Report on the activities of ElCom 2024

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Werner Luginbühl
President of ElCom

Security of supply

2024 was an extraordinary year for electricity production. Provisional figures published by the Swiss Federal Office of Energy (SFOE) indicate that a record high total of 80.5 TWh of electricity was generated in Switzerland. Consumption rose by 1.7 % to reach 57 TWh. Hydropower contributed over 48 TWh to this impressive production result, representing an 18.5 % increase compared with the previous year. This contribution and high rainfall levels are the primary reasons for the record high production. The Swiss nuclear power plants continued to provide a reliable source of production. Solar energy's contribution also increased – thanks to further expansion of photovoltaic systems – amounting to approximately 6 to 7 TWh. During the winter period from October 2023 to March 2024, 1.8 TWh more electricity was exported than imported – a level not reached in the past decade. This result is remarkable. However, it should not overshadow the fact that this is only the second time an export surplus has been achieved in winter in the past 12 years. On average, imports of around 4 TWh were required over this period.

After the energy crisis and fears over shortages in 2022, the supply situation eased again, and the markets continued to stabilise in 2024. While the all-clear could not be given for winter 2024–25, the risk of extraordinary situations has decreased significantly. We still face various unpredictable factors, such as geopolitical tensions and their impact on the global market for liquefied natural gas (LNG). In combination with sustained and extraordinarily low temperatures, the situation could deteriorate again.

Firstly, to ensure future security of supply following nuclear power plant decommissioning and rising electricity demand due to decarbonisation, Switzerland must rapidly and significantly increase its winter production capacity. The omnibus legislation, Hydropower Round Table and accelerated authorisaion procedures for solar and wind power plants lay the foundation for reaching this goal. However, recent experiences in project development do not provide much cause for optimism. The pace of expansion of photovoltaic systems is also prompting a certain level of backlash.

Secondly, an agreement on electricity would make a major contribution. The reliable and stable determination of cross-border transmission network capacity would improve Switzerland's security of supply. The agreement negotiated is welcome, and the objectives of the negotiation have been achieved. Conclusion of the agreement is vitally important for electricity supply.

However, as there is considerable uncertainty over the expansion of domestic capacity, the conclusion of the electricity agreement and production capacity abroad (in winter), it is important to continue focusing on the issue of reserves. ElCom has begun work on updating its analysis on medium and long-term security of electricity supply and the reserves required. This is set to be published during the first half of 2025.

Market surveillance
While the 2022 energy crisis may seem a distant memory, ElCom continues to monitor the price developments that arose at that time. It is analysing the reasons for the extraordinary price movements on the wholesale market during summer 2022 and the behaviour of the actors in the electricity trading sector.

In addition to the wholesale markets, ElCom also monitors the system services markets, including the procurement of control power and control energy by Swissgrid. It has determined that the significant increase in prices for secondary control energy (SCE) since mid-2022 – related to the change in the procurement process due to the introduction of the PICASSO secondary control platform in Switzerland – is essentially unjustified. Especially in view of the sharp price rise since spring 2024, it appears the market mechanism for SCE is working to only a limited extent. In response, ElCom decided to consider all possible measures to achieve a rapid correction. The Technical Secretariat introduced a temporary, differentiated price cap on a contractual basis as a short-term corrective measure. Another issue is the sharp increase in the deviations from the schedule and imbalances in the balance groups, leading to high control energy prices and, in turn, higher costs for balance energy. End users ultimately bear these costs. In response, ElCom produced a status report in collaboration with Swissgrid and the balance groups (physical output points) in summer 2024 and identified potential medium and long-term measures to improve the situation.

Changes were also made to the production of the monthly reports of the Federal Act on Subsidiary Financial Aid to support Systemically Critical Companies in the Electricity Industry (FiRECA). FiRECA entered into force two years ago and ElCom is monitoring the liquidity levels of systemically critical companies, as provided for. The relevant data reporting was standardised in the year under review. Standardisation of the data makes it easier to compare the liquidity situation of the systemically critical companies.

