / COOPERATIVE,
Plan-les-Ouates, GE

8 Data Sovereignty
SWISS FORT KNOX,
Saanen, BE

1

Atlas Topic
HEATING AND COOLING

Data centres are invisible heat islands. The cooling of servers generates vast amounts of waste heat, which is usually released directly into the air. Although the Canton of Zurich requires all newly built data centres to feed their waste heat into district heating networks, many potential recipients are already supplied by other sources, and the necessary infrastructure for storage and transmission is often too costly to expand.

We ask you to examine data centres from the perspective of heating and cooling. How are data centres cooled, and what technologies are in use? How much of the total operating energy becomes waste heat, and how does this vary seasonally? What visible and invisible infrastructures make up a cooling system, and what external effects does it create? Which options exist for reusing waste heat? Can you find existing references for inspiring heat reuse, whether at the local scale or as part of district heating systems?

Installing district heating pieplines in the City of Zurich, 2023.

Site
AIRPORT HUB
Glattbrugg, ZH

The Airport Hub in Glattbrugg, operated by Digital Realty, comprises three data centres known as ZUR1, ZUR2, and ZUR3. ZUR1 has been operational since 2000 and provides around 5 MW of capacity, while ZUR2 was constructed beginning in 2019, coming online around 2020, and delivers approximately 12 MW. The most recent addition, ZUR3 (2022) reaches a full capacity of 24 MW. Located on the border of Opfikon and Rümlang, the campus is being integrated into the Airport City energy network, a district heating and cooling system developed with with Energie Opfikon AG and Genossenschaft Elektra Baselland (EBL)—from 2025 onward to supply surplus residual heat to regional customers.

Location	Glattbrugg, ZH
Typology	Co-Location Data Centre
Size	27'881 m^2
Energy Demand	41 MW
Ownership	Digital Realty
Customers	Amazon, Microsoft, Google

Diesel generator exhaust vents dominate the facade of Digital Realty's newest ZUR3 data centre in Glattbrugg.

2

Atlas Topic
WATER USE

Just like your own computer, data centres also need cooling. By 2030, the cooling of large servers is expected to quadruple global water use. AI data centres also consume twice as much water as conventional ones, due to their high energy density. More cooling water is needed in hot summers. In prolonged dry spells, evaporative cooling may fail, forcing operators to draw on groundwater or tap into municipal water supplies to keep data centres running. This is an especially significant issue in dry and arid regions, but it will also impact Switzerland's future water consumption.

We ask you to investigate data centre networks from the perspective of water use and consumption in a world of climate crisis and water scarcity. How does the water consumption of data centres threaten ecologies? What does the long-term outlook hold for a country like Switzerland, which has an abundance of water? Where does the water come from, and does its use conflict with that of other sectors? Should data centres be regulated, located next to abundant water sources, or restricted from using water altogether? Are there ways of using water for cooling that can be integrated with other infrastructures?

A heat exchanger for lake thermal energy in Lake Zurich at Tiefenbrunnen harbour, 2022.

Site
EWL STOLLEN
Luzern, LU

EWL's data centre is housed within a former civil protection bunker, originally constructed in the 1960s and acquired by the City of Lucerne in 2011—after which EWL (Energie Wasser Luzern) repurposed it to serve as a modern data facility. Officially opened on 21 June 2022, the Stollen Luzern Data Centre leverages water from Lake Lucerne for cooling, while offering modular, individually rentable server racks across multiple internal vault-like tunnels. As a fully city-owned utility (100 % held by the City of Lucerne), EWL is a semi-public actor and operated its own co-location data centres since 2004 as part of its operation of critical infrastructure in the city of Lucerne and houses a duplicate of the city's data.

Location	Glattbrugg, ZH
Typology	Co-Location Data Centre
Size	1'640 m^2
Energy Demand	Unknown
Ownership	EWL Lucerne
Customers	City of Lucerne, Sonio AG, …

Entrance into EWL Stollen, a former bunker used by the Swiss military.

Atlas Topic
ENERGY DEMAND

Today, data centres account for 7 percent of Switzerland's energy consumption due to the high power demands of computing and cooling. According to a recent study, this figure could rise to 15 percent of Swiss energy consumption by 2030, with global demand soon reaching that of Japan's total energy consumption. Data centres put a strain on the energy grid, yet they also require a stable supply and therefore mostly use fuel-powered generators as a backup.

