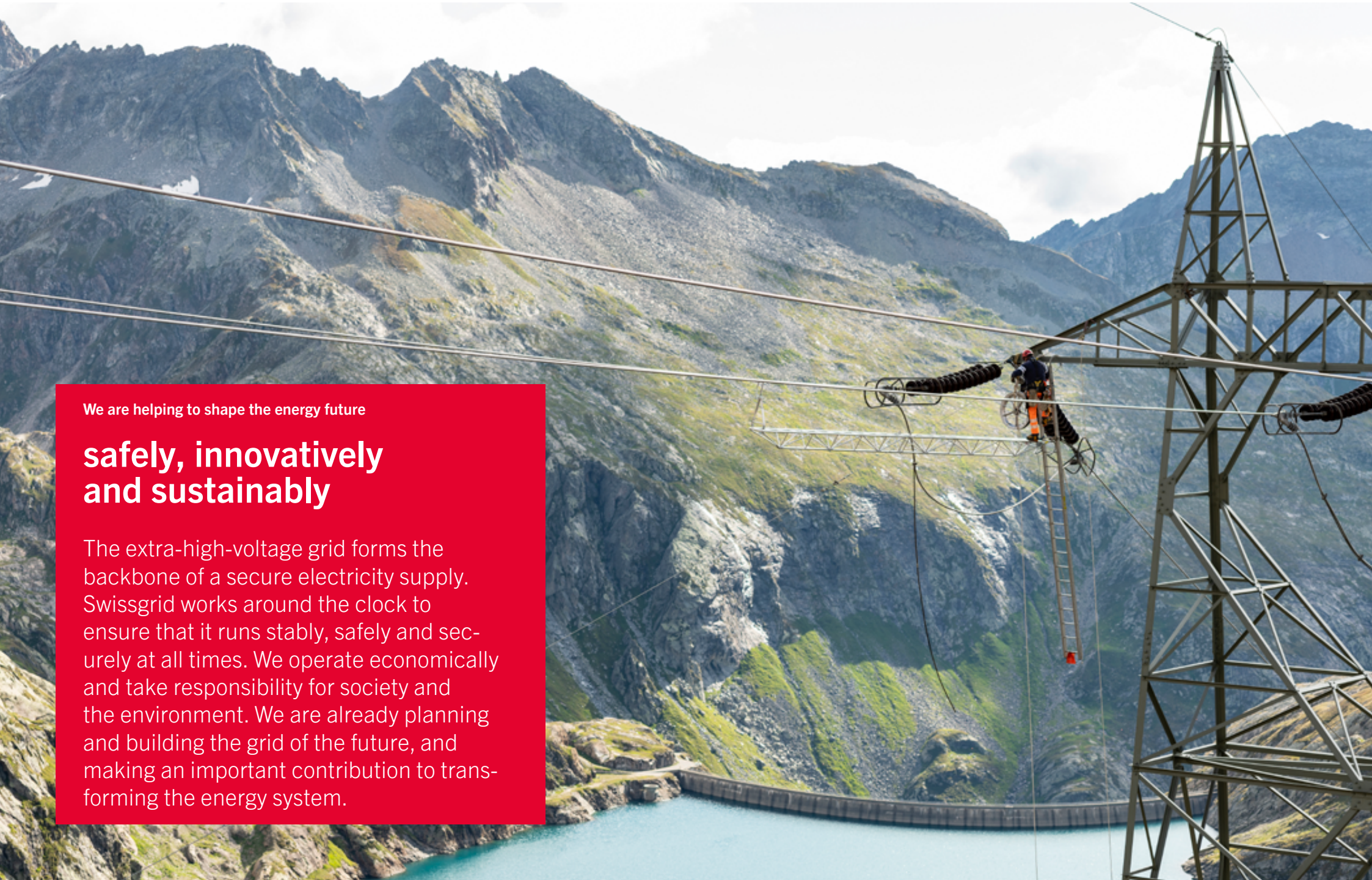
Sustainability Report 2022

swissgrid



We are helping to shape the energy future

safely, innovatively and sustainably

The extra-high-voltage grid forms the backbone of a secure electricity supply. Swissgrid works around the clock to ensure that it runs stably, safely and securely at all times. We operate economically and take responsibility for society and the environment. We are already planning and building the grid of the future, and making an important contribution to transforming the energy system.

Statements

GRI 2-22

Adrian Bult
Chairman of the Board of Directors

"A reliable supply of electricity is the backbone of our society and economy. The secure operation of the transmission system is a central pillar for the security of supply in Switzerland. As a national grid operator, Swissgrid has always taken a long-term approach to its business activities. Strategy 2027 anchors sustainability even more strongly in the company and corresponding activities are viewed holistically and systematised. Swissgrid is guided by the UN Sustainable Development Goals 2030."

Yves Zumwald
CEO

"At Swissgrid, various ecological, economic and social measures that follow the principles of sustainable development are already in place today. The key thematic areas of sustainable development at Swissgrid have also been identified for the 2027 strategy. In the new strategy period, they will be managed and measured across divisions. Through additional measures, Swissgrid is strengthening its commitment to sustainability while incorporating existing activities."

Michelle Roth
Head of Communication & Stakeholder Affairs

"Swissgrid creates transparency through its Sustainability Report. The report provides a consolidated overview of the main topics and corresponding key figures related to sustainability. At the same time, it serves as a basis for developing and reviewing goals and measures. Our sustainability reporting is structured based on the standards of the Global Reporting Initiative."

GRI 2-1, 2-2, 2-3, 2-4, 2-5, 2-14

Reporting context

Swissgrid has always taken a long-term approach to its business activities. Swissgrid is presenting its existing sustainability commitment for the first time in the form of a report for the 2022 financial year. This Sustainability Report covers Swissgrid Ltd, which is headquartered in Aarau. Swissgrid operates exclusively in Switzerland. The company owns a 100% stake in Pronovo AG. The latter is subject to the supervision of the Swiss Federal Office of Energy and is explicitly excluded from consolidation in Swissgrid on the basis of Art. 64 para. 5 EnG. Otherwise, Swissgrid does not hold any majority interests. An overview of all shareholdings can be found in the Financial Report under Financial assets.

This first Swissgrid Sustainability Report for the 2022 financial year is structured in line with four fields of action: Purpose, People, Partnership and Planet. Within these four fields of action, Swissgrid reports on its material topics and the information listed in the GRI Content Index with reference to the standards of the Global Reporting Initiative (GRI). Since many key figures are being collected systematically for the first time, no developments can yet be shown. Rather, this first Sustainability Report serves as a basis – and 2022 thus as a base year – for the further development of goals. The reporting period of the Sustainability Report coincides with that of the Swissgrid Annual Report, which was published on 20 April 2023. Like the Annual Report, the Sustainability Report is approved by the Executive Board and the Board of Directors. In future, the Sustainability Report will be published annually as part of the Annual Report. This report has not been externally verified.

Contact
Swissgrid Ltd
Bleichemattstrasse 31
P.O. Box
5001 Aarau
Switzerland

+41 58 580 21 11
info@swissgrid.ch

Media office
+41 58 580 31 00
media@swissgrid.ch

Content

Swissgrid

GRI 2-6

Company

Swissgrid is the national grid company and owner of the Swiss extra-high-voltage grid. Swissgrid's mandate is governed by the Electricity Supply Act (StromVG, SR 734.7) and the Electricity Supply Ordinance (StromVV, SR 734.71). The Swiss Federal Electricity Commission (ElCom) monitors compliance with these regulations. By fulfilling its mandate, Swissgrid makes an important contribution to the security of supply in Switzerland.

Swissgrid does not produce electricity but transports the electrical energy produced by the large power plants to the regions of consumption via the transmission system. Specialists in Swissgrid's grid control rooms monitor the grid around the clock and ensure that the balance between production and consumption is maintained at all times and that the energy is transported safely. Swissgrid regularly inspects and maintains or repairs pylons, lines, substations and switchgear. In addition, Swissgrid is responsible for the planning, replacement and expansion of the entire transmission system infrastructure, develops trading platforms, and ensures the corresponding cross-border capacities for the electricity market players.

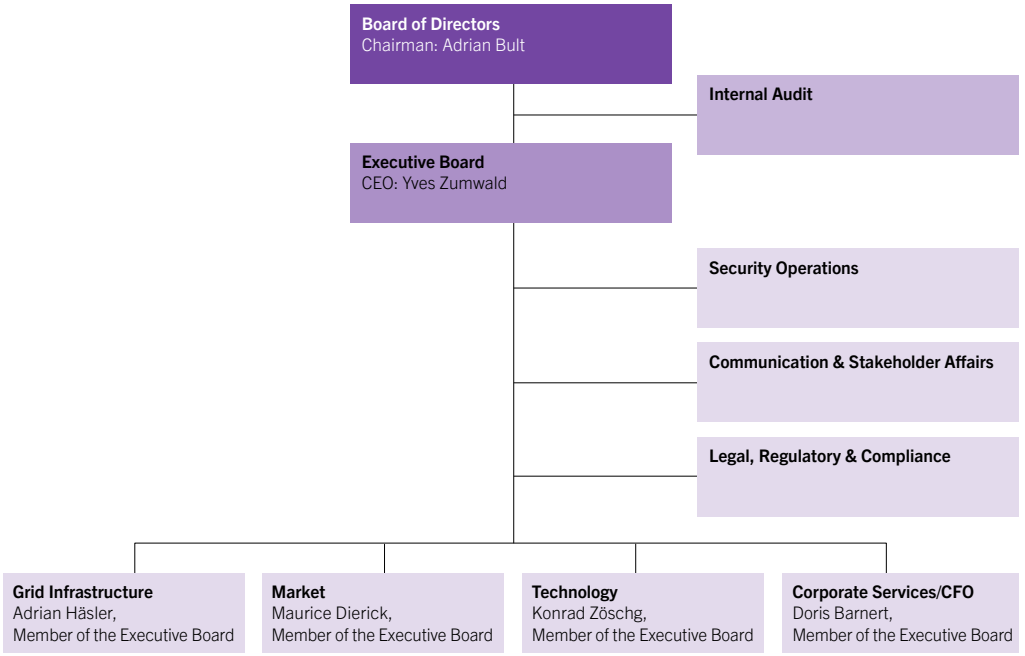
As a member of the European Network of Transmission System Operators ENTSO-E, Swissgrid plays an important role in coordination and grid usage in the European exchange of electricity. Together with the energy sector, business, policymakers and the general population, Swissgrid contributes to the transformation of the energy system and develops solutions to expand the Swiss transmission grid sustainably and efficiently.

History

GRI 2-1

Swissgrid was founded in 2006 in view of the gradual liberalisation of the Swiss electricity market with the aim of harmonising and centrally operating Switzerland's transmission system. Prior to that, different electricity grid companies were simultaneously responsible for power transmission in Switzerland. Since 2008, the Electricity Supply Act (StromVG) has stipulated that the transmission system must be owned by the national grid company. As the national grid company, Swissgrid has been responsible for the operation and safety of the approx. 6,700 km-long extra-high-voltage grid since 2009. Swissgrid took on ownership of the grid in 2013 and has since been responsible for its expansion. The acquisition was a multi-year process that was successfully completed in 2021.

Corporate structure



Following the final compensation of the grid takeovers that took place in 2021, the 18 procedural companies merged with Swissgrid with retroactive effect from 1 January 2022. The assets, liabilities and shareholders' equity of all the procedural companies were transferred to Swissgrid on the date of the merger.

Swissgrid holds 100% of the shares in the non-consolidated subsidiary Pronovo AG. Pronovo AG is the certification body responsible under Art. 64 of the Energy Act (EnG, SR 730.0) for recording guarantees of origin and for handling the federal government's support programmes for renewable energies (feed-in tariff system, one-off payment and additional cost financing). It is also responsible for the collection of grid premiums in this respect. It employs around 60 members of staff. Otherwise, Swissgrid does not hold any majority interests. An overview of all shareholdings can be found in the Financial Report under Financial assets.

GRI 2-6

Business activity and value chain

Legal and regulatory environment

The electricity industry's value chain can basically be divided into the following areas: electricity generation, electricity transmission, electricity distribution and electricity consumption. As the owner and operator of Switzerland's extra-high-voltage grid, Swissgrid is responsible for electricity transmission. The high investments for the construction of the transmission system, rising economies of scale (in view of falling marginal costs) and high irreversible costs result in a natural monopoly in the area of electricity transmission. This has been structured as a legal monopoly by the legislator based on the Electricity Supply Act (StromVG) and the Electricity Supply Ordinance (StromVV). To strengthen the supply of electricity in Switzerland, the Winter Reserve Ordinance (WResV SR 734.722) was also enacted in February 2023.

Given the public interest in the secure national supply of electricity, the resulting legislation and relevant supervision by the regulator, Swissgrid's business activities are overwhelmingly subject to strict regulation. ElCom is the independent state regulatory authority in the electricity sector and monitors compliance with the StromVG and StromVV or WResV. It is allowed to issue rulings where necessary, against which there is a right of appeal to the Federal Administrative Court with the possibility of appeal to the Federal Supreme Court.

Business activity

As the national grid company, Swissgrid is responsible for the non-discriminatory, reliable and efficient operation of the transmission system as well as its efficient maintenance. In fulfilling its legal mandate, Swissgrid respects the environmental sustainability of its actions. The renovation and demand-driven expansion of Switzerland's extra-high-voltage grid are considered amongst the company's most important tasks. Swissgrid also provides additional services, such as balance group and congestion management or, where necessary, ancillary services as part of European and Swiss interconnected operations. In doing so, Swissgrid safeguards Switzerland's interests.

Swissgrid is responsible for all of this

The transmission system in 2022

147 switchgears

6,700 kilometres long

Voltage of **380** and **220** kilovolts

41 cross-border lines in other countries

12,000 pylons

2 grid control rooms

7 locations

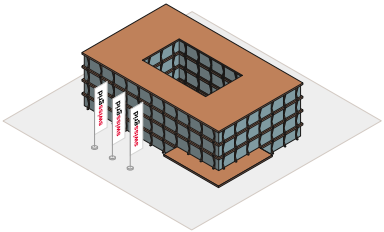
Locations and grid

GRI 2-1

Swissgrid has more than 700 highly skilled employees from more than 30 countries at its sites in Aarau and Prilly and its bases in Castione, Landquart, Laufenburg, Ostermundigen and Uznach. The Swiss transmission grid is 6,700 kilometres long and transports electrical energy at a voltage of 380 and 220 kilovolts. In addition to all the lines, the transmission system includes 147 switching stations, 12,000 electricity pylons and 24 transformers. There is a good reason why the Swiss transmission grid is one of the most stable in the world. 40,000 metering points meticulously map the grid. They record around 10,000 measured values within seconds. On the basis of this, Swissgrid monitors grid security and, in the event of an endangered or disrupted grid state, takes measures to restore the grid to a secure state.

This is the hardware the grid needs

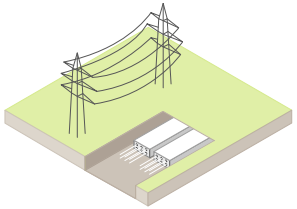
For the transmission system to function smoothly, it needs a sophisticated and perfectly coordinated infrastructure consisting of various key components.



Grid control rooms

Control centres in Aarau and Prilly

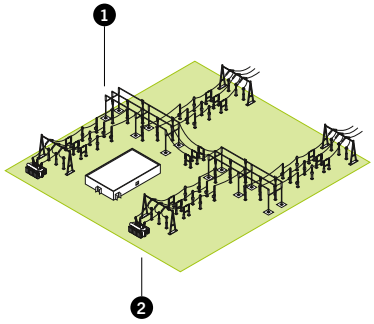
The two Swissgrid grid control rooms in Aarau and Prilly are at the heart of the Swiss transmission grid. From there, employees monitor the grid around the clock and ensure that the balance between production and consumption is maintained at all times and that electricity is transported safely.



Extra-high-voltage lines

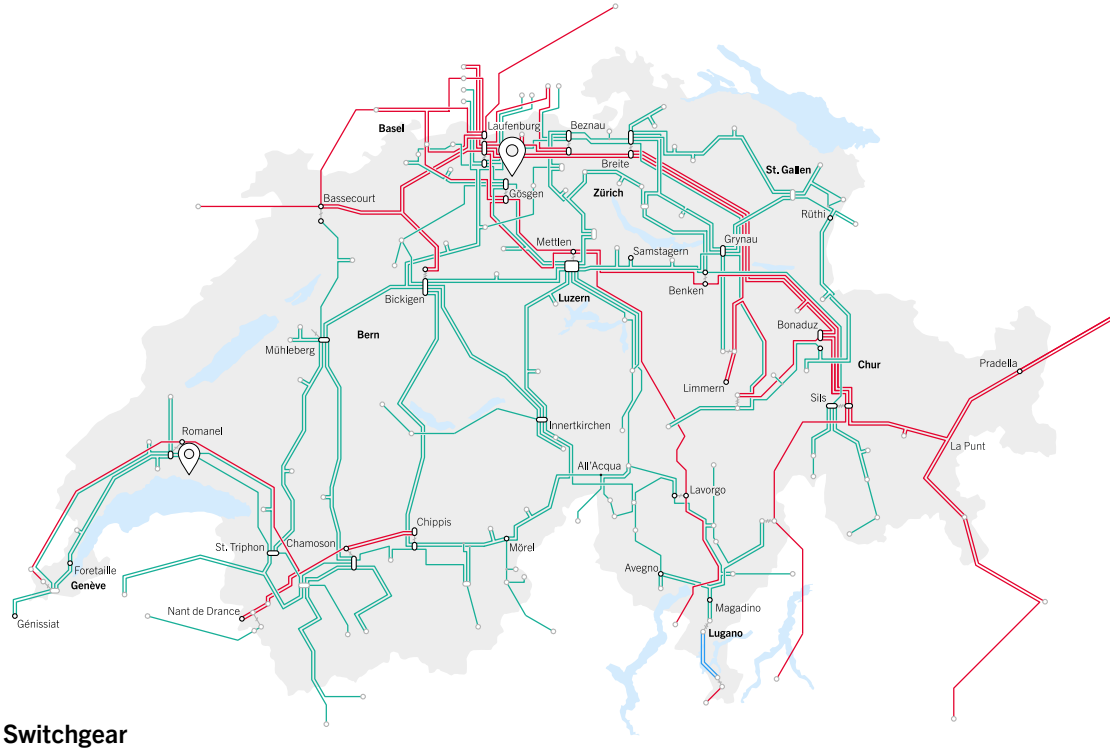
— 220-kV lines — 380-kV lines

The transmission system consists of 380- and 220-kV lines extending over a total of 6,700 kilometres. The Swiss grid also comprises 12,000 electricity pylons and is linked to the European interconnected grid by 41 lines. The 380-kV lines are used to import and export electricity, while large Swiss power plants feed their energy into the 220-kV grid. The electricity is mostly transported via overhead lines at extra-high voltage. Swissgrid examines the use of underground cables for every grid construction project.



Substations

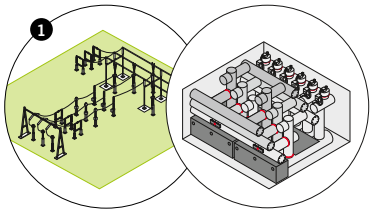
The substations connect different grid levels and are the nodes of the transmission system. Swissgrid's 125 substations house switchgear, sometimes have transformers, and also contain protection and station control technology.



Switchgear

Switchgear

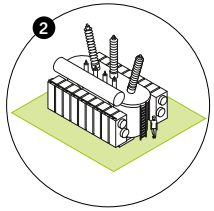
The lines are interconnected in Swissgrid's 147 switchgears. The employees in the grid control rooms disconnect and connect lines by means of switching operations, thereby controlling energy flows. This enables them to prevent overloads and switch off lines for inspection work. In addition to large-scale outdoor switchgear, there is also gas-insulated switchgear that only takes up a fraction of the space.



Transformers

Transformers

The 24 Swissgrid transformers connect the 380-kV grid to the 220-kV grid. They make it possible to reduce or increase the voltage in the grid.



Strategy

The year 2023 is the starting point for a new, five-year strategy period for Swissgrid. The last ten years have been marked by the takeover of the grids from their former owners and a subsequent development and consolidation phase. This has enabled the company to establish a solid basis from which to start tackling the challenges it faces in a rapidly changing energy system.

The energy system in transition

Following a long period of stability, there has been considerable movement in the electricity industry in the past 20 years. Fundamental change was triggered by the EU's decision to integrate the European power markets and to decarbonise the energy industry. Pressure to accelerate the transformation of the energy system and decarbonisation is increasing more and more due to the newly formulated climate targets within the framework of the European Green Deal.

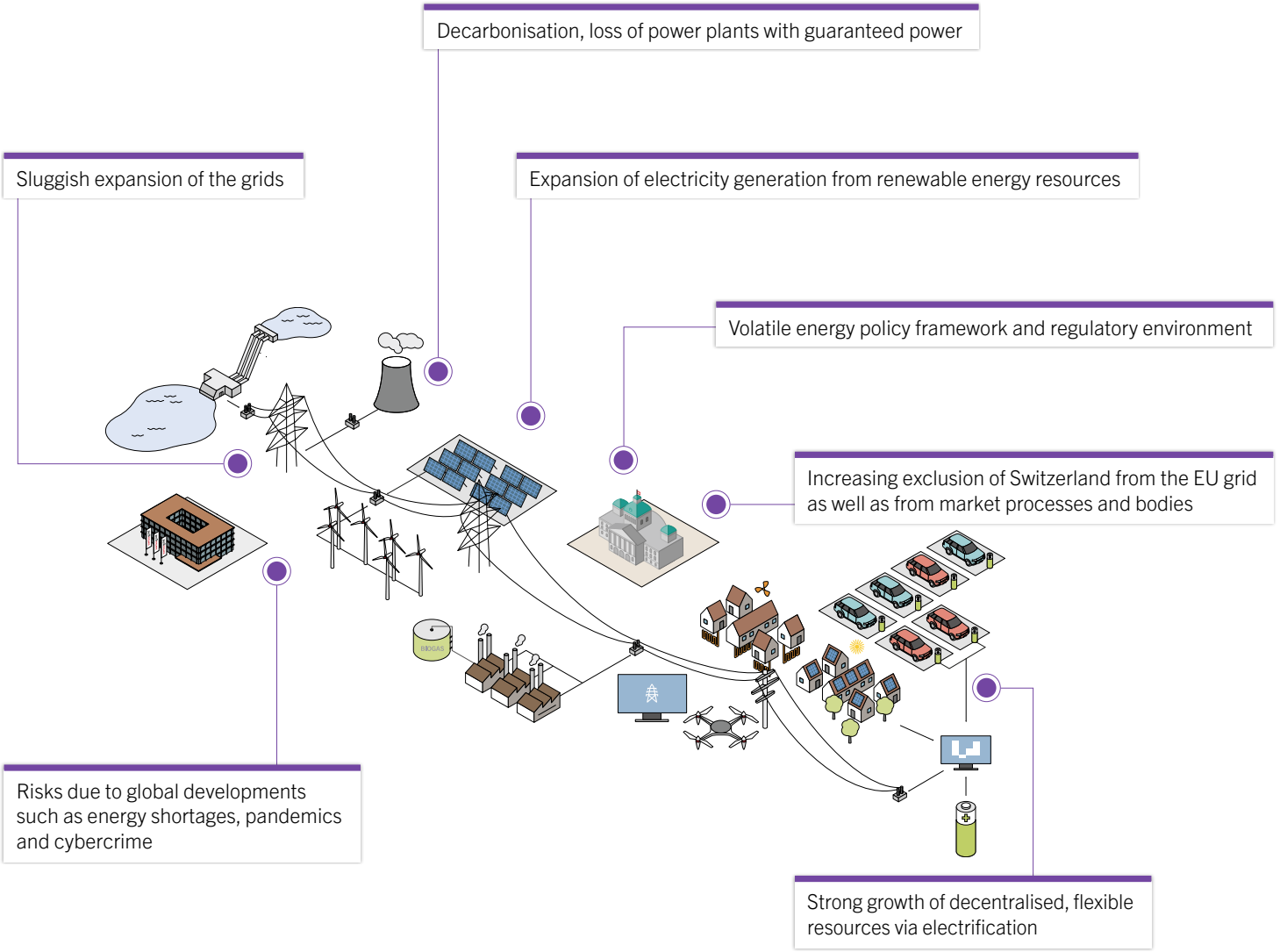
The energy policies of the EU and Switzerland are once again under scrutiny: geopolitical developments, the shortage of gas supply, limited power plant capacities in winter and exceptional developments in wholesale prices for gas and electricity reinforce the aspiration for national energy autonomy. It is to be expected that the power plant park, and hence the entire energy system, will continue to undergo change in the coming years.

These developments affect grid operators in several ways. The more rapid expansion of renewable energy production leads to significant changes in production patterns and volatile electricity flows. This poses great challenges for power system control, which means that sufficient reserve power and higher automation are needed to ensure grid stability. The political and regulatory environment requires grid operators to assume new tasks at very short notice. At the same time, the statutory framework conditions are hampering any important changes from being made: the approval and authorisation procedures for grid projects, which remain lengthy, are just one example. This is significantly slowing down the urgently needed adaptation of the grid infrastructure to the new framework conditions.

These challenges for Swissgrid are accentuated by the lack of an electricity agreement between Switzerland and the EU. Switzerland is increasingly excluded from important EU market mechanisms. This results in a greater risk of more unplanned electricity flows, a lack of consideration in security-relevant system processes and a reduction in import capacities.

Grid operators face challenges not only due to the changes in the energy system, but also on account of global developments. Threats such as the consequences of climate change for the grid infrastructure, pandemics or cybercrime make it clear that operators of critical infrastructures must have an exceptionally high level of protection and readiness. The demands placed on the resilience of these companies and on their security arrangements, emergency response measures, business continuity management and crisis management remain high.

Drivers for Swissgrid's strategic need for action



GRI 2-22

Strategy 2027

As the national grid company, Swissgrid assumes responsibility for the economy, society and the environment. That's why the motto for the new corporate strategy is:

"We are helping to shape the energy future – safely, innovatively and sustainably."