Pricing and tariffs
ElCom conducted three investigations at over 30 companies in relation to high energy tariffs. These investigations focused on the prioritisation of companies' own electricity production in basic supply and procurement, particularly within group company structures and at predominantly smaller providers applying very sharp tariff increases. ElCom produced a detailed report on these investigations.

The activities relating to the omnibus legislation required significant resources in 2024. The numerous amendments to acts and ordinances had to be properly incorporated into ElCom's data collection and regulatory processes and IT systems, not least because the deadlines for the 2026 tariff survey are very tight. The omnibus legislation means the results of the Sunshine Regulation can now also be published, which is scheduled for 2026.

The new regulations under the omnibus legislation are creating an exceptionally high level of regulatory density by Swiss standards. Unfortunately, Parliament failed to take advantage of the opportunity for complete market liberalisation. The new regulations have removed existing potential and misdirected incentives to optimise profit to some extent, particularly regarding the provision of energy in basic supply. However, there is also a high degree of new potential for optimisation. ElCom expressed criticism of this approach during the general consultation and office consultation procedures. The new regulations will undoubtedly result in many issues concerning costs and tariffs in the energy sector in 2025 and are likely to lead to many disputes. This applies to other areas too, such as feed-in tariffs for renewable energy and the local electricity communities.

Legal proceedings

ElCom again received numerous enquiries about higher electricity tariffs in 2024. Some network operators referred their end users to ElCom or even informed them that ElCom had approved their tariffs. It is important to emphasise once again that ElCom does not approve tariffs but instead only assesses them after they have been introduced. Network operators also have a legal obligation to provide sufficient justification for tariff adjustments. Give the absence of sufficient justification for tariff adjustments in some cases, ElCom published a directive setting out minimum requirements for network operators.

In relation to tariffs, whether communes and cantons can impose public levies and charges on the energy components of the tariff has long been a contentious issue. Such levies are expressly provided for by law in the case of network usage tariffs, which means their validity is undisputed. However, if such charges are levied as part of regulated basic supply, they would be specifically applied to tied end users via the basic supply tariff. This would effectively-amount to an additional transfer of profit at the expense of basic supply customers. In a judgement passed down in 2020, the Federal Supreme Court ruled that energy-related charges on the energy tariff were not prohibited under federal law. In light of this ruling, the Federal Administrative Court concluded in a judgement issued on 25 October 2024 that there was a valid legal basis for levying an energy charge (transfer of profit) in the specific case relating to the disputed tariff years. The Federal Department of the Environment, Transport, Energy and Communications (DETEC) appealed against this ruling to the Federal Supreme Court.

2 Interview with the Director: Swiss electricity market

The requirements that the electricity market must meet are constantly changing. As is so often the case, this raises the question of striking the right balance between regulation and free market. While Parliament failed to provide for market liberalisation in the revision of the Electricity Supply Act (ESA), new dynamic tariff models should ensure greater alignment between consumption and the market.

What potential and challenges does ElCom see in this respect?
Urs Meister: Dynamic tariff models are no substitute for market liberalisation. In fact, dynamic tariffs could be applied even more efficiently if the market was fully liberalised. Both dynamic energy and network tariffs would improve the electricity system's efficiency. Dynamic energy tariffs would provide clear benefits as the price signal required could be derived directly from the spot market. This kind of tariff model can be used as an instrument for increasing the elasticity of demand in the short term and aligning it more closely with changes in the supply of renewable energies. However, they may prove difficult to implement under the current cost-based regulatory regime of basic supply. While not actually prohibited, they entail a high degree of uncertainty. A network operator's effective procurement and production costs may differ significantly from short-term spot prices on which the dynamic energy tariff would be based. This means we may only see limited use of dynamic energy tariffs without complete market liberalisation.

