



OUR 2021

SUSTAINABILITY

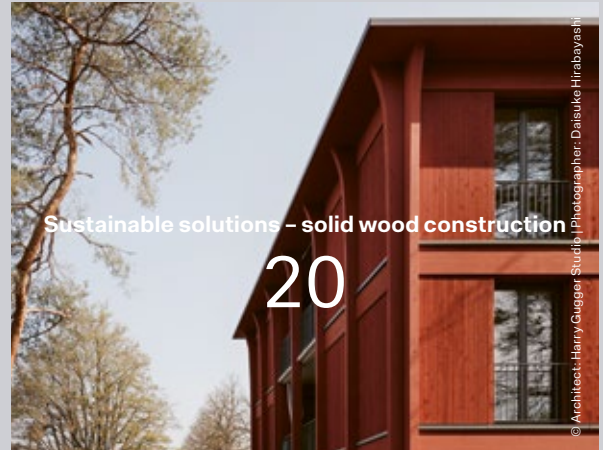
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SUSTAINABILITY



OUR 2021

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Gruner champions sustainability at many levels. One example is nature conservation as part of its environmental services for Deutsche Bahn AG.





DEAR
READER,

The construction sector accounts for almost 40% of global CO₂ emissions according to a report published by the UN Environment Programme in 2020. As a planning and engineering company operating in the building construction, infrastructure and energy business areas, our corporate social responsibility includes the climate and the environment. We have to – and want to – make a contribution to resource-efficient building. Every project has to be assessed individually: for example, is it better not to participate in a controversial project – or should we get involved by advocating for the most sustainable solution? You can read more starting on page 6.

Secondly, as a broadly based company, Gruner has an excellent basis. We combine proximity to our customers and local projects with the expertise of more than 1,100 employees in Switzerland and abroad. Gruner was involved in planning and executing the world's first major hydropower projects and is still a leader in this field. For decades, Gruner has had a department that explicitly examines environmental issues. That department is steadily growing. Above all, in discussions with many of our employees, I find that environmental, social and economic aspects have always played a key role and that they are taken into account in the planning and execution of projects in all areas. MAILING.32 showcases projects (pages 14, 16), service packages (pages 12, 13, 19), an initiative (page 11) and innovations (pages 18, 20, 22) with a focus on sustainability. Last but not least, we let the younger generation have their say (page 27). This is the generation that has been taking to the streets for the past few years to pressurize politicians into paying greater attention to sustainability, which has been a key issue since the 1970s.

Setting high standards for ourselves is essential for our credibility on any issue. We are certified ISO-14001-compliant and our own carbon emissions are being reduced every year even though we are growing (pages 32, 33). Over the past five years or so, we have reduced our carbon emissions from travel by nearly one third by encouraging the use of public transportation and modernizing our fleet and switching to electric vehicles.

Economically, 2021 was a solid year: Turnover rose by almost 10%. The increase in our business volume was due to a large extent to the acquisition of Basler & Hofmann West AG in Zollikofen, near Bern. In December, Gruner acquired Zeltner Ingenieure AG in Belp and opened a new branch office in Lucerne. That strengthens our presence in the Bern region and central Switzerland. In addition, we are building up a Buildings business unit in western Switzerland so that we can participate in the strong growth in this region. We have taken the first steps to simplify our legal structure and extended the Executive Committee to include the strategically important HR function.

Our objective is to drive forward our development in 2022 by stepping up our alignment with our customers and projects, offering new services in international markets and scaling existing local services at all Gruner locations. By introducing new innovations to complement our offering at all phases of construction projects, we aim to create sustainable added value for our customers.

I hope you enjoy reading the new issue of Gruner MAILING.32.

Olivier Aebi
CEO Gruner



HEAD OF HR NOW A MEMBER OF THE EXECUTIVE COMMITTEE

Monica Schneider has been Head of Human Resources at Gruner since September 2021. In January 2022, she became a member of the Executive Committee, so HR now has a voice on the top management and can influence entrepreneurial decisions.

TURNOVER

CHF 153.3 million
+9.5%

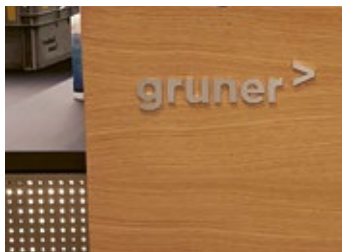


NEW AERIAL VIEWS OF SPITALLAMM

Gruner is involved in the design and execution planning of the Spittalamm arch dam on the Grimsensee reservoir. The aerial views taken by Gruner show the ongoing construction of the new retaining wall on the valley side.

HEADCOUNT

1,104
+8.4%



GRUNER SIMPLIFIES ITS STRUCTURE

Gruner is simplifying its legal and brand structure. Stucky and Gruner have both been using the Gruner brand since January 1, 2022, and various legal entities have been merged. All locations and contacts remain unchanged.



FIRE SAFETY CONCEPT FOR LIDL

Gruner developed a holistic fire safety concept for the headquarters of Lidl Germany in Bad Wimpfen, Germany. 1,500 employees work at this complex, which was opened in spring 2021.



GOLDAU - RORSCHACH STADT RAIL LINK NOW OPERATING

The new 1.3-kilometer double rail track between Goldach and Rorschach Stadt has come into service after two and a half years of construction work. During this time, the Rorschach Stadt station was also extended. Gruner's specialists were on site to supervise the project and construction work.



AWARD FOR "HYPOS" INNOVATION

The European Commission has named Gruner a "Key Innovator" for the development of the HYPOS software. HYPOS uses satellite images to support the planning and administration of hydroelectric power facilities. The development is a joint venture.



PROJECTS

BICKWIL TUNNEL

The Bickwil tunnel is the heart of the new A4 feeder road in Obfelden/Ottenbach. Gruner is designing the 600-meter-long cut-and-cover trench for this project with soil nail walls, relocation of pipelines and the cover. Since this project entails multiple phases, it has been likened to a millipede.

7,739
+18.6%



HVAC PLANNING FOR THE SWISS BROADCASTER SRF

The first presentation areas in the news and sports center at SRF's new studios in Zurich Leutschenbach have been in use since November 2021. Gruner planned the heating, ventilation and air-conditioning systems and acted as specialist coordinator.

POWER CONSUMPTION PER OCCUPIED WORKSPACE

959 kWh p. a.
-5.3%

SUSTAINABILITY

Gruner is aware of its responsibility

Sustainability requires a long-term perspective. Planning and building is a comparatively slow process that generally takes several years. Buildings, especially in the infrastructure and energy sector, last for decades. Moreover, building is resource-intensive and uses a great deal of energy. As a planning and engineering company, how can we set an example in sustainability – not least for our customers? A discussion with Olivier Aebi, Yanik Nabholz, Esther Rusnak and Yves Schachenmann provided some answers.





"WE CANNOT EXTOL THE BENEFITS OF SUSTAINABILITY TO OUR CUSTOMERS IF WE DO NOT SET AN EXAMPLE."

Esther Rusnak,
Head of the Competence Center Sustainability,
Gruner General Planning Switzerland

Let's start with the classic question: Why is sustainability important for Gruner?

Esther Rusnak: Sustainability is social responsibility. Therefore, Gruner has an obligation to act sustainably in its work and how it runs its business. The construction industry generates about 40 percent of greenhouse gases in Switzerland. Gruner's sustainable planning and construction practices are helping to reduce the sector's impact on the environment.

Olivier Aebi: I agree with that. As one of Switzerland's largest planning and engineering companies, Gruner has a social responsibility as well as an entrepreneurial responsibility. It is up to us to decide whether and how we act on that responsibility.

"WHAT AND HOW GRUNER PLANS AND BUILDS HAS QUITE A BIG IMPACT ON THE ACHIEVEMENT OF CO₂ TARGETS."

Olivier Aebi,
CEO Gruner

Yanik Nabholz: Responsibility is defined, for example, by corporate social responsibility. That requires Gruner to think and act sustainably in many areas. Through ethical and sustainable conduct, Gruner can position itself as an attractive employer – not just for the younger generation.

Yves Schachenmann: That's true. These days, sustainability is one of the criteria people use to choose their employer. That includes me: I want to work for a company that actively sets an example in sustainability.



In many places, the targets for carbon neutrality have recently been tightened, so fundamental changes are needed in the construction sector. As an engineering and planning company, how is Gruner responding to these challenges?

Aebi: Gruner's turnover in Switzerland is over CHF 100 million. On average, our fees account for just under 10 percent of the overall investment. In other words, our building volume is about one billion a year. What and how Gruner plans and builds has quite a big impact on the achievement of the CO₂ targets. We are aware of that responsibility and we put it into practice through our strategy, our projects for customers and our membership of key associations.

What are Gruner's strengths when it comes to sustainability? What targets does Gruner set to strengthen its position as a sustainable and eco-friendly company?

Aebi: We have a broad spectrum of competencies and very many outstanding experts. Since most of our sustainability services are based in-house, we know what we are talking about. One of Gruner's particular strengths is that we can undertake the planning for almost every concept we design. That sets us apart from other environmental and sustainability consultancies.

Rusnak: We are not simply a strong partner in the area of sustainability, we are also expanding our in-house Competence Center Sustainability. The aim of this team is to bundle and strengthen our wide-ranging expertise in sustainability and identify how it can be used on a project-specific basis. It is important for all employees to know what know-how and opportunities for internal collaboration are available at Gruner.

Schachenmann: The top priority for me is putting sustainability into practice within the company. That is vital for the credibility of our sustainability services.

"INTERNALLY, WE ARE ALREADY WELL POSITIONED THANKS TO VERY PRAGMATIC AND SUSTAINABLE DAY-TO-DAY MEASURES."

Yanik Nabholz,
Head of Legal, Insurance

The Competence Center Sustainability will enable us to use our enormous potential optimally for sustainable customer projects in the future.

Has Gruner got the right employees for that?

Schachenmann: Gruner already has many motivated employees with skills in sustainability – in all age groups. We also receive many on-spec applications from young people with environmental and sustainability-related qualifications. The expressions of interest currently exceed the jobs we can offer.

Rusnak: I anticipate that the importance of sustainability will continue to grow and we will hire more employees with the necessary background knowledge.

Is it possible to reconcile environmental sustainability with Gruner's core business, in other words, construction?

Aebi: Gruner makes a contribution to sustainability. Who is better placed than our engineers to make customers aware that they could use recyclable building materials, aim for a sustainability label for their building or reduce energy consumption in the construction and operation of the building? That is our responsibility as part of the services we provide.