We ask you to investigate the energy consumption of data centres. Who are the biggest consumers? Where is the energy for data centres produced? How much energy can the Swiss energy grid hold? How will an increased energy demand affect the climate, and what effect will the liberalisation of the energy market have on consumption and costs? Can data centres be designed more efficiently? Ultimately, can we reduce the energy consumption of data centres, or should we simply put on hold on the expansion of data centres in Switzerland?

The substation of Zurichs cantonal energy provider in Oberengstringen is located next to a data centre by Equinix, 2023.

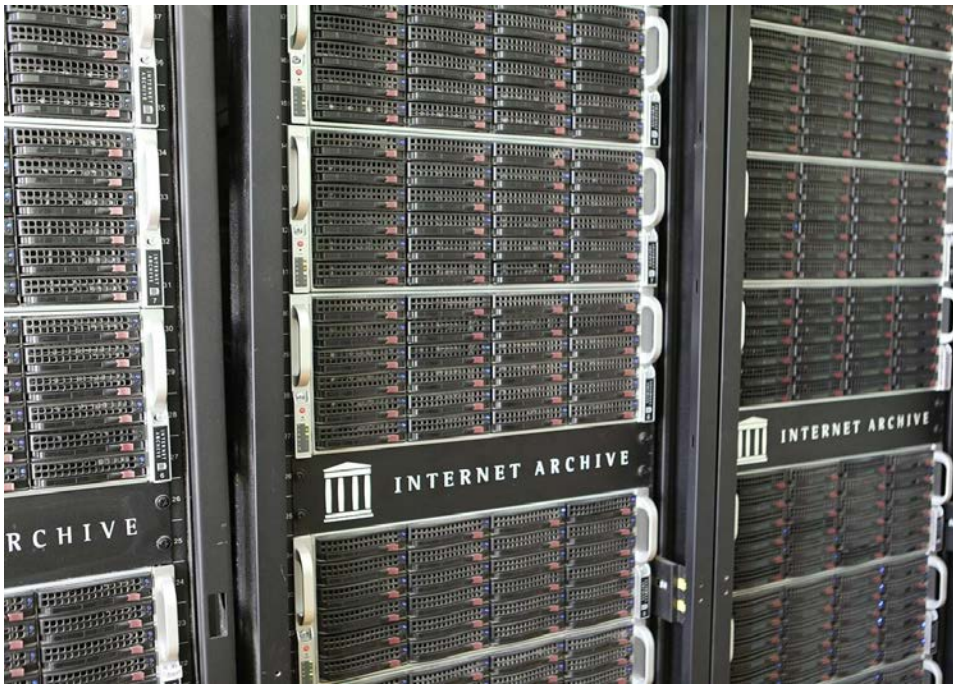
Site
GREEN, METRO CAMPUS
Dielsdorf, ZH

The Metro Campus in Dielsdorf, developed by Green, is Switzerland's largest data centre complex to date, designed to reach a total computing capacity of 90 MW once all three identical buildings are completed—two are already operational, with the first opening in 2022, the same year Amazon launched its Swiss cloud region. Built on former agricultural land, the campus spans over 43000 m^2 of IT space and features direct access to rail infrastructure, ensuring strong logistical connectivity. In addition to colocation services, the site offers office space for enterprise clients such as Mobiliar, which operates its servers on-site. The facility is equipped with advanced energy-efficient cooling and power redundancy systems to support hyperscale and enterprise workloads.

Location	Dielsdorf, ZH
Typology	Co-Location and Hyperscaler Data Centre
Size	20'000 m^2
Energy Demand	90 MW
Ownership	Green
Customers	Amazon, Microsoft, Google, …

The first of three identical data centres to be built by Green in Dielsdorf. Alone it has a capacity of 30 MW.

Atlas Topic
NETWORKS: STORING AND PROCESSING



Data centres are complex infrastructures consisting of endless kilometres of wires, high-density hardware like chips, GPUs, TPUs, hard drives, server racks, and more. All this infrastructure is connected through thousands of servers into a vast computing grid. Different types of data centres also shape their spatial configuration. While some are primarily designed for data storage, others are optimised for intensive computation. The infrastructure inside data centres relies on a vast supply chain of raw materials, from rare earths and lithium for processors and batteries to copper and aluminium for wiring and cooling systems. Extracting these resources often comes with high environmental and social costs, linking digital infrastructure to global mining and trade networks.