Several network operators are already experimenting with dynamic network tariffs. What challenges does this present?
The main goal of network tariffs is making optimal use of network capacity and reducing the costs of network expansion in the long term. Dynamic network tariffs are easier to implement than dynamic energy tariffs in a cost-based regulatory regime. However, it is difficult to quantify the benefits. As the prices cannot simply be derived from the spot market, they have to be generated almost artificially by the network operator to optimise use of network capacity. The effects on network expansion are unclear and there is also a lack of international and, above all, long-term experience in terms of the impact and saving potential. It remains to be seen what form an optimal dynamic network tariff would take.

Which regulatory requirements must be met in relation to dynamic tariffs?
Cost-based energy and network tariff regulations generally apply here too. Tariffs and how they are structured must be transparent for end users – communication plays a key role in this respect. Finally, network operators cannot make a dynamic tariff the only option for customers. These tariffs generally require automated control of consumption, but not all consumers have the necessary technology in place yet.

Let's stay on the topic of market versus regulation: in 2024, you carried out targeted intervention in the electricity market by introducing a price cap for secondary control energy (SCE). Why did you believe this step was necessary?
As part of its regulatory activities, ElCom is responsible for ensuring efficiency and appropriate tariffs. This also applies to the procurement of system services by Swissgrid, which ultimately impact on electricity prices for end users. Since mid-2022 we have seen significant increases in SCE surcharges above the spot market price, which became more acute again from spring 2024 – even though market prices actually fell. Based on our analysis, we concluded that the market mechanism for SCE is working to only a limited extent and that procurement of SCE is not producing market-based results. In response, ElCom decided to assess all possi-

ble measures. A temporary, differentiated price cap on a contractual basis was introduced as a short-term corrective measure. This price cap only applies to some SCE bids, i.e. those which have been awarded a contract and received compensation for the offered capacity. In terms of impact and potential negative effects, the balanced price cap based on contractual agreement is a necessary and proportionate corrective measure in our view. Finally, the sharp rise in SCE prices – in combination with more frequent imbalances – is also having an impact on electricity prices and putting strain on end users.

Urs Meister
Director of ElCom

« Dynamic tariff models are no substitute for market liberalisation »

Why has the imbalance in Switzerland's control zone increased to such an extent, and what can be done to rectify the situation?
It's true we have seen greater forecasting deviations recently. As a result, a huge amount of control energy has been used temporarily. Strong development in the expansion of renewable energies and their reliance on weather conditions is another major factor. Forecasting consumption and power supply is clearly becoming much more challenging for suppliers and balance groups. Deviations from scheduling are occurring more frequently, resulting in greater use of expensive balance energy. This is why it's vitally important that network operators quickly improve their measurement data and forecasting processes – not least by systematically incorporating short-term weather forecasts into them. As the market has only been partially liberalised in Switzerland, there is a lack of incentive for rapid action to some extent as the additional costs of balance energy can ultimately be passed on to end users via the basic supply tariffs. ElCom will now focus more on this issue.

Are you planning further measures or is that it for now?
The price cap is a short-term and – most importantly – temporary measure to correct exceptionally high and fundamentally unjustified SCE prices in the current procurement environment. As it does not represent a permanent solution, additional measures are now needed to make the SCE market more efficient and competitive. Effective commercial integration into the European PICASSO platform may improve the market's liquidity situation and efficiency, but this will not happen unless an electricity agreement is reached with the EU. We're also looking at other measures to increase market liquidity, such as changes to product definitions. Finally, measures are also needed to reduce demand for bal-ancing energy and, in turn, the necessary control energy. This includes improving data and forecasting quality, such as the specification or adjustment of balance management processes, or incentive mechanisms – for example, by revising the balance energy price mechanism.