Rusnak: We look very carefully at the consequences of building for society, the economy and the environ-



"AS A HEAD OF DEPARTMENT, I CAN WORK PURPOSEFULLY WITH MY TEAM TO BRING ABOUT CHANGE."

Yves Schachenmann,
Head of Environment

ment. Take a dam, for example: On the one hand, this method of energy generation is very long-term – and therefore sustainable – and operation is carbon-neutral. On the other hand, a new dam changes the surrounding area so it can have negative implications for the local community and the environment. To find an appropriate and sustainable solution for everyone concerned, we need to consider sustainability as an integral element from the outset and make sure it is taken into account.

Gruner as a whole was recently certified as complying with the international environmental management standard ISO 14001:2015. What does that mean for Gruner and its customers?

Aebi: It sends out a positive message, both within the company and externally. Actually, the certificate per

se is less important to me. What is essential is the process we went through to obtain the certificate, which has had an additional impact on Gruner.

Schachenmann: If we want to position ourselves as a sustainable planning and engineering company, certification is important for our credibility. However, the precondition is that the Executive Committee is behind it and sets an example. By that, I do not mean that all the impetus has to come from the top. On the contrary, everyone has to play their part.

Rusnak: ISO certification is doubtless a good step, especially for our credibility with customers. We cannot extol the benefits of sustainability to our customers if we do not set an example. Therefore, we are working very hard to make our own day-to-day work even more sustainable.

Nabholz: Internally, we are already well positioned thanks to very pragmatic and sustainable day-to-day measures. In the area of mobility, we are building up a fleet of electric vehicles and we encourage staff to use public transport. Thanks to people using the train instead of cars for business trips, we were able to avoid 116 t of CO₂ last year according to the emissions report we received from the Swiss railways.

Aebi: For our locations, we choose buildings that we can run optimally. – It is very pleasing to see that our internal measures to reduce CO₂ emissions are having an impact. The key figures in our annual sustainability report show that we are making good progress. That is our responsibility, and we can and must exercise it.

How does Gruner raise employees' awareness so they offer customers sustainable solutions? What sustainable/ecological perspectives do customers expect from Gruner?

Rusnak: We need to reset our day-to-day mentality and embrace the new methods of sustainable planning and construction. This is not easy to do. Therefore, we have to show our colleagues sensitively what needs to be done and what is possible. That is the role of the Competence Center Sustainability – and we are constantly discovering how much is already being done from a sustainability perspective. At General Planning we are noticing growing interest from cus-

tomers in sustainability aspects, accompanied by a rising demand for it.

Schachenmann: For instance, for decades now Gruner has offered environmental services through its Environment department. We have noticed an increase in inquiries from customers because they have to meet certain requirements. One example is the project we are undertaking with Deutsche Bahn AG to maintain biodiversity. There is an article on this project in this issue (see p. 14). Internal inquiries are also becoming more frequent. This is a positive development, which we want to encourage through the Competence Center Sustainability.

"WE NEED TO RESET OUR DAY-TO-DAY MENTALITY AND EMBRACE THE NEW METHODS OF SUSTAINABLE PLANNING AND CONSTRUCTION."

Esther Rusnak,
Head of the Competence Center Sustainability,
Gruner General Planning Switzerland

Aebi: In particular, listed companies with a large real estate portfolio have to meet certain sustainability criteria nowadays in order to obtain a good rating, which is favorable for their share price and investor interest. We have the know-how to offer such customers solutions that can help them reduce greenhouse gas emissions and the consumption of gray energy in their property-related activities.

What challenges does Gruner face as a result of new laws, standards and directives and rising corporate social responsibility requirements?

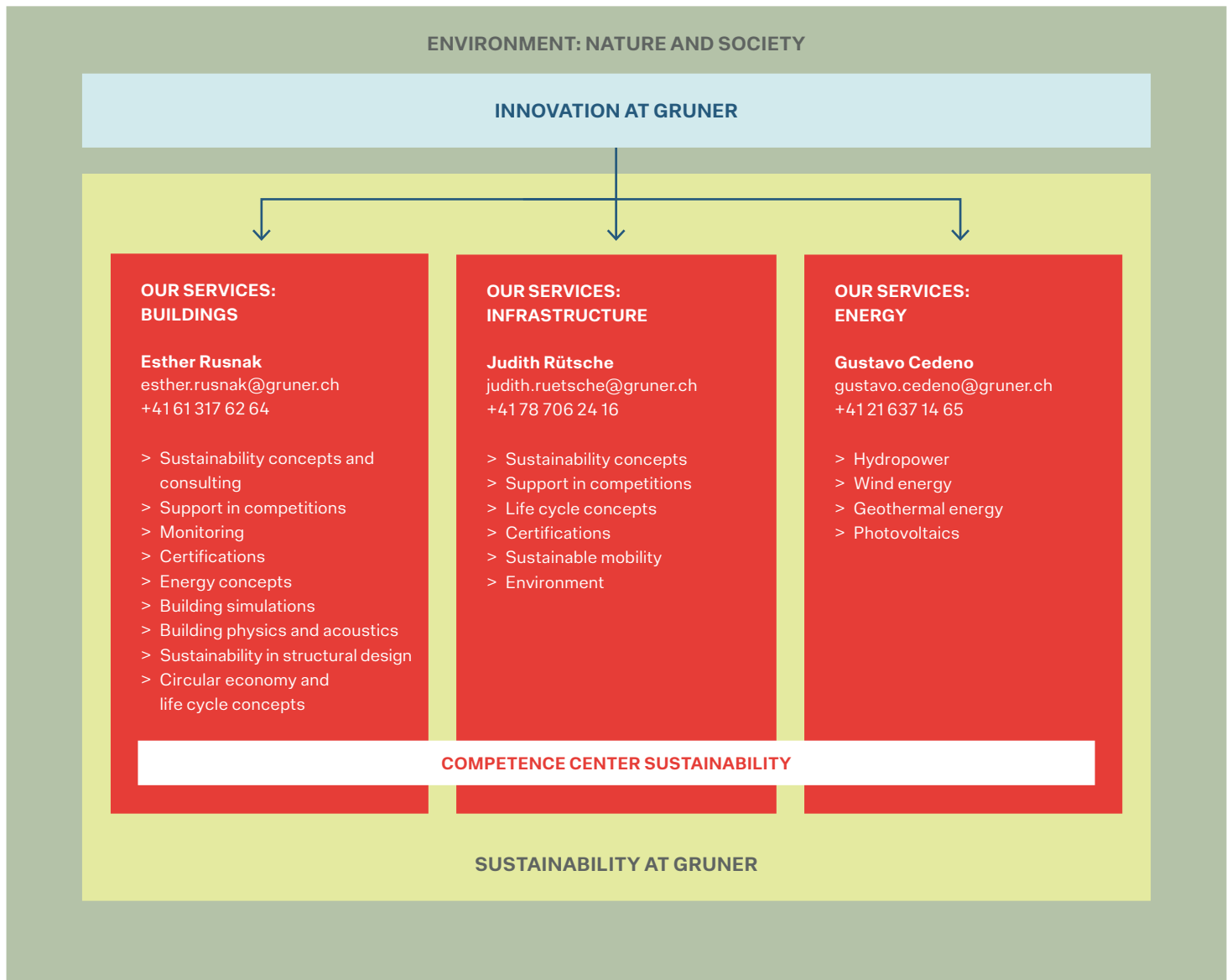
Nabholz: Sustainability has been legally embedded in the Federal Constitution for a long time. The framework for ecological, economic and social conduct is also embedded in environmental, competition and labor law. In terms of compliance, corporate social responsibility means that Gruner has to meet the expectations of its stakeholders and society in general and act sustainably. The challenge for Gruner is monitoring the legal and social developments and integrating them optimally into our daily work.

Aebi: As a planning and engineering company with the corresponding knowledge of laws, standards, directives, sustainability criteria and labeling, our consulting, planning and execution activities are focused on the future and thus on tomorrow's world.

In your function, what practical contribution can you make to sustainability in the company and in customer projects?

Schachenmann: A big contribution, like everyone else. As a head of department, I can work purposefully with my team to bring about change. When I hire new team members, I try to find out about their potential and knowledge of sustainability in order to recruit the right people. I am not only interested in their professional knowledge; a common understanding of values is also important.

Rusnak: Weighing up the options plays a big part for me. As an architect involved in general planning, what can I make better and more sustainable? Overall, we need to be more aware of sustainability – in our private lives as well as at work. One thing influences another.



COMPETENCE CENTER SUSTAINABILITY

Building for a future worth living in

About 40% of global CO₂ emissions are caused by the construction, operation and demolition of buildings and infrastructure facilities. Moreover, the construction sector consumes large amounts of nonrenewable resources, including for energy generation. That makes it one of the driving forces of climate change.

In the light of this, all companies involved in the construction process have an enormous responsibility. Their aim must be to minimize their role in the climate crisis by adopting a new mindset in the planning, construction and operation of all types of buildings and installations and ensuring that they are built sustainably.

In keeping with Gruner's vision of building a future worth living in, we are aware of this responsibility, and sustainability is already

integrated into the execution of many of our projects. Here we can rely on our network, which brings together a wide range of disciplines. To ensure smooth and efficient project execution both internally and externally, this year we established a Competence Center Sustainability. This brings together our specialist knowledge of planning and building and the development of innovative and sustainable energy solutions. It is also a platform for constantly sharing knowledge and the first line of contact for all aspects of sustainability.

MOBILITY AND TRANSPORTATION

Sustainability assessment of traffic infrastructure

Mobility is regarded as a 21st-century megatrend. Sustainable spatial and traffic planning is therefore becoming increasingly important. Gruner is playing its part in shaping a resource-saving, future-proof mobility infrastructure.

Foresighted spatial and traffic planning

Sustainable development of traffic infrastructure projects is inseparable from foresighted spatial planning. Together, they pave the way for future-proof solutions for increasingly dense urban areas, taking into account the resulting impact on the environment and rising mobility requirements. That is where the overview of our general planners and specialists in mobility, traffic and spatial planning can make a difference.

Sustainable development in Switzerland

The Federal Council's strategy aims to encourage the use of recognized sustainability standards in the planning, construction and operation of buildings and civil engineering infrastructure. This led first to a standard for sustainable building construction in Switzerland (SNBS Building Construction), followed by a standard for the construction of infrastructure (SNBS Infrastructure). These standards cover all project types (conversion, new construction/replacement, maintenance and operation) and all project phases from strategic planning to deconstruction.