We want you to investigate the heart of the data centre, its internal infrastructures of hardware and servers. What actually constitutes a data centre? What kind of materials are used and where do the materials for these chips come from? What is the ecological and social impact of data centres globally? Can you untangle the global network of multinationals surrounding the complex server infrastructures? Could data centres be organised differently? How might the physical form and architecture of data centres evolve as their functions and densities change? Can they even be distributed as small servers throughout the city? How might the design of data centres address not only technical efficiency but also questions of sustainability, adaptability, and public space?

These servers in San Francisco host a copy of the entirety of the internet, 2023.

Site
OIZ ALBIS
Zürich, ZH

In a 2009 referendum, Zurich voters approved the centralization of the city's fragmented IT infrastructure—then spread across more than 100 decentralized server rooms—by endorsing a CHF 139 million investment. This led to the construction of two municipal data centres in Hagenholz and Albisrieden, both completed in 2012. The Zurich Albis data centre, operated by the city's Organisation und Informatik Zürich (OIZ), offers a capacity of 6 MW. As its infrastructure currently exceeds the city administration's own needs, Zurich also functions as a commercial data centre provider, renting space to external clients including Julius Bär and the Swiss National Bank.

Location	Zurich, ZH
Typology	Co-Location and Corporate Data Centre
Size	2'000 m^2
Energy Demand	6 MW
Ownership	City of Zurich, OIZ
Customers	Vontobel, Julius Bär, Swiss National Bank

The data centre of the city of Zurich is part of a bigge complex of the IT department OIZ. The facade does not disclose its content to the outside.

5

Atlas Topic
NETWORKS: DATA BACKBONES

Data is transferred not only via the air, but also via a high-capacity backbone network to which data centres usually have direct access. Due to the privatisation of infrastructure, there are several parallel networks for data transmission in Switzerland. Today, companies such as SBB, Swisscom, Gas&Com and Swiss Fibre Net AG all operate their own networks. Unlike electricity or gas, fibre-optic backbone networks often piggyback on existing infrastructures such as railway tracks, highways, or power lines. Like any other Swiss federal or research institution, ETH is connected to Switch's backbone network, which links federal and research institutions such as ETH.

We ask you to consider the journey of data, from your digital devices to a data centre and back. How and where does the data travel? Is it linked to a network, and can we follow a byte locally or globally? How did global data networks develop? Can you map the network and find out about its locations? Where do these infrastructures meet and exchange information? Are parallel infrastructures useful for redundancy? Should this kind of infrastructure be nationalised to control the flow of our data and who has access to it? Do we want private companies running the network for our most precious data? Would totally separate networks provide higher security? Would we want a future where all our data is treated equally?

Construction of the fibre-optic backbone network along a high-pressure natural gas pipeline, 2023.

Site
CSCS ETHZ
Lugano, TI

The Swiss National Supercomputing Centre (CSCS) in Lugano, operated by ETH Zurich since its founding in 1991, hosts Switzerland's most powerful computer infrastructure. Its current system, Alps, launched in 2024, is powered by NVIDIA Grace Hopper (GH200) superchips and succeeds Piz Daint, which ran from 2012 onward. The facility operates entirely on hydropower and uses lake water for cooling, with recovered heat fed back into the city of Lugano. Connected via the high-speed SWITCH network, CSCS supports national research, including the ETH-backed development of Apertus, a large language model released in September 2025 as part of the Swiss AI initiative.

Location	Lugano, TI
Typology	Supercomputing Data Centre
Size	2'000 m^2
Energy Demand	20 MW
Ownership	ETH Zurich
Customers	Swiss AI Initiative, Meteo Swiss, CERN, …

A proud advertisement for its newest super computer on the facade of ETHZ's CSCS in Lugano.

6

Atlas Topic
ARCHITECTURAL ADAPTATION TO TECHNOLOGICAL CHANGE

The infrastructure required for cloud computing is changing rapidly. Just 50 years ago, telecommunication operations were organised completely different. This also means that buildings acting as infrastructure for these networks need to be adapted. In recent years, data centres have grown in size and computing capacity, emerging as a new architectural typology devoid of human intervention and shaped entirely by technological considerations. But there are also cases in which existing architectures have been transformed into data centres, such as the Swisscom building, designed by Theo Hotz.