Regulations are important, but over-regulation can hold back innovation. How can the right balance be struck?
Regulation can actually improve market efficiency. Some regulations are essential to enable a market to function properly – for example, in the case of natural monopolies like the

network. Other regulations play a vital role in ensuring security of supply as the market could not achieve this on its own. Conversely, many regulations only benefit certain actors or distribute subsidies and cross-subsidies in many different and sometimes hidden ways. This makes markets not only less transparent but also less efficient. In our role as a regulatory authority, we try to create opportunity for innovative, beneficial and efficient solutions within the applicable legal framework, but without disadvantaging customers or other market actors. Establishing the framework conditions is ultimately a political responsibility.

3 The Swiss electricity market

The Niederried reservoir on the Aare was created in 1913. Today it serves as a nature reserve of national importance where approximately 10,000 water birds winter each year.

3.1 Structure of network operators in Switzerland

There were 586 active network operators in Switzerland in 2024. They supply a total of around 5.35 million invoice recipients, serving about 5.9 million measurement points (0.28 % more than in the previous year). The number of network operators fell from 632 to 586 between 2019 and 2024. There has been a clear trend towards fewer network operators for some time now. This is explained by network acquisitions and the merger of communes. The sector is very diverse: while the major network operators supply over 300,000 end customers, that figure stands at just about 1,700 for a median network operator. The smallest operator supplies just 4 customers. Only 78 supply more than 10,000 end users, and 13 of them over 100,000 (Figure 1).

This heterogeneity is also reflected in the many different types of legal structures under which these network operators are organised.

Just 25 % of network operators are joint-stock companies, compared with around 20 % cooperatives. The remaining 55 % are either municipal utilities or companies under public law.

In addition to operating the networks, the Swiss network operators also supply electricity to customers who do not have access to the free market. It is therefore interesting to look at the energy procurement and offtake of Swiss energy supply companies – not least in the context of energy prices in recent years.

The pro-rata offtake of the network operators in relation to the total offtake in Switzerland reflects the ownership structure and network usage revenues (see Section 6.1). The largest 100 network operators supply around 89 % of the energy sold, of which the 10 largest network operators in Switzerland supply over 52 %.