Strategy 2027 includes five closely related priority topics:

Security of supply comprises measures to ensure grid-related security of supply in the long term, irrespective of the degree of integration into the processes of the EU, while at the same time supporting the Confederation's energy strategy.

Grid transfer capacity is equally important. Its aim is to increase the capacity of the grid in line with demand and to construct and operate the grid even more efficiently in the future.

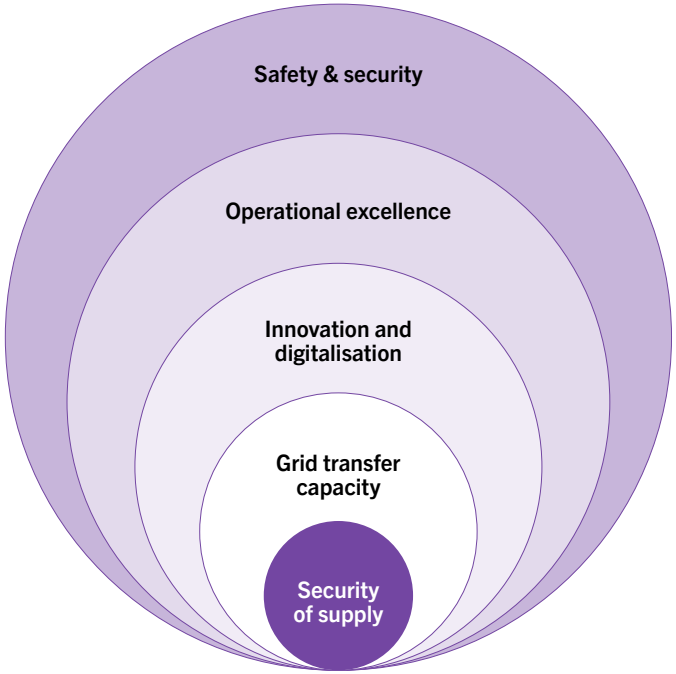
Innovation and digitalisation are the main focus of a comprehensive package of measures that lay the necessary foundations for implementing the desired digital transformation.

Operational excellence addresses the fields of action required to ensure that Swissgrid continues to develop the culture and skills within the company to keep pace with future requirements, as well as the sustainable development of the company in all strategic and operational activities.

Safety & security strives to ensure a high level of resilience and comprehensive protection of all Swissgrid resources. Safety is the top priority for Swissgrid, given its responsibility for one of Switzerland's critical infrastructures. Its further development can only succeed if risks and dangers relevant to the company are recognised and reduced at an early stage.

The priorities in detail

Five priorities of Strategy 2027



Strategy 2027 was developed in 2022 by an internal strategy team in collaboration with various employees, managers and the Executive Board and approved by the Board of Directors.

GRI 2-22

Corporate social & environmental responsibility

A secure supply of electricity is an important basis for Switzerland's safety and prosperity, in addition to the country's long-term economic and socio-political growth. As the national grid company, Swissgrid makes a significant contribution to ensuring security of supply. Swissgrid's statutory mandate is fundamentally geared towards the long term. As the link between electricity generation and consumption, Swissgrid is actively helping to shape the path towards a sustainable energy system. Swissgrid is therefore making a significant contribution to achieving the 2030 climate targets and realising the Energy Strategy 2050.

As part of its strategy development, Swissgrid has decided to systematise the ecological, economic and social measures already in place in the various business areas and to embed sustainability even more strongly throughout the company. All areas of sustainability management at Swissgrid are now grouped together under the domain of corporate social and environmental sustainability (CSER) and represent an important component of Swissgrid's Strategy 2027.

"Swissgrid's goal is to ensure that sustainability is put into practice throughout the company and that all employees are actively involved."

GRI 3

Material topics and their relation to the Sustainable Development Goals

In an analysis of its business activities, Swissgrid examined the United Nations (UN) Sustainable Development Goals (SDGs) upon which the company has an impact. The result of this analysis was a selection of topics that were incorporated into a materiality analysis in accordance with Global Reporting Initiative (GRI) standards. The materiality analysis indicates the relevance of economic, environmental and social issues from the perspective of Swissgrid and its stakeholders, divided into four fields of action – Purpose, People, Partnership and Planet.

As there is not yet a sector-specific standard for the electricity industry as part of the 2021 GRI Standard, and given the special role played by the transmission system operators in the sector, Swissgrid carried out an independent analysis of the corporate context. This comprised an overview of the company's activities, business relationships and stakeholders. In addition, the current and potential impacts of business activity on the economy, society and the environment were identified.

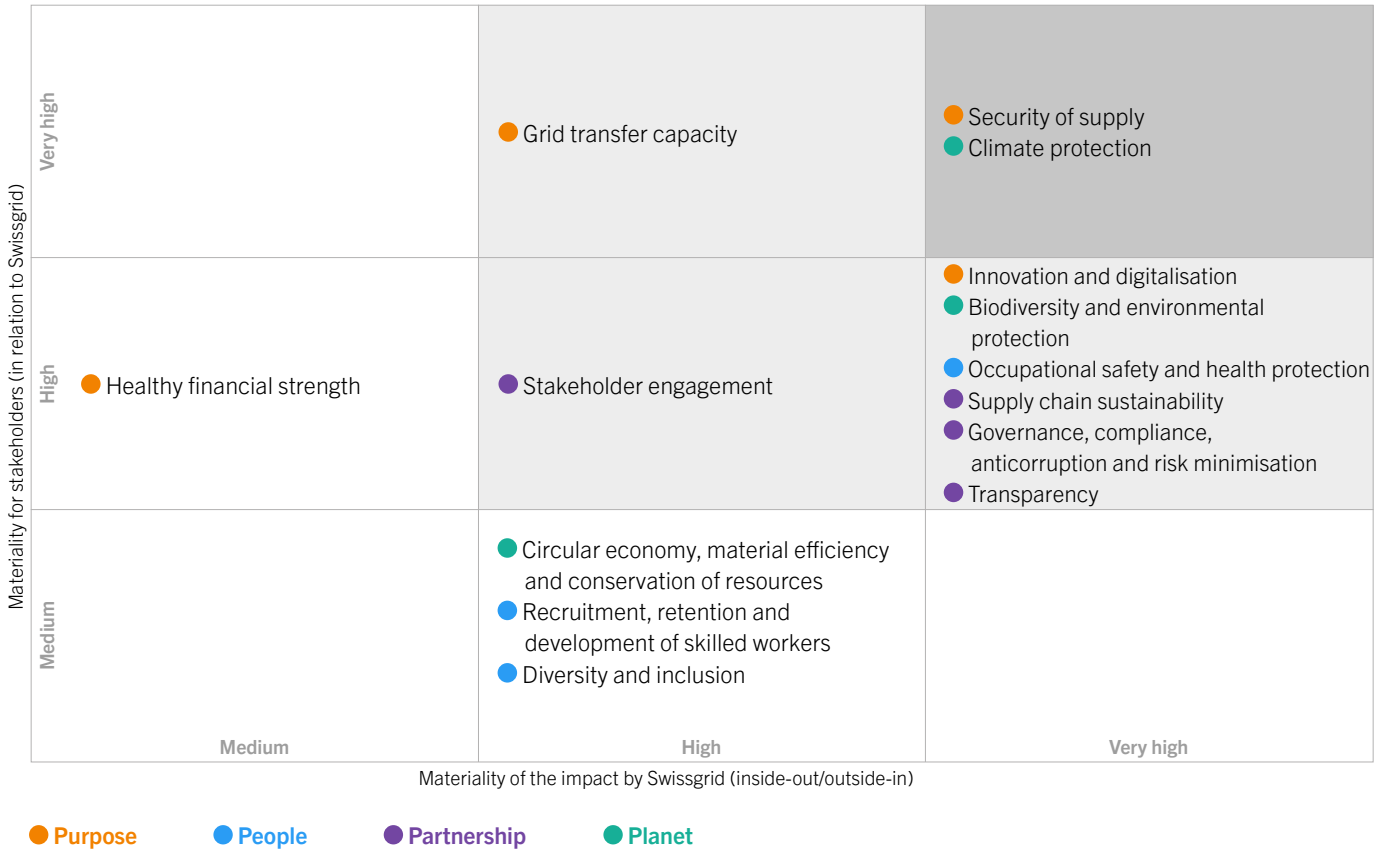
The result of the materiality analysis was approved by the Executive Board and the Board of Directors and is presented as a matrix. The matrix combines two aspects of materiality: the vertical axis represents the assessment by Swissgrid's stakeholders of topics over which the company has a significant influence, while the horizontal axis illustrates how the company is affected by certain issues (outside-in), together with the impact of the company's business activity on the economy, the environment and society (inside-out). The vertical dimension will be explored in even more detail in the future by directly involving the stakeholders. It currently represents a preliminary evaluation by Swissgrid of the relevance of the topics for the stakeholders. The current assessment is based, among other things, on an analysis of sustainability reports from various European transmission system operators and Swiss electricity supply companies.

"The critical themes reflect the five focal points of Strategy 2027 and deepen them from a sustainable development perspective."

While the Strategy 2027 priority topics of security of supply, grid transfer capacity, and innovation and digitalisation are addressed comprehensively, the other 11 topics represent specific sustainability dimensions within the priority topics of operational excellence and safety & security.

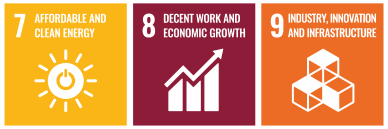
The following graphic shows the materiality matrix. Each topic is assigned to one of the four areas of action: Purpose, People, Partnership and Planet. Topics classified as immaterial are not listed.

Swissgrid materiality matrix



Swissgrid addresses a targeted selection of the UN Sustainable Development Goals in the four fields of action – Purpose, People, Partnership and Planet – via the identified essential topics. Targets for the material topics will be continuously defined during normal management cycles and appropriate measures implemented. In addition, in 2023 Swissgrid is establishing systematic CSER programme management. Programme management ensures that the objectives and measures of the essential topics are coordinated and efficiently realised.

Contribution of the main themes to the UN Sustainable Development Goals

Purpose	
	Security of supply Grid transfer capacity Innovation and digitalisation Healthy financial strength
People	
	Occupational health and safety Attracting, retaining and developing skilled workers Diversity and inclusion
Partnership	
	Governance, compliance, anti-corruption and risk minimisation Supply chain sustainability Stakeholder engagement Transparency
Planet	
	Climate protection Biodiversity and environmental protection Circular economy, material efficiency and resource conservation

GRI 2-23

Values, principles and code of conduct

In its Strategy 2027, Swissgrid explicitly states that it conducts its business not only in the service of the Swiss economy and electricity industry, but also for the benefit of society and the environment. Therefore, as part of the strategy development, the corporate mission was supplemented with a corresponding addendum that highlights this responsibility.

Our mission

Electricity keeps the world and our country moving. Electricity creates security, quality of life and prosperity.

We operate the transmission system constantly, reliably, efficiently and without discrimination in service to the Swiss economy and electricity industry. We are designing and building the transmission system of the future.

Together with our partners in Switzerland and abroad, we use market-based solutions to further develop the energy system.

Safety is the top priority in everything we do.

In doing so, we are taking responsibility for society and the environment.

With this new focus in Swissgrid's mission and strategy, the Board of Directors and Executive Board are committed to further developing sustainability in all of the company's strategic and operational activities in order to create added value for society. This commitment expands the company's existing commitment to sustainability, which is based on the ten principles of the UN Global Compact.

Swissgrid attaches great importance to integrity, fairness, mutual respect, professionalism and transparency as the foundation for ethical behaviour. Swissgrid supports and respects internationally proclaimed human rights and ensures that the company and its employees are not complicit in human rights abuses in the course of business. Furthermore, Swissgrid complies with the core labour standards of the International Labour Organization (ILO). Swissgrid has established a certified management system in accordance with ISO 14001 to protect the environment. Swissgrid takes decisive action against corruption in all its forms.

Swissgrid has documented these and other ethical principles in a code of conduct. The Code of Conduct, which is laid down by the Board of Directors, and compliance with which is monitored by the Executive Board, applies to all employees and to all members of the Executive Board and the Board of Directors of Swissgrid as part of their contractual obligations. The code is available as part of a comprehensive information page on the significance and design of compliance at Swissgrid.

For more information, see the chapter on "Governance, compliance, anti-corruption and risk minimisation"

Purpose

The main topics in the Purpose section describe Swissgrid's legal mandate in terms of security of supply and grid transfer capacity. This section also includes the key topics of innovation and digitalisation, and healthy financial strength, which enable Swissgrid to fulfil its mandate effectively and efficiently. The electricity grid is a critical infrastructure that has a serious and immediate impact on the state, the economy and the population in the event of failures or disruptions. As the country's national grid company, Swissgrid is therefore jointly responsible for the high quality of life and prosperity in Switzerland.

GRI 203-2

Security of supply

Swissgrid does not produce electricity but transports the electrical energy produced by the power plants to the centres of consumption via the transmission system. The transmission system (or extra-high-voltage grid) is the highest of seven grid levels in the Swiss electricity system, which is designed to transport large volumes of energy over long distances. As well as transporting electricity within Switzerland, it also enables energy to be imported and exported.

"Swissgrid's transmission system is therefore the cornerstone of secure electricity supply in Switzerland."

As the operator of the transmission system, Swissgrid must ensure its permanent availability or minimum operation during an incident (e.g. a supply interruption) and the return to normal operating conditions afterwards. Swissgrid thus plays an important role in maintaining security and prosperity in Switzerland. In addition, the Swiss transmission grid is closely connected to neighbouring countries and plays a crucial role in the transfer of electricity in Europe. If the grid is unavailable, either in whole or in part, this can have serious consequences for society and the economy. Quantification of significant indirect economic impacts is not possible due to the complex data situation in the Swiss supply region.

In Swissgrid's grid control rooms, specialists monitor the grid around the clock and ensure that the balance between electricity generation and consumption is maintained at all times and that the grid is not overloaded. In order to be able to guarantee grid-side security of supply in Switzerland, good interconnection with the European interconnected grid is imperative. It ensures that regional electricity shortages in the winter months can be overcome and power plant failures or overproduction can be balanced out internationally.

Infrastructure

Important prerequisites for grid-side security of supply include a resilient grid infrastructure and the availability of IT and communication systems. To ensure the safe and reliable operation of the Swiss transmission grid, Swissgrid pursues an integral security policy. This defines the objectives and framework for action for implementing precautions in a consistent and coordinated way according to standardised rules. The purpose of integral security management is, on the one hand, to protect people and the environment from negative influences caused by Swissgrid's activities and, on the other hand, to protect Swissgrid's employees, installations, systems and information from adverse effects.

The employees in the Swissgrid control centre operate the grid 24/7

More information
Grid regulation
Grid stability
Frequency

System operation

The production and consumption of energy must always be in balance. Swissgrid ensures that this balance is guaranteed and that the grid is operated at a frequency of 50 Hertz. The frequency of 50 Hertz is kept stable throughout the European interconnected grid together with the European transmission system operators. For this purpose, the employees in the grid control rooms coordinate production and consumption via schedule management and call up control energy in the event of deviations from the target frequency. In order to avoid grid elements becoming overloaded, employees also take topological measures, such as connecting and disconnecting lines in switching stations or using redispatch. In the event of redispatch, Swissgrid intervenes in the power plant deployment and directs some of the generating units to increase or decrease their production.

Swissgrid is preparing system operation for future requirements through partial automation, data-based decision support, optimised staff deployment and a new operating strategy. By 2035, a broad operational use of actively controlled elements is targeted for the expansion of system controllability. The aim is to reduce the risks related to voltage maintenance while increasing the controllability of load flows.

Market design

Another prerequisite for security of supply is the availability of control power to compensate for short-term deviations between production and consumption or to control grid bottlenecks (balancing measures). For this reason, Swissgrid continuously optimises the Swiss market for control power and collaborates with the transmission system operators in neighbouring countries in order to increase market liquidity.

Swissgrid is working closely with the other players in the Swiss electricity system with the aim of being able to better integrate decentralised and flexible energy sources as well as prosumers (electricity producers that are consumers of electricity at the same time) to stabilise the grid. For example, Swissgrid has tested the use of the crowd balancing platform Equigy for the provision of system services such as frequency control and congestion management in a pilot project together with the electric power supplier of the city of Zurich. This pilot project was successfully completed in December 2022.

European cooperation

According to Article 89 of the Federal Constitution, Switzerland shall endeavour to ensure a safe, economic and environmentally sustainable energy supply. Integration into the European electricity system is an important prerequisite for achieving this goal. A total of 41 international interconnection lines closely connect the Swiss transmission grid to the European interconnected grid.

"The interconnection with the European interconnected grid contributes significantly to the stability of the grid and thus to a secure electricity supply – for example, when power bottlenecks have to be overcome in the winter months, or power plant failures or overproduction have to be harmonised internationally."

Due to the lack of an electricity agreement with the EU, Switzerland is increasingly excluded from European coordination processes. This has a negative effect on grid operation. Unplanned load flows through Switzerland are increasingly jeopardising grid stability and Swissgrid is having to use electricity (primarily from Swiss hydropower) to stabilise the grid.

Swissgrid is working with the European transmission system operators to integrate Switzerland as far as possible into processes relevant to grid security. To this end, Swissgrid is seeking contracts with the transmission system operators grouped together in the "Italy North" and "CORE" capacity calculation regions. A contract was concluded with "Italy North" in 2021, which was renewed in 2022. Negotiations are ongoing with "CORE". However, these contracts under private law are not an adequate substitute for an electricity agreement in the long term. Swissgrid is reaching the limits of possible solutions available at the private level.

Due to the lack of an electricity agreement, Swissgrid's participation in the new European balancing energy platforms (MARI, PICASSO, TERRE) is also at great risk. While Swissgrid is currently connected to the central platform TERRE, connection to MARI and PICASSO is not possible for the time being due to political differences. Exclusion would lead to a further increase in unplanned load flows in the Swiss grid.

Key figures for security of supply 2022

74,052 GWh
Transported energy

0
Number of interruptions and average interruption duration

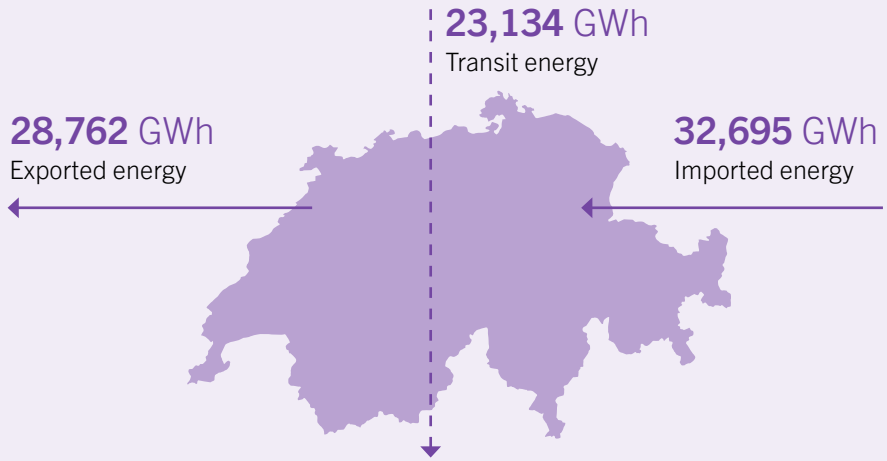
0
Energy not supplied

987 GWh
Active power losses absolute

1.33 %
Active power losses of the transported energy

1,118 GWh
Positive control energy

754 GWh
Negative control energy



GRI 203-1

Grid transfer capacity

Swissgrid addresses the need for the development of the transmission system in its Strategy 2027 under the topic of grid transfer capacity. Switzerland's power system is in the midst of the greatest upheaval in its history. Energy reform brings with it a paradigm shift from a centralised to a decentralised energy system. Increasingly volatile utility power generation due to the growing share of renewable energies – photovoltaics and wind power, electricity storage in batteries and pumped storage power plants, as well as the rise in consumption due to e-mobility, heat pumping technology and data centres, result in additional challenges for secure grid operation. This has far-reaching effects on the electricity industry in Switzerland and throughout Europe, and therefore also on the Swiss grid.

As a key element for the economic and social development of Switzerland, the transmission system makes an important contribution to achieving the goals of the Energy Strategy 2050.

"The renovation of the energy system can only succeed if the grid infrastructure is modernised to meet the new framework conditions and operated even more efficiently."

In addition to the modernisation of the transmission system, there is a need for continuous maintenance work on the existing grid. Automated data collection and analysis increase efficiency in this area.

Grid capacity

Sufficient capacities in the transmission system are a prerequisite for security of supply. However, the transmission system is already facing bottlenecks, which are likely to increase significantly due to the rising demand for electricity and the expansion of renewable energies. In order to alleviate the situation and keep the transmission system fit for the future, Swissgrid periodically summarises important expansion and modernisation projects in a multi-year plan and publishes them under the title "Strategisches Netz" ["Strategic Grid"]. These are also important because electricity imports via the transmission system are a cornerstone of the Confederation's Energy Strategy 2050. As a hub for European energy exchange, the transmission system must also meet international standards.

Important activities relating to the "Strategic Grid 2025" continue to be hampered by protracted approval processes and numerous objections. This makes it more difficult to eliminate grid congestion. As far as the authorisation procedures are concerned, Swissgrid relies on talking to the affected cantons, municipalities and residents at an early stage of the process. In this way, the acceptance of new extra-high-voltage lines is to be improved and, if possible, the processes from project planning to commissioning will be accelerated.

The progressive ageing of existing components represents another risk to grid capacity. Only one third of Swissgrid's grid infrastructure dates from after 1980. Many elements have reached the end of their service life and need to be renewed. Swissgrid therefore systematically records the condition of its plants and prioritises modernisation measures accordingly.

More information
Grid of the future

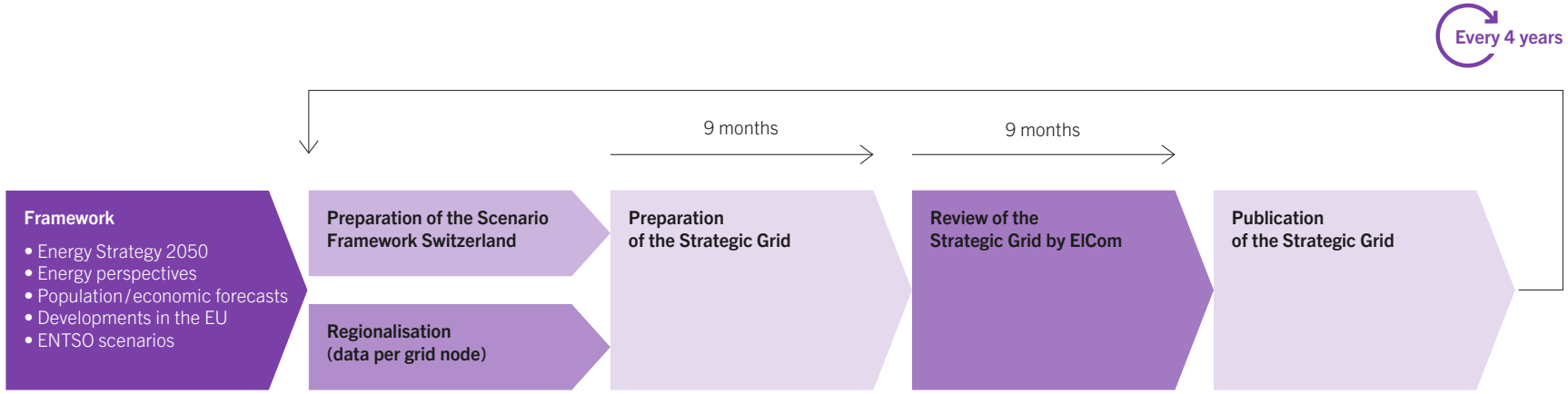
Grid development

Modernisation of the transmission system is a key factor for a sustainable energy future. Its conversion and expansion has slowed down in recent decades, however. The transmission system must be developed in the long term to ensure that it can meet future needs for a secure supply of electricity. Swissgrid periodically draws up a multi-year plan for this purpose: the Strategic Grid.

The "Strategic Grid 2040" is the third coordinated process for the further development of the Swiss transmission grid. For the first time, it is taking into account the legal basis established in the "Electricity Networks Strategy". According to this basis, the planning process must be repeated in a comparable manner every four years. In the "Strategic Grid 2040", for the first time, the development of future scenarios as a basis for grid planning is the task of the Swiss Federal Office of Energy (SFOE).

The planning of the Strategic Grid is based on the so-called Scenario Framework Switzerland published by the SFOE and includes national target values for each generation technology and group of consumers for the years 2030 and 2040. In addition, Swissgrid receives information on the regional development of production and consumption within Switzerland from Swiss Federal Railways (SBB) and from the distribution system and power plant operators that are directly connected to the transmission system. Swissgrid uses this data to determine the grid development requirements.

Grid planning process



Process efficiency

To ensure more efficient operation of the grid, operational planning and system operation will be brought closer to real time by gaining a deeper knowledge of operating conditions and collecting better measurement data. System controllability can be increased as a result.

Efficiency improvements are also sought via risk-based plant management relying on automated data collection and analysis. A digital image of the grid is created especially for this purpose. This also makes it possible to optimise renewal and maintenance measures.

Automating outage planning

The transmission system is in operation around the clock, 365 days a year, and cannot simply be switched off for maintenance work. Decommissioning of individual grid elements must be meticulously planned and coordinated. Ensuring grid stability also limits the possible number of outages.

In order to improve the coordination of planned work and automate planning processes, Swissgrid has initiated “Vision Operational Planning”. The aim is to coordinate the various construction projects and maintenance measures more effectively and at the same time optimise the planning and implementation of the associated outages.

Improving security with drones

The steel pylons and their supporting structures in the transmission system are exposed to extreme weather conditions. Most structures are made from steel and corrode if they come into contact with water. Swissgrid treats all of its steel structures with an anti-corrosion paint so that the bare steel does not come into contact with water. The traditional procedure consists of a mechanical inspection by employees of installation companies, who climb the poles and check the condition of the steel with the help of a chisel. This procedure is both time-consuming and expensive. In addition, the lines must be switched off while this work is carried out. In a pilot project using a drone with an embedded sensor, an innovative procedure is being investigated through which this corrosion analysis can be carried out with greater speed and safety, and in a standardised manner, without having to switch off the line.