Application in structural and civil engineering

We are currently using SNBS Infrastructure for a project in Kehrsatz (Canton of Bern), where the planning process is just starting. This is a model project because of its all-round approach to urban densification in the town center close to the railway station and the inclusion of the existing traffic infrastructure as well as new elements.

We are also providing an input on various aspects of traffic planning by applying the SNBS Building Construction standard for residential projects and were chosen to lead a sustainability evaluation to select the best option for the Thun North motorway junction on the basis of an assessment catalog developed jointly with the Swiss Confederation, the canton and the municipalities affected.

The role of the mobility concept

A mobility concept is a tool that can be used with developers and approval authorities to find solutions that are acceptable to all parties. For example, based on a bundle of agreed measures, we were able to provide advice for the developers and investors of, among others, University Children's Hospital in Zurich, the head office of an insurance company and a residential and service center (180,000 m² surface area), resulting in a sustainable mobility strategy.

COMPETENCE CENTER MOBILITY

In close collaboration with the Competence Center Sustainability, spatial and traffic planners are working on a range of mobility issues at federal, cantonal and municipal levels and for the private sector. The Competence Center Mobility tackles complex traffic-planning assignments.

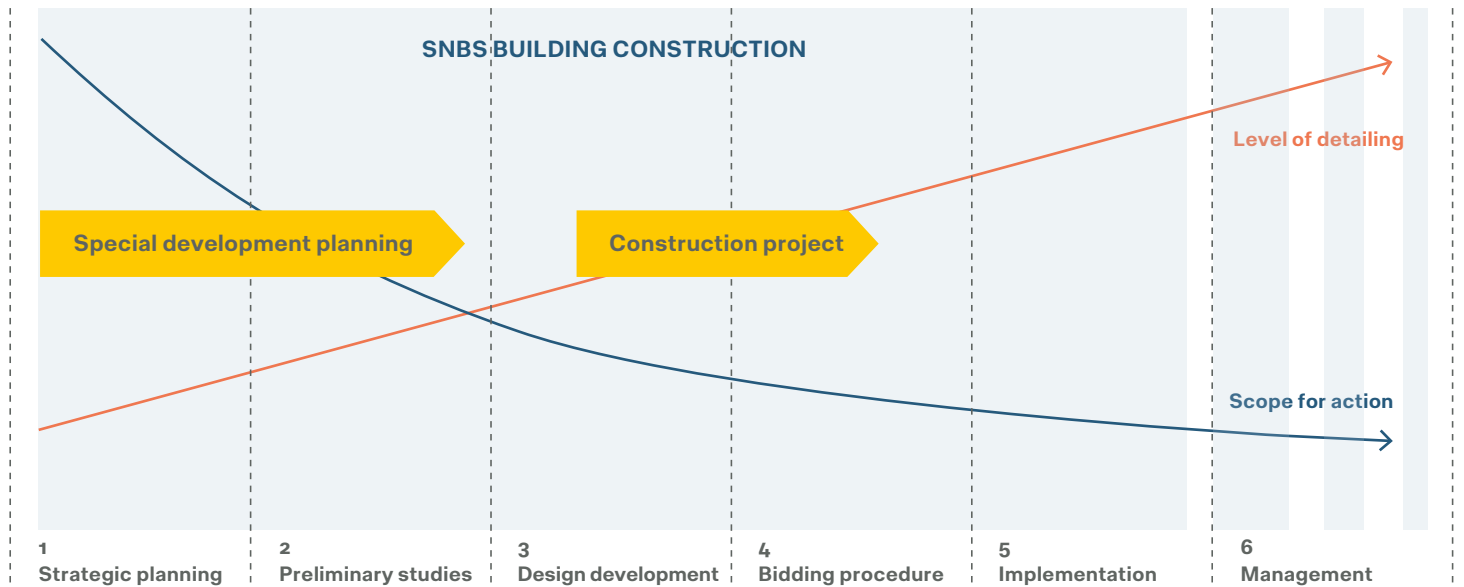
- > Strategic planning of traffic infrastructure
- > Expert reports on transport issues
- > Traffic masterplan (local planning, land-use planning)
- > Mobility concepts for focal areas of development
- > Access, operation, and design concepts
- > Accident and weak-spot analyses
- > Sustainability assessment of traffic infrastructure



Julia Bernecker
Senior Project Manager, Traffic Planning, Transport Engineering, Infrastructure Basel, Environment



Denise Roth-Zeltner
Senior Project Manager, Traffic Planning, Spatial Planning, Infrastructure Bern, Spatial Planning



In the course of project development, the level of detailing gradually increases while the scope for action progressively diminishes. All the more crucial, then, is the early application of sustainability criteria in line with the planning stage.

SUSTAINABILITY IN SPECIAL DEVELOPMENT PLANNING

Guideline for practical implementation

On comprehensive development projects, sustainability criteria need to be introduced as early as possible. Yet that is not always very easy. This prompted the city of St. Gallen, with Gruner’s support, to develop a guideline based on the Sustainable Construction Standard Switzerland. The guideline is an exemplary and readily adaptable working tool for comprehensive developments based on special development plans.

In collaboration with the city of St. Gallen, the St. Gallen Energy Agency and the NNBS (Sustainable Construction Network Switzerland), Gruner drew up a guideline for sustainable design and construction at special development plan level on the basis of the SNBS (Sustainable Construction Standard Switzerland) Building Construction. The guideline is a valuable working tool that presents recommendations for addressing all SNBS Building Construction criteria in the process of special development planning. The recommendations are primarily based on practical experience and vary according to project and locality. The guideline sets out to enable investors, private clients, design practices and public-sector bodies to interpret and apply the SNBS Building Construction sustainability criteria in the early project stages, also to sites subject to special development plans. This allows timely identification of the implications for the three dimensions of sustainability – society, economy and environment – and effective exploitation of the benefits in the design and implementation of building projects. The aim is to enshrine the SNBS criteria in the special development planning process in a way appropriate to the planning stage.

Benefits at a glance

- > Consideration of sustainability issues at an early stage
- > Recognition of need for action and identification/exploitation of scope for sustainable construction by assigning SNBS Building Construction criteria and indicators to special development planning issues
- > Facilitation of sustainability measures consistent with the planning stage and consequent enhancement of quality in development and improvement of sites and districts
- > Means of communication for promoting sustainability in early project phases

Although the principles behind the guideline stem from practical experience in the city of St. Gallen, it is readily adaptable, subject to minor modifications, to other cities and municipalities. Our urban, mobility and sustainability experts offer the necessary experience to advise and support customers in enshrining sustainability criteria in the comprehensive development framework.



Judith Rüttsche
Head of Department Urban,
Mobility and Sustainability



**Link to guideline
(in German)**



A perennial challenge: reconciling the interests of diverse groups, nature conservation and the legal framework.



As Gruner's nature conservation expert Patrick Schaub points out, unsealed, i. e. ballasted, track offers a suitable habitat for reptiles.

BASEL-KARLSRUHE NEAT FEEDER IMPROVEMENTS

Once-in-a-lifetime project on conservation site

Two extra rail tracks and a four-track marshaling facility are to be built by the end of 2028 between the Badischer Bahnhof (Basel's German station) and the German border. A delicate operation given that the works encroach on one of Switzerland's most important nature conservation sites. Gruner is designing and supervising the nature conservation measures.

The smooth snake is one of several protected fauna species inhabiting the Badischer Bahnhof nature conservation site at the former marshaling yard of Deutsche Bahn AG (DB). The 20ha site has been entered in the Swiss Federal Inventory of Dry Meadows and Pastures of National Importance since 2010. Even 20 years before that, Germany had pledged to widen the line between Basel and Karlsruhe from two to four tracks: not only is the Rhine valley section a bottleneck for traffic to and from Basel, it is also a key feeder for the NEAT (new transalpine rail route). Gruner was mandated by Deutsche Bahn AG to devise and implement diverse nature conservation and species protection measures as ecological compensation for the new works and improvements. Gruner started, prior to project approval, by examining the proposals for their environmental effects. The areas to be preserved and the substitute habitats have now been defined in an environmental impact assessment and a project landscape conservation plan.

Habitats can be preserved

It is a known fact that, even today, rail track and embankments offer a suitable habitat and migration corridors for animals. Unsealed areas leave their habitat more or less intact. Gruner's assessment additionally concludes that it is possible to preserve

26 years

is the project period with continuous Gruner involvement (2002–2028).

3,000 species

of insects and other animals plus 400 plant species inhabit the Badischer Bahnhof nature conservation site.

EUR 580 million

is being invested, as at the present date, by Deutsche Bahn, the Federal Republic of Germany and the European Union, for the 3.1km section between the Badischer Bahnhof in Basel and the national border.



Teeming with life: decommissioned rail bridges converted into a migration corridor for fauna species.

the habitat's functionality as an ecosystem for flora and fauna. Existing structures can be replaced, complemented and upgraded so as to recreate a properly functioning network for animals and plants. The substitute areas, for example, incorporate underground stone structures, so-called "reptile rockeries," as a retreat and safe hibernation place for lizards and smooth snakes. Moreover, decommissioned track crossing the river Wiese is to be converted into migration corridors for fauna species. On the basis of an environmental site supervision mandate, Gruner ensured the proper execution of these measures prior to the start of construction and carried out the first annual performance control. Consulting and implementation services were thus provided from a single source.

Finding the right balance is the key

By liaising between client Deutsche Bahn AG on the one hand and nature conservation organizations, species experts and state authorities on the other, Gruner plays a pivotal role. Its aim is to reconcile the demands of the various interest groups. This requires a high willingness to compromise among all involved parties. The increasing presence of invasive plants, which are displacing indigenous species, is a sign of the ongoing climate change and biodiversity loss. Increasingly stringent laws on the



THE SMOOTH SNAKE

Though harmless for humans, the smooth snake can be deadly for other animals: it coils itself around its prey, which it then proceeds to eat. In Switzerland, where the smooth snake is classed as a threatened species, it has the widest range of all snake species. The Badischer Bahnhof nature conservation site in Basel is one of its most important habitats. This is because it thrives in a dry climate.

The smooth snake is one of several threatened species in this area.

protection and renaturalization of ecosystems are helping to combat these developments. Environmental services have assumed an ever greater importance in recent years. All in all, Gruner faces a challenging task given the need for prompt decisions that are both entrepreneurially sound and ecological responsible, and their communication to all project parties.

The preliminary measures were completed during the autumn of 2020. The four-tracking works are currently in progress on the Swiss side of the border. The performance controls will continue until project completion in 2028.



Patrick Schaub
Nature conservation expert at Gruner



Our civil engineering site supervisors Danilo Rizzo and Reto Hügi are on site practically every day to monitor the progress of the works using BIM to Field. Visible in the background is the tent protecting the archaeological excavations.