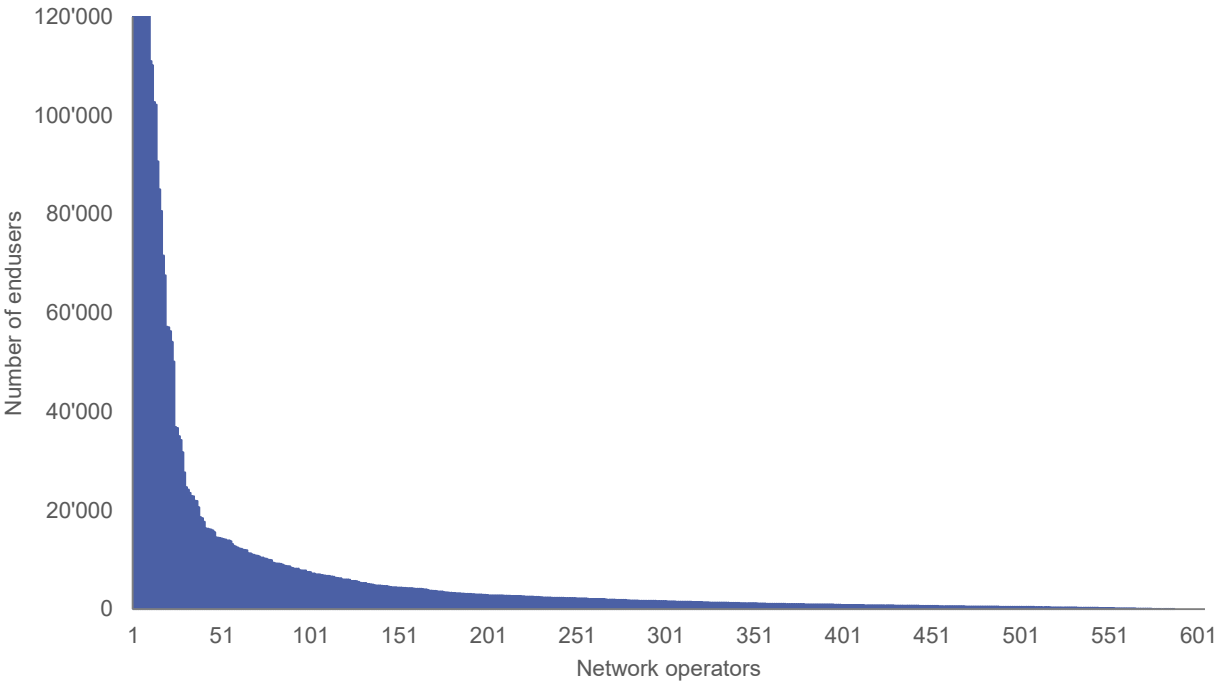


Figure 1: Number of customers per distribution network operator. To improve readability, the vertical scale has been cut off at 120,000; the data cut-off concerns nine distribution network operators.

The production and sales of electricity for Swiss basic supply customers diverge significantly. Around 34,000 GWh of electricity a year is provided for basic supply customers in Switzerland according to the declarations of network operators. Of the around 590 network operators, 382 (just under 65 %) indicated that they do not produce their own electricity. These network operators have a total requirement of around 7,400 GWh per year or 14 % of the total offtake of 53,700 GWh per year (basic supply and unrestricted consumers incl. active power losses). Around 137 network operators (23 %) indicated a maximum of 10 GWh of self-generated electricity (requirement of 5,000 GWh per year or 9 % of the total offtake) and just 22 network operators (4 %) stated that they generate electricity of over 100 GWh themselves (requirement of 13,200 GWh or 25 % of total offtake).

The most common type of procurement in the previous year, the 'fully comprehensive contract' (around 39 %, previous year: 49 %) was replaced on the market by structured procurement (around 52 %, previous year: 40 %). Both remain amongst the most popular procurement types.

3.2 Market access and switching rate

A free choice of electricity providers is only available in Switzerland to consumers of at least 100 MWh of electricity a year. The principle of 'once free, always free' applies.Eligible consumers have until October to decide whether they wish to leave basic supply in the following year.

ElCom conducts an annual survey on switching behaviour amongst the major network operators.A total of 89 network operators participated in the survey in 2024. They supply over four million invoice recipients, meeting around two-thirds of Switzerland's electricity requirements.

Figure 2 shows the development since partial market liberalisation in 2012. The right to freely choose an electricity supplier was exercised on a relatively small scale in the first few years after the market was liberalised. As market prices fell, the number of end users choosing to exercise this right rose sharply in the years that followed. Their share on the free market has stagnated again over recent years – including in 2024. Although switching to free network access is binding, the curves shown in Figure 2 can fall if new end users come under the eligible consumers category or if electricity consumption in free network access declines in relation to the remainder. Participation in the survey – which was extremely low in 2024 for example – also has a bearing on the relative share of energy.