Corrosion analyses with drones are faster, standardised and safer

More information
MIDAS – Maintenance of Infrastructure with Drones in Autonomous Flights

Innovation and digitalisation

The increasing volatility of electricity flows and the growing number of time-critical system interventions mean that new, innovative approaches are required at a technical and organisational level. To meet these challenges, it is necessary to drive forward the digitalisation and automation of processes as well as the provision and evaluation of data.

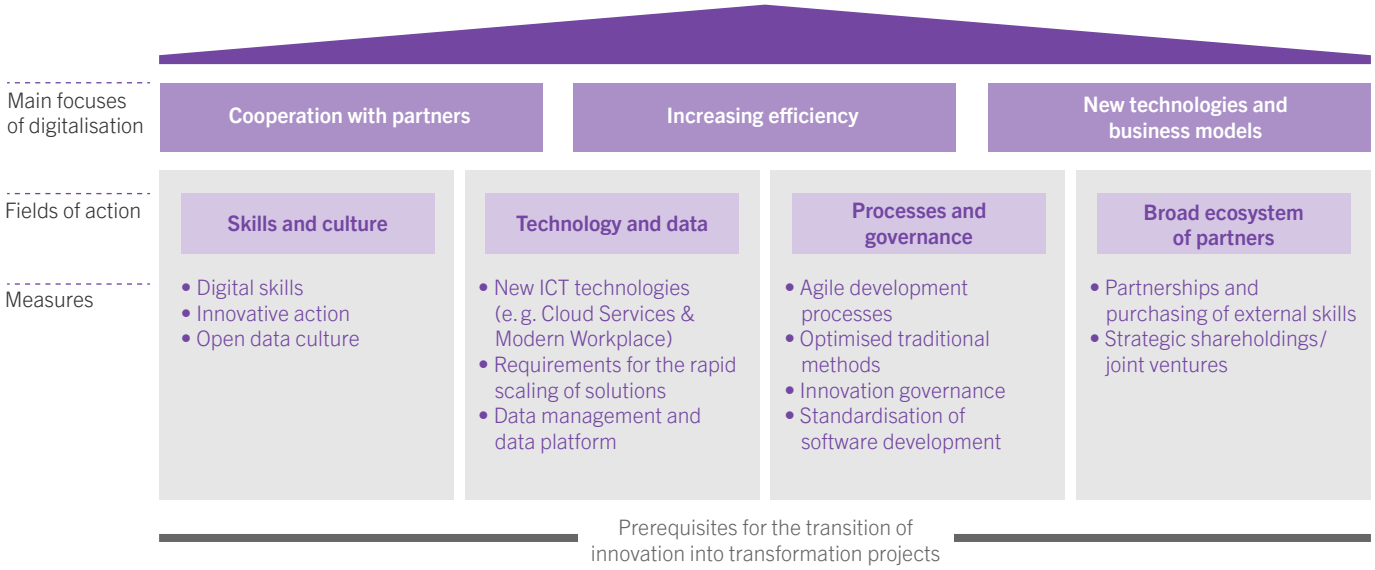
That is why one area of focus of Swissgrid's Strategy 2027 will be innovation and digitalisation in the core business. Innovation and digitalisation are encouraged in all areas of the company by Swissgrid strengthening the relevant competencies as well as the corporate culture, taking advantage of the opportunities offered by new technologies, developing and implementing innovative ideas quickly and drawing on external expertise where necessary.

The focus is on digitalising cooperation with partners, automating processes and supporting new business models. Swissgrid is systematically creating the necessary conditions for this in terms of technology, data, personnel and culture.

Innovation & transformation portfolio

In order to drive digitalisation and innovation in all business areas, Swissgrid is implementing practical projects and innovation plans. The use of new technologies is explained below using the example of the "digital twin" and "asset monitoring and performance management".

Priorities, fields of action and measures surrounding digitalisation



Digital twin
In a pilot project, Swissgrid and an ETH spin-off have combined the potential of augmented reality (AR) with the digital twin of a substation and used it for its inspection. The AR application guides the user through digital checkpoints that are displayed in space through areas of interest and points of interest by overlaying the virtual 3D model over the real world and supported with targeted information such as images, videos and animated 3D models.

Augmented reality supports Swissgrid employees during inspections

Asset monitoring and performance management
The aim of asset monitoring and performance management is to operate the grid infrastructure in a risk-based manner on the basis of asset performance data. In future, the inspection data, plant data and online measured values stored in the digital twins will provide a basis for assessing the asset condition and criticality in order to plan maintenance and renewals more efficiently. In parallel to this, the plants are monitored via asset monitoring, plant-specific faults and problems are systematically analysed and solutions are proactively implemented. The plants' specific operating states are also used to enable capacity increases in grid operations via Dynamic Asset Rating.

For example, Swissgrid is testing the use of real-time measurement data and microclimatic weather forecasts with dynamic line rating to better model the dependency between weather conditions, conductor temperature and intensity of current. Meters mounted directly on the conductors continuously determine the intensity of current, temperature, angle of inclination and acceleration. The maximum amount of electricity that can flow through the conductors can be flexibly determined on the basis of this real-time data, combined with local weather forecasts. This enables a more efficient utilisation of the grid infrastructure.

Healthy financial strength

Swissgrid ensures the high availability of the transmission system and grid-side security of supply in Switzerland. This makes Swissgrid one of Switzerland's most critical infrastructures and of great importance to the Swiss economy and population. Due to the great public interest in secure electricity supply throughout Switzerland, the legislator has heavily regulated Swissgrid's business activities and turned the natural monopoly in the field of power transmission into a legal monopoly.

In its role as the national grid company, Swissgrid is investing in the expansion and modernisation of the transmission system. The company is therefore making an important contribution to the transformation of the energy system. Grid expansion is capital-intensive. Accordingly, there is high demand for financing, which Swissgrid covers on the financial markets. Information on the financing of Swissgrid can be found in the Financial Report.

In addition, the Federal Council has enacted measures in 2022 to strengthen Switzerland's security of supply, particularly in winter. The Council has entrusted Swissgrid with the operational handling of the measures via its Winter Reserve Ordinance (WResV). The Federal Council is thus demonstrating its confidence in Swissgrid's expertise and competence. These measures result in costs that Swissgrid must finance in the interim until they are fully recovered via the tariffs from 2024.

The legal framework conditions and the regulated business model strengthen Swissgrid's appeal on the financial markets. This is reflected in the awarding of first-class credit ratings for Swissgrid by various banks and rating agencies.

Credit ratings	2022	2023
Credit Suisse	Rating AA–	Forecast stable
UBS	Rating AA–	Forecast stable
Zürcher Kantonalbank	Rating AA	Forecast stable
fedafin	Rating AA+	Forecast stable

In addition to the excellent credit ratings that have been in place for years, the ESG "Prime" rating by the renowned sustainability rating agency ISS confirms Swissgrid's commitment to strengthening sustainability within the company.

Key financial figures 2022

GRI 201-1

CHF **3,890.7** million
Total balance sheet

CHF **96.4** million
Earnings before tax

33.9 %
Equity ratio

Swissgrid's annual financial statements in accordance with Swiss GAAP FER can be found in the Financial Report.

The regulated business model does not recognise donations and financial support as allowable costs.

GRI 201-4

Government grants

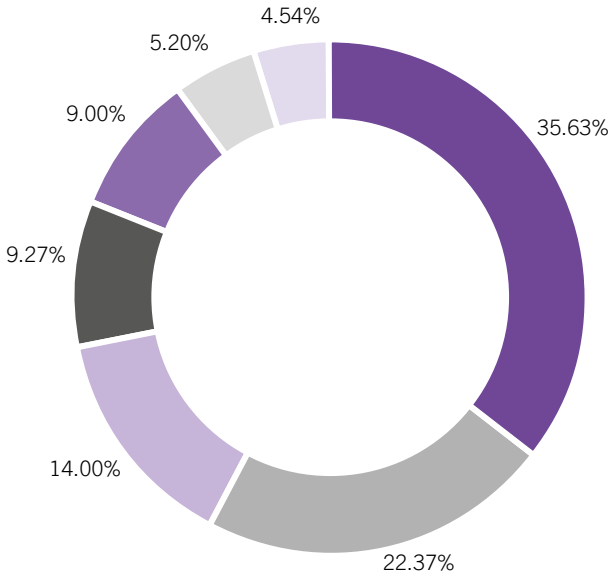
Swissgrid does not receive any subsidies from the government. The majority of the shareholders are power supply companies, which in turn are majority-owned by the public sector. Swissgrid is directly or indirectly majority-owned by the cantons and the municipalities.

GRI 207

Taxes

Swissgrid pays its taxes in Switzerland and complies with national tax legislation. Due to its regulated business model, Swissgrid does not need a tax strategy.

Ownership of Swissgrid



Others

1.73%	FMV SA
1.62%	Azienda elettrica ticinese
1.59%	Kraftwerke Linth-Limmern AG (KLL)
1.50%	Officine Idroelettriche della Maggia SA
1.39%	BKW Energie AG
1.20%	SN Energie AG
0.98%	IWB Industrielle Werke Basel
0.73%	Forces Motrices de Mauvoisin SA
0.69%	EnAlpin AG
0.50%	Kanton Graubünden
0.46%	Officine Idroelettriche di Blenio SA
0.42%	Aziende Industriali di Lugano (AIL) SA
0.38%	Kraftwerke Mattmark AG
0.32%	Repower AG
0.14%	Elektrizitätswerk Obwalden
0.12%	Engadiner Kraftwerke AG
0.12%	Kraftwerke Vorderrhein AG (KVR)
0.08%	General Electric Technology GmbH
0.02%	Kraftwerke Sarganserland AG (KSL)
0.01%	AEK Energie AG
< 0.01%	Aare Versorgungs AG (AVAG)
< 0.01%	Alpiq Suisse SA
< 0.01%	Electra-Massa AG
< 0.01%	Forces Motrices Hongrin-Léman SA (FMHL)
< 0.01%	Grande Dixence SA
< 0.01%	Nant de Drance SA

as of 31 December 2022

People

The People section includes the key topics that make Swissgrid an attractive employer: occupational health and safety; attracting, retaining and developing skilled workers, and diversity and inclusion. Swissgrid is aware that its evolution into an innovative, highly digitalised company beholden to sustainable development is only possible with motivated and highly qualified employees.

Occupational health and safety

Safety is a top priority for Swissgrid in all its activities. Ensuring the safety and health of employees, contractors, visitors and local residents is central to the company's objectives. Swissgrid has a management system for occupational health and safety in accordance with ISO 45001:2018. This is continually being further developed. An important focus here is the safety culture. This is why, in 2022, Swissgrid underwent certification according to the "Safety Culture Ladder" method.

GRI 403-1, 403-8

Management approach

The Executive Board determines the framework for occupational health and safety at Swissgrid and is responsible for making sure that all employees comply with safety standards and relevant laws and regulations. All employees have a duty and obligation to apply these principles. Compliance with statutory and industry provisions is mandatory for Swissgrid, but not sufficient. In specific areas, these provisions are therefore supplemented with additional corporate standards.

The following principles apply at Swissgrid when it comes to occupational health and safety:

1

We design our workplace conditions according to accepted health and safety principles. In this context, we pay particular attention to prevention and precautionary measures.

2

Regardless of the activity, the risk must be minimised as effectively as possible. Safety-conscious behaviour is therefore a basic requirement for employees. By means of ongoing training, the high standard is maintained and continually improved.

3

Occupational health and safety in the workplace is an important management task. By promoting the health, quality and safety awareness of the employees in the workplace, the line managers fulfil an important role model function and line responsibility.

4

We lay down our occupational health and safety objectives in writing. We conduct regular occupational safety inspections to ensure the success of our occupational health and safety measures and the fulfilment of legal requirements.

5

When planning and introducing new procedures, we focus on the latest technologies as our yardstick.

As part of an integrated health, safety & environment (HSE) management system certified to ISO 45001:2018 and ISO 14001:2015, Swissgrid addresses the issues of occupational health and safety, and environmental protection. The HSE management system applies to the entirety of Swissgrid. In particular, all business units, bases and facilities (substations and pipelines) are part of the HSE management system. Geographically, the HSE management system is therefore nationwide in scope. Swissgrid service providers are responsible for the occupational safety and health protection of their employees and of persons working on their behalf. Swissgrid carries out checks and inspections on its service providers.

The aim of Swissgrid's HSE management system is, in addition to compliance with the legal requirements for occupational safety, health and environmental protection, to ensure continuous improvement with a systematic approach and to promote the organisation's understanding of safety and environmentally relevant activities.

HSE management system

Employees and other workers covered by Swissgrid's internally and externally audited HSE management system:

737 people [1]
Internal employees

648 people [1]
External employees

318 [2]
inspections in 2022

35 [3]
with medium risk

0
with high risk

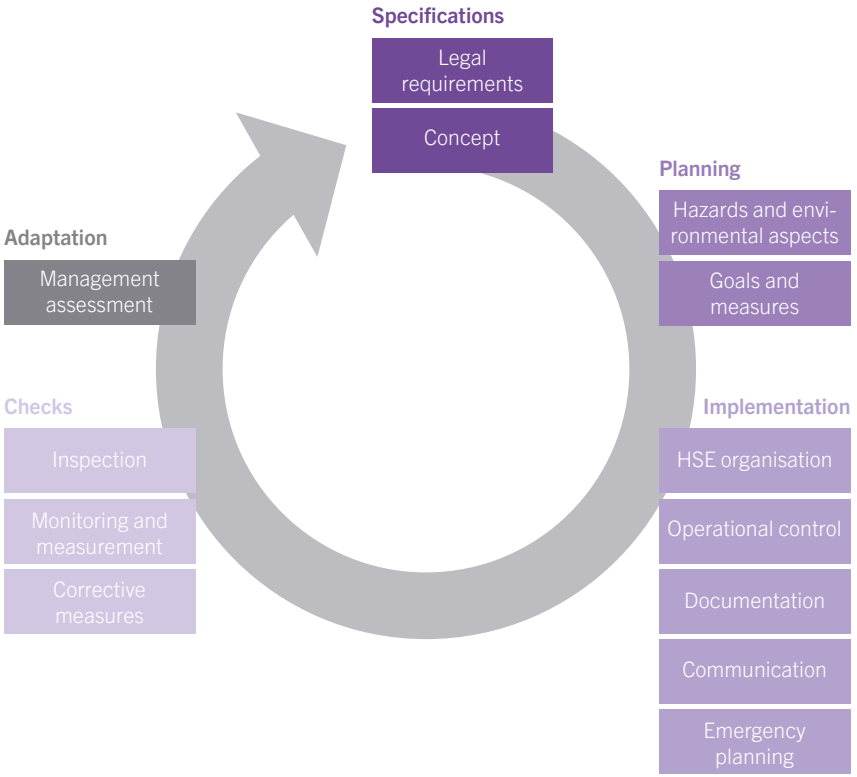
[1] 100% of all internal and external employees
[2] Construction of substation, construction of track, maintenance of substation, maintenance of track, protection against corrosion, frost
[3] 11% of inspections in 2022

The HSE management system regulates the following topics:

- Tasks and duties or the allocation of competences and responsibilities in the field of occupational safety, health and environmental protection
- HSE targets for the continuous reduction of accidents, illnesses and environmental impacts, as well as measures or environmental programmes to achieve the targets
- Behaviours and procedures to ensure occupational safety, health protection and operational environmental protection, as well as conformity with the relevant legislation

The HSE management system is based on the PDCA management model ("plan-execute-review-adjust"). This management model is based on continuous improvement of HSE performance. The following diagram shows an overview of Swissgrid's HSE management system model:

Swissgrid's HSE management system model



Proposals for possible improvement measures are derived from hazard assessments, recorded accidents and near misses, environmental relevance analysis and the defined HSE targets. These measures are planned and implemented by Swissgrid's safety and environmental protection officers in collaboration with the managers and employees concerned. The line is responsible for realising the measures. The measures for achieving the HSE goals are recorded in the document "ZHSE-80-161 Operational development of the HSE safety domain" as well as in the annually updated Safety Road Map. Target achievement is continuously evaluated and reported via a key figure cockpit. The implementation of the HSE programme is monitored by the Head of Health & Safety or the Safety and Environmental Protection Officers.

Safety and environmentally relevant key figures for monitoring are defined in a corresponding directive. The accident statistics are integrated into the key figure cockpit and are presented once a year to employees and to the Executive Board in the annual HSE management review.

"Swissgrid's HSE management system is audited and certified by an accredited external auditor based on ISO standards 14001:2015 and 45001:2018."

An audit for recertification of the HSE management system takes place every three years. In the two years in between, a surveillance audit is carried out by the external auditor. In 2022, the Swiss Safety Center confirmed Swissgrid's integrated HSE management system as suitable, appropriate and effective, and thus successfully recertified it. The result shows renewed progress compared to the previous year. The introduction of the Safety Culture Ladder, which is an important starting point for increasing the effectiveness of the management system, was highlighted in particular.

GRI 403-4, 403-7

Safety culture

Swissgrid defines safety culture as a common understanding and awareness regarding the issue of safety that is shared by all managers and employees in an organisation. This includes, among other things, the definition of responsibilities, regular training and further education, as well as appropriate handling of mistakes. A positive safety culture requires all managers and employees in an organisation to have a questioning attitude, conduct themselves in a safety-driven manner and communicate openly with regard to safety-related issues. The safety culture is an integral part of Swissgrid's corporate culture. In addition to topics such as operational security, information security, physical security as well as crisis and business continuity management, safety culture includes in particular occupational safety and health protection for employees.

Swissgrid attaches great importance to constantly strengthening its safety culture. This is why Swissgrid introduced the Safety Culture Ladder (SCL) in 2020 and was successfully certified to Stage 3 in 2022. The audit report highlighted the already well-developed security awareness in all security domains, the good working conditions and the existing training modules.

The findings from the audit report serve as motivation for Swissgrid to continuously define and implement additional measures to promote the safety culture in order to work even more safely in all areas in the future and to reach Stage 4 in the SCL maturity model by 2027. An important aspect of these measures is to also involve service providers in the process of further development. Since the beginning of 2022, Swissgrid has required those service providers in whose activities occupational safety plays a central role to introduce the SCL. This requirement is laid down in the contract.

Swissgrid has produced a "Safety Culture Ladder" guide for service providers.

GRI 403-5, 403-6

Training

To enable its employees to behave safely, Swissgrid offers a comprehensive training programme. All employees receive introductory training on health and safety when they join the company. This provides information on roles and responsibilities in the area of occupational safety, ergonomics in the workplace, Swissgrid's emergency organisation, important environmental protection requirements and insurance basics. Swissgrid's onboarding programme also includes topics such as personal protective equipment, information security, business continuity management, enterprise risk management and crisis management.

"Fire extinguishing" station at the "Safety & security days" 2022

As part of the "Safety & security days" held for the first time in 2022 under the motto "I – you – we: safe together", all employees were granted the opportunity to spend a day dealing with safety-related topics in a practical and diverse way. It is of great concern to the Executive Board that all Swissgrid employees take part in this one-day training event, which will take place regularly in the future. Participation in the training is therefore compulsory.

"Safety & security days" under the motto "I – you – we: safe together"

Employees in the Grid Infrastructure business area and at all service providers who are to achieve electrical expert status complete a training programme consisting of nine training modules. In addition to basic knowledge in health and safety, the modules mainly focus on electrical safety. The aim is for the experts to be able to manage the electrical risks. In addition, selected employees receive a one-day training course on safety inspections, which addresses the objective of internal inspections, the duties and powers of inspectors, personal conduct during inspections and the vital SUVA rules.

GRI 403-4

Employee participation

Safety and health protection affect the most fundamental interests of workers – their health and physical safety are at stake. Swissgrid employees are therefore entitled by law to information and a say in all matters of safety and health protection (Art. 6 ArG and Art. 6a VUV). At Swissgrid, the right to have a say is effected through staff representation.

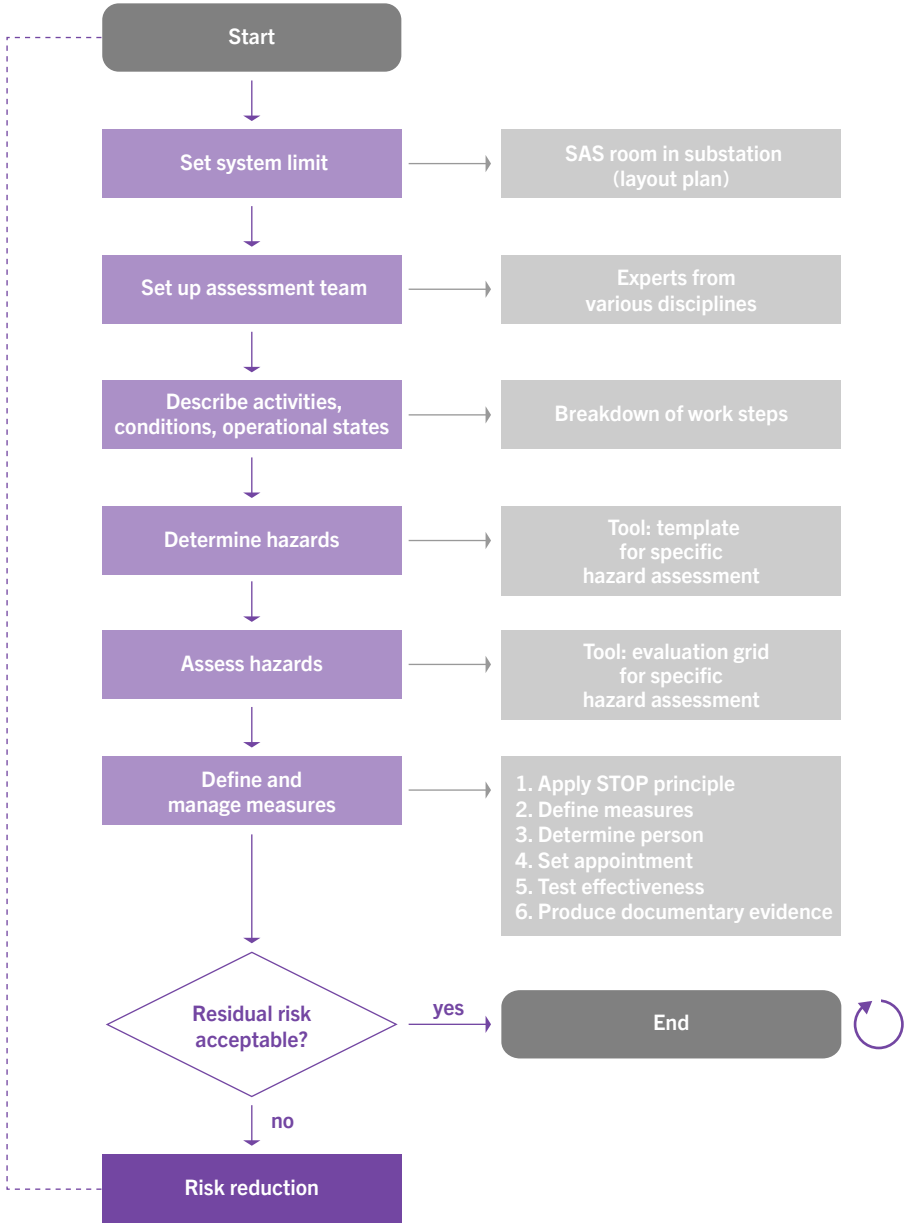
GRI 403-2

Hazards and events

In Swissgrid's area of activity, as in the energy sector in general, there are considerable risks and hazards that can lead to serious personal injury, environmental damage and property damage. Swissgrid aims to proactively identify and assess risks and hazards, and either eliminate them with adequate measures or at least minimise them to an acceptable residual risk.

Swissgrid is aware of its responsibility as an employer and ensures the occupational safety and health protection of its employees in accordance with the Accident Insurance Act (UVG) and the Labour Act (ArG). In order to ensure the measures for the protection of its employees are as effective as possible, Swissgrid defines measures according to the STOP principle. The STOP principle describes the hierarchy of the quality of effect of measures from S = substitution (replacement) via T = technical measures and O = organisational measures through to P = person-related measures and, at the same time, implies the core idea of STOP: stop, think and evaluate before you act.

Process flow risk assessment



Various risk assessments are carried out at Swissgrid. Firstly, the basic hazards and general activities at Swissgrid are systematically analysed, assessed and documented in the activity-related risk assessment based on the SUVA hazard portfolio (SUVA 66105). Furthermore, the company checks whether recognised rules are available for the hazards. If this is not the case, the rules must be formulated or, where the hazard potential is high, a risk assessment (SUVA 66099) must be carried out. Standardised measures are derived from the activity-related risk assessment and are valid throughout Swissgrid.

The activity-related risk assessment must be reviewed at least every three years and updated if necessary. However, a review and update may also be necessary due to identified deviations, after an accident or near-miss event, or after a change in the law.

In addition to the activity-related risk assessment, Swissgrid also carries out project-specific, use-related, order-related and plant-specific risk assessments, as well as risk assessments for the commissioning and start-up of plants.

More information
Behaviour near lines

Behaviour near lines
The Swissgrid grid consists of around 12,000 pylons and 6,700 kilometres of lines. Part of this crosses cultivated land or passes close to populated areas. Swissgrid is therefore very concerned to protect not only its own employees and the employees of its service providers from potentially dangerous situations, but also the general public. Accordingly, Swissgrid proactively provides information on the safety regulations when planning and working as well as for sports and leisure activities in the vicinity of its lines.

Actions in the event of an emergency
Swissgrid has compiled the regulations and standards for the protection of people and the environment when working at, on and near Swissgrid Ltd installations in a publicly available manual. In this manual, among other things, Swissgrid sets out details of responsibilities and correct behaviour in an emergency. Visitors to Swissgrid are also informed about the correct behaviour in an emergency by means of a leaflet. Information on this is available to Swissgrid employees via the intranet and employees receive annual training on correct behaviour in the event of an evacuation. In addition, there are trained first aiders and evacuation helpers at all Swissgrid sites who can be contacted at any time. If a hazardous situation arises, all employees of Swissgrid and its service providers are obliged to interrupt their work and immediately inform their superiors and the safety officers.