We would like you to analyse existing and potential architectural adaptations to the technological changes in regard to data centres. What is the architectural and urban history of Swiss telecommunication infrastructure? Can you find examples of architectural transformations in Switzerland? Can you portray best practices of architectural adaptations for data centres looking at global examples? What elements are necessary to adapt a building? How does dehumanisation affect a building and its neighbourhood? Can any building be adapted for this purpose? Should these buildings remain out of sight and out of mind on the outskirts, or should they be an integral part of city life? Are there any ruins of such infrastructure that could be reused as data centres? How can these buildings become more human-centred? Finally: Can we, as designers, play a role in making data centres more inviting to the public?

A cooling unit in front of a building converted into a data centre in Glattbrugg, 2025.

Site
SWISSCOM HERDERN
Zürich, ZH

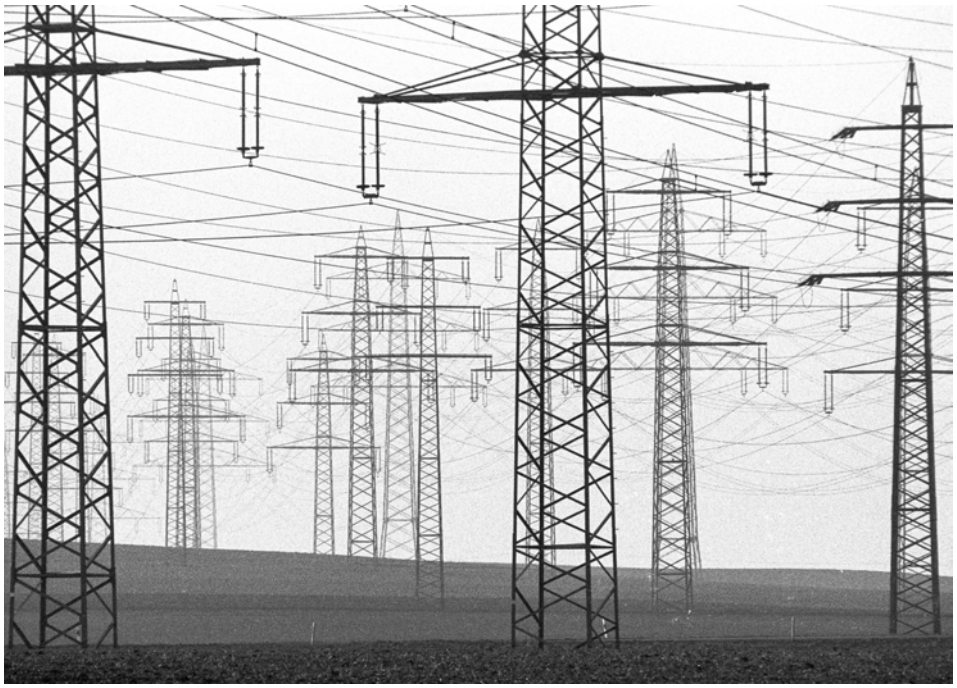
The iconic Swisscom data centre in Zurich, designed by Theo Hotz and built in 1979 as a PTT telecommunications hub, has since been repurposed several times—the latest in 2012—in line with technological shifts. Its former amenities—including a canteen, tennis courts, and a childcare facility—are no longer in use, as daily operations now require fewer than ten staff across the entire site. The history of the data centre is thus also a history of automation and dehumanisation, today offering less than ten jobs on site while providing a computation capacity of 10 MW housing Swisscom's own services and servers of external customers. It is one of two data centres directly owned by Swisscom. The data centre is a symbol for external customers architectural adaptations following a shift in infrastructural needs, enabled by the buildings structural and spatial reserves and its flexible floor plan.

Location	Zurich, ZH
Typology	Co-Location and Corporate Data Centre
Size	8'000 m^2
Energy Demand	10 MW
Ownership	Swisscom
Customers	Unknown

The Swisscom Herdern data centre has been given an iconic design by Theo Hotz Architekten.