WETTSTEIN DISTRICT HEATING EXTENSION

A further step towards net zero

Basel utility company IWB (Industrielle Werke Basel) is planning a massive expansion of the city's district heating system over the next 15 years. The network is already one of the biggest in Switzerland with some 120 km of pipes, to which 60 km are now being added. Gruner is currently assisting IWB on a sub-project to extend the service in the Wettstein district by providing support in matters of design, engineering, bidding, civils works, including associated site supervision, and coordination and installation of the building connections.

The Canton of Basel-Stadt Energy Act has the clear aim of reducing carbon emissions – to be achieved, among other means, through a stronger focus on renewable energies. By pushing ahead with its plans to extend the district heating network on the basis of the cantonal energy masterplan, IWB is driving forward the required decarbonization of heating provision. Even today, the district heating system serves some 45,000 households and other buildings. The extension project will provide around 6,000 new connections. The higher connection density and replacement of fossil-fuel systems by district heating will pave the way for a reduction in carbon emissions in the Canton of Basel-Stadt by some 70,000 tonnes p. a. by 2035.

Mains for distributing renewable heat

Waste heat from IWB's waste incineration plant and its two wood-fired power stations serves as the main renewable heat source for the district heating system. A district heating mains system is required as the primary network for the distribution of heat from the plant to the various districts.

DN 300/500, DN 200/355, DN 100/225

plastic jacket pipes

1,800 meters

district heating mains will
be laid in the Wettsteinquartier
subproject.

As a reliable partner and experienced specialist in civil and pipeline engineering, Gruner has already successfully completed numerous sustainability projects across all disciplines for IWB. The present mandate for the Wettstein district heating system extension sub-project relates to the installation of approx. 1.8 km of mains plus various building connections within the district. Our brief specifically covers stages 41–53 of the relevant SIA (Swiss Society of Engineers and Architects) plan of work. Interdisciplinary collaboration with other experts at Gruner enables us to offer an extended range of services that include structural design, foundation engineering and as-built documentation.

District heating extension in five phases

The district heating main between Claragraben and Bäumlhofstrasse is the primary supply line for the district and for later densification of the network. Phase I (2021–2024) started in March 2021. The works to the various roads are split into five, sometimes parallel phases. "After one year of construction, roughly 50% of the first phase has been completed," explains Reto Hügi, site supervisor at Gruner. The dif-

ferent phases with varying timeframes demand meticulous coordination by the site management team. Other important factors that pose technical and scheduling challenges include the heavily populated neighborhood, the road, public transport, archaeological excavations and the (tree protection) requirements imposed by the city's parks department. "The experience gathered from similar projects helps us to adopt a solution-oriented approach," says Danilo Rizzo, site supervisor at Gruner. "Early, efficient coordination, the timely involvement of all agencies and project team members plus the excellent networking with the authorities that we have established over the years are paramount for a project of this timescale and geographical magnitude."

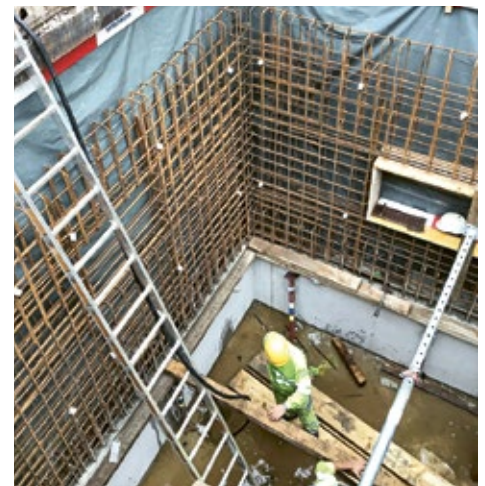
Installation of a further district heating main in Bäumlhofstrasse is planned for the medium-term connection of the district heating network with a separate system in the municipality of Riehen.



Of crucial importance is a well-built, properly supported mains trench offering adequate space for subsequent installation of the pipes without any risk of accidents. Particularly in densely developed areas, the size of district heating pipes may pose severe challenges for both the civil engineering and pipelaying works. While the necessary mains trenches need to be accordingly wider and deeper, considerable effort is also needed to handle pipes weighing over 60 kg/m.



Photos taken by a drone show the second phase, the section of Riehenstrasse and Wettsteinallee. The main difficulty here arose from the proximity of tree pits and the flanking arboricultural measures this necessitated.



District heating systems require so-called sectioning stations at branches in the pipe network. These house fittings in the form of gate valves for isolating pipeline sections and, if necessary, for emptying or bleeding the system. Steel beams and sections were used to support the pit. Also pictured are the blockouts for later installation of the district heating pipes.

DATA ACQUISITION AND HANDLING

Better data, better decisions



© Patrick de Goumoens

The inspection of infrastructure and structures is now very topical with recent structural failures such as the one of Ponte Morandi bridge in Italy. With our new ADAM (Acquisition, Diagnostics, Analysis, Monitoring) service, we offer efficient, sustainable data acquisition and management from a single source, fully integrated with all our engineering services.

We obtain data from various sources. ADAM services allow us to optimize project costs, obtain more and better-quality data than with traditional surveying methods, and thus make better decisions in our projects and for our clients.

Precise 3D model as a basis

With our specialized equipment and engineering mindset, Gruner is well equipped to meet a wide range of requirements. We have state-of-the-art equipment for industrial inspections, photogrammetry and laser scanning surveys as well as bathymetric studies. Even confined spaces and environments without GPS (tunnels, caverns) can be surveyed with our drones. With the data collected on the entire structure of an object, we can create a precise 3D model that our draftspeople, modelers and project managers can later use for a BIM-based construction methodology followed by BIM-based operations and maintenance.

Commitment to sustainability and the environment

Our ADAM service also supports our customers in their sustainability goals as it is very well suited for environmental and resource monitoring. For example, with a drone we can far more quickly and safely inspect structures such as a bridge, a photovoltaic array or a high-voltage line for visible technical defects, material losses or malfunctions. Thanks to their ease of use, we can carry out consistent, repeatable monitoring of processes, for example to map a melting glacier. We can also react very quickly to changing conditions.

Our technology has therefore clear advantages: rapid implementation of an idea, low cost of data collection, high level of detail, and better level of safety. Gruner is also the right partner for monitoring based on the BIM methodology.

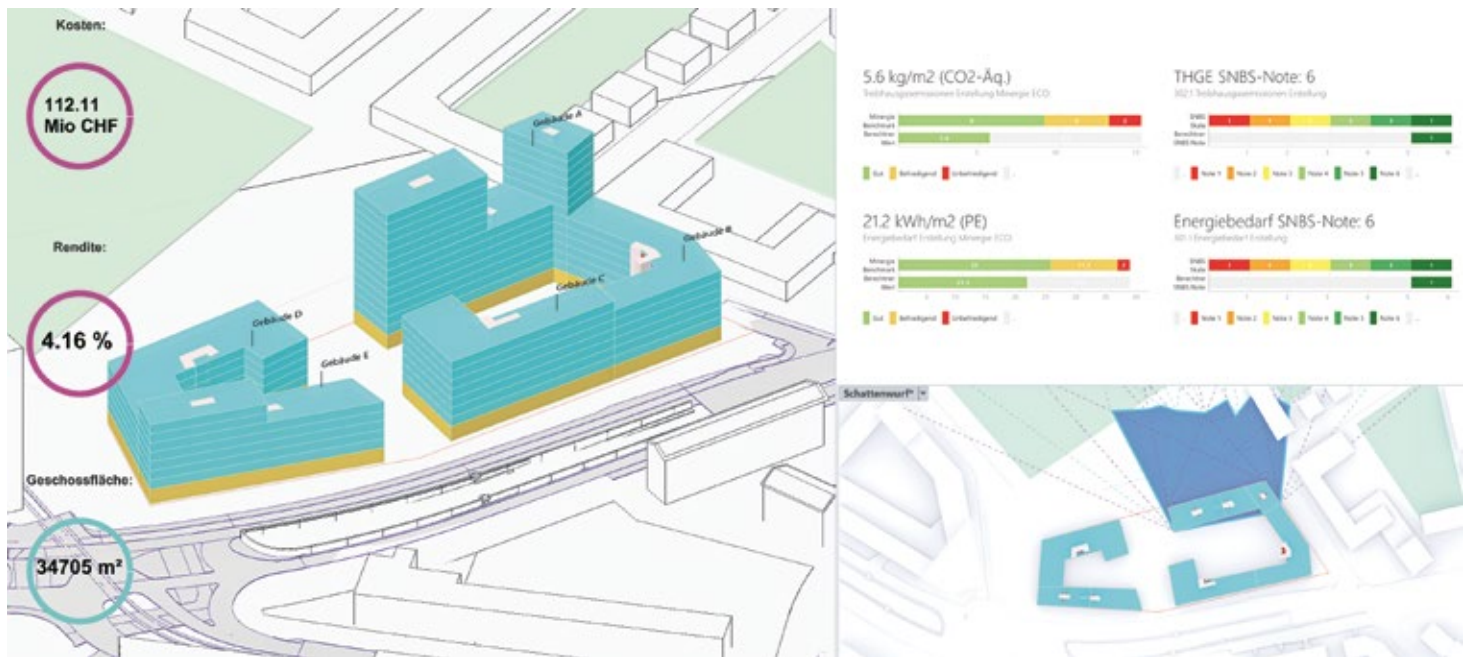


Declan Kelleher
Head of Innovation & Technology,
Development of ADAM business unit



Further details on ADAM
are available at gruner.ch

The Baipaza Dam (1985/1986) in Tajikistan is to be refurbished. In preparation for the feasibility study, we conducted a bathymetry survey of the 24-kilometer-long reservoir. The collected data was incorporated into a 3D model of the entire installation (dam, hydropower plant, all buildings) as a basis for further design phases. After the refurbishment, the 3D model can be used as a digital twin for the operation, maintenance, and logistics of the plant.



Integrated data visualization allows customized display in a personalized cockpit of the decision-relevant KPIs (key performance indicators) for each option.

SUSTAINABILITY ANALYSIS AT EARLY-STAGE DESIGN

Success factor for sustainable project development

Digitalization and sustainability – are they compatible? Very much so, as Gruner’s integrated automated sustainability analysis demonstrates. This provides decision support for clients and architects in early-stage design, i. e. at a time when they still exert significant influence on sustainability and rely on prompt feedback.