First aid at Swissgrid

60
First aiders employed by Swissgrid

75
Electrical specialists who have completed first aider training

Every **2** years refresher course for all trainees

HSE-relevant events can be reported in a standardised way to the safety and environmental protection officers, who will analyse them. In addition, all employees at Swissgrid have the opportunity to report incidents, observations and ideas of any kind in connection with risks and hazards via an app – and can do so anonymously. In 2022, 103 messages were sent via the app.

Health protection

GRI 403-3, 403-6

Swissgrid recognises its responsibility for the health of its employees and fulfils its legal mandate. A compulsory health check for Swissgrid's night and shift workers is carried out annually by an independent body. In addition, those employees who have to climb masts as part of their role also receive a health check. An annual stress test is conducted for employees in the roles mentioned as well as for other employees if required. Swissgrid also covers the costs of the tick vaccination and the annual flu vaccination for its employees. In addition, Swissgrid ensures that employees are provided with an ergonomic workplace. Employees working from home can access various SUVA leaflets and an explanatory video on this topic.

Even when dealing with Covid-19, the protection of its employees has always been and remains Swissgrid's top priority. Swissgrid took measures early on and continues to update them in 2022 in line with the situation. These included general hygiene and precautionary measures such as mandatory mask wearing and social distancing rules, capacity restrictions for buildings and meeting rooms, restrictions and recommendations for internal and external meetings and events, and travel recommendations for business and private trips. The return to normality and the lifting of the measures implemented took place gradually at Swissgrid. Swissgrid

returned to normal operating conditions on Monday 2 May 2022. That meant lifting virtually all measures against Covid-19. The general hygiene measures still apply.

All Swissgrid's permanent employees are insured under the accident insurance scheme pursuant to the UVG and Swissgrid's supplementary UVG insurance. These offer the following benefits to cover the risks of occupational accident and occupational disease:

- Medical expenses in a private ward during hospitalisation
- Daily allowance
- Disability benefit
- Rescue/transport/recovery/search costs, etc.

All employees are also compulsorily insured against leisure-time accidents (non-occupational accidents), including commuting, if they work at Swissgrid for at least eight hours per week. Employees working for less than eight hours a week are not insured against leisure-time accidents. Accidents suffered by these employees on the way to and from work are insured under the occupational accident insurance scheme.

GRI 403-10

Swissgrid does not report figures on work-related health problems, as data cannot be comprehensively collected due to the regulations in force to protect the privacy of employees.

GRI 403-9

Key figures for occupational accidents 2022

Employees

0 (0%) Deaths due to occupational accidents

0 (0%) Occupational accidents with loss of working hours

2 (0.3%) Occupational accidents without loss of working hours

2 (0.3%) Total occupational accidents

1,180,022 (100%)
Total working hours

% calculated on the basis of 200,000 working hours.

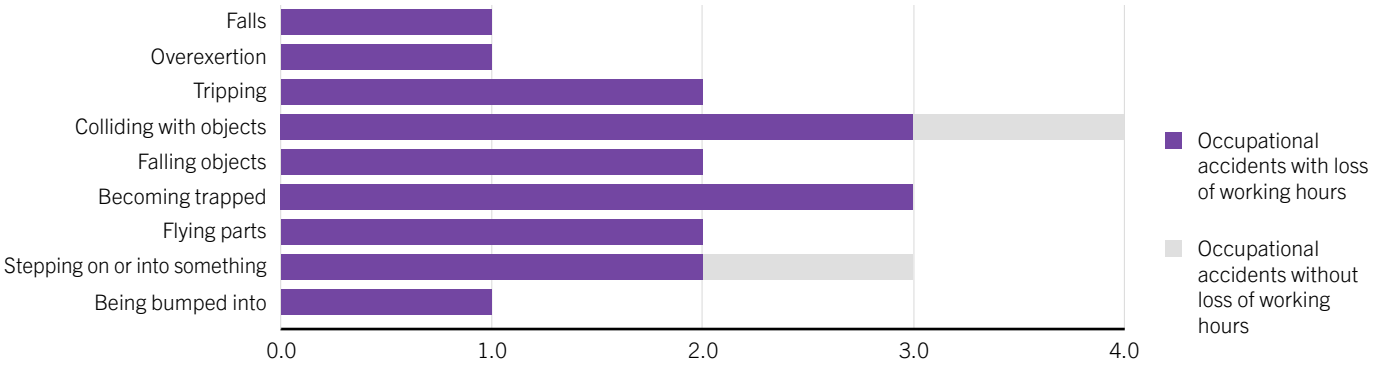
Service providers

0 Deaths due to occupational accidents

17 Occupational accidents with loss of working hours

17 Total occupational accidents

Occurrence of occupational accidents in 2022 (employees and service providers)



Potential hazards

Swissgrid has identified the following potential hazards with a risk of serious injury:

Hazard potential	Accidents in the reporting period (employees and service providers)	Measures
Working near live high-voltage systems	None	• Implementation of the legal requirements relating to plant equipment and employee training • All work is planned and instructed by means of a written work order • Restrictive access • Regular announced and unannounced inspections at the construction and work sites
Working at height	2	• Promotion of training for authorised trainers in accordance with ESTI 245 • All work is planned and instructed by means of a written work order • Regular announced and unannounced inspections at the construction and work sites
Forestry work	1	• Use of specialised and experienced contractors • Regular announced and unannounced inspections at the construction and work sites
Collaborating with helicopters	2	• All work is planned and instructed by means of a written work order • Restrictive use of helicopters, testing of alternative, lower-risk options
Handling hazardous substances (insulating oils, gases, cleaning agents and coolants)	None	• Implementation of the legal requirements relating to plant equipment and employee training

Attracting, retaining and developing skilled workers

Swissgrid is an attractive employer and wants to successfully attract new talent. After attracting skilled workers, it is therefore essential to offer all employees the opportunity for professional development. Missing qualifications are provided through education and training. Flat hierarchies, streamlined processes and decentralised self-control and organisation enable employees to participate in decision-making processes and take on responsibility. In this way, Swissgrid creates optimal conditions for highly motivated employees.

Management approach

Swissgrid has a working human resources strategy with clear objectives and defined measures. In order to be able to achieve the goals of Strategy 2027, Swissgrid brings together various efforts under the overarching term of operational excellence, including the continuing professional development of employees and their skills. Swissgrid also focuses on diversity and inclusion. Swissgrid's existing guiding and leadership principles form the basis for its behaviour. Impact-oriented and sustainable leadership behaviour in management is also central to the corporate culture. Managers received training in 2021 and 2022 through the "Fit for excellence" programme, which will be continued in individual parts.

Programmes tailored to individual needs are designed to attract and retain the talent needed. As an attractive employer with flat hierarchies, Swissgrid supports its employees in taking on responsibilities. All employees also have the opportunity for professional development. Continuing professional development opportunities are transparent and individual support is criteria-based and systematic. The goal is for at least two-thirds of the management positions with personnel management responsibility to be filled each year by internal candidates. This strengthens how employees identify with the company.

Attracting talent

Due to its short company history, the level of awareness on the labour market of Swissgrid has been comparatively low until now. Swissgrid has succeeded in establishing itself as a progressive employer, however, thanks to its targeted efforts. By directly addressing potential applicants through portraits of Swissgrid employees, Swissgrid draws attention to the large number of interesting positions available within the company. Swissgrid establishes direct contact with students and graduates at recruitment events organised by universities both in Switzerland and abroad. In this way, Swissgrid creates the conditions for attracting the best talent on the market.

"Swissgrid is once again the best-rated company in the energy sector in the 'Engineering' category and the only energy company to appear in the 'IT' category."

In the Universum 2022 survey of the most attractive employers, which surveyed 10,593 students, Swissgrid achieved 24th place in the "Engineering" category (previous year 18th) and 41st in the "IT" category (previous year 52nd). This means that Swissgrid is once again the best-rated company in the energy sector in the "Engineering" category and the only energy company to appear in the "IT" category.

Collective agreements and staff representation

GRI 2-30, 402-1, 404-2, 407-1

In Switzerland, the concept of peaceful labour relations is taken very seriously. This states that conflicts between employers' and workers' organisations should be settled at the negotiating table rather than through industrial action. This mutual approach between employers and employees is also evident outside the collective labour agreements. Swissgrid is not subject to any collective labour agreement.

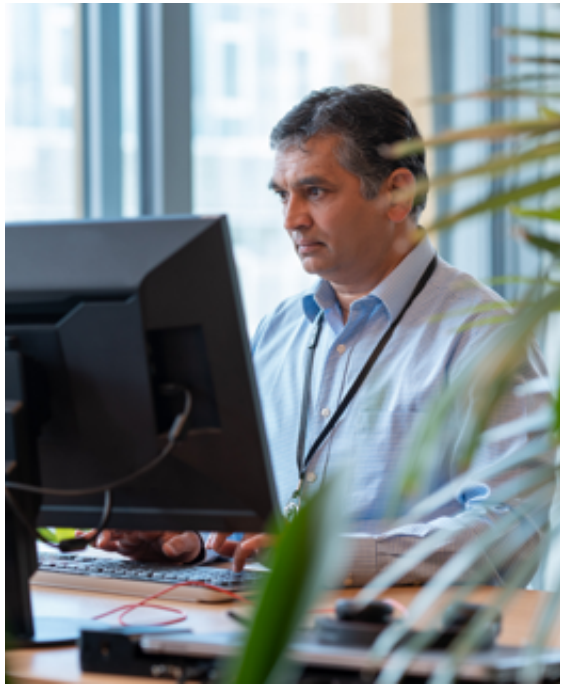
The interests of the workforce are safeguarded by personnel representatives. This also applies to the pension foundation, where the interests of both the employees and the company management are represented by the pension commission with equal representation. Minimum requirements with regard to gender as well as the representation of Italian-speaking areas of Switzerland and the sites shall be taken into account when appointing the personnel representatives. Two of the seven members of the Personnel Commission represent the workforce in the Pension Commission. The rights of participation are in accordance with the Federal Act on Information and Participation of Workers in Companies (Co-Determination Act), which ensures the right to timely and comprehensive information on all matters, knowledge of which is a prerequisite for the proper performance of their duties. This includes the right to information and the special rights of participation regarding occupational safety and employee protection, regarding the transfer of undertakings pursuant to Articles 333 and 333a CO, in the case of mass dismissals pursuant to Articles 335d-335g CO, as well as regarding the affiliation to an occupational pension scheme and the termination of an affiliation contract.

GRI 401-2

Talent retention

To ensure that its employees are motivated and stay with the company for as long as possible, Swissgrid has created an attractive working environment based on team spirit, flat hierarchies and an informal work culture. In addition, the company supports employees in taking responsibility, encourages their further development and, at the same time, offers them the greatest possible flexibility in their daily work. Swissgrid likewise supports new employees who move to Switzerland from abroad during their relocation and integration.

The benefits Swissgrid provides to its employees as stipulated in the employment regulations do not differ according to the level of employment. Life insurance and health insurance are privately organised in Switzerland. Disability and invalidity insurance are covered by the EO and IV state social insurance schemes. In the event of inability to work during the probation period as a result of illness or accident and through no fault of the employee, Swissgrid pays the employee 100% of the annual basic wages for a maximum of 30 days. In the event of inability to work as a result of illness or accident occasioned after the probation period and through no fault of the employee, Swissgrid pays the employee 100% of the annual basic wages for a maximum of 180 days. The old-age pension scheme includes the AHV, which is also state-funded, as well as the pension fund, to which all employees are subject. Parental leave is granted in accordance with the statutory provisions: 14 weeks in the case of maternity leave and, in the case of paternity leave, five additional days on top of the statutory two weeks.



GRI 2-7, 2-8, 401-1, 401-2

Number of employees

As of 31 December 2022, 723 people were employed by Swissgrid. Internships are generally temporary positions. These form part of Swissgrid's recruitment efforts to bring sought-after skills into the company. Swissgrid often offers interns permanent positions at the end of their internship.

Internal employees

	Ms		Mr		Total
	Number	%	Number	%	Number
Permanent employees	142	21.1	530	78.9	672
Temporary employees	17	34.0	33	66.0	50
Employees without guaranteed working hours	0	0.0	1	100.0	1
Total	**159**	**22.0**	**564**	**78.0**	**723**[1]

External employees

	Ms		Mr		Total
	Number	%	Number	%	Number
Contract for hiring temporary personnel	8	19.5	33	80.5	41
Service provider contract	103	17.0	504	83.0	607
Total	**111**	**17.1**	**537**	**82.9**	**648**

Appointments

	Ms		Mr		Total
	Number	%	Number	%	Number
< 30 years	16	13.2	31	25.6	47
30 – 50 years	16	13.2	50	41.3	66
> 50 years	2	1.7	6	5.0	8
Total	**34**	**28.1**	**87**	**71.9**	**121**

Fluctuation incl. retirements

	Ms		Mr		Total
	Number	%	Number	%	Number
< 30 years	1	0.02	4	9.30	5
30 – 50 years	6	1.36	19	4.30	25
> 50 years	2	1.07	14	7.49	16
Total	**9**	**6.34**	**37**	**16.98**	**46**

[1] Not including apprentices and employees paid by the hour (14 persons)

The proportion of part-time employees is 49.1% for women and 14.7% for men.

External employees

Swissgrid employs a number of external staff for short-term projects. A distinction is made between contracts with staff leasing companies and contracts with service providers. Most external staff work in the Technology business unit, which is responsible for driving forward the digitalisation of business processes and the resulting transformation of the company.

Newly hired employees and employee turnover

With 121 new hires and 46 departures, of which around a third were retirements, Swissgrid grew significantly in line with its strategy in 2022.

Employee satisfaction

In order to identify how to potentially improve and become a more attractive employer, Swissgrid is interested in what its existing employees think of it as a company. That is why Swissgrid regularly conducts employee surveys. In the 2022 survey of 161 companies carried out by icommit, Swissgrid achieved an employer satisfaction rating in the top 25%. Particularly in terms of its attractiveness as an employer and the question of whether its employees would recommend it, Swissgrid's results are significantly above the benchmark of the companies surveyed.

Awards

As part of their surveys, icommit awarded innovative working environment projects that have a positive impact on commitment in companies. In 2022, Swissgrid was awarded the special prize in the "Rising Star of the Year" category by icommit and the Swiss Employers' Association. Overall, Swissgrid achieved 11th place in the Swiss Employer Award 2022 in the category of companies with 250 – 999 employees.

GRI 201-3

Pension plans

Swissgrid is affiliated with the "PKE Vorsorgestiftung Energie" pension fund. With assets of approximately CHF 12 billion and around 26,000 insured persons, PKE is one of the largest pension funds in Switzerland. Swissgrid's employees are insured according to the statutory provisions and the effective pension regulations. Entry into the pension fund is mandatory for all employees subject to the BVG. The premiums consist of contributions by the employer and the employees.

Pension provision at Swissgrid

107.7 %
Cover ratio PKE Vorsorgestiftung Energie as at 31/12/2022

0.24 %
Risk contributions Swissgrid

0.16 %
Employee risk contributions

Savings contributions Swissgrid
7.2 to **22.7 %**
of the insured salary (depending on age)

Employee savings contributions
4.8 to **10.3 %**
of the insured salary (depending on age)

Additional voluntary savings contributions Employees
2 to **4 %**
of the insured salary (depending on age)

GRI 404-3

Further development of talent

Swissgrid conducts systematic succession planning every year as part of the annual staffing reviews and, since 2020, has carried out analysis of the potential of its employees. Thanks to the identification and promotion of talent, two thirds of vacant management positions have been filled by internal employees in recent years. In order to strengthen the leadership culture, in 2021 and 2022 the Executive School of Management, Technology and Law at the University of St. Gallen designed and undertook the “Fit for Excellence” programme. The programme included a leadership and a management part and was completed by 120 existing and aspiring Swissgrid managers. Participation was compulsory for these individuals.

In addition to preparing employees for retirement at an early stage through external courses and events, Swissgrid offers the possibility of phased retirement. Transition to retirement can be planned even more effectively through reducing the workload and responsibility in a targeted way.

If Swissgrid is forced to part with employees for whom it is foreseeable that they will need support in finding new employment, the company offers outplacement counselling and an extension of the notice period.

Developing talent also means that, at Swissgrid, all employees with a permanent employment contract receive regular performance appraisals. Mandatory interviews take place annually; semi-annual interviews are possible upon request. To assess the performance of employees in a consistent manner, employees and supervisors were given in-depth training in performance management. As part of calibration conferences at the department, business unit and overall company level, the most objective possible assessment of individual performance and target achievement must be ensured.

“Thanks to the identification and promotion of talent, two thirds of vacant management positions have been filled by internal employees in recent years.”

The results of the 2022 employee survey reflect the positive changes in this area, too. The majority of employees are not satisfied with what they have achieved but try to achieve even better performance. Managers are also credited with setting clear goals and priorities. However, there is still room for improvement in the area of regular feedback on the services provided.

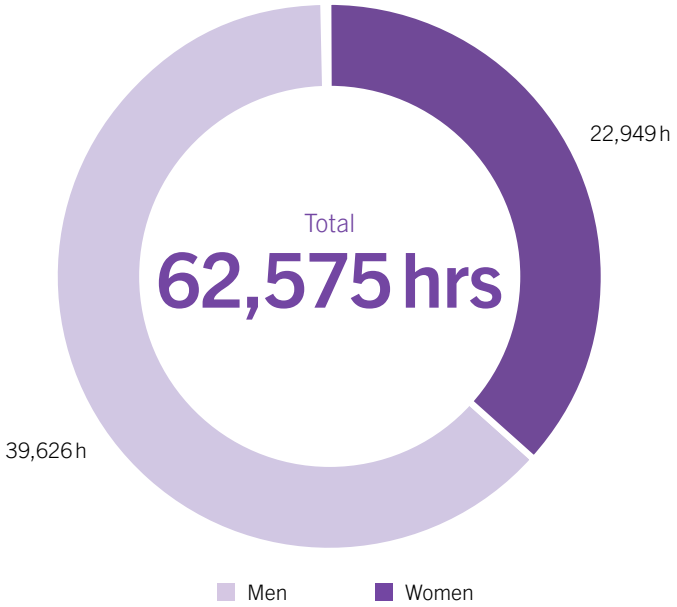
GRI 404-1, 404-2

Education and training

Education and training are central to equipping the workforce to do their jobs. The basis for this is provided by the directive "Training and further education". The Training Services team is responsible for Swissgrid's learning management system. The team develops online training, conducts face-to-face training sessions and supports internal specialists in planning and conducting training sessions.

Swissgrid differentiates between the predefined internal and external training courses, which are derived from the defined training needs of the line organisation, and individual training courses, which serve the personal development of the employees. The assumption of the costs of personal training and further education as well as the further regulations regarding the crediting of working hours, a possible commitment period or also the reimbursement in the event of termination of the employment relationship are regulated in the training and further education regulations.

Hours spent in training and further education 2022



711 hrs

Interns (I), doctoral candidates (D), apprentices (A) and staff paid by the hour (H)

55,296 hrs

Employees excluding I/D/A/H and not in a management role

6,568 hrs

Managers excluding Executive Board and Board of Directors

GRI 405

Diversity and inclusion

Swissgrid's ambition is to become an innovative, highly digitalised company and an attractive employer, offering all employees, regardless of their ethnic origin, sexual orientation, religion, age, gender, impairment or other diversity aspects, a working environment in which they feel comfortable and can perform to their full potential. Swissgrid therefore not only promotes creativity and innovation within the company but also increases the agility and performance of its employees and business units. In addition, Swissgrid is aware that diversity and inclusion (D & I) are an important competitive factor in a labour market that is increasingly characterised by a "war for talent". Swissgrid's comprehensive D & I strategy promotes diversity within the company, creates an inclusive corporate culture and addresses the challenges on the labour market by using the entire breadth of talent available.

Management approach

Diversity and the promotion of work-life balance have been a cornerstone of Swissgrid's HR strategy since 2018. Accordingly, various measures were implemented between 2018 and 2022 to this end, such as the introduction of the directive "Protection of personal integrity at work", the establishment of external contact and counselling centres for employees in difficult personal circumstances as well as for the support, coordination and mediation of care services for families, or the introduction of functional salary bands. To do justice to the increasing importance of D & I in the labour market and to anchor the topic even more firmly internally, Swissgrid developed a dedicated D & I strategy in 2022. The D & I strategy makes a central contribution to the "operational excellence" strategic focus of Swissgrid's strategy 2027 by defining fields of action, goals and measures around cultural development.

Swissgrid has set out the goal of the D & I strategy in its own mission statement:

Swissgrid guarantees non-discriminatory access to all roles. Swissgrid draws on a diverse talent pool when filling vacant positions. The development of all employees at Swissgrid is based on transparent and comprehensible criteria and is planned and implemented jointly by management and employees.

By providing the best possible working conditions, Swissgrid employees develop their full potential and can carry out their work to the best of their ability and achieve the goals they have set.

Leaders ensure an inclusive leadership culture in all areas and teams, which guarantees equal opportunities and the framework conditions for this and in which employees feel comfortable, contribute ideas, take responsibility and openly address challenges or conflicts.

Swissgrid will achieve this goal by implementing measures from the four pillars “diversity management”, “employee development”, “optimal working conditions” and “inclusive leadership” from 2023 onwards. The success of the implementation of the adopted measures is not only measured by defined key figures, but also periodically through participation in a diversity benchmark study by a university research centre. The Executive Board is informed about the status of implementation in an annual “D & I Status Report”.

GRI 405-1, 202-2

Diversity management

As part of its diversity management, Swissgrid uses the diversity of the labour market to ensure that it has the resources and skills it needs now and in the future. Swissgrid promotes employee loyalty, motivation, cooperation and satisfaction through diverse teams. Employees are encouraged to be more open to change and to support the desired change in the corporate culture.

The aim of diversity management is to create an environment and corresponding conditions that ensure a high level of diversity among employees. This target is measured by the mean value of the employee surveys on the D & I dimension and the associated individual questions, the proportion of women at Swissgrid and the proportion of women recruited and promoted to management positions with personnel management responsibility.

The following tables show the composition of Swissgrid’s Board of Directors and Executive Board as at 31 December 2022 by gender, age and Swiss language region or country of origin:

Executive Board

Gender	Number	Percent
Male	4	80.0
Female	1	20.0

Age	Number	Percent
< 30 years	0	0.0
30 – 50 years	1	20.0
> 50 years	4	80.0

Swiss language region / country of origin	Number	Percent
German-speaking Switzerland	3	60.0
French-speaking Switzerland	1	20.0
Italian-speaking Switzerland	0	0.0
EU member state	1	20.0
Other	0	0.0

Board of Directors

Gender	Number	Percent
Male	8	88.9
Female	1	11.1

Age	Number	Percent
< 30 years	0	0.0
30 – 50 years	1	11.1
> 50 years	8	88.9

Swiss language region	Number	Percent
German-speaking Switzerland	7	77.8
French-speaking Switzerland	1	11.1
Italian-speaking Switzerland	1	11.1

The following tables show the composition of Swissgrid's employees as at 31 December 2022 by hierarchical level and function:

Hierarchical levels (total of 737 employees)

Gender	Managers excluding Board of Directors	I/D	A/H	I/D/A/H	Total
Male	81	20	13	460	574
Female	12	13	1	137	163
Age					
< 30 years	0	28	8	54	90
30 – 50 years	67	4	0	384	455
> 50 years	26	1	6	159	192

I Interns
A Apprentices
D Doctoral candidates
H Staff paid by the hour

Functions (total of 723 employees)[1]

Gender	Technical functions	Corporate functions	Total
Male	488	73	561
Female	83	79	162
Age			
< 30 years	67	15	82
30 – 50 years	352	103	455
> 50 years	152	34	186

[1] Number of employees excluding apprentices and employees paid by the hour

33 % Proportion of women promoted to management positions with personnel management responsibility in 2022

Employee development

Staff development measures are presented in the chapter "Attracting, retaining and developing skilled workers".

Optimal working conditions

GRI 401-3, 405-2, 406

Swissgrid facilitates working conditions (structures, processes, responsibilities) that ensure optimal cooperation in teams as well as across divisions and also takes into account changing needs. Among other things, this includes improving the compatibility of work and other aspects of life, including opportunities for flexible working. Equal pay is also a major concern for Swissgrid and is therefore reviewed regularly. Protection of personal integrity is the basis of respectful collaboration and is taken very seriously at Swissgrid.

Structures and processes

Swissgrid analyses the structures, processes and responsibilities in teams and departments that scored more than six points below the Swissgrid benchmark in these areas in the 2022 employee survey. Improvement measures are then defined and implemented based on this analysis. Swissgrid measures the success of these measures by means of employee surveys that are compared with the 2022 survey.

Making work compatible with other aspects of life

Swissgrid supports making work compatible with other aspects of life by looking into further support and care services, alternative working models such as "job sharing" and the introduction of a sabbatical for all employees and partially self-financed parental leave. Swissgrid is expanding its existing offerings in this area. Today, Swissgrid employees have access to advice from internal staff representatives – and also profawo as an external partner – on issues relating to the compatibility of work and other aspects of life. In addition to personal counselling and information about relevant services in Switzerland, non-profit organisation profawo also offers employees a free referral service for childcare places, nannies and emergency nannies, as well as relief services for relatives.

Furthermore, Swissgrid also offers the possibility of filling all positions at 80% capacity. The paternity leave allowance of 15 days, as well as generous holiday regulations, which also allow for a sabbatical, are another plus. The progressive guidelines for hybrid working introduced in 2022 also contribute to a better work-life balance.

Maternity and paternity leave

	Ms		Mr	
	Number	**%**	**Number**	**%**
Resuming a role after maternity/paternity leave	6	66.7	18	100
No resumption of role after maternity/paternity leave	2	22.2	0	0
Still on maternity or paternity leave as of 31/12/2022	1	11.1	0	0
Total	**9**	**100**	**18**	**100**

A retention rate of returnees after 12 months is not shown for 2022, as this is the first report of its kind.