7

Atlas Topic
LOCATION FACTORS



Data centres require an energy connection, proximity to its customers and users, and access to a good fibre-optic backbone network. These factors limit the number of suitable locations. In Switzerland for example, the most suitable locations are already fully utilised. Either there is no land available, or the energy supply is insufficient. For this reason, new locations further away from the centres are increasingly being developed. Today, data centres in the Zurich area are not limited to the municipalities of Zurich, Opfikon and Rümlang. The Greater Zurich area encompasses several other municipalities near Zurich and extends as far as Winterthur and Aargau. The same applies to Geneva. This shortage of space requires new ideas and collaborations with other space users.

We ask you to investigate the location factors for data centres in Switzerland. How did clusters of data centres emerge in the past. Why are data centres built in certain locations? What infrastructure do they need, and what internal decisions determine a site? Are there agreements made with communes, and how do they benefit? What is the public benefit of having a data centre in your vicinity? What are the ongoing trends? How do different ownership models affect the location and design of data centres? Can data centre operators collaborate with other entities to benefit the wider public?

Overhead power lines in the Rhein-Erft district near Cologne, 1991

Site
INFOMANIAK / COOPERATIVE
Plan-les-Ouates, GE

The data centre and the housing cooperative at La Bistoquette in Plan-les-Ouates, opened in 2025, and exemplify a way of integrating data centres into an urban context. Operated by Infomaniak—known for its Swiss-based cloud products kSuite and Swiss Transfer—the data centre is embedded beneath a cooperative housing complex of 103 dwellings and commercial spaces. With a computing capacity of 1.7 MW, the facility shares 100% of its waste heat with the surrounding community, supplying up to 6,000 households via Geneva's district heating network. Developed in close collaboration between the company, the cooperative, and local authorities, the project reflects land-use efficiency. Unlike traditional stand-alone data centres, La Bistoquette demonstrates how energy-intensive digital infrastructure can become socially and ecologically integrated.

Location	Plan-les-Ouates, GE
Typology	Co-Location and Corporate Data Centre
Size	1'800 m^2
Energy Demand	Unknown
Ownership	Infomaniak
Customers	Unknown

There is a children's slide on the upper floors of the La Bistoquette cooperative. The data centre in the basement is not apparent from the outside.

8

Atlas Topic
DATA SOVEREIGNTY

Accessing data centres is notoriously difficult, and the information about whose data is stored within them is largely opaque. They are heavily secured and monitored, creating a largely dehumanised environment that is difficult to study or engage with publicly. This lack of transparency contributes to an abstract perception of the cloud as immaterial and ephemeral, while in reality, our digital lives are concentrated in the hands of a few global tech giants. Questions of governance and control over data—who owns it, who decides how it is used, and where it is stored—are increasingly urgent. Switzerland has become a hub for data storage, not merely because of security, but because its political stability, robust infrastructure, and favorable tax conditions make it attractive for the global tech industry.

We would like you to research the the topic of data sovereignty and its spatial configurations in Switzerland. How can societies regain control over their data, ensure democratic governance of digital infrastructure, and prevent the concentration of information power in a few corporate hands? Are there any existing or debated regulations in the political discourse? Can private companies guarantee data security, or do we need public data centres? Should ETH continue to try to regain their data sovereignty and develop Swiss AI models? Does infrastructure design affect data sovereignty?

Surveillance cameras at a data centre by Green in Dielsdorf, 2025.

Site
SWISS FORT KNOX
Saanen, BE

Swiss Fort Knox, operated by SIAG and owned by Mount10, is a high-security data centre housed in a former Swiss Air Force bunker in the Alps, originally built in 1969 and decommissioned in the 1990s. Repurposed for digital infrastructure from 1994 onward, the site has been transformed into what Mount10 advertises as “Europe’s most secure data centre,” often drawing on imagery that could come straight from James Bond films to emphasize its secrecy and resilience. The facility features biometric access, EMP protection, and fully autonomous systems, while cooling is provided by glacier-fed water from an underground lake. It hosts highly sensitive data—including genomic archives, blockchain systems, and servers for Swiss governmental and corporate clients.

Location	Saanen, BE
Typology	Co-Location Data Centre
Size	Unknown
Energy Demand	Unknown
Ownership	Mount 10
Customers	Proxeus, Swiss Federal Assembly, …

Entrance into Swiss Fort Knox, a former bunker used by the Swiss military next to the military airport of Saanen.