The SNBS (Sustainable Construction Standard Switzerland Building Construction) recommends the early definition of sustainable construction targets, ideally at stages 1 and 2 of the relevant SIA (Swiss Society of Engineers and Architects) plan of work. This is because early, binding decisions on the sustainability of a project create transparency, planning certainty and obligations for all involved – which, in turn, lays the foundation for time and cost optimizations. This process is supported by the SNBS tool, which provides an assessment based on 45 indicators and associated parameters. The fact that the assessment procedure under this standard involves considerable manual input makes it difficult to integrate in an agile working process. This is where Gruner’s integrated automated sustainability analysis comes in. With its automated processes, it offers high added value particularly for architectural design competitions and feasibility studies with integrated SNBS.

Variant models reveal dependencies

Automated overall project analysis by means of computer simulation is a Gruner specialty (see p. 29). The simulations also permit

the adjustment of parameters in line with the SNBS indicators. To optimize decision-making, different variant models are generated that allow direct comparison in terms of their SNBS assessment. In this way, dependencies between changes in geometry and the results of the sustainability assessment are immediately apparent for all project team members. This makes it possible to perform direct, interactive sustainability checks on optimization proposals put forward by various team members and thus places the emphasis firmly on the collaborative development of innovative approaches to optimizing design.



Manuel Frey
Head of Early Stage Design (ESD)

SUSTAINABLE SOLUTIONS

Can today's structural engineers still specify concrete with a good conscience?

Sandro Brunella is Head of the Gruner business unit Structural design Northwestern Switzerland, Geotechnical engineering. At the same time, he is a full-blooded structural engineer and, in respect of construction materials, a perpetual fan of the "climate killer" concrete. We talked to him about the influence of structural engineers on the sustainability performance of construction facilities and the use of concrete and other building materials.

You co-authored the SIA guidance paper "Concrete with recycled aggregates", published at the end of last year. How did that come about?

I was motivated by my passion for concrete and my love of nature. I have always been intensely preoccupied with the material concrete, its development and the possibility of finding lower-emission construction methods, and have regularly undertaken CPD on this subject. As an engineer, I recognize the responsibility of our profession to look for sustainable solutions. In our projects, we must apply and fully capitalize on whatever is technically feasible, with the aim of making a significant contribution to the protection of our environment.

What other approaches alongside the use of recycled aggregate are being pursued in the field of construction materials?

The 19th century was the century of steel construction, the 20th was that of concrete and the 21st is set to become that of structural timberwork. This is clearly evident today in public-sector calls for bids and in competition entries, where timber construction is increasingly proposed for sustainability reasons. And we are, of course, closely pursuing this path. But we are also consciously seeking solutions for a more sustainable use of concrete given that it is set to remain the dominant structural material in the near future. This is due to its many advantageous properties, including high strength, practically unlimited mouldability, aesthetic appeal, durability, fire performance, acoustic performance, thermal storage capacity, and, of course, its regional availability and economic benefits. It nonetheless remains clear that the ecological development of concrete still has a long way to go – and, indeed, a good deal is currently happening in both research and the cement and concrete industry. New cements with reduced clinker ratios to cut carbon emissions are constantly being developed. Moreover, recycled concrete offers a means of trap-

ping carbon dioxide – a strategy with, as yet, largely unexploited potential. Also under development are concrete-like products, e. g. based on earth materials from excavation. Indeed, quite generally, the direct use of excavated material for floor constructions or secondary building elements is very much a topical subject.

What does this mean for structural engineers like yourself?

It means we must rethink construction, be bold in exploring new avenues and develop holistic solutions that make sense from a life-cycle perspective. Although hybrid structures, for instance, combine the advantages of wood and concrete, they are often not designed as single-mindedly as pure timberwork structures – which are typically of entirely dry construction, with prefabricated modules and panels, and therefore much quicker to build and easy to recycle. Exactly what is appropriate must therefore be clarified in the earliest project phases, specifically at the concept design stage. The focus must be on finding the best – i. e. most sustainable – solution for the particular structure, client and location.

Selecting the most sustainable materials is presumably only one of the ways in which an engineer can help minimize environmental emissions during building construction. What other options do you have?

Another possibility, for example, would involve optimizing the building elements, i. e. maximizing the efficiency of structural systems and using a minimum of materials. Here, we have created the possibility of using automated mathematical optimization algorithms that are capable of paring down the load-bearing structure to the absolute minimum. This serves to cut material consumption and emissions, reduce building weight and thereby save on excavation works and foundations. Alternatively, a key project goal may consist in achieving maximum user flexibility in order to guarantee a long service life. It may thus be appropriate

8%

of global carbon emissions are attributable to the production of cement, which is the main component of concrete – more than the figures for aviation and data centers put together.

200,000 kg CO₂

is the average volume of emissions which, according to a survey by the Institution of Structural Engineers, a designer can save each year by placing the focus on sustainable structural design.

2050

is the year by which the World Cement and Concrete Association plans to offer climate-neutral concrete.

19%

is the reduction in carbon emissions achieved between 1990 and 2020 for production of one tonne of cementitious material.

“SUSTAINABILITY IS A SOCIAL RESPONSIBILITY THAT WE ENGINEERS MUST HONOR ON EVERY SINGLE PROJECT.”

Sandro Brunella,
Head of Structural design Northwestern Switzerland, Geotechnical engineering

to design spare capacity into structures to accommodate any later vertical extension or conversion. Here too, the emphasis is on finding the optimum solution for the particular situation.

Who, today, are the main drivers behind the trend towards ecological and resource-efficient construction?

Above all, public-sector customers and institutional clients, in other words those players who can or have to be able to afford it. Whereas return on investment used to be the key concern of big clients, today both return and sustainability are decisive factors. On other projects, clients may need to be persuaded – by either the engineers or the architects. Even today, many projects are still put out for bidding without any sustainability criteria being specified. In such cases, we can only exert an influence and address the subject of sustainability after contract award. And that, of course, is what we try to do.



Hirtenweg residential development by Harry Gugger Studio
A new multi-block housing scheme for the Canton of Basel-Stadt is under construction in Riehen. The challenges posed by this high-density development include the preparation of a low-cost, sustainable design solution, clear definition of public and private space, and implementation of a fast-track, phased procedure that eliminates the need for residents to relocate. Gruner partnered architect Harry Gugger Studio and design-and-build contractor ERNE Holzbau as early as the concept design phase in developing the competition entry. The three blocks housing a total of 43 apartments are of solid timber and modular construction. They are arranged such that their basement levels correspond in terms of size and position with existing below-ground structures so as to reduce the volume of excavation and thereby minimize transportation and emissions.

“Traditional” structural engineers will hardly be able to do that on their own. How do you go about collaborating with the other designers in the effort to find the “most sustainable solution”?

We always look to adopt an interdisciplinary approach based on a constructive dialogue. And, thanks to the wide-ranging competencies within Gruner, we are in an excellent position – which we fully exploit. Whenever we tackle a new challenge, we discuss all the implications of our concept, e. g. in terms of fire safety, building services or acoustics, with our colleagues. Through our close dialogue, we make every effort to enhance the sustainability of our projects.

POWER-TO-GAS

Key technology for the energy revolution

Switzerland's first industrial power-to-gas plant was recently put into service. Gruner was involved in this pioneering project, acting as designer during the construction phase. The potential offered by power-to-gas is demonstrated in a study by the Swiss Federal Laboratories for Materials Science and Technology (Empa). But what exactly is this potential? We asked our power station and energy system specialists.

Do you think power-to-gas (PtG) has a future?

Philipp Huwyler: The last two years have seen the industry take a massive step in the right direction. While the technology's efficiency is disputed and costs are still relatively high, PtG has one big advantage over alternative options: it allows longer-term storage and the easy distribution of clean energy through conversion of renewable electricity into gas. PtG can bridge the spatial and temporal gap between energy production and consumption.

Nadine Lienhard: This adds flexibility while allowing so-called sector coupling and conversion between different energy carriers, e.g. heat, gas and electricity. This unique flexibility in the use of hydrogen or methane across other energy sectors is what makes PtG a forward-looking technology.

What can PtG contribute to the energy revolution?

Huwyler: One thing that is needed to achieve net zero is carbon-neutral transport. The two options currently available are hydrogen and batteries. Hydrogen has the advantage of longer range and shorter refueling times compared to contemporary diesel vehicles. That is what convinces me that hydrogen from PtG plants – not just for cost reasons – will first gain a foothold in the long-distance and heavy-goods transportation sector, where immediate electrification is not feasible.

Lienhard: This is particularly relevant in Switzerland where some 150 hydrogen trucks will be in service by 2050 – a figure unmatched worldwide. But PtG is only sustainable when operated in conjunction with a green electricity supply, for example from hydropower stations or waste incineration plants. This limits the possible sites and applications of PtG plants.

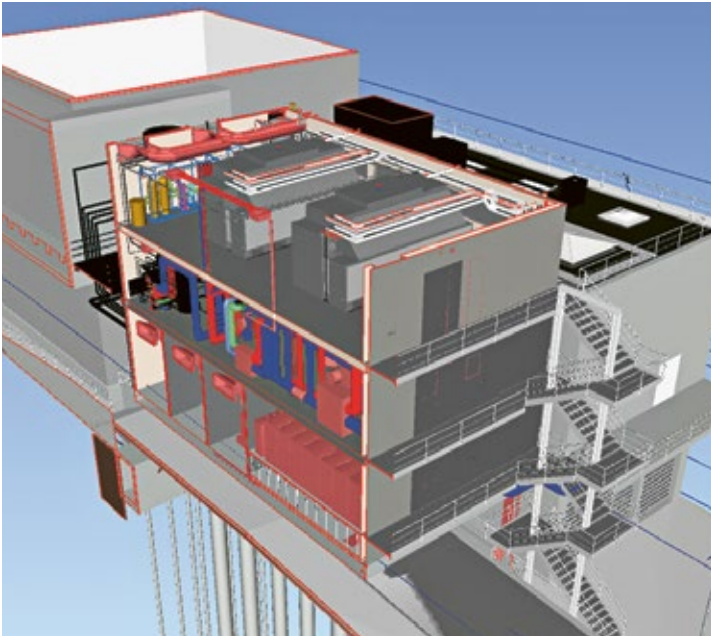
The team has already been able to apply its expertise and gain valuable experience on two pioneering projects in Switzerland. What other projects lie ahead?

Huwyler: We are currently involved in another trailblazing scheme that entails the preparation of a feasibility study and will help shape the future of PtG technology in Switzerland. On the basis of a specific project, we are pinpointing the technical, economic and political challenges and conditions for the use of hydrogen pressure pipelines.