100 %
of the employees are entitled to maternity or paternity leave

9
employees took maternity leave in 2022

18
employees took paternity leave in 2022

Equal pay

Equal pay for work of equal value is a matter of course for Swissgrid. Swissgrid has created transparency in this regard with the introduction of role-based salary bands in 2019. In 2021, the Swiss Association for Quality and Management Systems (SQS) audited wages at Swissgrid. SQS confirmed in this maintenance audit that pay equity between women and men continues to exist at Swissgrid. With a deviation rate of 3.8%, the result of the audit is again well below the threshold value of 5%. The remuneration of all employees was audited, with the exception of interns and employees paid by the hour. SQS has only identified wage differences for eight employees in 2021 that cannot be explained by age, education, experience or similar reasons. Together with the respective line managers, Human Resources reviewed the remuneration situation of these employees as part of the "2022 Salary Round" and adjusted any differences that could not be explained.

As a consequence, Swissgrid may continue to use the SQS "Fair Compensation" certificate in accordance with the criteria of the Association of Compensation & Benefits Experts without any conditions. In order to monitor and ensure pay equity between women and men, Swissgrid will again conduct a pay equity analysis in 2023 to supplement the legal requirements.

Protection of personal integrity
Swissgrid values a good work environment. Mutual respect and trust, as well as an open communication culture and the ability and willingness to openly address conflicts and work together to find solutions, form the basis of constructive collaboration. Swissgrid takes its statutory duty to protect the personal integrity of its employees seriously and implements the necessary measures to guarantee it.

The directive on "Protection of personal integrity in the workplace" aims to protect Swissgrid employees from any kind of threat, harm or violation of their personal integrity such as discrimination, bullying or sexual harassment and to prohibit this kind of behaviour. The directive sets out responsibilities, duties, authorisations and procedures in case of violations.

"Protection of personal integrity is the basis of respectful collaboration and is taken very seriously at Swissgrid."

Discrimination, bullying and sexual harassment violate an individual's dignity and self-worth. Such injuries compromise not only the well-being and health of the persons affected but also cooperation in the company. As a result, they are not tolerated at Swissgrid.

Swissgrid employees receive advice and support in difficult private and/or business situations through MOVIS, the leading company in Switzerland for external employee counselling. These include, for example, the following topics:

- **Work-related issues:** Conflicts in the workplace, sexual harassment, bullying, discrimination, operational changes
- **Personal issues:** Family, marriage, partnership, education, death and mourning, care for relatives, housing, migration
- **The employee's own health or that of their close relatives:** Mental illness, somatic illness, addiction, stress, burnout, insecurity and fear, coping with disability
- **Finance:** Budget counselling, burden of debt, social security, retirement

Swissgrid employees can contact the experienced and professional advisors at MOVIS seven days a week, 24 hours a day, at sites in all language regions of Switzerland. Discussions are confidential and the contents are not disclosed to the employer. Swissgrid only receives regular reports on the use of the service and the topics dealt with. It is very important to Swissgrid that its employees receive appropriate professional support to help resolve the situation they face. This service is therefore free of charge for employees.

No cases of discrimination were reported to Swissgrid during the reporting period. This concerns both reports via internal units such as superiors, the Head of Compliance or the RiskTalk application as well as reports to MOVIS.

Inclusive leadership

Inclusive leadership means that managers take into account the diversity of their employees and their needs, enable equal opportunities and create the necessary framework conditions to achieve this. Leaders promote a climate of respect, trust and (psychological) security in which all employees can contribute their knowledge and experience and develop their full potential. Inclusive leadership is part of Swissgrid's corporate culture and must be anchored even more firmly throughout the company.

The guiding and leadership principles form the basis of inclusive leadership at Swissgrid. These are part of the target agreement and performance appraisal of all employees. In order to anchor and further develop the existing guiding and leadership principles in the company even more strongly, all employees and, in particular, managers will be specifically made aware of and trained in various aspects of inclusive leadership. In addition, the involvement of employees will be further institutionalised by defining a process for the submission of new ideas and for their processing (including the necessary resources) and establishing guidelines for this.

Swissgrid's aim is to ensure that no group of employees in the company has a systematically different experience of their work at Swissgrid from the rest of the company's workforce. Swissgrid measures this target by determining whether there is a difference between the mean values of different groups of employees (e.g. women and men, different generations) in the employee surveys.

Partner-ship

The Partnership section addresses four main topics: governance, compliance, anti-corruption and risk minimisation; sustainability in the supply chain; stakeholder engagement; and transparency. These topics may seem very different at first glance, but the task essentially remains the same. Thanks to clear responsibilities and well-structured processes, knowledge of stakeholder needs and forward-looking action, the aim is to comply with the law, to identify and minimise risks, and to create added value and transparency for society, both in our own business activities and in the supply chain.

Governance, compliance, anti-corruption and risk minimisation

The four closely interlinked topics in this chapter highlight different aspects of how Swissgrid manages its own business activities and the interfaces with its environment. For Swissgrid, as the operator of critical infrastructure, it is crucial to ensure smooth business operations. It is also vital to comply with the extensive regulations and to behave ethically.

Corporate governance

Good corporate governance is important for Swissgrid in order to optimally fulfil its legal mandate. As such, both the Board of Directors and the Executive Board attach great importance to good corporate governance and control. Swissgrid reports annually on current corporate governance as part of its financial reporting. The principles of corporate governance at Swissgrid are set out in the internal organisational regulations.

Board of Directors and Executive Board

GRI 2-9, 2-10, 2-11, 2-12, 2-13, 2-15, 2-17, 2-18

All members of the Board of Directors and the Executive Board of Swissgrid are presented in the Corporate Governance Report 2022. The report includes information on the duration of their membership in the respective body and on their other activities and affiliations. The report also states the stakeholder group to which Board members belong. The provisions on the election and term of office of members of the Board of Directors are stated in the Corporate Governance Report. In addition, the various committees of the Board of Directors and their respective members are presented.

“Good corporate governance is important for Swissgrid in order to optimally fulfil its legal mandate.”

The Board of Directors is responsible for the overall management of the company and for supervising the management of the company. The Board of Directors has delegated the operational management and the representation of the company to the CEO in compliance with the legal requirements for independence (Art. 18 Para. 7 of the Electricity Supply Act (Stromversorgungsgesetz, StromVG)). It has also issued the organisational regulations. The members of the Board of Directors do not exercise any executive roles within Swissgrid.

The Board of Directors of Swissgrid is responsible for defining the company’s vision and mission in accordance with the legal requirements and the Articles of Incorporation. It is also responsible for the Code of Conduct and the Whistleblowing Policy. As part of the strategic management of the company, the Board of Directors has approved the Strategy 2027, in

which the sustainable development of the company is of crucial importance. Future changes to Swissgrid's strategic orientation and thus to the company's corporate, social and environmental responsibility (CSER) commitment must be approved by the Board of Directors.

Responsibility for specific sub-areas within sustainable corporate development was divided between the Board committees. The areas of "Purpose" and "Partnership" have been assigned to the Finance and Audit Committee, while the Human Resources and Compensation Committee and the Strategy Committee will deal with the areas of "People" and "Planet" respectively.

Swissgrid's Executive Board is responsible for the company's system of directives, develops functional strategies and defines Swissgrid's guiding and management principles and annual targets within the framework of the overarching guidelines. In order to systematise existing CSER measures at Swissgrid, in 2023 the Executive Board will create a function that is responsible for CSER programme management in the sense of central management and control, as well as regular reporting. Operational implementation of the CSER measures will be conducted within the business units.

"Future changes to Swissgrid's strategic orientation and thus to the company's corporate, social and environmental responsibility (CSER) commitment must be approved by the Board of Directors."

The Board of Directors examines current topics of relevance to the company in depth at its ordinary meetings or at extraordinary events such as workshops and visits. It regularly consults with both internal and external experts for this purpose. New members of the Board of Directors are familiarised with company-specific topics in an onboarding session. Proposals to the Board of Directors are also designed in such a way that the impact of the individual proposals on the central topics of innovation and CSER according to Strategy 2027 must be shown using a traffic light system and statements relating to the points of innovation culture, digital capabilities and innovative approach, or Purpose, People, Partnership and Planet. This not only underlines the importance of these issues for the company, but also lays the foundation for uniform assessment and measurement and the company-wide reporting system.

The information and control instruments of the Board of Directors vis-à-vis the Executive Board are set out in detail in Swissgrid's Corporate Governance Report 2022. In addition to regular reporting by the CEO or the Executive Board on the operational course of business and the implementation of the corporate strategy, quarterly financial reporting, the semi-annual risk report and the annual report of the external auditors, the internal auditors and the internal control system regarding financial accounting and reporting are of central importance. The co-sourcing model used by the internal auditors and the selective involvement of external specialists ensure that independent opinions are also regularly obtained when monitoring the management.

As part of their annual self-evaluation, the Board of Directors and the Executive Board review whether the composition of the individual committees, the understanding of their roles, the selection of agenda items, the conduct of meetings, the culture of discussion and cooperation with other bodies meet the expectations placed on them. The role and requirements profile is also regularly reviewed. By doing this, Swissgrid ensures that the Board of Directors and the Executive Board have the necessary knowledge and experience.

GRI 2-19, 2-20, 2-21

Remuneration

The members of the Board of Directors receive a fixed remuneration (fees and expenses) based on a sliding scale for the Chairman, the Vice-Chairwoman, the Chairs of the committees and the other Board members. Remuneration for the members of the Executive Board consists of a basic salary (including per diem expenses) and a variable salary component that is dependent on achieving company and personal targets. The amount of remuneration for members of the Executive Board is determined by the Staff and Compensation Committee within the framework defined by the Board of Directors. The remuneration of the Executive Board and the Board of Directors is disclosed in the notes to the Swiss GAAP FER annual financial statements in paragraphs 8 and 9 and is approved in this form by the General Assembly. The determination of the total compensation and the annual base salary of the Board of Directors and the Executive Board is based on a benchmark established by an external, independent company.

In 2022, the annual basic salary excluding performance-related remuneration of the highest earner at Swissgrid was 3.8 times higher than the average annual basic salary of all employees, excluding the highest earner. In 2022, it was adjusted for the first time since 2018 and increased by 6.3% compared to the previous year. The average annual basic salary of all employees, excluding the highest earner, increased by 0.8% over the same period.

Compliance

GRI 2-16, 2-23, 2-24, 2-25

Swissgrid has established a compliance management system to ensure adherence to legal regulations and ethical principles. Swissgrid's compliance management system is based on ISO 37301:2021-11.

The Board of Directors is responsible for the overall supervision of compliance with the law, the Articles of Association, regulations and directives. In the notes to the organisational regulations, the Board of Directors specifies the basic features of compliance management. At a strategic level, the CEO firms up these requirements in the "Compliance Concept". The Compliance function, which is led by the Head of Compliance, is responsible for the operational implementation of compliance management in accordance with the requirements of the Board of Directors and the CEO. Compliance with internal and external regulations in day-to-day work is the responsibility of all internal and external Swissgrid employees. They are all ambassadors for exemplary and ethical conduct. The Compliance function supports the employees in ensuring compliance in the company, together with the Board of Directors and the Executive Board.

Swissgrid's compliance management system comprises activities and measures in the three main areas of prevention, detection and response. Based on a regular compliance risk assessment, the compliance concept defines the responsibilities and focal points (legal areas). In addition, the Compliance function reports regularly on activities and measures to the Head of Legal, Regulatory & Compliance, the CEO and the Finance and Audit Committee of the Board of Directors.

GRI 2-23, 2-24, 2-26, 410

Prevention

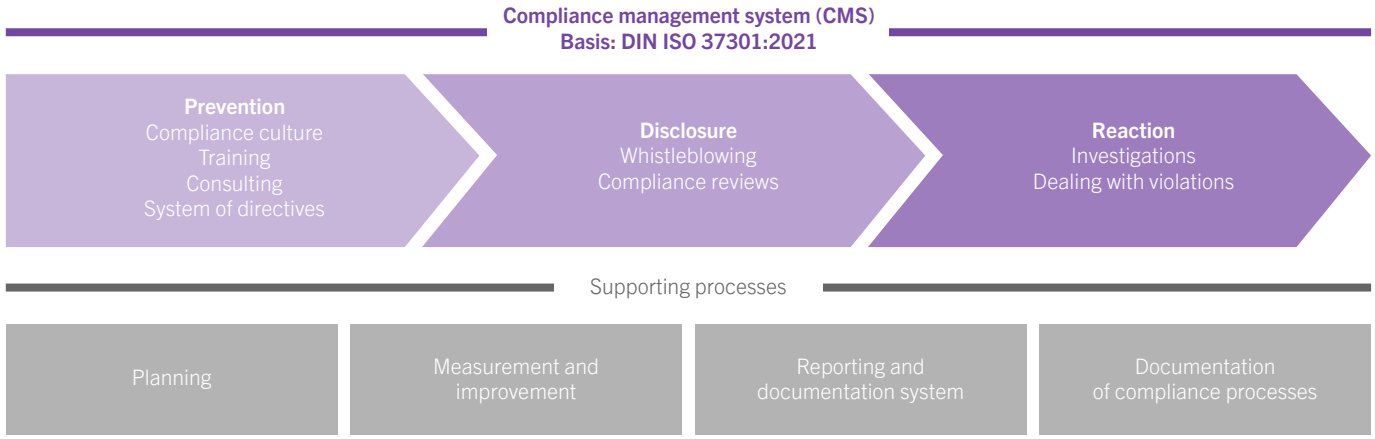
To support employees in complying with internal regulations, the Compliance function ensures that the regulations are centrally available to employees. The Code of Conduct is issued by the Board of Directors and governs the principles of lawful and ethical conduct. Swissgrid defines regulations on specific topics in various directives, which together make up the system of directives.

If a directive is newly introduced or significantly changed, the Compliance function and/or employees with technical responsibility for the directive conduct training. New employees are informed about the applicable standards as part of the onboarding programme. Furthermore, the Compliance function conducts special compliance training for individual teams or departments on directives and topics that are particularly relevant to them. For the creation and specification of its training sessions, the Compliance function maintains a training concept that it reviews and improves on an ongoing basis.

Swissgrid's security personnel, who are employed through a third-party company, receive training on ethical principles and human rights as part of their basic training. This applies to 100% of the security staff employed by Swissgrid.

As a further preventive measure, the Compliance function advises employees on compliance with internal and external standards.

Scope of application of the compliance management system



GRI 2-26

Disclosure

The Board of Directors of Swissgrid has instigated a whistleblowing policy to ensure that serious breaches of regulations can be reported. This ensures that employees can report any serious violations to a reporting office without fear of negative repercussions. It also stipulates that the investigative body will follow up and investigate these leads in a structured and confidential manner.

Due to far-reaching changes in the regulatory framework in recent years, Swissgrid began revising its whistleblowing policy in the reporting period, which will be completed in 2023. The revised whistleblowing policy is based in particular on DIN ISO 37002:2021.

The Compliance function also conducts regular compliance reviews on behalf of the CEO. To this end, it prepares an annual risk-based plan. In the compliance reviews, the Compliance function checks whether the directives and legal requirements are being complied with and whether measures to prevent violations are in place and effective. Human rights are enshrined in the Swiss Federal Constitution and are therefore one of the legal requirements subject to checking for compliance on the basis of risk at Swissgrid.

Swissgrid conducts an average of one to two compliance reviews per year.

Response

The Compliance function is obliged to investigate all whistleblowing reports. It also examines indications of violations from the compliance reviews. Together with the Head of Legal, Regulatory & Compliance, it conducts a preliminary investigation to assess whether there is sufficient initial suspicion and whether the mandate for an investigation shall be requested from the CEO or the Chairman of the Board of Directors. All information related to investigations must be treated confidentially. The work carried out and the results of the investigation must be documented.

Violations must be dealt with after an investigation. This encompasses two aspects:

Violations have consequences. These will depend on the severity of the violations and the degree of fault of the employee. The extent of the consequences will be determined by HR and the employee's supervisor on a case-by-case basis.

In order to prevent identical or similar violations, directives must be adapted, additional control measures introduced, processes revised and/or additional training carried out, depending on the case. This allows compliance management to be continuously developed and adapted to the needs and risks.

GRI 2-27, 411, 416

Violations

In 2022, there were no significant judgements against Swissgrid due to compliance violations. No significant monetary fines were paid out during this period. An amount of CHF 25,000 was defined as the materiality threshold for reporting.

Swissgrid does not pursue any activities in areas with recognised indigenous populations whose rights may be violated.

GRI 205

Anti-corruption

Swissgrid is taking decisive action against corruption. Corruption is incompatible with the ethical principles of the company. Since Swissgrid, as the operator of the Swiss transmission grid, awards considerable contract volumes and is also in constant contact with the authorities, it attaches great importance to combating corruption.

Swissgrid assesses its corruption risk as part of the semi-annual Enterprise Risk Assessment. The corporate risk "misappropriation of monetary assets" includes corruption, embezzlement and misrepresentation. As a measure against this risk, Swissgrid's internal control system is reviewed annually for design errors and effectiveness. Compared to the other corporate risks, corruption is not one of Swissgrid's significant risk factors and is therefore not dealt with separately in the publicly available risk report. However, the risk of corruption is regularly reviewed as part of the risk-based compliance reviews.

Swissgrid has taken various measures to combat corruption. The Code of Conduct raises employees' awareness of corruption. All employees are trained to counter corruption as part of their compliance training. Specifically, the compliance training for all new employees includes information on situations in which conflicts of interest may arise and how these can be identified and avoided. Correct behaviour in an observed case of corruption is clearly explained using examples. The principles for dealing with gifts and invitations, for example, are based on value, timing and frequency.

The risk of corruption is also mitigated by other measures: The awarding of high-value contracts is jointly reviewed by evaluation teams and the parties involved must declare their impartiality. Employees must avoid conflicts of interest or, if necessary, disclose them and step aside. The placing of high-value orders, including follow-up orders, is supervised by specially trained procurement & claim managers. In addition to price criteria, Swissgrid's tenders always include quality criteria. Price quotes are not permitted in accordance with federal law. The signature regulations provide for the collective signature of the employees and also link the authority to sign to the order value. A dual control principle, at a minimum, applies to the placing of orders and the initiation of payments. Finally, procurement is subject to internal audits conducted at more frequent intervals.

In addition to internal audits and compliance reviews, employees have the opportunity to anonymously report suspected violations to the Compliance function at intervals of several years (whistleblowing). Employees also have a general duty under labour law to inform the employer of possible serious harm.

GRI 205-3

Violations
In 2022, there were no judgements on corruption cases at Swissgrid.

Risk minimisation

In its role as the operator of one of Switzerland's most critical infrastructures, risk management is an integral part of prudent and effective corporate governance for Swissgrid. It covers the entire organisation without its subsidiaries and shareholding, fulfils the legal requirements in Switzerland and is based on the established ISO 31000 and COSO ERM standards.

The Risk Management unit assists Swissgrid managers at all tiers in consciously dealing with risks. This includes expedient and transparent reporting as well as managing an appropriate risk management system. Swissgrid fosters the deliberate management of risks at all levels of the company.

The Board of Directors has defined the governance requirements for risk management and delegated its implementation to the CEO. The Head of Enterprise Risk Management manages the risk management process, provides the methods and advises the operating units on risk management.

The risk assessment takes place twice a year. The key risks are identified and assessed as part of a multi-stage process that includes the evaluation of risks based on the probability of their occurrence and the extent of their impact, as well as the definition of strategies to manage said risks.

Risk monitoring, including the effectiveness and level of implementation of the measures taken, is performed as part of regular risk updates. The Executive Board and the Board of Directors receive the results of the risk assessment and the risk updates in the form of a standardised report.

The assessment of Swissgrid's risk situation in 2022 can be found in the Annual Report 2022.

"The safety of persons and installations is guaranteed at all times. Safety is the top priority in everything we do."

At Swissgrid, minimising risks goes beyond enterprise risk management. The aim is to ensure that the safety of persons and installations is guaranteed at all times. Safety is the top priority in everything we do. This includes conducting a personal safety check on internal and external employees in safety-critical functions. This check is only initiated and carried out with the consent of the person concerned.

When it comes to security, Swissgrid pursues an integral approach that encompasses six security domains: operational security, physical security, information security, crisis management, business continuity management, and occupational health and safety. The integral safety policy sets out Swissgrid's safety objectives and regulates the essential aspects required for the effective implementation of company-wide integral safety management. These include the principles, the overarching framework conditions and domain-specific requirements, and security organisation.

Operational security

The aim of operational security, sometimes also referred to as process security, is to ensure that Swissgrid provides a reliable service (security of supply) in every grid state. It is based on the processes and elements of safety risk management, such as the reporting system, event investigation, safety risk analysis, safety culture and clearly defined roles and responsibilities.

Operational safety focuses on the reliable, fault-tolerant execution of work actions or the corresponding processes and instructions in complex grid and system operations and the associated specific challenges (e.g. automation or human-machine interactions).

Among other things, this uses the following specific methods and processes:

- Independent, continuous observation of operations with the aim of identifying and improving instructions that are inappropriate or prone to errors, or procedures that deviate from the instructions.
- The principles of "human factors" to design a fault-tolerant, robust work environment adapted to the specific characteristics of human beings and promoting event analysis.

A competence management system that consistently ensures and documents basic training, the retention of knowledge and skills, the further training of employees (especially in the operation of systems and installations), and the building up of experience.

While national and international regulations exist for all operational processes and states of the system and the network (e.g. network codes), there are hardly any industry standards specifically with regard to operational security. Accordingly, Swissgrid relies on ICAO Doc 9859, Safety Management Manual, Fourth Edition 2018, which is used in other sectors with similar characteristics (e.g. aviation, nuclear energy).

Physical security
The aim of this security domain is to ensure the physical safety of employees and third parties, as well as property. This also includes the protection of persons at events (e.g. general meetings, staff events, information events, media conferences).

The protection of persons from accidents falls within the remit of occupational safety rather than physical safety.

Comprehensive basic protection cannot be fully ensured in the area of physical security due to the lack of specific and complete specifications and recommendations (both general and industry-specific). Swissgrid has therefore developed its own company-wide standards based on best practice in order to meet the requirements of a critical infrastructure. Among other things, these take into account the ISO/IEC 27002 standard, the Association of Swiss Electricity Companies' (VSE) "Physical Safety of Substations, Grid Level 1 and Lower" industry recommendation in 2019, and the 2015 fire protection standard of the Association of Cantonal Fire Insurers (VKF).

Swissgrid substation Fionnay GD in Valais

Information security GRI 418
The aim of the "information security" domain is to guarantee the confidentiality, availability and integrity of data and information in physical form or based on ICT systems for business and operating technology.

A risk-based information security management system built according to international standards (e.g. the standards of the ISO/IEC 27000 family) defines the set of rules and measures to be applied. This management system supports the entire implementation process from implementation through to review and further development. The basic measures to be applied and measures specific to the energy sector are derived and implemented from the same family of standards.

"Swissgrid's information security management system was successfully certified to ISO/IEC 27001 in 2022."

For Swissgrid, information security also includes well-maintained personal data management. In implementing the revised Swiss data protection legislation, Swissgrid adopts a risk-based approach, i.e. measures aimed at ensuring compliance with obligations subject to sanctions are implemented as a matter of priority. This is intended to protect employees from sanctions (fines) and to prevent damage to Swissgrid's reputation as a result of non-compliance with mandatory data protection provisions. Among other things, these goals are pursued through directives on data protection,

training of all employees, and the integration of checks and balances into existing processes.

To date, no complaints of data protection violations have been brought to the attention of the internal data protection unit. There have only been two requests to the Data Protection Officer (DPO) in the last three years: a request by the applicant to be informed of the personal data that Swissgrid has processed about him or her and a request for deletion by a person who had worked for Swissgrid.

Furthermore, no cases of data loss or theft have been reported to the internal data protection unit to date. However, there has also been no dedicated internal reporting process so far. This will be implemented with a directive on data protection in 2023 in view of the entry into force of the revised Swiss data protection legislation (approximation of EU data protection legislation).

"Crack the password" station at the "Safety & Security Days" 2022

Crisis management and business continuity management
Swissgrid's crisis management and business continuity management (BCM) have the common goal of ensuring flexible incident management that is adapted to the situation so that the continuity of critical processes can be guaranteed in the event of an incident. Crisis management and BCM serve to continue Swissgrid's mission in accordance with the defined framework conditions, subject to certain restrictions, in the event of deviations from the normal situation. They are based on the Swissgrid mandate in accordance with Art. 20 StromVG and Art. 5 of the Electricity Supply Ordinance (StromVV), ENTSO-E requirements in accordance with the Synchronous Area Framework Agreement, Transmission Code and VSE industry document, and the requirements of the Federal Office for Civil Protection.

The existence and proper functioning of crisis management and BCM correspond to the necessary basic protection. In accordance with the ISO 223xx series, Swissgrid's business continuity management system is being continuously developed for this purpose within the framework of a roadmap approved by the Executive Board, including annual targets. It describes, among other things, the creation of BCM specifications, the regular identification of BCM scenarios, and the development, testing and practice of risk-based business continuity plans. Business impact analysis is used to identify critical processes and their requirements for restoring process performance, which are to be taken into account within the BCM framework. At the same time, this determines the

corresponding level of protection. This analysis is repeated as necessary and reviewed at least annually. Swissgrid employees are regularly trained in correct conduct in the event of an incident as part of crisis exercises. In addition, the existing systems and processes are checked for their functionality. Implemented BCM processes are tested annually.

Every year, three additional exercises lasting several days are conducted at the associated simulation centres in Prilly and Aarau. The aim of these exercises is to simulate a major disruption or blackout and to practise rebuilding the network. Swissgrid, all distribution system and power plant operators connected to the transmission system and the operators of restoration cells participate in these exercises.

Swissgrid envisages that, in the event of a major event, personnel will be gathered at decentralised sites in Switzerland in order to carry out the necessary work on site. This procedure is practised annually.

The status of BCM implementation and the company's business continuity capability are regularly reported to the Executive Board and the Board of Directors.

The topic of health and safety is dealt with in greater detail in the chapter "Occupational health and safety".