GIS Data	Geoportal des Bundes map.geo.admin.ch
	Geoportal Kanton Zürich maps.zh.ch
	GeoVITe — Geodata Service of the ETH Zürich geovite.ethz.ch/index.html
	OpenStreetMaps openstreetmap.org
	Gisco EuroStat ec.europa.eu/eurostat/de/web/gisco/geodata/reference-data
	Overview available GIS-Data Switzerland cloud.mapplus.ch/opendata/doku.php?id=en:start
Statistics and Information	Bundesamt für Statistik — BfS bfs.admin.ch
	Atlas BfS atlas.bfs.admin.ch
	Swiss Open Government Data opendata.swiss
	Bundesamt für Energie — BfE bfe.admin.ch
Atlas References	Anatomy of an AI System anatomyof.ai
	Grounding the Cloud grounding.cloud

Digital Resources

Data Centre and Telecommunication Data	Data Center Map datacentermap.com
	Energy demand from AI iea.org/reports/energy-and-ai/energy-demand-from-ai
	Infrastructure Connectivity Map, International Telecomunication Union bbmaps.itu.int/bbmaps
	Submarine Cable Map www.submarinecablemap.com
Energy Data	Energy Statistics Switzerland bfs.admin.ch/bfs/de/home/statistiken/energie.html bfe.admin.ch/bfe/de/home/versorgung/statistik-und-geodaten/energiestatistiken.html
	Energy Dashboard Switzerland energiedashboard.admin.ch/dashboard
	Swiss Energy Charts energy-charts.info
	Global Energy Monitor globalenergymonitor.org
Historic Archives and Images	Universität Bern — Ryhiner collection unibe.ch/university/services/university_library/research/special_collections/map_collections/ryh_ch/index_eng.html
	Stadt Zürich — Historische Bilder stadt-zuerich.ch/historischebilder
	ETH Library — Bildarchiv library.ethz.ch/de/Ressourcen/Bilder-Fotografien-Grafiken/Bildarchiv
	Baugeschichtliches Archiv — Online Sammlung baz.e-pics.ethz.ch
	Historisches Lexikon der Schweiz hls-dhs-dss.ch

Student Server

URL smb://nas22.ethz.ch/arch_nsl_topalovic_student/

GIS Library …/0000_GIS-LIBRARY

Studio Folder …/2025_HS_THE PRODUCTION OF CLOUD

…/1_ADMIN

— Student Info
— Poster
— Programme Booklet
— Texts Reading Sessions
— Inputs (introductions, lectures, tasks, etc.)

…/2_RESOURCES

— Fonts
— Templates (permission letters , slide presentation, etc.)
— GIS File
— Texts
— References
— Research documents for each topic

…/4_SUBMISSIONS

— Reading Sessions
— Atlas Review
— Midterm Review
— Final Review

…/6_STUDENT FOLDER

— Personal exchange folder for group work

Submission

Server Submission

After each Review you will upload your slide presentation and the material you have gathered and produced onto the student server under 4_SUBMISSION (see p.XX).

This material includes all:
– original image files (including web-sourced images)
– original photographs, video and audio recordings you have produced
– PDFs, JPGs, PNGs of all drawings, maps and diagrams you have produced
– original vector drawing files (.ai, .dwg, .3ds, .psd, etc.)
– GIS files (.qis, but also all .wms, .shp files)
– if you are using In-Design for your presentation, please package your presentation and upload onto the server incl the Images folder

Final Submission

After the Final Review, you have until the 17. December, 17:00 to upload your whole material onto the server. Without a server submission we cannot grant you your ECTS credits.

Evaluation

Evaluation Critera

We assess your work according to the degree to which you have met the following learning objectives:

General
1) You have participated during inputs, reading sessions, and desk crits
2) You have collaborated well within your group and in the studio
3) You have shown self-initiative (when you needed support)
4) You have developed your work independently

Phase I: Atlas
1) You have conducted a thorough research of your resarch topic and study site/data centre using online and library research, and data analysis, site visits and expert consultations.
2) You have thoughtfully and creatively represented your research by using cartography, sketches, diagrams, drawings, photography and text.
3) You have compiled your conclusions to create comprehensive research questions and a meaningful research brief.

Phase II: Reportage
1) You have thoughtfully prepared your field work in advance, contacted locals and experts relevant for your topic, and planned your trip to your study site accordingly.
2) You conducted interviews in a professional manner and were able to draw meaningful conclusions.
3) You have creatively documented your investigations in the field with the help of video and audio recordings.
4) You have compiled your material into a compelling video essay that tells your own story of how you experienced the site and what you have uncovered.
5) You have compiled the challenges and potentials of your site in order to come up with a first hypothesis of your topic and site.