Lienhard: The feasibility study will contribute significantly to the technical and economic optimization of hydrogen storage and transportation in Switzerland. This is because transportation by truck, as we know it today, will eventually reach its limits.



Nadine Lienhard and Philipp Huwyler – our team for your PtG project



Limeco BIM model: methanation plant with local hydrogen production



Aarmatt hybrid plant, Solothurn, allows sector coupling of the gas, district heating and electricity networks

How will Gruner position itself in the Swiss energy market in future?

Huwylar: As engineers, we are independent in every respect. That allows us to identify the options for coupling and using various energy carriers to good effect. Our aim is to partner our customers in devising sustainable and integral optimization solutions that usefully serve the entire energy system at a specific location. Not only with PtG.

Lienhard: Especially in the transition period, many issues still need to be resolved. Present efforts are directed at developing a system that allows selection of the energy form appropriate to the particular situation. If we want to remain a strong partner for our customers in matters of sustainable energy solutions, then we must respond to new energy carriers and technologies, adapt our thinking, and help develop and shape the coming innovations.

"WE WANT TO REMAIN A STRONG PLAYER IN THE ENERGY MARKET. WE MUST THEREFORE RESPOND TO NEW ENERGY CARRIERS AND TECHNOLOGIES, ADAPT OUR THINKING, AND HELP DEVELOP AND SHAPE THE COMING INNOVATIONS."

Nadine Lienhard, Project Manager of Power plants and energy systems

"HEAVY-GOODS VEHICLES ARE INDISPUTABLY THE MOST VIABLE CONSUMER OF HYDROGEN IN SWITZERLAND – AT LEAST FOR THE MOMENT."

Philipp Huwylar, Head of Power plants and energy systems

POWER-TO-GAS – PIONEERING PROJECTS IN SWITZERLAND

First PtG hybrid plant (Aarmatt), Solothurn

Sustainable energy supply through sector coupling of gas, district heating and electricity networks using CHP unit with integrated thermal store

Client **Regio Energie Solothurn**

Our services **Preliminary study, design, implementation**



Limeco – first industrial PtG plant nationwide

Production of green hydrogen from renewable electricity generated by "waste incinerator", subsequent mixing with sewage gas from company's own wastewater treatment plant and processing in catalytic methanation plant to produce synthetic natural gas that is directly fed into the existing natural gas network

Client **Regiowerk Limmattal**

Our services **Technical design phase (SIA work stage 51):**

Design of internal system connections and interfaces plus their coordination with other involved project designers and system suppliers



Feasibility study for hydrogen storage and transportation pipeline

Preparation of basic documentation for design, acceptance and approval of hydrogen pressure pipelines

Client **SFOE (Swiss Federal Office of Energy), FOGA (Research Fund of Swiss Gas Industry) and Basel utility company IWB (Industrielle Werke Basel)**

Our services **Guideline based on feasibility study for hydrogen storage and transportation facility (SIA work stage 21)**

WORKING WORLD IN FLUX

Will everything be different from now on?

The latest generation of engineers has been shaped by an era of radical change. New requirements are being placed on companies, engineering know-how, training and CPD. How are the industry and the education system coping with this? We collected opinions from a variety of perspectives.

"THE FUTURE CALLS FOR MUCH GREATER FLEXIBILITY AND INDIVIDUALITY."



Thomas Heim

Scientific Officer and Co-Program Head CAS/DAS/MAS
Digital Construction Lucerne UASA

Climate and environmental policy is spawning new professions and obliging engineers to acquire new specialist knowledge. What can higher education institutes do and what must companies like Gruner contribute to ensure that the industry remains fit for the future?

It is the job of higher education institutes to more closely integrate sustainability criteria in training and CPD programs, and to capitalize on the potential offered by digitalization. One prerequisite for a sustainable, fit-for-future construction industry will be a common understanding of the methods used in digital design, construction and operation.

Sustainability criteria will gradually cease to be just an additional requirement, but will become the norm. The focus will then be on integral approaches that boost efficiency in the construction and operation of buildings. These will be supported by digital processes, which must therefore form the backbone of sustainable practice. The potentialities offered by digitalization will be increasingly integrated through BIM and continuously refined by companies like Gruner.

The onus is now on engineers to complement their expertise with multidisciplinary knowledge on the digital value chain and engage in the continuing professional development needed to help shape the digital transformation. What is also needed is a new collaborative mindset instead of a defensive silo mentality.

"A NEW MINDSET IS NEEDED INSTEAD OF DEFENSIVE SILO MENTALITIES."



Monica Schneider

Head of HR, Member of the Executive Committee, Gruner

To what extent is Gruner's Human Resources service unit affected by this development? How is employer branding used to acquire and retain young talent?

In the near future, the company and thus the HR team will be confronted by new requirements in terms of expertise and problem-solving skills that arise from politically defined climate and environmental targets. At the same time, the generational shift is fundamentally transforming the employee universe. In only a few years, millennials and generation Z will account for the biggest part of the labor market. With their diverse values, they will reformulate the demands for an ideal workplace. Clearly defined, inflexible job packages are no longer a suitable means of attracting the best employees in all age groups and keeping them in the company.

The future calls for much greater flexibility and individuality. Of crucial importance here are factors such as scope for individual creativity, personal development, a culture of trust, new forms of digital working and an inspiring, modern style of leadership. Even when it comes to recruiting suitable workers and young talent, new approaches are required. Traditional job advertisements will be superseded by a proactive strategy of contacting candidates.



Christian Epper

Head of Infrastructure Eastern Switzerland, Gruner

The baby-boomer generation is approaching retirement and a new generation is taking its place. How is Gruner coping with this shift? What mutual expectations and what benefits will it entail?

Of fundamental importance for us is that young people are passionate about their profession, that they uphold Gruner's values and that they act as team players. Apart from that, through their education, they need to have acquired the necessary skills to address present and future sustainability issues. These days, it goes without saying that young engineers are digitally fit. Gruner offers them a platform for their further development. That can benefit us enormously.

The new generation is a driver, a catalyst and the source of innovative ideas that make Gruner fit for the future. Gruner, for its part, must offer young engineers the kind of projects that interest them. And our wide-ranging service portfolio – covering the environment, mobility, transport and numerous other fields – enables us to do this. Of course, the transition from the baby-boomer generation to the new generation of engineers is not always trouble-free. But we need this challenge, this debate and the willingness to walk the path together. The young generation drives forward the development while the older generation assumes a supporting role.

"THE NEW GENERATION IS A DRIVER, A CATALYST AND THE SOURCE OF INNOVATIVE IDEAS THAT MAKE GRUNER FIT FOR THE FUTURE."

"WE MUST START TO BREAK DOWN THE SILO MENTALITY."



Birgitta Schock

President of the SIA Digital Transformation Expert Committee

As early as 2009, the SIA (Swiss Society of Engineers and Architects) delivered a powerful statement in a position paper entitled "Bildung für eine nachhaltige Gestaltung des Lebensraums" ("Education for a Sustainable Design of the Living Environment"). What specific demands does the SIA place on its members and on higher education institutes?

The construction and real estate sector bears a major responsibility to the environment while also acting as a driver of decision-making on fit-for-future solutions. That is why we have to break down silos: with the focus now on the life cycle, the degenerative approach needs complementing by a holistic and regenerative perspective. In other words, we must liberate ourselves from entrenched roles and bolster teamwork. This requires a different mindset and new forms of education. The acquisition of expert knowledge beyond one's own specialism may offer a suitable means of promoting a holistic understanding.

However, the education system in its present form still fails to adequately cater for the constant shift in modern professional profiles. As an interdisciplinary professional association, the SIA is well positioned to collaborate in the creation of more appropriate forms of education. We have now set up a third central commission, alongside those for standards and regulations, to deal with information management. The commission will help us to break down silos and thereby counteract the shortage of skilled workers.

VOLUNTARY WORK

Gruner gives us the chance to help others

Under the banner "Moving mountains in the mountains", our highly motivated trainees spend one week each year helping out on projects in Switzerland's mountain regions. Acting in tandem with the coordinating charity bergversetzer, the trainees help to move forward a particular building project while themselves gathering precious hands-on experience.



Tired, but happy faces: the trainees are making progress in erecting the new dairy cow barn.

For me, getting to know other trainees and working with them was highly motivating. I spent a full week immersed in an unfamiliar world doing out-of-the-ordinary jobs.

Timon Müller

Not many companies support projects like this. Gruner gives us trainees the chance to help others and turn our plans into reality with our own bare hands.

Tim Riedel



Apart from acquiring technical knowledge, the trainees can also hone social skills such as teamwork.

We are doing something good by helping farming families with their building projects. Plus it's a rewarding experience for the trainees. It's great to see Gruner organizing such initiatives.

Marco Toth

I knew I'd be able to learn a lot in the course of this week. The progress we made on the farming family's project was the icing on the cake.

Alarico Bitterli



Follow us on Instagram to see photos and videos from the annual project week.

More information about bergversetzer: bergversetzer.ch

GRUNER'S YOUNG TALENTS

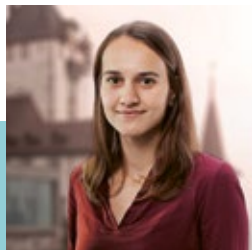
Their thoughts on sustainability and the demands of the future

Gruner's young talents represent the next generation of engineers to champion sustainable design and construction. We asked some of them for their thoughts on sustainability:

1. How is sustainability embodied in your area of work?
2. Why is sustainability important for you personally?
3. What should forward-thinking engineers have to offer?



All answers are posted online.



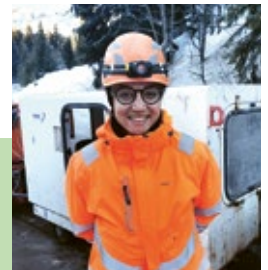
Fabienne Stämpfli, 29
Project Manager Hydraulic Engineering, Environment and Natural Hazards, business unit Infrastructure Bern, Spatial Planning

1.
Nowadays, many sustainability criteria are already factored into the design and implementation of hydraulic engineering projects. Our projects respond to diverse demands and thus improve flood control for people, buildings and infrastructure. They also enhance the quality of rivers and streams as natural and recreational environments while being cost-effective and resilient.



Adrien Vernier, 33
Site Supervisor, business unit General Planning Switzerland

3.
In terms of professional practice, sustainable design depends on the intelligent selection of materials, the optimization of construction procedures and the development of a local network. At a personal level, sustainable engineers can keep themselves and others abreast of the latest findings and oversee the measures taken on site.