Supply chain sustainability

Swissgrid operates one of the most stable and secure transmission grids in the world. This would not be possible without innovative and reliable suppliers. That is why suppliers have a special status at Swissgrid. The focus is on quality, reliability, cost-effectiveness and sustainability. The Swissgrid Sustainability Charter defines clear environmental and social requirements for direct suppliers, the supply chain and products. In procurement, sustainability is taken into account throughout the entire life cycle of the products, from raw material extraction to disposal.

In the supply chain, the greatest risks to human rights occur in the following areas:

- Health and safety at work
- Environmental protection
- Employment and working conditions
- Freedom of assembly and expression

Management approach

GRI 308-2, 408-1, 409, 414-2

Swissgrid is a member of the United Nations Global Compact and is committed to its responsibility with regard to respect for human rights, the core labour standards of the International Labour Organization (ILO) and environmental laws, and actively combats all forms of corruption. These principles are particularly at risk in procurement, which is why Swissgrid assumes responsibility for compliance with social and environmental standards in its supply chain.

Since 2022, Swissgrid has had a new sustainability strategy for procurement to ensure that its business partners also adhere to the same rules. Sustainability complements the previous procurement goals, such as low costs, the reduction of risks and impact on performance (shortening delivery times and improving quality). The influence of the various tenders on Swissgrid's strategy, i.e. on operational safety, security of supply, operational excellence and grid transfer capacity, has also already been assessed in the context of the procurements.

The sustainability strategy for procurement entails the following benefits:

- Verification of suppliers' compliance with environmental and social legislation
- Reducing reputational risk in business operations
- Cost control through a global total cost of ownership (TCO) approach
- Waste reduction, efficiency improvements and reduction of resource use
- Improvement of the ESG score

Implementation of environmental and social requirements in procurement

The implementation of the sustainability strategy for procurement relies on concrete demands on suppliers and on ecological and social requirements for products and services. While the requirements for the products can be checked as part of the tenders, Swissgrid relies on a Supplier Code of Conduct and sustainability ratings with regard to the requirements for the suppliers.

Supplier Sustainability Charter and The Greener Choice – A Joint Call for Action

As a first step, all suppliers with whom Swissgrid has concluded new contracts worth more than CHF 150,000 since the sustainability strategy for procurement came into force must sign a Supplier Sustainability Charter as part of the qualification process. In the six months since its introduction in July 2022, this charter has already been signed by 63 suppliers. A total of 191 procurements were carried out in 2022 and new contracts were concluded with 113 suppliers (excl. supplements and management decisions). Over the next few years, all suppliers will sign the charter. Sanctions are provided for in the event of violation of the requirements. So far, it has not yet proved necessary to terminate a contract because of breaches of environmental or social requirements. In one case, however, a company was excluded from new tenders because work in an ongoing contract was not executed in an environmentally compliant manner.

More information
The Greener Choice

Supplier Sustainability Charter signed by
63
suppliers

Implementation of
191
procurements

New contracts concluded with
113
suppliers

Swissgrid is also a member, together with nine other European transmission system operators, of the initiative "The Greener Choice – A Joint Call for Action", which calls on its suppliers to support transmission system operators with more sustainable products and services and thus make an important contribution to the common goal of a climate-neutral Europe.

GRI 308-1, 408-1, 409-1, 414-1

Social and environmental requirements in the supply chain

Swissgrid has always taken a long-term approach to its business activities. When making procurements, Swissgrid takes the entire life cycle of each product into account. Life cycle assessment analysis therefore feeds into projects and into procurement. In total, social criteria were required in 63 procurements and environmental criteria in 82 procurements.

To verify compliance with the requirements and monitor the upstream value chain, Swissgrid will work with the EcoVadis sustainability rating platform from 2023. The platform currently provides ratings for around 15% of Swissgrid suppliers. As a first step, Swissgrid aims to review the most important suppliers.

As the operator of critical infrastructure, Swissgrid insists on a high level of safety. The aim is to promote safety awareness among service providers. To that end, Swissgrid has introduced the Safety Culture Ladder (SCL). From 2022, this will be a requirement for those service providers whose activities require a high level of occupational safety.

More information on the safety culture at Swissgrid can be found in the chapter "Occupational health and safety".

Fair competition

GRI 203-1, 204-1, 206

As the national grid company, Swissgrid is subject to the Federal Act on Public Procurement (PPA) and the associated Ordinance (PPO). Procurements above the defined threshold value are put out to tender. As a natural and legal monopolist with an awarded procurement volume of almost CHF 500 million in 2022, Swissgrid is aware of its special economic responsibility and importance on procurement markets. As Swissgrid's transmission lines connect peripheral areas with urban centres, some local providers in structurally weak areas receive contracts. However, Swissgrid does not keep any statistics on this.

In the reporting period, there were no significant judgements against Swissgrid regarding anti-competitive behaviour, cartels or monopolies. An amount of CHF 25,000 was defined as the materiality threshold for reporting.

GRI 2-29

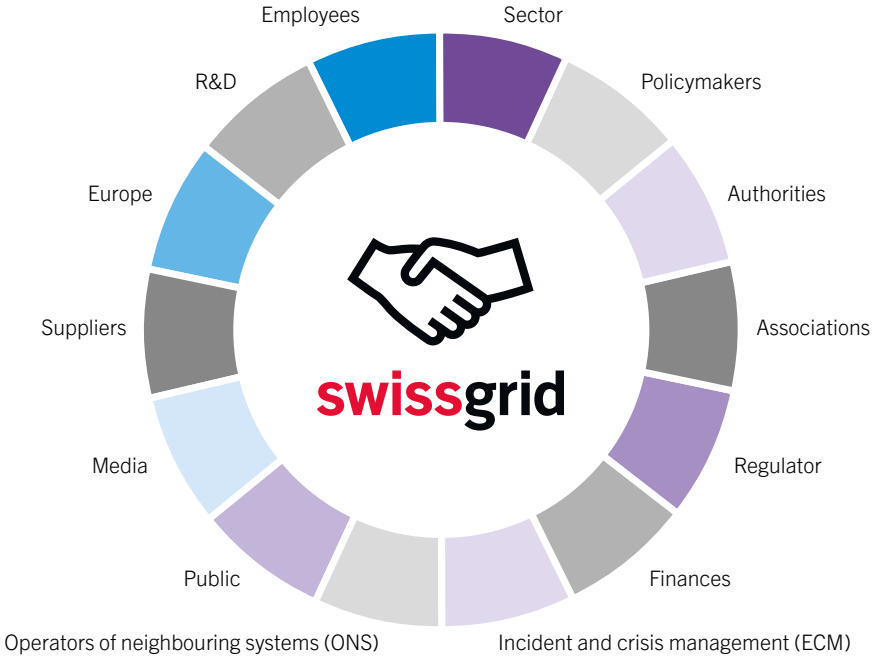
Stakeholder engagement

Swissgrid fulfils its legal mandate in a turbulent environment. Many people, groups and organisations have an interest in what Swissgrid does and how it does it. At the same time, many can directly or indirectly influence Swissgrid's business activities. Direct influence may be exerted, among other things, by national politics, which creates the legal framework conditions for Swissgrid, or by ElCom as the regulator, which monitors compliance with these framework conditions. However, Swissgrid is also indirectly influenced by political and technical developments in Europe, for example.

The energy sector is the most important stakeholder group for Swissgrid. Swissgrid is closely linked to it through technical and financial agreements and maintains intensive exchange.

The following diagram provides an overview of all of Swissgrid's stakeholder groups, which are described in more detail in the following table.

Stakeholder groups of Swissgrid



Stakeholder group	Description
Employees	The employees are of central importance for the successful fulfilment of Swissgrid's legal mandate. Their concerns are addressed with the highest priority.
Sector	Owners and operators of grid and power plant facilities, grid users of Swissgrid, shareholders, market participants Swissgrid works very closely with these stakeholders.
Policymakers	National, cantonal and municipal governments and cantonal energy directors Swissgrid maintains close contact with relevant politicians and represents Swissgrid's interests to them.
Authorities	National, cantonal and communal offices and monitoring authorities such as the Swiss Federal Inspectorate for Heavy Current Installations (ESTI) Swissgrid ensures strategic exchange and smooth cooperation with the relevant authorities.
Associations	Associations that are directly or indirectly active in the Swiss energy sector, such as the Association of Swiss Electricity Companies (VSE) Swissgrid endeavours to gain support and acceptance from these stakeholders.
Regulator	The Swiss Federal Electricity Commission (ElCom) monitors Swissgrid's prices and tariffs. Swissgrid coordinates closely with ElCom and provides support on various tasks and topics.
Finances	Lenders, investors and insurers Swissgrid tries to maintain an AA rating and its creditworthiness with these stakeholders.
Research & development (R&D)	Universities, universities of applied sciences and start-ups Swissgrid develops and implements projects in the area of innovation and digitalisation with these stakeholders.
Suppliers	Manufacturers and suppliers of grid components and service providers in the field of IT and consulting Swissgrid strives for optimal cooperation and targeted management with these stakeholders.
Public	Residents living in the vicinity of existing installations and grid projects, landowners Swissgrid tries to cultivate a sound knowledge of the company and its role among these stakeholders, as well as acceptance of grid projects on the part of those affected. Furthermore, Swissgrid is committed to creating trust and demonstrating to all Swiss citizens the benefits of Swissgrid's tasks and roles as a critical infrastructure.
Media	Major specialist media in Switzerland, mass media The media play an essential role in how Swissgrid is perceived by the public.
Operators of neighbouring systems (ONS)	Owners and operators of network assets in the rail, gas and telecommunications sectors Just as with the industry, Swissgrid also works very closely with these stakeholders.
Europe	Foreign transmission system operators and European bodies such as the European Network of Transmission System Operators for Electricity (ENTSO-E) and the EU Commission Swissgrid's technical and political involvement in Europe is the main objective in its cooperation with EU stakeholders.
Incident and crisis management (ECM)	Crisis teams of partner companies and national crisis organisations such as the Organisation for Power Supply in Extraordinary Situations (OSTRAL) Swissgrid maintains close contact with these stakeholders in order to be able to act quickly and in a well-coordinated manner in the event of an incident.

5.1.1 Management approach

Swissgrid coordinates and manages all activities vis-à-vis the various stakeholder groups via the Communication & Stakeholder Affairs department. In doing so, Swissgrid pursues an integrated communication approach and ensures that its activities and messaging are appropriate for the addressees. The development of existing stakeholder management into stakeholder engagement is part of the strategic focus on "operational excellence" in Swissgrid's Strategy 2027. The aim of Swissgrid's stakeholder engagement is to ensure that key stakeholders trust Swissgrid and support its positions, interests and concerns. Raising awareness of and communicating approaches to solutions in cooperation with European partners and with regard to the need for regulatory action in Switzerland are critical to Swissgrid's success.

The basis is a strategic engagement concept that addresses the issues that are essential for Swissgrid and designs and applies appropriate measures for the various stakeholder groups. Other success factors for realising stakeholder engagement are the use of dialogue platforms, joint initiatives with partners and regular stakeholder surveys to measure progress.

Swissgrid relies on active relationship management and dialogue with stakeholders. To this end, the company pursues open, transparent and dialogue-oriented communication with the public, media, politics, authorities, associations and industry partners, as well as ONS as key stakeholders. Swissgrid ensures proactive communication and engages in dialogue with its stakeholders through the company's own communication channels, media relations, industry events and information events in regions affected by grid construction. It is important for Swissgrid to focus on the company as a whole, with all its tasks and services at the service of the economy, society and the environment.

In its specialist departments, Swissgrid identifies and investigates relevant priority topics and addresses them together with the stakeholders. Stakeholder needs and interests are systematically analysed and prioritised for each priority theme and/or project. Swissgrid actively seeks dialogue with all stakeholders. Conferences, events, panel discussions and exhibitions are all suitable platforms for presenting Swissgrid's positions. As part of its overarching dialogue concept, Swissgrid evaluates and consolidates its various activities in visitor services, at trade fairs, at info points, on

third-party platforms and in the virtual space. Visitor services make it possible to communicate Swissgrid's complex tasks in a simple and understandable way and thus promote knowledge in the target groups relevant to Swissgrid.

"Stakeholder needs and interests are systematically analysed and prioritised for each priority theme and/or project."

Possible cooperations (third-party platforms) are systematically examined. To this end, Swissgrid strives to work with partners who are already established and appeal to broad sections of the population. Dialogue platforms offer Swissgrid an opportunity to provide personal information about its mission, benefits and challenges, to increase trust in the company and thus to strengthen support for its concerns.

Swissgrid also aims to cooperate with third-party partners in its own dialogue platforms. Trade fair appearances and stakeholder events are organised jointly with key stakeholders. Important industry and stakeholder events foster cooperation with partners, thus promoting a higher level of interaction in discussions.

Monitoring

Swissgrid conducted stakeholder surveys in 2013, 2016 and 2022. The surveys evaluated awareness, image and sympathy, as well as satisfaction with Swissgrid's cooperation and communication.

A total of 3,228 people took part in the 2022 stakeholder survey, distributed across eight target groups: the energy sector; Swiss associations; policymaking bodies and authorities; Europe (TSOs and associations); research & development (universities, etc.); finance; media; and 2,738 people from the general population in all parts of the country. The number of participants in the survey met expectations and guarantees representative results due to the sample size.

Stakeholder survey 2022

3,228

people distributed across eight target groups: the energy sector; Swiss associations; policymaking bodies and authorities; Europe (TSOs and associations); research & development (universities, etc.); finance; media

2,738

people from the general population in all parts of the country

The most important results at a glance
In particular, the level of awareness among the population has increased significantly and is showing a positive trend. It is pleasing to note that there is a high degree of agreement in the perception of all target groups with regard to the central tasks and the role of Swissgrid in the electricity and energy sector. The most frequently mentioned associations include “critical infrastructure”, “energy future”, “stability” and “security”. Trust in Swissgrid has increased among all target groups and was rated as high overall in 2022.

Overall satisfaction regarding quality in terms of contact and cooperation is high across all target groups (excluding the general population). Business contacts appreciate Swissgrid’s cooperative partnership, friendliness, competence and expertise. In the assessment of all target groups, Swissgrid’s performance in terms of guaranteeing secure grid operation, providing a reliable and demand-oriented grid and active participation in European bodies is deemed extremely positive.

The majority of respondents are satisfied to very satisfied with Swissgrid’s information and communication. Swissgrid received good marks for the fact that it mostly communicates promptly (in the case of events), clearly, comprehensibly, transparently and without contradictions. The Swissgrid website is by far the best-known of Swissgrid’s communication channels, which also receives high approval ratings in terms of content quality. The corporate image is perceived as technical and modern. In terms of communication frequency, almost a third of the population would like Swissgrid to communicate more frequently, especially with regard to grid projects. There is also a desire for more information events.

In the perception of the general population and the target groups of policymaking bodies, authorities and associations, the modernisation of the transmission grid and an electricity agreement with the EU are necessary and central issues for Switzerland’s security of supply. From the point of view of the general population, consideration of the interests of the population directly affected by grid projects is rated as low. Swissgrid will continue to consolidate its dialogue as much as possible and in accordance with the ordinary sectoral plan procedure.

“The balance sheet on the perception and impact of Swissgrid shows predominantly positive results. Overall satisfaction and trust in Swissgrid are high across all target groups.”

Broad stakeholder surveys will again be conducted in the new strategy period. They serve to review the achievement of the set goals and to pick up on stakeholders’ needs in terms of cooperation, dialogue and issues. The assessment of Swissgrid’s key sustainability issues from the stakeholders' perspective will also be a focus of future stakeholder surveys. The surveys will also be incorporated into the development of the next corporate strategy.

Swissgrid Grid Forum 2022

Swissgrid's Sustainability Report is prepared in accordance with the GRI standards. Swissgrid takes the reporting principles of the GRI standards into account in this report and generally follows them in its communications. This means that Swissgrid reports information that is accurate, comprehensive and sufficiently detailed to assess the company's influence on the material issues. In addition, Swissgrid presents information in an unbiased manner and provides a balanced insight into the positive and negative influences of its business activities. By putting together this first Sustainability Report, Swissgrid is also creating the basis for its future non-financial reporting. The selection, collection and reporting of the main topics are comprehensible and fully documented, so that direct comparison and tracking of developments will be possible in future annual reports.

Points particularly worthy of note here are the information relating to public affairs and the memberships of Swiss and European bodies, which are disclosed for the first time.

GRI 1

Transparency

Transparency is the basis for Swissgrid's credibility and therefore represents an important pillar in its communication with the various stakeholders. Due to its important role for Switzerland's economy, society and environment, Swissgrid considers it its duty to provide accurate, easily accessible and comprehensible information on its business activities to a broad public. Swissgrid fulfils its legal obligation by publishing its Annual Report. In addition, the company is now creating transparency about the non-financial aspects of its business activities in the form of this Sustainability Report. In doing so, Swissgrid places its business activities in the broader context of sustainable development.

Public affairs

GRI 415

Swissgrid operates in an area defined by the conflicting priorities of politics, administrative authorities, the industry and the public. For this reason, it is important that Swissgrid can effectively represent and assert its interests with these stakeholders. Its activities are based on a public affairs concept that defines the objectives, key topics and stakeholders of Swissgrid's political engagement. Public affairs activities are part of Swissgrid's comprehensive communication measures and are aligned with its overarching communication objectives.

The most important stakeholders at national level are members of parliament, members of government and administration/authorities at federal, cantonal and, in some cases, municipal level. At the same time, the Swiss electricity industry, associations, citizens' initiatives and the general public form further stakeholder groups that must be addressed at national level. At international level, the EU bodies (ENTSO-E, TSC, CIGRE, JAO, etc.) and the transmission system operators of neighbouring countries are the main stakeholders.

Swissgrid does not make any financial contributions to political parties or organisations. As a legally created monopolist, Swissgrid has a special responsibility with regard to independence and reputation.

GRI 2-28

Memberships

Swissgrid is a member of the Renewables Grid Initiative (RGI). RGI is a unique alliance of non-governmental organisations and transmission system operators from all over Europe engaged in an "ecosystem of players in energy transition". We advocate for fair, transparent and sustainable grid development to enable the growth of renewables and achieve full decarbonisation in line with the Paris Agreement.

Swissgrid is also a member of CIGRE. At an international level, CIGRE addresses matters relating to all grid levels, from extra-high voltage to decentralised, intelligent electricity systems. CIGRE's main goal is to optimise existing electricity grids and energy systems and to develop them further for the future. The focus is primarily on the areas of sector coupling, storage and controllable consumers (hydrogen, hydro/heat/gas storage, heat pumps and electromobility).

In order to fulfil its legal mandate, Swissgrid represents its concerns and interests in around 100 Swiss and European bodies. Certain committees are classified as highly relevant by the Executive Board and coordinated by committee management. According to Article 89 of the Federal Constitution, Switzerland shall endeavour to ensure a safe, economic and environmentally sustainable energy supply. This serves as the basis for the criteria for classifying a committee as highly relevant. Annual committee targets are defined for highly relevant committees on the basis of Swissgrid's corporate targets. In addition, briefings and debriefings are held for the meetings of these committees, at which the respective Swissgrid position is developed with all technical, economic, legal or regulatory and strategic aspects, and upcoming tasks are distributed internally. The Executive Board also receives a quarterly overview of the "highlights and lowlights" of the work conducted in the highly relevant committees.

Swissgrid considers a "committee" to be any collaboration in a defined group (consisting of several internal and external stakeholders) that is established for the purpose of discussion, consultation or reaching decisions on a specific and clearly defined range of topics over an extended period of time (generally at least six months) and requires internal coordination.

The following 16 bodies are currently classified as highly relevant by the Executive Board:

ENTSO-E Assembly (mandatory participation according to statutes): This body is one of the two governing bodies of the European Network of Transmission System Operators for Electricity (ENTSO-E). This body represents the 39 members of ENTSO-E.

More information
ENTSO-E Assembly

ENTSO-E Board: The Board is the second management body of ENTSO-E. It consists of 12 elected members.

More information
ENTSO-E Board

ENTSO-E ICTC: The ENTSO-E Information and Communication Technologies Committee serves the business needs of the association by ensuring the governance and oversight of the technical management, development and operation of the association's ICT infrastructure, ICT products, portfolio, standards, architecture and services.

More information
ENTSO-E ICTC

ENTSO-E LRG: The ENTSO-E Legal and Regulatory Group is responsible for ensuring ENTSO-E's compliance with laws and regulations.

More information
ENTSO-E LRG

JAO SH (mandatory participation according to statutes): The Joint Allocation Office is the leading service provider for transmission system operators on the European electricity market. Cross-border transmission capacity rights can be auctioned via a uniform trading platform. JAO also provides accounting (clearing and settlement), contracting, reporting, project support and IT services.

More information
JAO SH

TSC/TSCNET committees (mandatory participation according to statutes): TSCNET Services, the regional security coordinator based in Munich, supports transmission system operators in keeping the world's largest synchronous power grid stable. TSCNET Services is one of the leading regional security coordinators (RCC) in Europe. The company provides integrated services to electricity transmission system operators and their control centres to maintain the operational reliability of our electricity system – 24 hours a day, seven days a week.

ENTSO-E SOC: The ENTSO-E System Operations Committee is responsible for developing and maintaining a European operational framework.

More information
ENTSO-E SOC

ENTSO-E RG CE: The Regional Group Continental Europe of ENTSO-E defines the framework for the regional activities of the transmission system operators of the continental European synchronous zone.

More information
ENTSO-E RG CE

ENTSO-E RGCE CSO: The Coordinated System Operations subgroup of ENTSO-E RG CE is mainly concerned with existing regular operations according to the interconnection rules and aims to improve them and develop new processes specific to the RG CE.

More information
ENTSO-E RGCE CSO

ENTSO-E MC: The objective of the ENTSO-E Market Committee and the associated working groups and projects is to implement the third internal energy market package and the Clean Energy package, as they point the way to the development of a well-functioning European electricity market.

More information
ENTSO-E MC

More information
ENTSO-E SDC

ENTSO-E SDC: The System Development Committee of ENTSO-E is responsible for the cooperation of transmission system operators in grid development and planning. Its main task is to coordinate the development of a secure, environmentally sound and economic transmission grid with the aim of creating a robust European grid.

IBWT SC: The Italian Borders Working Table is the joint market coupling project for the allocation of cross-border transmission capacity between 12 European countries (Italy, Greece, France, Switzerland, Slovenia, Germany, Austria, Belgium, the Netherlands, Luxembourg, Denmark and Norway), in which the transmission system operators (ADMIE, APG, ELES, RTE, SWISSGRID and TERNA) and the power exchanges work together.

HGRT/EPEX SB (mandatory participation under the Articles of Association): Swissgrid participates in the "Holding des Gestionnaires de Réseau de Transport d'Electricité". The holding company is owned by European transmission system operators and combines their influence on the leading spot exchange for power in Central and Western Europe, EPEX SPOT, via a 49% stake. Swissgrid sits on the Boards of Directors of HGRT and EPEX SPOT.

Core SG: Core is an association of transmission system operators in Central and Eastern Europe, which represents a capacity calculation region with uniform rules. Core sets the direction and strategic planning for its core activities, and monitors and manages projects to implement EU ordinances.

VSE Board of Directors: The Association of Swiss Electricity Companies is the nationally and internationally recognised umbrella organisation of the Swiss electricity industry, founded in 1895. It coordinates and combines the common interests and competences of its members and represents them with respect to politics, business and society. In this way, it ensures reliable framework conditions for secure, market-competitive and sustainable electricity supply in Switzerland.

Operational coordination Switzerland: Close cooperation between all nationally involved players in the electricity sector is imperative for security of supply in Switzerland. The "Operational Coordination Switzerland" committee ensures coordination between the various players and the appropriate flow of information.

More information
VSE Board of Directors

Planet

At Swissgrid, the Planet division covers the three main topics of climate protection; biodiversity and environmental protection; and circular economy, material efficiency and resource conservation. Climate protection includes all information about Swissgrid's energy consumption and emissions. Biodiversity and environmental protection briefly presents the two environmental areas of noise and non-ionising radiation, among others.

GRI 305

Climate protection

Swissgrid causes climate-damaging gases through its business activities, but at the same time is affected by climate change itself in many ways. For Swissgrid, reducing greenhouse gas emissions within the scope of its possibilities is a core strategic element in its efforts to reduce the environmental impact of its own business activities. Swissgrid is clearly committed to the net zero target of the Paris Climate Agreement and aims to reduce greenhouse gases along the national reduction paths. In contrast, Swissgrid is monitoring the effects of climate change as part of its risk management and is taking precautions to adapt to its consequences. And last but not least, Swissgrid plays an important role in upgrading the grid in order to integrate renewable energy resources. To this end, Swissgrid is actively involved in the "Decarbonisation of the Energy System" project organised by eight European transmission system operators.

Management approach

"With the upgrading of the transmission system for renewable energies and the integration of very many small producers, Swissgrid is at the centre of a future decentralised energy system and a decarbonised society."

However, since Swissgrid's performance mandate requires it to transmit all electricity on a non-discriminatory basis, regardless of its origin (renewable, fossil or nuclear), Swissgrid has no influence on the electricity mix of the transported electricity. Control energy, which is used to balance electricity generation and consumption, does not have to be accounted for by Swissgrid either.

Swissgrid, on the other hand, is credited with greenhouse gas emissions from active power losses. Active power losses occur during power transmission due to the resistance of the lines, corona discharges and losses in the transformers. Swissgrid is obliged to compensate for these losses through tenders on the power market. In this context, additional costs that would arise from the purchase of more expensive, renewable energy are not chargeable and thus cannot be charged via the tariffs due to the regulatory business model.

Efficiency improvements in the context of upgrading existing plants reduce active power losses and thus contribute directly and indirectly to reducing greenhouse gas emissions. The most effective measure to reduce proportional active power losses essentially consists of voltage increases from 220 kV to 380 kV. Yet the approval procedures for such projects take several years, partly due to objections.