Phase III: Models
1) You have narrowed your research and narrative to the topics that you find relevant to your study site and drawn convincing conclusions.
2) You have thoughtfully and creatively represented your conclusions and the potentials of your study site in one or more physical models, carefully making use of different materials, techniques and scales.
3) You were able to deepen and strengthen your hypothesis and create a design hyptohesis for the future of data centres.
4) You have compiled your findings into a compelling argument that you show in a comprehensive slide presentation
5) You have compiled and displayed your work using the tool of the online reportage on our website.

Written Statement

After the semester, each group will receive a short qualitative written statement as a supplement to the grade.

Teaching Team

Milica Topalovic
aot@arch.ethz.ch

Martin Kohlberger
kohlberger@arch.ethz.ch

Yiqiu Liu
liu@arch.ethz.ch

Jakob Walter
jawalter@arch.ethz.ch

Jan Westerheide
westerheide@arch.ethz.ch

Student List

Janka Beck
jabeck@student.ethz.ch

Matteo Bianchi
matbianchi@student.ethz.ch

Adam Chong
chonga@student.ethz.ch

Gabriele Clarelli
gclarelli@student.ethz.ch

Timothy Clerc
tclerc@student.ethz.ch

Tinka de Leeuw
tdeleeuw@student.ethz.ch

Joanna Druey
jdruey@student.ethz.ch

Aqil Durrani
abinmohamed@student.ethz.ch

Valentin Egger
eggerv@student.ethz.ch

Omar El Sayed
oelsayed@student.ethz.ch

Marlon Etter
etterma@student.ethz.ch

Timo Feddern
tfeddern@student.ethz.ch

Laurin Fravi
lfravi@student.ethz.ch

Leandro Gohl
legohl@student.ethz.ch

Loris Gomez
lgomez@student.ethz.ch

Lena Good
legood@student.ethz.ch

Rebecca Grobotek
rgrobotek@student.ethz.ch

Linus Ham
linham@student.ethz.ch

Frederic Holstein
fholstei@student.ethz.ch

Noé Keller
kellernoe@student.ethz.ch

Noah Martin
nomartin@student.ethz.ch

Mateo Mesenholl
mmesenholl@student.ethz.ch

Neo Miksaj
nmiksaj@student.ethz.ch

Tim Misio
tmisio@student.ethz.ch

Lena Nydegger
lnydegger@student.ethz.ch

Lilo Patt
lipatt@student.ethz.ch

Lucien Peguiron
lpeguiron@student.ethz.ch

Serena Peier
speier@student.ethz.ch

Seraina Regli
seregli@student.ethz.ch

Ellen Stettler
estettler@student.ethz.ch

Noah Tagwerker
ntagwerker@student.ethz.ch

Diego Wicki
wickid@student.ethz.ch

Fiona Wong
wongfi@student.ethz.ch

Gabriele Zanni
zannig@student.ethz.ch

Teaching Environment

We aim at mutual respect and responsible interaction with each other—regardless of origin, education, religion, ideology, physical abilities, gender, or sexual identity. If you observe or experience any type of harassment, discrimination, or mental/physical violence, there are several contact points and people:

Care & Conflict Management D-ARCH	The department's contact point in cases of mental distress or in conflict situations. Mail: *alice.keller@arch.ethz.ch* Website*: arch.ethz.ch/en/culture_care/care_conflictmanagement.html*
Respect Office of the ETH	The official ETH support when faced with inappropriate behaviour or conflict. Mail: *respect*@ethz.ch Website*: ethz.ch/students/en/counselling/inappropriate-behaviour-conflict/respect-office.html*
On Mental Goodness group D-ARCH	This group was created to promote the mental well-being of all people studying and working at the Department of Architecture. Online Reporting Tool: tally.so/r/w5B0WZ Website*: arch.ethz.ch/culture_care/care_conflictmanagement/OMG.html*
Grading	We grade your work per group, which means students from the same group receive the same grade. We believe that different perspectives and skills can enrich a group's work and ultimately lead to better projects. However, if irreconcilable differences of opinion arise within your group, please do not hesitate to contact us.