Armelle Nicolle, 28
Project Engineer, business unit Hydropower, Dams

3.
The first mentality shift consists in no longer solely relying on engineers and their technical solutions to solve the climate crisis. Action is needed at various levels of society. The daily routine of sustainable engineers is informed by a long-term vision. They will seek to optimize the use of materials and design easily maintainable products with a minimum impact on the environment. They will lead their customers in the right direction and help to explain issues to the general public.



Pierre-Adil Abdelmoula, 33
Project Manager Water and Environment, business unit Infrastructure Western Switzerland

2.
As parents, we hope that the world as we know it will continue to exist for our children. It is sad enough that, here, we can no longer contemplate a better world.

EARTHQUAKE DESIGN

Protection also for secondary elements

High priority is given to the earthquake resistance of buildings. This applies to both the primary structure and the non-load-bearing elements. Vital infrastructure facilities allocated to Structural Class III are subject to special requirements.



Baden Cantonal Hospital: Gruner services include consulting, specification of concept, checking of measures, supervision of works

The primary load-bearing structure of buildings is generally designed and constructed for earthquake resistance in accordance with the applicable standards. Yet, project team members are often largely unfamiliar with the responsibilities, requirements and framework for protecting secondary (i.e. non-structural) elements, installations and furnishings (SEIF). Suspended ceilings, non-load-bearing walls or building service runs, for example, undergo acceleration due to building movement. If inadequately secured, they may overturn, be displaced or collapse and thereby endanger occupants, damage structural elements, block escape routes or impair the operation of key systems. High financial losses are also likely given that the SEIF account for the lion's share of total building costs. At the same time, the general rule for all buildings – duly enshrined in SIA standards – is that all risks to persons through the failure of SEIF must be eliminated.

"IF DULY CONSIDERED AT AN EARLY STAGE IN THE DESIGN AND BIDDING PHASE, THE SEISMIC REQUIREMENTS FOR SECONDARY BUILDING ELEMENTS CAN LARGELY BE ACCOMMODATED WITHOUT ANY SIGNIFICANT EXTRA COST."

Andrea Sandra Blaser

Designing to relevant seismic requirements

For vital Structural Class III infrastructure facilities, such as hospitals or fire stations, the serviceability of the building must be guaranteed after an earthquake event. For this reason, the SEIF and their attachment to the structure are in some cases subject to special requirements, to be determined in consultation with the designers and client team.

Gruner offers in-depth experience in all matters relating to the protection of secondary elements, installations and furnishings. Its services range from consulting on design concepts and detailed, cost-optimized technical design to supervision and acceptance of seismic safety measures. We are glad to draw on our expertise in advising clients, architects and specialist designers.



Andrea Sandra Blaser
Project Manager Structural Engineering,
Structural design NWS, Geotechnical eng.

BIM2SIM

Integral part of design process

Process-intelligent data and information management used in conjunction with modern simulation tools (BIM2SIM) is facilitating a reduction in interfaces, manual processes and the associated work effort while at the same time boosting the informative value, transparency and objectivity of decision support. At the same time, computer-based design methods together with integral building and numeric flow simulations are helping to optimize carbon footprints, to determine the effectively needed level of servicing for buildings and other facilities, and also, for example, to understand complex indoor and outdoor climatic phenomena.

Value added by computer simulations across all design phases

Early-stage design (SIA work stages 0–2) enables investors and project developers to take earlier decisions with implications for viability and sustainability on the basis of superior and more comprehensive decision support.

In the design development and construction phases (SIA work stages 3–5), model-based building and system simulations using BIM2SIM can be used to perform detailed risk and sensitivity analyses and provide clients, architects and specialist designers with model-based output for concept validation and the sizing of buildings and systems.

In the operation phase (SIA work stage 6), monitoring, operational fine-tuning and performance gap analysis using a digital twin – all backed up by real-time data from sensors – allows long-term improvements to energy efficiency, cost-cutting over the entire life cycle and the optimization of building and system performance.



David Akeret
Project Engineer Digital Design/
Building Environment Control



Further details on BIM2SIM are
available at gruner.ch

DEMOLITION

Reuse of building components

The construction industry has an enormous ecological footprint and accounts for one-third of global greenhouse-gas emissions. Selective deconstruction methods and the integration of reclaimed building components in a recycling chain geared to the closed-loop economy, e.g. ideally through immediate reuse, can drastically reduce greenhouse-gas emissions.

In order to recycle building components, they must first be recorded and catalogued. A georeferenced surveying tool for construction facilities developed by our specialists enables us to support our customers in cataloguing reusable components.

These are marked in the floor plan on the tablet and assigned various attributes:

- > Component designation
- > Classification by component category based on eCC-BC
- > Condition and material
- > Name of manufacturer, where possible
- > Details on dismantlability
- > Details on carbon savings and embodied energy where component reused
- > Size
- > Photos etc.

Any available data sheets, certificates etc. may be added. The data can be directly forwarded in tabular form for further processing within the company or by an architectural salvage center.



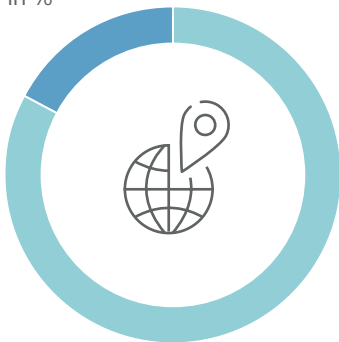
Ullrich Dickgiesser
Head of Demolition and Decontamination,
Health and Safety

Sustainable growth and high customer satisfaction

Turnover

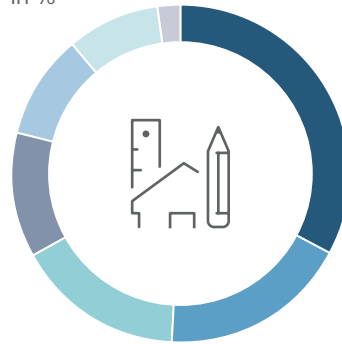
CHF 153.3 million
+9.5 %

Turnover by market
in %



83 % Switzerland
17 % Rest of world

Turnover by competencies
in %



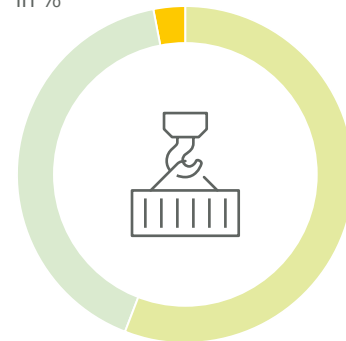
33 % Infrastructure, spatial planning
18 % Energy
16 % Structural design, geotechnical engineering
12 % Building services
10 % Fire safety, safety & security
9 % General planning
2 % Environment

No. of projects in 2021

7,739 projects
+18.6 %

56 % Small projects (up to CHF 20,000)
41 % Medium-sized projects (CHF 20,001 to 500,000)
3 % Large projects (from CHF 500,001)

Projects by total remuneration
in %

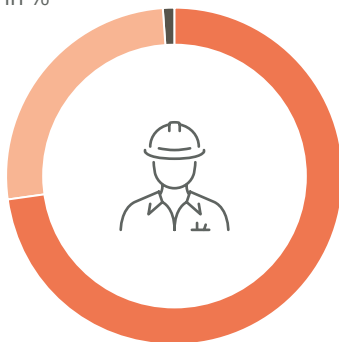


Customer satisfaction

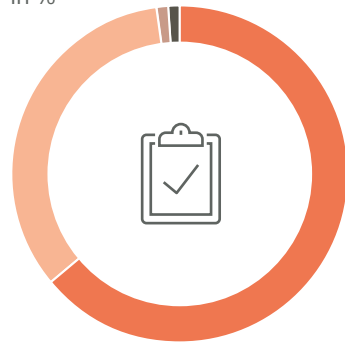
98 % rate Gruner as "very good" or "good"