The second important area in which Swissgrid has an influence on the climate is SF_6 emissions. SF_6 is a gas with good insulating properties that is harmless to humans and animals and is used in switchgear. At the moment, it cannot yet be replaced in high-voltage substations, as no alternatives with suitable properties exist for this voltage level. In the short term, this is about the correct handling of powerful greenhouse gases, which is ensured by clear specifications and good training of those responsible. Swissgrid is working with industry partners and research institutes to find alternatives and is a member of the SF_6 industry solution, which aims to limit the use and emissions of SF_6 as far as possible. Swissgrid is also a member of an initiative of various European transmission system operators that supports the research and development of alternatives to SF_6 in switchgear in high-voltage systems by 2030.

In the other areas, such as buildings and mobility, a number of measures are being implemented to reduce greenhouse gas emissions. These are planned and implemented within the framework of the environmental management system according to ISO 14001. The environmental management system is part of Swissgrid's integrated HSE management system and is audited and certified by an accredited external auditor based on ISO standards 14001:2015 and 45001:2018. In 2022, the Swiss Safety Center approved Swissgrid's integrated HSE management system as suitable, appropriate and effective, and thus re-certified it.

While Swissgrid has already included the long-term commitment to the Paris net zero target in its strategy, concrete, shorter-term climate targets and a reduction path are to be defined in future as soon as a complete greenhouse gas footprint is available.

In addition to its own impact on the climate, Swissgrid is itself affected by climate change. Swissgrid is monitoring developments in order to be able to incorporate threats and opportunities arising from the changes into its planning.

GRI 302

Energy

Energy consumption forms the basis for calculating greenhouse gas emissions. For this reason, it is presented according to Scopes 1–3 of the Greenhouse Gas (GHG) Protocol. Scope 1 includes all direct greenhouse gas emissions. These come from sources owned or controlled by the company. Scope 2 includes greenhouse gas emissions from the generation of purchased electricity consumed by the company. Scope 3 emissions are a consequence of the company's activities, but come from sources not owned or controlled by the company.

By far the largest energy consumption is caused by active power losses, followed by the electricity consumption of the substations. These two areas, which are directly related to power transmission, account for 99.4% of electricity consumption (Scope 1 and 2). For Scope 3, Swissgrid currently records business traffic and the electricity consumption of communication networks that are not part of Swissgrid's own communication network.

Energy consumption in MWh (final energy)	2022	% of Scope 1 and 2
Total Scope 1 and 2	**1,001,030**	**100.0**
Scope 1	**1,257**	**0.1**
Fuel consumption of Swissgrid vehicle fleet (diesel/petrol)	1,187	0.1
Fuel consumption of emergency power systems (diesel)	70	0.0
Scope 2	**999,773**	**99.9**
Active power losses from energy transmission	986,690	98.5
Electricity consumption of substations (projected)	8,875	0.9
Electricity consumption at sites and bases	3,029	0.3
Electricity consumption of communication network (Swissgrid)	354	0.1
District heating/cooling at sites	825	0.1
Scope 3	**914**	
Electricity consumption of communication network (third parties)	232	
Air travel	509	
Journeys by private car	162	
Transport (diesel/petrol)	11	
Rail travel	n/a	
Commuting employees	n/a	

GRI 305-1, 305-2, 305-3

Greenhouse gas emissions

The following table shows Swissgrid's greenhouse gas emissions according to the GHG Protocol in the Scope 1 and 2 categories. Scope 3 lists business travel and third-party communication networks. It is necessary to examine whether further categories of upstream and downstream greenhouse gas emissions can be recorded, in particular the indirect emissions from pipeline construction in the upstream and downstream value chain.

Swissgrid calculates the greenhouse gas emissions of its own consumption of electricity using the emission factor for the Swiss consumer mix. Since 1 January 2022, Swissgrid has covered the annual electricity requirements of around 6 GWh for its Aarau and Prilly sites and for 16 substations with 100% hydropower from Switzerland. These certificates have not yet been taken into account in the listed key figures. The crediting would reduce the greenhouse gas emissions of Swissgrid's own consumption from 1,569 tonnes to about one tenth, i.e. around 152 tonnes.

Greenhouse gas emissions in tonnes CO_2e	2022	% of Scope 1 to 2
Total Scope 1 und 2	**131,986**	**100**
Scope 1[1]	**3,978**	**3.0**
SF_6 losses[2]	3,578	2.7
Fuel consumption of Swissgrid vehicle fleet (diesel/petrol)	381	0.3
Fuel consumption of emergency power systems (diesel)[3]	19	0.0
Scope 2	**128,008**	**97.0**
Active power losses from energy transmission[4]	126,296	95.7
Internal consumption by substations[4,5]	1,136	0.9
Own consumption by sites and bases[5]	388	0.3
Own consumption by the communication network (Swissgrid)	45	0.0
District heating/cooling[6]	142	0.1
Scope 3	**184**	
Electricity consumption of communication network (third parties)	30	
Air travel	145	
Transport (diesel/petrol)	3	
Rail travel	7	
Commuting employees	n/a	

[1] Without refrigerant losses
[2] Calculated with SF_6 global warming potential 22,800 (Swiss Industry Agreement on SF_6).
[3] Share of substations estimated, as not yet measurable. Projected operating hours, share around 7% (included in the stated value).
[4] Emission factor: 128 kg CO_2e/MWh (treeze (2021). Consumer electricity mix Switzerland 2018), sites, bases and substations: Procurement of HKN CH hydropower above 6,180 MWh per year was not deducted from Scope 2 GHG emissions. According to the LCA data in the KBOB/ecobau/IPB construction sector, the emission factor for hydropower is 12.4 kg CO_2e/MWh.
[5] The proportion of own consumption cannot yet be measured across all substations, sites and bases. Values are projected.
[6] Emission factor: 172.5 kg CO_2e/MWh (treeze [2017]). Greenhouse gas emissions from the electricity and district heating mixes in Switzerland according to the GHG Protocol)

GRI 305-4

Intensity indicators 2022

The key figures show the greenhouse gas emissions for transported electricity. In the future, it will also be possible to present these figures in a time comparison.

1.78 kg/MWh
kg CO_2e for the amount of electricity transported (incl. SF_6 losses)

0.48 kg/MWh
kg CO_2e from SF_6 losses for the amount of electricity transported

Active power losses

In 2022, greenhouse gas emissions from active power losses amounted to around 126,000 tonnes of CO_2e, representing around 96% of Swissgrid's total Scope 1 and 2 emissions.

Swissgrid is thus bearing loads over which it currently has little influence. An initial starting point here is the reduction of active power losses through increased efficiency. At a political level, the allowable nature of costs for environmentally beneficial electricity must be introduced into the discussions. In the future, it must also be taken into account that these emissions will continuously decrease due to the progressive decarbonisation of electricity generation.

SF_6 losses

The second, important source of greenhouse gases is SF_6 losses. SF_6 is an effective insulating gas that cannot yet be replaced by other insulation media in switchgear systems in the extra-high voltage range (> 110 kV). It is considered the strongest greenhouse gas, with a global warming potential of 22,800. With regard to losses that can arise from leaks and accidents, Swissgrid must meet specific requirements that are laid down in a voluntary industry solution. From 2021, total SF_6 emissions from the manufacture and operation of extra-high, high and medium-voltage installations in Switzerland must be less than 1 tonne per year. For Swissgrid, this means a maximum loss rate of 0.16% per year. With leakages of 157 kg and a leakage rate of approx. 0.07%, Swissgrid is well below the specifications. This figure includes the loss of around 32 kg of SF_6 in an accident in Laufenburg. Annual greenhouse gas emissions were 3,578 tonnes CO_2e in 2022. This accounts for 2.8% of total greenhouse gas emissions. The starting points here are the proper handling of SF_6 and the avoidance of accidents. All grid maintenance managers undergo training for this purpose. In the medium to long term, substitute solutions for SF_6 are being sought together with industry and research institutions.

Greenhouse gas emissions from own electricity consumption

Swissgrid's third-largest source of greenhouse gas emissions, at 1,569 tonnes, is its own consumption of electricity, primarily in the substations, but also at the operating sites in Aarau and Prilly and the bases in Castione, Landquart, Laufenburg, Ostermundigen and Uznach. Consumption in all 130 substations has currently been estimated on the basis of surveys at 25 substations, as the historical development of Swissgrid in many substations means that it is not possible to clearly distinguish Swissgrid's installations from the subordinate grid levels of the previous owners. In addition to improving the collection of consumption data, the most important starting point here is improving the efficiency of the plants by means of modernisation and digitalisation. Another source of greenhouse gases that can be attributed to the substations are the emissions from the emergency power systems that run on fuel oil and have to be periodically checked for proper functioning (19 tonnes of CO_2e).

Other greenhouse gas emissions
Further greenhouse gas emissions are caused by the heat purchased in Aarau and the company's own vehicle fleet. Emissions in the reporting period were 523 tonnes of CO_2e, which represents 0.4% of total emissions. The large contribution of the active power losses makes these emissions appear low. If the active power losses are omitted, the share of further greenhouse gas emissions is 27.6%. The starting points are the decarbonisation of the energy purchased for the buildings and mobility measures. It has not yet been possible to fully record the emissions in Scope 3. In future, business trips that are not made with the company's own fleet of vehicles, including helicopter flights for maintenance purposes of the transmission lines, are to be recorded here. In addition, commuting trips are to be surveyed periodically.

For business travel, some rules apply that contribute to the reduction of greenhouse gas emissions, such as the promotion and preference of public transport and the additional purchase of electric vehicles in the vehicle fleet.

Swissgrid's workplaces are well served by public transport. The additional measures for commuting trips therefore mainly concern parking management in Aarau, where the most parking spaces are available. There are charging stations for electric cars and priority for the paid parking spaces is given to employees whose journey time by public transport is significantly longer than by private transport. Parking is managed via an app.

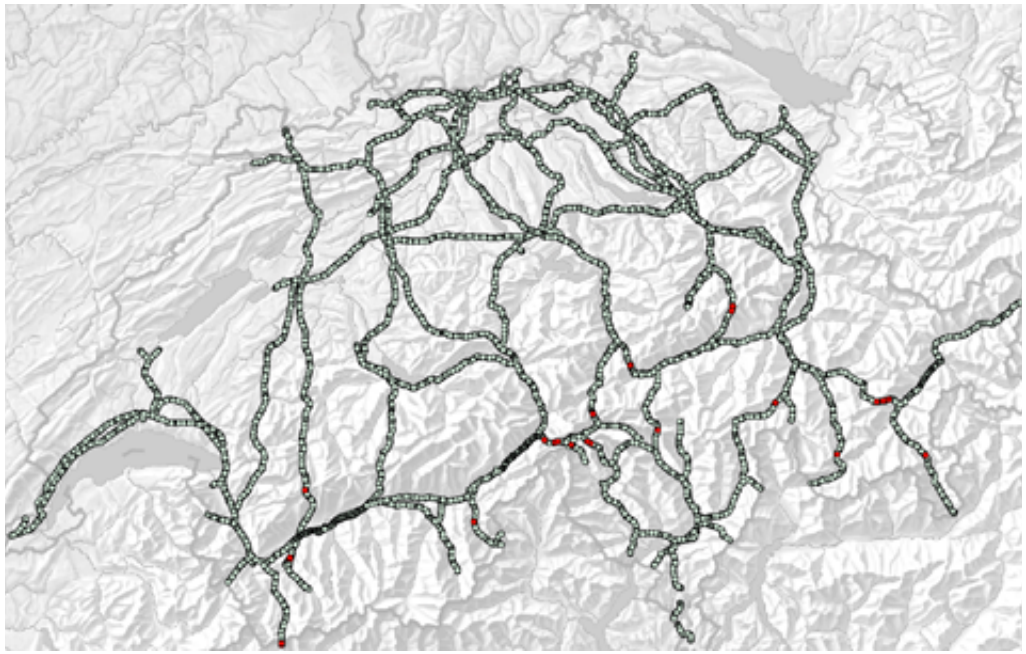
Swissgrid has a further indirect influence in the area of Scope 3 emissions via the supply chain. The new Procurement Act (BöB) and the associated Ordinance (VöB) allow for a simpler application of environmental criteria in the context of procurements. This concerns procured goods for which technical specifications or award criteria can be defined, but also suitability criteria, for which environmental measures such as the existence of environmental or climate management systems can be specified.

Initiatives to reduce greenhouse gas emissions in the grid

In addition to the measures already presented in the management approach and in the chapters "Grid transfer capacity" and "Supply chain sustainability", which contribute to reducing Swissgrid's greenhouse gas emissions – such as dynamic line rating or the inclusion of sustainability criteria in procurement – Swissgrid is undertaking further specific initiatives to reduce greenhouse gas emissions.

In 2021, Swissgrid joined seven other TSOs from Austria, Belgium, France, Germany, Italy, the Netherlands and Spain to launch an initiative highlighting their crucial role in the energy transition and giving concrete examples of supporting measures. The jointly drafted document "Decarbonising the Energy System" lists how they can contribute to decarbonisation with their activities and develop methods to support the climate neutrality of the energy supply system. They are strongly committed to reducing global greenhouse gas emissions by supporting sustainable development and the transformation of the electricity sector from fossil fuel use to zero carbon production.

More information
Initiative by European transmission system operators



Overview of Swissgrid pylons standing in permafrost (shown in red on the map)

Consequences of climate change

GRI 201-2

Initial clarifications of the consequences of climate change on the grid show that both positive and negative effects can occur:

- Snow and ice loads are expected to change, which could influence the static requirements for overhead lines in alpine areas.
- A higher snow line and changing snow amounts may affect the accessibility of the facilities in winter.
- Depending on changes in avalanche risk, protective structures will have to be adapted.
- The thawing permafrost leads to unstable mast anchorages. In total, 33 of Swissgrid's approximately 12,000 pylons are located in permafrost. The stability of these poles must be monitored and improved if necessary, which may also mean moving the poles to more stable ground.
- Increased rockfalls or landslides can endanger pipelines and individual substations, which may make increased protection necessary.
- More severe storms and associated flooding may endanger the facilities. Stronger flood protection may be needed.
- An increase in forest fires due to greater drought may also endanger the plants.

It is not yet possible to estimate the costs caused by climate change.

GRI 304-1, 304-2, 304-3, 304-4, 413

Biodiversity and environmental protection

Swissgrid's business activities have both a negative and a positive impact on biodiversity. Flora and fauna are affected by the grid infrastructure. In the case of existing lines, holding down of vegetation beneath the lines and the effects on avifauna are particularly pertinent. Through appropriate measures and targeted management of the areas, these negative effects can be reduced and positive ones enhanced. Swissgrid can also provide interested parties like landowners and nature conservation organisations with the opportunity to implement upgrading measures in the area of the mast sites or under the lines by establishing suitable framework conditions. Likewise, upgrading measures in the open spaces of the substations can promote biodiversity.

The planning and implementation of grid projects are highly regulated. It is important to apply the environmental protection and biodiversity measures defined in the administrative and planning approval procedures in accordance with the law. The existing measures to reduce the impact of projects on biodiversity and to increase biodiversity in general are directly linked to specific projects. In the future, measures to promote biodiversity will be taken systematically at substation sites, pylon sites and along line routes. This will simplify planning and implementation.

Management approach

Swissgrid strives to keep the impact of its own business activities on the environment as low as possible. Swissgrid has a direct impact on the environment and in particular on biodiversity in the operation and maintenance of substations, in the maintenance of existing routes and in grid projects. In addition, high-voltage power lines pose a danger to birds, especially when visibility is poor. Regardless of protection, replacement and compensation measures, permanent impacts on the forest, on vegetation at mast sites and substations, and on avifauna cannot be completely avoided.

> "Swissgrid has a direct impact on the environment and in particular on biodiversity in the operation and maintenance of substations, in the maintenance of existing routes and in grid projects."

At the moment, Swissgrid has decentralised data on biodiversity. The technically trained grid maintenance managers are tasked with maintaining the substations. Since Swissgrid does not own the land through which the routes run, the rights and obligations are regulated in easement agreements with the landowners. Maintenance measures for the routes are organised in three regions and must be agreed with the landowners and foresters. In the case of grid projects, data on the procedures, which are heavily regulated by law, and on the implementation of measures are available on a project basis. There is no central overview.

As a first step, Swissgrid will push ahead with the inventory so that the data can be accessed centrally. This is all the more important because the legal framework conditions for Swissgrid may change in the future due to discussions on a secure electricity supply with renewable energies and the revision of the Nature and Cultural Heritage Protection Act.

In a second step, Swissgrid aims to define and implement systematic maintenance concepts at the substations. The focus is not on extending the project to the route and mast locations, as Swissgrid is not the landowner here. In addition

to promoting biodiversity, maintenance concepts are always about combating neophytes, which can often spread more easily due to maintenance measures. An important goal in the renewal or replacement of existing installations is to relieve protected areas as much as possible from routes and installations.

The planning and implementation of grid projects are highly regulated. It is important to apply the environmental protection and biodiversity measures defined in the administrative and planning approval procedures in accordance with the law. The existing measures to reduce the impact of projects on biodiversity and to increase biodiversity in general are directly linked to specific projects.

Inventory

Swissgrid has precise knowledge of its mast locations. The table shows the number of masts located in different protected areas. As individual masts can be located in several protected area types, double counting may occur. In total, 1,603 of the 11,896 masts are located in at least one protected area, which corresponds to 13.5%.

Protected areas	Quantity
Federal Inventory of Landscapes and Natural Monuments (BLN)	1,211
Moorlands	187
Floodplains	109
Raised and transitional bogs	5
Low-moor bogs	54
Amphibian spawning areas	112
Dry meadows and pastures	136
Masts in at least one of these protected areas (multiple assignment possible)	**1,603**

Furthermore, 78 masts are located in biosphere reserves, 36 of which are not in a protected area.

The objectives of the current strategy period are to compile an inventory of the replacement and compensation measures required by the authorities in the projects and to systematise the involvement of the experts at Swissgrid and the documentation.

Maintenance

The overhead lines are exposed to wind and weather, and in the mountains also to avalanches, debris flows and rockfalls. Bushes and trees may also grow close to the overhead lines in forests and hedges. In addition to the technical work on the lines and pylons, the planned maintenance work also includes clearing near the lines. Six foresters at Swissgrid plan and carry out this work along the lines. This way, the lines can be operated safely at all times and outages are avoided. Despite disturbances to the forest, foresters thus also contribute to biodiversity beneath the lines, because power line routes create habitats for numerous plants and animals. The vegetation management carried out by the foresters is therefore important not only for the security of supply and line maintenance, but can also create ecological added value.

Forest aisle management

In the case of the existing lines, the current route management mainly involves keeping down the trees under the pipelines, as regulated in the easements with the landowners. In forests, the plants under the lines must be cut back severely. Ecologically valuable, stepped and structured forest edges can be preserved but by keeping down trees under the power lines, trees with cavities used as nesting places and habitats for birds may also be felled.

During the operational phase, the overhead lines pose a certain risk of collision for birds, especially with the earth cable located at the highest point. Collisions are more common in low light or low visibility conditions. In migratory areas, isolated protective measures have been taken, such as bird protection markings. An overview will be prepared in the course of 2023. Electrocution is rare in the extra-high-voltage grid due to the large distances, even for large birds such as eagle owls, storks or birds of prey.

“In the case of underground cables, a complete restoration of hedges, individual trees or the forest is only possible to a limited extent, as no deep-rooted plants are permitted to grow above underground cables. Especially in forest areas, these forest aisles are problematic, as neophytes often establish themselves. As such, there are often conflicts of interest between different protection interests.”

Environmental connectivity measures for pylons
Overhead line pylons are often located in intensively cultivated land or along linear infrastructures such as water bodies or traffic routes. The areas under the poles are mostly inaccessible for machinery and are therefore hardly suitable for intensive cultivation. They are thus among the few sites where environmental funding measures (especially for small structures) do not directly collide with other interests and thus have great potential for habitat enhancement and connectivity projects. These areas are often already being used for environmental purposes today. Swissgrid is open to such uses, provided they do not jeopardise security of supply. The instructions for small structures on and under overhead line pylons regulate the conditions under which Swissgrid permits the construction or installation of small structures under or on its overhead line pylons. Today, the initiative lies with the landowners, who often work together with local nature conservation groups.

More information
Habitat under extra-high-voltage masts

Example of ponds under high-voltage masts: The yellow-bellied toad is highly endangered in Switzerland and neighbouring countries. Its numbers have seen a sharp reduction, so much so that it is expected to become extinct in many regions. The reason behind this is loss of habitat, which results from, among other factors, the drainage of wetland and river engineering. Yellow-bellied toads need a diverse, ecologically well-connected habitat with water bodies that dry up at times. They lay their spawn in small, temporary ponds, often when there are no other species living in the water. Other species, such as dragonfly larvae, are a threat to the yellow-bellied toad's tadpoles. Drying out the pools is therefore important, even if it poses a certain risk to the offspring.

Yellow-bellied toad

The space underneath the Swissgrid masts is perfectly suited to the placement of small ponds. Pro Natura and naturschutzlösungen have cross-referenced Swissgrid lines with the information from Info Species to see the locations in which both masts and yellow-bellied toads are present. Since adult yellow-bellied toads live not only in water but also in wood heaps, loose soil and dense vegetation, masts in forests or in the vicinity of forests were sought.

In light of this, Mühleberg was selected as the perfect location for the pilot project. Ten ponds were created and soon after populated with yellow-bellied toads. The ponds were made by hand. A protective fleece was laid inside the pit, on top of which a rubber liner was placed. At the deepest point a soakaway and a hole were made, to ensure that the water can flow away and the temporary ponds do not become permanent ponds. In addition, the ponds must be situated at least one metre away from the mast foundations for maintenance purposes. In the ponds themselves, small hideaways made from large stones or rootstocks were created. In addition, miniature structures offer the adult yellow-bellied toads, and other species, a place to live.

Further projects are planned in many regions. Swissgrid supports the nature conservation organisations, surveys the locations together with them, provides the necessary geodata and specifies which conditions must be adhered to for the security of the lines. A total of 31 projects have been carried out so far to create small structures. Some of these projects involve several masts. In recent years, the number of enquiries from nature conservation organisations has increased significantly.

Swiss community workers creating a pond
© Wolfgang Bischoff, naturschutzlösungen

The yellow-bellied toads find a new home underneath Swissgrid's high-voltage masts © Wolfgang Bischoff, naturschutzlösungen

More information
Soil remediation in the Uri valley floor to benefit agriculture and the environment

Example of soil remediation on the valley floor in Uri: Until a few years ago, two extra-high-voltage lines ran parallel along the Uri valley floor. An SBB railway line also ran alongside Swissgrid's major north-south axis. In 2018, the two partners combined both these lines on the section between Attinghausen and Altdorf Nord onto a common route that runs parallel to the motorway and the banks of the Reuss. After this infrastructure bundling, the two old lines with 31 masts from the 1950s could be dismantled. Most of the places where pylons were disassembled were on agricultural land.

The rust protection previously used on the masts contained environmentally hazardous substances. As the old protective layer decomposes over the years due to weathering, pollutants such as lead, zinc and PCBs can enter the soil along with smaller quantities of chromium and cadmium.

During the project approval process, the canton of Uri and Swissgrid agreed that the soil around all the pylon sites on agricultural land would be remediated to remove pollutants, irrespective of the extent of exposure to environmentally hazardous substances. The remediation measures defined in the project went far beyond those required by the Environmental Protection Act or the Federal Ordinance on Soil Pollution.

As part of the soil remediation, the soil was replaced at a depth of up to 80 cm and in a radius of around 15 metres around the masts. The individual surfaces were measured with a mobile X-ray machine to ensure that all pollutants were removed.

Example of soil remediation © Oliver Iseli

Newly cultivated soil must be left to rest for a while and gently managed for three years in accordance with soil protection requirements so that it can develop its favourable properties for agriculture at the new location (known as subsequent cultivation). The farmers were compensated for this. After three years of special management, the areas were fit to be released for normal use in consultation with the cantonal soil protection agency.

Small structures at substations
Today, green spaces within the area of substations are often managed without regard to biodiversity. However, substations outside settlement areas offer many opportunities to increase biodiversity. Swissgrid is keen to develop an overarching green space management system for these substations that simultaneously promotes biodiversity and reduces maintenance costs. Green spaces should be maintained close to nature and without herbicides and fertilisers. Where appropriate, small structures can be used to promote habitats for animals and plants.

More information
Groundbreaking ceremony for the new transformer at the Mettlen substation

Example of biodiversity measures a the Mettlen substation: At the new Mettlen substation, which is located in the immediate vicinity of various watercourses, flood protection is the top priority. However, the banks of the Winkelbach stream, which runs directly across the substation site, as well as the adjoining hedges and copses, provide a home for many small animals. To ensure that the site remains accessible to them, Swissgrid is placing particular emphasis on incorporating native and near-natural small structures into the design phase and installing passages and crossings for small animals. These will serve as bridges and hiding places for weasels, amphibians and reptiles without causing water to accumulate in the Winkelbach.

Example of measures to encourage mouse weasels in the area around the Sils substation: Various small structures were created at the Sils substation, to the benefit of the local fauna and Swissgrid. On colder days, mice seek shelter in the operating buildings of the mostly automatic substation, and, in the worst case, may start nibbling on the data cables. What is basically harmless for the mice can cause a breakdown in communications between the grid control room and the substation. Technicians then have to go out and replace the affected cables. To address the mouse problem, Swissgrid is now promoting the mouse weasel, the world's smallest predator. In Switzerland, these animals are on the red list of endangered species. To make these animals feel at home in the Sils substation, rock piles were created in collaboration with experts for the weasels in the area. Strips of old grass have been left as a structural element to connect sections of habitat and to provide cover, and the mowing frequency has been modified accordingly. To allow the weasels to enter and leave the substation area freely, slip tubes were installed in the fence foundations. Through the project at the Sils substation, Swissgrid hopes not only to counteract the mouse problem, but also to provide a new habitat for the weasels.

At other sites, too, the previously mown lawns are to be ecologically upgraded through a new maintenance concept.

Mouse weasel

GRI 413

Grid projects

Electricity grids and large infrastructure in general seem to be at odds with the environment. The visual impact on the landscape, electromagnetic fields, noise and threatened habitats are the most common concerns among the population. However, the legal framework conditions require environmental considerations to be integrated into the planning and implementation of every construction project, be it to renovate existing lines and substations or to build new ones.