Criteria: quality and service

Criterion: service
in %



Criterion: quality
in %



- 64% ■ Very good
- 34% ■ Good
- 1% ■ Satisfactory
- 1% ■ Unsatisfactory

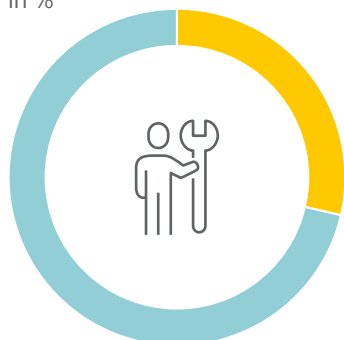


Human Resources

1,104 employees
+8.4 %

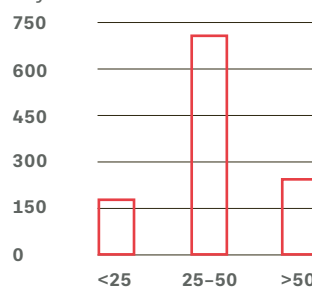
from 38 countries
71 apprentices

Employees by gender
in %

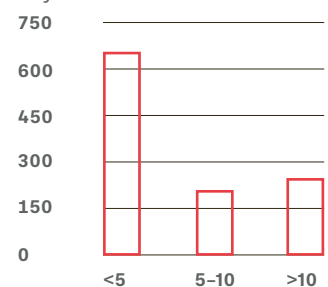


- 29% ■ Female
- 71% ■ Male

Age
in years



Length of service
in years

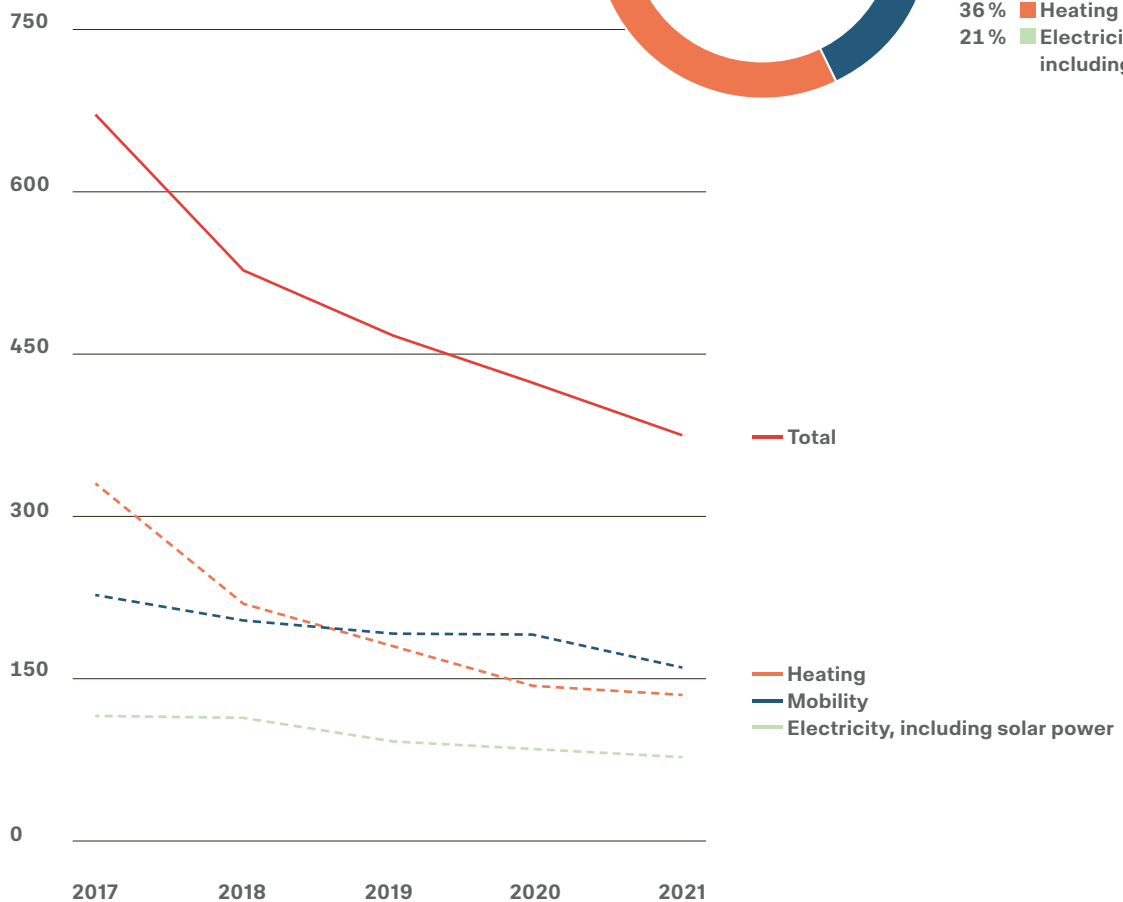


Sustainable practices are having an impact

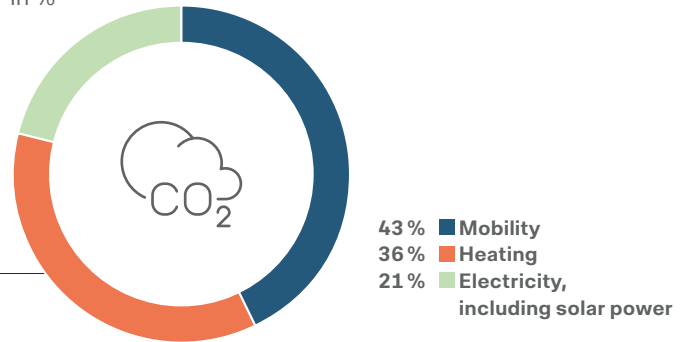
Gruner's total CO₂ emissions

379.3t CO₂
-9%

5-year comparison of CO₂ emissions
CO₂ in tonnes p. a.



CO₂ emissions by energy type
in %



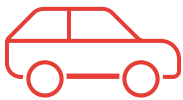
Our performance in 2021 compared to the previous year



Savings increased by switching to rail travel

116 t CO₂
+7 %

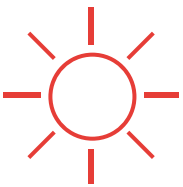
In the past 3 years, we have steadily reduced our carbon footprint by making more trips by rail (savings based on use of public transport vs. cars). This is substantiated by the annual ecological profile compiled for our trips. Our mobility strategy is making a contribution to this.



Total distance travelled by car

1.2 mn km p. a.
-12.8 %

We have introduced the ABAFleet tool to monitor the routes travelled. That has helped us optimize the use of company cars. As a result, we have reduced car travel by approx. 500,000 km p. a. since 2016. Between 2017 and 2021 our fleet was reduced from 101 to 93 vehicles. In the past couple of years, we have stepped up the use of electric cars.



Energy for heating per occupied workspace

1,147 kWh
-0.4 %

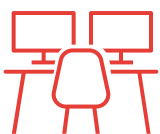
We only achieved a slight reduction in energy consumption for heating per occupied workspace, partly due to the increase in working from home owing to the coronavirus.



Electricity per occupied workspace

959 kWh
-5.3 %

Electricity consumption per employee was reduced further. A new photovoltaic installation at the Oberwil location has increased the proportion of renewable electricity from 4 % to 7 %.



Area per occupied workspace

19 m²
±0

The new locations in Fribourg and Martigny resulted in a slight increase in office space. The space required per occupied workspace was virtually unchanged from the previous year.

Innovation and networking



2021 GRUNER INNOVATION AWARD

The 2021 Gruner Innovation Award went to Robin Dergeloo for his bachelor thesis entitled "Comparative investigations on pre-stressed-concrete beams for the new construction of a pharmacological production building". Gruner presents the award annually for the most innovative bachelor thesis on the Civil Engineering course at the University of Applied Sciences and Arts Northwestern Switzerland (FHNW). Georg Rüdlin (pictured left), Senior Project Manager and Team Leader Structural Design at Gruner, congratulated the winner, Robin Dergeloo, on his achievement.

GRUNER INNOVATION INITIATIVE

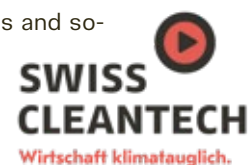
The Gruner Innovation Initiative was launched with the aim of promoting innovation management. All employees can submit their ideas to so-called innovation circles, i. e. groups organized for the individual Gruner sites. There is no such thing as a "bad" idea: All suggestions for furthering Gruner's in-house and external development are welcome. The relevant innovation circle then takes a vote on each proposal and whether it should be pursued. The best innovations are rewarded.

140 memberships nationally and internationally

MEMBER OF SWISSCLEANTECH

Gruner became a member of swisscleantech in 2021. The swisscleantech business association has established an effective framework for climate-compatible business practices that make the target of carbon neutrality by 2050 achievable. "Promoting environmental protection is one of Gruner's fundamental principles," says Gruner CEO Olivier Aebi with regard to the new membership. "By joining swisscleantech, we are deepening our ecological responsibility while supporting the cleantech community. For only by working together can we make things happen in business, politics and society."

[swisscleantech.ch](https://www.swisscleantech.ch)



Our competencies at a glance

FIRE SAFETY

Better safe than sorry

With profound expertise and a fiery commitment, we offer our customers advice and support on both small and large-scale projects in the fields of fire safety and building physics. All our efforts are geared to delivering a convincing solution that satisfies all criteria. Although a residual fire risk always remains, our consulting services and innovative engineering methods ensure that this remains at an acceptable level.

INFRASTRUCTURE

Rapid progress – safe arrival

We are there to help people who are on the move and need reliable services. We offer our customers advice and support in the development and implementation of large- and small-scale infrastructure projects, at local, regional, national and international level, for public and private transport facilities as well as electricity, water, district heating/cooling and gas utilities.

GEOTECHNICAL ENGINEERING

Safety and cost-efficiency united

The crucial parameter in foundation engineering is the condition of the subsoil, which harbors both opportunities and risks. We are extremely conscientious in seeking innovative project solutions that combine high safety standards with maximum cost-efficiency. Thanks to specialist knowledge and experience from countless civil engineering projects, we are well equipped for every new challenge.

SAFETY, SECURITY

The less risk, the better

We help to protect infrastructure, companies and individuals while improving security at major events. Our risk analyses and assessments enable us to pinpoint hidden dangers. We partner our customers in analyzing possible solutions and put in place effective measures that prevent minor incidents from triggering major crises.

ENERGY

Clean energy for clean living

No matter how deep the water, with hydropower plants we are never out of our depth. We oversee energy projects – production plants, distribution systems such as high-voltage lines, transformers and smart grids as well as strategic developments – in Switzerland and worldwide, from the feasibility to the commissioning stage, always with an eye to optimizing technical, safety, ecological and economic performance.

LEAD DESIGN, GENERAL PLANNING

Better ways of managing construction

In ensuring the smooth progression of design and construction, we adopt a variety of roles: as general planner/lead designer on new-build, refurbishment and alteration projects, we eliminate all interface problems in the design and production processes. At the design stage, we reconcile the demands of clients and architects. At the construction stage, we keep a tight grip on costs, deadlines and on-site workmanship.

BUILDING SERVICES

All-round comfort

We develop intelligent integral concepts for buildings where owners and users can feel at home. The life-cycle perspective nonetheless remains firmly in focus. Light, shade and the indoor environment are simulated before the first pipe is even laid. Architecture, structure and M&E equipment are skillfully reconciled throughout the concept, design and implementation phases. As experts in the use of geothermal energy, gas and biomass for heating, cooling and electricity generation, we are also helping to implement Switzerland's energy strategy 2050.

STRUCTURAL DESIGN

Meticulous design that stands above the rest

We develop the optimum structural solutions for buildings and bridges. With an open-minded, innovative approach to the realization of complex and creative architecture, we are your engineering partner of choice. In terms of sustainability and visual impact, our structures always deliver what is promised. And for structural maintenance and improvement schemes, we are never short of good ideas.

SPATIAL PLANNING

An eye for the big picture

Spatial planning faces spatial, technological, instrumental and environmental challenges. This requires new methods and instruments for planning. This is where we come in with site developments such as special use plans or master plans, as well as local planning, consulting for building owners and participation for future-proof spatial structures.

ENVIRONMENT

Next step – the future

Regardless of facility type – whether for buildings, roads, tunnels, landfills or the open countryside – we provide surveys, analyses and counselling, and develop comprehensive solutions for our customers' projects. Our sound decision support maximizes the benefits for the environment and humankind – in the near future and for generations to come.

We deliver compelling quality.

As a leading engineering and design company, Gruner offers a comprehensive service portfolio for public- and private-sector clients.

It advises and supports its customers in the business areas of building construction, infrastructure and energy – from strategic planning and commissioning through to the facility management of buildings and infrastructure. Expertise, knowledge and experience gained in many years of involvement in complex construction projects set us apart.

True to our vision: Building a future worth living in.



Gruner in Switzerland

www.gruner.ch

Aarau, Appenzell, Basel,
Berneck, Brugg, Degersheim,
Flawil, Fribourg, Köniz,
Lucern, Martigny, Oberwil BL,
Renens VD, Rodersdorf,
Roggwil TG, Solothurn,
Stein AG, St. Gallen, Teufen,
Wil SG, Zollikofen, Zug, Zurich



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