Planning procedures and environmental impact report

Swissgrid is responsible for the project planning for and implementation of transmission lines. The federal approval and authorisation procedure comprises six phases. An overview of the entire planning procedure can be found on the Swissgrid website, under Approval process.

Today, the planning of pipelines is a complex process in which the legal framework conditions are observed and optimisation takes place according to the four areas of spatial development, technical aspects, environmental protection and economic aspects, comprising more than 40 individual criteria.

At the moment electricity is primarily transmitted via overhead lines. They account for 99% of the Swiss transmission grid. The use of underground cables in the extra-high-voltage grid is comparatively new and experience in the field is relatively limited. Both technologies have their advantages and disadvantages with regard to project planning, construction as well as operation and maintenance. For every grid project, Swissgrid therefore reviews both the overhead line as well as the underground cabling variants. The Federal Council reaches a decision for an underground cable or an overhead line during the sectoral plan process.

Beyond the impact on habitats and biodiversity, other important environmental aspects such as the visual impact on the landscape, electromagnetic fields or noise must be taken into account when planning a transmission line. Swissgrid is also using new tools for this, such as the 3D Decision Support System (3D DSS). This allows the various legal framework conditions from the fields of regional planning, environment, technology and economic efficiency to be clearly presented. The discussion on the often diverging interests can be objectified and better solutions for line management can be found more quickly.

Environmental concerns are addressed through a mandatory environmental impact report in the planning approval procedure and the inclusion of environmental stakeholder groups.

“The environmental impact report identifies direct and indirect impacts on flora, fauna and water bodies and proposes concrete measures to reduce those impacts. It should be noted that the obligation to conduct an environmental impact assessment has often led to optimisations of the line routing and mast locations during the project planning phase. ”

The parties involved and affected can submit an objection to the Swiss Federal Inspectorate for Heavy Current Installations (ESTI) during the public display of the project. If the differences cannot be reconciled by ESTI, the Swiss Federal Office of Energy continues the negotiations. At the end of this phase, the authorities grant Swissgrid the construction permit or enact additional conditions that need to be considered during project planning.

More information
It’s all about the resistance

15 years
until commissioning

30 years
possible with delays

Once the construction permit has been issued for a grid project, this decision can be opposed or appealed by authorities, associations or directly affected parties. The Federal Administrative Court and the Federal Supreme Court then decide on whether the rulings by the federal administration are lawful and whether the law was correctly applied to objections by affected parties. If the courts give their approval, construction can commence. If the appeal is upheld, the project goes back to the planning approval procedure.

The period from the start of a grid project through to commissioning the lines is currently around 15 years. However, objections and court judgements always lead to significant delays in projects, so they can take up to 30 years.

Implementation of measures during construction
The measures in the environmental impact report are prioritised according to the principle "prevention is better than cure". This means that projects try to avoid impacting the environment in the first place, or endeavour to protect nature from the effects of the construction project. A protective measure could involve covering a green area so that it remains unaffected by the construction work, for example. If interventions are necessary that temporarily damage the environment, restoration measures are subsequently taken. In the course of restoration, any interventions must be remedied in the same way, with the same function, to the same extent and in the same place. If, for example, an access route to a construction site has to cross through a meadow, this meadow must be restored once the building work is complete.

Despite all the protection and restoration measures, the environment is affected in the long term whenever a line or substation is built. At the very least, the area of land where the new substation or masts are located is lost. In Switzerland, unavoidable impacts on the protection of nature and cultural heritage must be compensated for whenever substations and lines are built. In this case, the steps taken are referred to as alternative measures. Alternative measures are only

More information
Environmental protection in Swissgrid construction projects

The process in an ideal case

used where neither protection nor restoration measures are possible. If Swissgrid has to permanently clear a forest under a new line, for example, the trees must be replanted elsewhere. Or if a switch area is added to a substation, areas of an equivalent size must be redesignated as cultural landscapes elsewhere in the region. The aim of these alternative measures is to restore the region's overall environmental balance.

The ecological measures adopted will then be implemented during construction. Swissgrid maintains the information on this within the projects. An overview of all projects can be found on the Swissgrid website, under "Project overview". For each project, examples of the environmental measures adopted or already implemented are also listed in the chapter "People & environment". The inclusion of these statutory orders in inventories will be examined in 2023.

Swissgrid requires new suppliers who carry out the work on site to confirm that all applicable legal regulations are complied with by signing the Sustainability Charter for Suppliers. Swissgrid also requires its suppliers to reduce their emissions wherever possible and reasonable, to keep the flow of goods as low as possible in terms of rejects and waste, to use mainly reusable or recyclable resources, and to treat the environment and biodiversity with care. Three years after construction, the correct implementation of the measures is checked, the maintenance concept defined and, if necessary, alternative measures determined. Through these measures, biodiversity can often be maintained at a high level and in some cases even increased. Swissgrid also offers active support in controlling of neophytes, most of which have been introduced from elsewhere, on routes and at substations.

Other environmental topics

GRI 416-1

The environmental impact assessments also examine the effects of the installations in terms of electromagnetic fields and noise.

More information
Emissions

Electromagnetic fields

Electromagnetic fields are generated during the transport of electricity. The strength of electric and magnetic fields decreases with distance. The greater the distance to a conductor or cable, the lower the electric and magnetic fields. In the case of cables in households, the fields are already vanishingly small within just a few decimetres of distance, and in the case of extra-high-voltage lines under full load, at around 100 metres. The electromagnetic fields are often higher above buried cables than directly under overhead lines.

Switzerland has one of the strictest limits for electromagnetic fields in Europe. Swissgrid adheres to this and regularly measures and calculates the strength of the fields on existing lines. In the case of grid projects, compliance with the limit values also determines the choice of routes.

Swissgrid has entered into a partnership with the non-profit research foundation located at the ETH Zurich, the Swiss Research Foundation for Electricity and Mobile Communication (FSM). The FSM promotes research about technological, biological, health-related and social issues in the context of electromagnetic fields of radio and electricity technologies. The foundation also provides consulting for the authorities, companies and organisations, hosts conferences and imparts expert knowledge to the general public.

Noise

Unfavourable weather conditions in particular, such as rain, hoarfrost or wet snow, can cause local electrical discharge in power lines. Known as corona discharges, this can produce a crackling or humming sound.

In Switzerland we have an emissions limit of 55 decibels in residential areas (45 decibels at night), which must be adhered to by law. The noise pollution from a busy street is over 80 decibels. Where necessary, Swissgrid employs all technical means to limit the corona effect. Corona noises are not present in underground lines.

More information
When lines crackle and hum

Snow-covered extra-high voltage power line

GRI 301, 306

Circular economy, material efficiency and resource conservation

In order to achieve the climate targets and reduce the burden on the environment in general, material cycles must be designed in a similar way to natural cycles in the medium term. The goal is to basically reuse all materials taken from nature at the end of their life cycle as raw materials for new products or to return them to nature without any harmful effects. Non-degradable materials should remain in the technical system for as long as possible. To achieve this, products need to be rethought from the ground up by means of eco-design.

Management approach

Material flow analysis from 2020 showed that the large material flows at Swissgrid are primarily triggered by construction projects: concrete, steel, aluminium, to a lesser extent transformer oil, wood, insulation materials, paints, plastics, copper, etc. On the waste side, concrete, excavated material and steel are at the top of the list. Metals are fully recycled. Most of the concrete is processed and returns to the cycle as recycled material. Only a small proportion is contaminated and is disposed of properly in accordance with the disposal concepts devised for all projects. This also applies to hazardous substances in the form of waste subject to control, special waste and municipal waste.

Both material consumption and waste are directly dependent on the renovation and new construction projects that are implemented. For this reason, comparison with different years and specific reduction targets are not meaningful.

The key areas of action in the transmission system are the implementation of eco-design, the selection of products that are as sustainable as possible in the procurement process by including ecological criteria, the implementation of the principles of “share, reuse, repair and recycle” as far as possible, as well as consistent recycling and the proper waste treatment of non-avoidable waste (normal waste, hazardous materials and landfill material). The material flows in the other areas, such as buildings, administration, mobility, etc. are not negligible, but are of secondary importance.

“The handling of hazardous substances, recycling and proper waste disposal are already being consistently implemented today. Swissgrid maintains a register of contaminated sites and pollutants.”

Problematic contaminated sites are continuously remediated – at the latest when a substation is due to be renovated. One example of this is the polychlorinated biphenyls (PCB)-containing condensers that were disposed of properly in the late 1990s and early 2000s. Swissgrid has documented the regulations and standards for the protection of people and the environment when working on and in the vicinity of Swissgrid Ltd installations in a manual on occupational safety, health and environmental protection. Swissgrid is not yet systematically addressing the other fields of action. In the new strategy period, the goal is to establish a reliable controlling system for material flows. Furthermore, environmental considerations regarding the circular economy and resource efficiency are to be increasingly incorporated into construction projects and maintenance.

Since Swissgrid’s sustainable procurement policy includes social as well as environmental requirements, the topic is addressed in more detail in the “Partnership” area of action.

Overarching areas of action for resource efficiency

Swissgrid's main mandate is to ensure security of supply. The grid of the future must be able to meet the challenges arising from the transformation of the energy system. To this end, Swissgrid takes a holistic view of the electricity system (market and grid) and finds sustainable, optimised solutions at reasonable costs. Central to this is using resources as sparingly as possible.

As an important step towards resource efficiency, the NOVA principle is always applied during grid upgrades. It advocates grid optimisation before grid enhancement before grid expansion, and aims to keep the environmental and landscape impacts of grid expansion as low as possible. If more efficient grid operation (e.g. topological measures, redispatching or use of flexibilities) is not sufficient to control identified congestion, then the first measure is grid optimisation. If this does not achieve the objective, grid enhancement (e.g. more powerful conductor cables, higher voltage) is then carried out. Only as a last resort will grid expansion with new routes be pursued. Swissgrid is also trying to reduce the number of parallel transmission lines in the long term by combining transmission lines with national roads and railway lines. One example of this is the second Gotthard tube, in which the approximately 18-km-long pipeline from Göschenen to Airolo is combined with a national road.

More information
Principles of long-term grid planning

Example of cabling in a tunnel

"Swissgrid checks the overhead line as well as underground cable options for every grid project. Both technologies have their advantages and disadvantages with regard to project planning, construction as well as operation and maintenance."

In particular, overhead lines are superior to underground lines in terms of ecological balance and the use of materials.

Another approach to increasing resource efficiency is to merge substations. In Switzerland, due to the historical development of the grid by the former local owners and the high density of large hydropower plants, there are many substations in a small area. As far as replacement investments are concerned, checks are carried out in coordination with the local distribution system operators to determine which substations can be merged or dismantled if necessary.

Research projects to improve resource efficiency and reduce environmental impact

While the goal of the Energy Strategy 2050 and many measures are already known today, others still need to be developed. Together with industry and research partners, Swissgrid initiates and supports scientific projects that seek out and develop technical solutions.

Grid projects at Swissgrid are becoming increasingly complex. This is due in particular to the fact that more and more diverse demands – not only in terms of technology and economic efficiency, but also in terms of ecology and society – are being included. In recent years, Swissgrid has initiated and supported a number of scientific projects on the environmentally compatible design of routes and plant components together with its research partners.

Example: "Hybrid overhead lines in Switzerland" by ETH Zurich: Because new lines meet with little acceptance among those affected, the optimisation of existing pipelines is an alternative. The research project "Hybrid overhead lines in Switzerland" at ETH Zurich is investigating how the transfer capacity of existing 380 kV overhead lines can be increased by combining DC and AC systems. Calculations show that the transfer capacity of such lines could be increased by 50%.

In addition to the technical aspects, the researchers also consider economic efficiency and social acceptance.

More information
One power line, two systems
More capacity on transmission lines

More information
Grid technologies
Overhead line and cable

Example: Comparison of underground cabling and overhead lines: At the moment, electricity is primarily transmitted via overhead lines. They account for 99% of the Swiss transmission grid. So far, 42 km of underground cables are in use in the extra-high-voltage grid and are comparatively new. Both technologies have their advantages and disadvantages with regard to project planning, construction as well as operation and maintenance. For every grid project, Swissgrid therefore reviews both the overhead line as well as the underground cabling variants.

The main advantage of underground cabling is that it reduces the impact on the landscape by eliminating the need for pylons. Transition from the overhead line to the underground cable, however, requires distinctive transition structures that are approximately the size of an ice hockey field. The amount of material required for cabling is significantly higher, as the lines are embedded in concrete and must be heavily insulated. Furthermore, underground cables have a much greater impact on the environment, especially during construction, and the areas above them must also be kept completely free of roots during operation. Overall, the costs of underground cables are about 3.5 times higher than overhead lines over the entire life cycle. Since cable lines also produce significantly more reactive power than overhead lines, the construction of new cable lines leads much more quickly to the need to build compensation systems. In addition to additional material costs for construction, this also means higher power losses in the operating phase.

In order to be able to better compare the environmental impacts of the two transmission technologies, Swissgrid is currently drawing up a life cycle assessment.

Example of cabling in a cable conduit block

Example of a transition structure

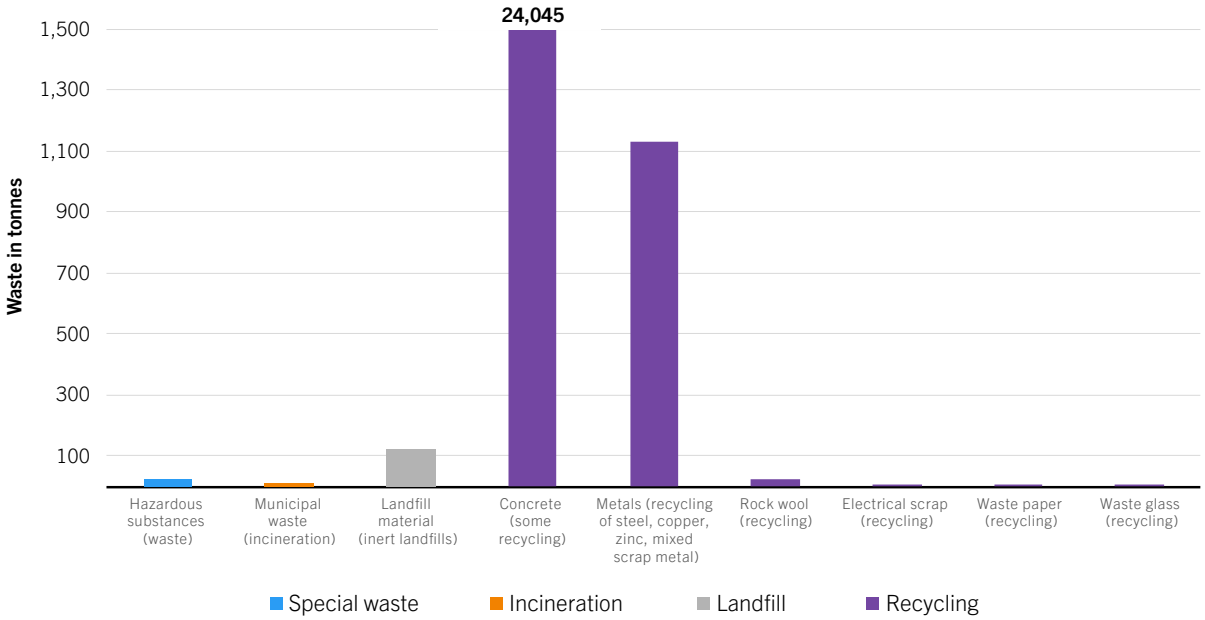
Example of liquid soil instead of concrete as bedding material for the construction of underground pipelines: In Switzerland, cable lines are sometimes built as a pipe block, which is embedded in concrete due to the good mechanical protection. A study compares this traditional installation method with liquid soil, which is already being used in some cases at other transmission system operators. With liquid soil, the excavated or supplied soil is made temporarily flowable and self-compacting by adding additives such as cement, compound and lime and water. In weighing up the advantages and disadvantages of liquid soil versus concrete, the study comes to a positive conclusion in favour of concrete. While the use of liquid soil has a slight environmental benefit, especially due to the conservation of resources through the recycling of the excavated material on site, concrete has clear advantages in terms of mechanical protection and the life cycle of the cable system. On the other hand, the thermal conductivity of concrete and liquid soil hardly differ. The slightly lower costs of liquid soil are marginal compared to the greater safety associated with concrete. Liquid soil will be tested at Swissgrid in a substation for the time being.

Waste quantities

GRI 306-3, 306-4, 306-5

The following compilation is based on data from 2020. It shows the orders of magnitude and thus the relevance of the waste streams. Not shown are 17,427 m³ of excavated material, most of which can be reused on site. The amounts of waste vary greatly from year to year depending on the renovation and new construction projects carried out.

Waste (figures according to Material Flow Analysis 2020)



Appendix

GRI Index

Application Swissgrid has reported the information mentioned in this GRI content index for the 2022 financial year with reference to the GRI standards.

GRI 1 used GRI 1: Foundation 2021

GRI Standard	Disclosure	Location
GRI 1: Foundation 2021	Reporting principles	Transparency
GRI 2: General Disclosures 2021	2-1 Organizational details	Reporting context; History; Corporate structure; Locations and grid
	2-2 Entities included in the organization's sustainability reporting	Reporting context
	2-3 Reporting period, frequency and contact point	Reporting context
	2-4 Restatements of information	Reporting context
	2-5 External assurance	Reporting context
	2-6 Activities, value chain and other business r elationships	Company; Business activity and value chain
	2-7 Employees	Number of employees; Newly hired employees and employee turnover
	2-8 Workers who are not employees	External employees; Newly hired employees and employee turnover
	2-9 Governance structure and composition	Board of Directors and Executive Board
	2-10 Nomination and selection of the highest governance body	Board of Directors and Executive Board
	2-11 Chair of the highest governance body	Board of Directors and Executive Board; Corporate Governance Report 2022
	2-12 Role of the highest governance body in overseeing the management of impacts	Board of Directors and Executive Board
	2-13 Delegation of responsibility for managing impacts	Board of Directors and Executive Board
	2-14 Role of the highest governance body in sustainability reporting	Reporting context; Board of Directors and Executive Board
	2-15 Conflicts of interest	Board of Directors and Executive Board
	2-16 Communication of critical concerns	Compliance
	2-17 Collective knowledge of the highest governance body	Board of Directors and Executive Board
	2-18 Evaluation of the performance of the highest governance body	Board of Directors and Executive Board
	2-19 Remuneration policies	Remuneration

GRI Standard	Disclosure	Location
	2-20 Process to determine remuneration	Remuneration
	2-21 Annual total compensation ratio	Remuneration
	2-22 Statement on sustainable development strategy	Statements; Strategy 2027; Corporate social & environmental responsibility
	2-23 Policy commitments	Values, principles and code of conduct; Compliance
	2-24 Embedding policy commitments	Compliance
	2-25 Processes to remediate negative impacts	Compliance
	2-26 Mechanisms for seeking advice and raising concerns	Prevention; Disclosure
	2-27 Compliance with laws and regulations	Violations in 2022
	2-28 Membership associations	Memberships
	2-29 Approach to stakeholder engagement	Stakeholder engagement
	2-30 Collective bargaining agreements	Collective agreements and staff representation
GRI 3: Material Topics 2021	3-1 Process to determine material topics	Material topics and their relation to the Sustainable Development Goals
	3-2 List of material topics	Material topics and their relation to the Sustainable Development Goals
	3-3 Management of material topics	Material topics and their relation to the Sustainable Development Goals
Economy		
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	Key financial figures 2022, Financial Report 2022
	201-2 Financial implications and other risks and opportunities due to climate change	Consequences of climate change
	201-3 Defined benefit plan obligations and other retirement plans	Pension plans
	201-4 Financial assistance received from government	Government grants
GRI 202: Market Presence 2016	202-1 Ratios of standard entry level wage by gender compared to local minimum wage	Not recorded (cf. also assessment of equal pay in the subsection on equal pay)
	202-2 Proportion of senior management hired from the local community	Diversity management
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	Grid transfer capacity
	203-2 Significant indirect economic impacts	Security of supply
GRI 204: Procurement Practices 2016	204-1 Proportion of spending on local suppliers	Fair competition

GRI Standard	Disclosure	Location
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	Anti-corruption
	205-2 Communication and training about anti-corruption policies and procedures	Anti-corruption
	205-3 Confirmed incidents of corruption and actions taken	Violations
GRI 206: Anti-competitive Behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	Fair competition
GRI 207: Tax 2019	207-1 Approach to tax	Taxes
	207-2 Tax governance, control, and risk management	Taxes
	207-3 Stakeholder engagement and management of concerns related to tax	Taxes
	207-4 Country-by-country reporting	Not relevant, as Swissgrid only operates in Switzerland
Ecology		
GRI 301: Materials 2016	301-1 Materials used by weight or volume	Circular economy, material efficiency and resource conservation
	301-2 Recycled input materials used	Not yet systematically recorded
	301-3 Reclaimed products and their packaging materials	Not material
GRI 302: Energy 2016	302-1 Energy consumption within the organization	Energy
	302-2 Energy consumption outside of the organization	Energy
	302-3 Energy intensity	Energy
	302-4 Reduction of energy consumption	Energy
	302-5 Reductions in energy requirements of products and services	Energy
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	Not material
	303-2 Management of water discharge-related impacts	Not material
	303-3 Water withdrawal	Not material
	303-4 Water discharge	Not material
	303-5 Water consumption	Not material
GRI 304: Biodiversity 2016	304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Biodiversity and environmental protection
	304-2 Significant impacts of activities, products and services on biodiversity	Biodiversity and environmental protection
	304-3 Habitats protected or restored	Biodiversity and environmental protection

GRI Standard	Disclosure	Location
	304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations	Not yet systematically recorded
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	Climate protection; Greenhouse gas emissions
	305-2 Energy indirect (Scope 2) GHG emissions	Climate protection; Greenhouse gas emissions
	305-3 Other indirect (Scope 3) GHG emissions	Climate protection; Greenhouse gas emissions
	305-4 GHG emissions intensity	Intensity indicators 2022
	305-5 Reduction of GHG emissions	Greenhouse gas emissions
	305-6 Emissions of ozone-depleting substances (ODS)	Not material
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Not material
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	Circular economy, material efficiency and resource conservation
	306-2 Management of significant waste-related impacts	Circular economy, material efficiency and resource conservation
	306-3 Waste generated	Circular economy, material efficiency and resource conservation; Waste quantities
	306-4 Waste diverted from disposal	Circular economy, material efficiency and resource conservation; Waste quantities
	306-5 Waste directed to disposal	Circular economy, material efficiency and resource conservation; Waste quantities
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	Social and environmental requirements in the supply chain
	308-2 Negative environmental impacts in the supply chain and actions taken	Management approach
Social issues		
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	Newly hired employees and employee turnover
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	Talent retention
	401-3 Parental leave	Maternity and paternity leave
GRI 402: Labor/Management Relations	402-1 Minimum notice periods regarding operational changes	Collective agreements and staff representation
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	Management approach
	403-2 Hazard identification, risk assessment, and incident investigation	Hazards and events
	403-3 Occupational health services	Health protection
	403-4 Worker participation, consultation, and communication on occupational health and safety	Safety culture; Employee participation

GRI Standard	Disclosure	Location
	403-5 Worker training on occupational health and safety	Training
	403-6 Promotion of worker health	Training; Health protection
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Safety culture
	403-8 Workers covered by an occupational health and safety management system	Management approach
	403-9 Work-related injuries	Key figures for occupational accidents 2022
	403-10 Work-related ill health	Health protection
GRI 404: Training and Education	404-1 Average hours of training per year per employee	Education and training
	404-2 Programs for upgrading employee skills and transition assistance programs	Attracting talent; Education and training
	404-3 Percentage of employees receiving regular performance and career development reviews	Further development of talent
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	Diversity and inclusion; Diversity management
	405-2 Ratio of basic salary and remuneration of women to men	Equal pay
GRI 406: Non-discrimination 2015	406-1 Incidents of discrimination and corrective actions taken	Protection of personal integrity
GRI 407: Freedom of Association and Collective Bargaining 2016	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Collective agreements and staff representation
GRI 408: Child Labor 2016	408-1 Operations and suppliers at significant risk for incidents of child labor	Management approach; Social and environmental requirements in the supply chain
GRI 409: Forced or Compulsory Labor	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	Management approach; Social and environmental requirements in the supply chain
GRI 410: Security Practices 2016	410-1 Security personnel trained in human rights policies or procedures	Prevention
GRI 411: Rights of Indigenous Peoples 2016	411-1 Incidents of violations involving rights of indigenous peoples	Violations in 2022
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	Biodiversity and environmental protection
	413-2 Operations with significant actual and potential negative impacts on local communities	Grid projects; Other environmental topics

GRI Standard	Disclosure	Location
GRI 414: Supplier Social Assessment 2016	414-1 New suppliers that were screened using social criteria	Social and environmental requirements in the supply chain
	414-2 Negative social impacts in the supply chain and actions taken	Management approach
GRI 415: Public Policy 2016	415-1 Political contributions	Public affairs
GRI 416: Customer Health and Safety	416-1 Assessment of the health and safety impacts of product and service categories	Other environmental topics
	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	Violations in 2022
GRI 417: Marketing and Labeling 2016	417-1 Requirements for product and service information and labeling	Not material
	417-2 Incidents of non-compliance concerning product and service information and labeling	Not material
	417-3 Incidents of non-compliance concerning marketing communications	Not material
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	Information security

Publication data

Publisher
Swissgrid Ltd
Bleichemattstrasse 31
P.O. Box
5001 Aarau
Switzerland

+41 58 580 21 11
info@swissgrid.ch

Concept and design
SOURCE Associates AG, Zurich

Photography and picture credits
Wolfgang Bischoff (naturschutzlösungen), Luxwerk, Oliver Iseli, Uwe Spoering, Swissgrid, Stefan Walter, Getty Images, iStock, Imago Images, Shutterstock

Content concept and editing
Peter Sustainability Consulting GmbH, Horw
open up AG, Zurich

Legal notice

Swissgrid's Sustainability Report 2022 is available on the website report.swissgrid.ch/en/sustainability in German, French and English. The German version is authoritative. For further information, please see www.swissgrid.ch.