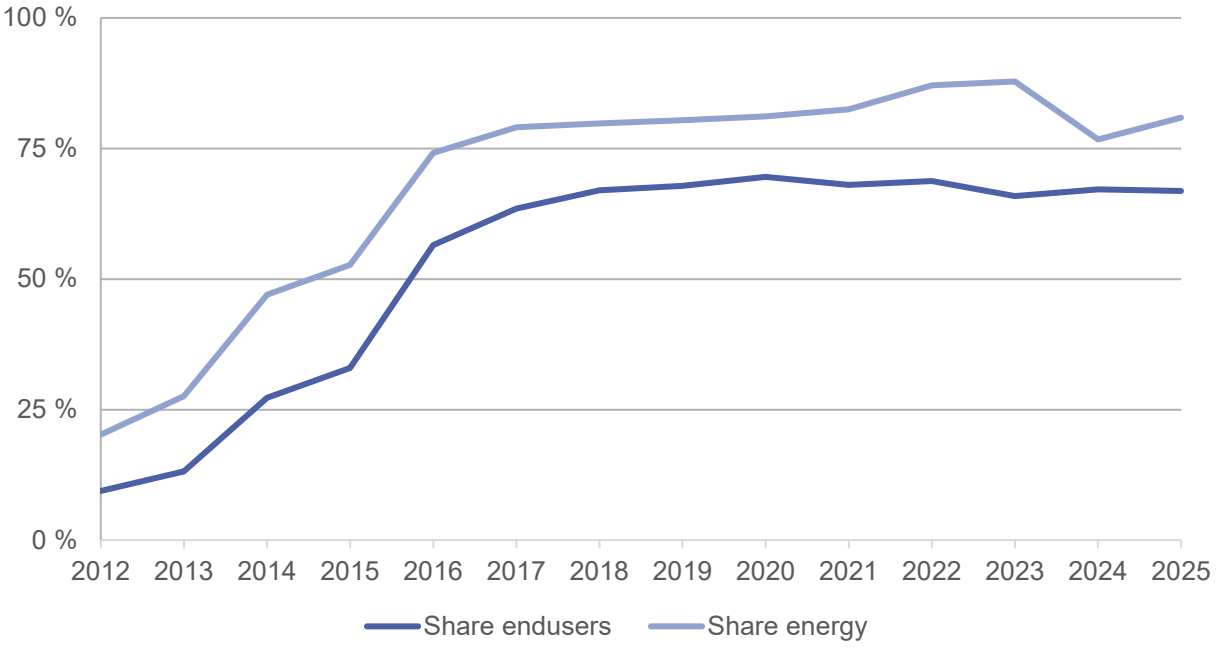


Figure 2: Development of the proportion of end users eligible for network access who exercise this right and the related amounts of energy.

In total, over 38,000 end users are entitled to network access for the 2025 planning year, which represents around 0.7 % of invoice recipients. They also account for half of electricity consumption in Switzerland.

3.3 Transmission network tariffs

Swissgrid bears the cost of expanding and upgrading the transmission network and ensuring stable network operation via various tariffs as the operator of the high-voltage grid. End users ultimately bear these costs by paying distribution network tariffs. After reaching a record-high level in 2024, the cost burden from the transmission network fell sharply again in 2025. Some system services tariffs were reduced significantly, while network usage tariffs remained relatively stable overall. The electricity reserve tariff first introduced in 2024 also fell. This new tariff decreased by around 80 % in 2025 compared with the previous year (see Table 1).

	2021	2022	2023	2024	2025
Network usage					
Working tariff [centimes per kWh]	0,20	0,25	0,27	0,27	0,27
Power tariff [CHF per MW]	33'600	43'920	48'660	46'380	47'220
Fixed basic tariff per exit point	319'800	413'040	443'700	443'400	427'560
General system services tariff [centimes per kWh]	0,16	0,16	0,46	0,75	0,55
Individual system service tariff Active power losses [centimes per kWh]	0,15	0,14	0,30	0,64	0,35
Power reserve	-	-	-	1,20	0,23

Table 1: Development of transmission network tariffs for the period 2021–25 for network usage, system services and the power reserve (source: Swissgrid AG).

Swissgrid provides or procures various system services to maintain stable network operation. They primarily aim to ensure consumption and production are always balanced and that the significant expansion of photovoltaic systems can be seamlessly integrated into the Swiss electricity grid. To achieve these goals, Swissgrid must procure control power and control energy (see Section 4.5). As this procurement takes place on the market, the costs incurred depend heavily on the price situation and price expectations on the energy wholesale markets. As Swissgrid publishes its tariffs for the following year in March, this means its forecasts are based on the information available several months before procurement is actually made. After the crisis in 2022, the system services tariffs had to be raised in 2023 and 2024 due to the increase in procurement prices and the accumulated coverage differentials from the previous years. As the market situation has now eased again considerably, Swissgrid has reduced the system services tariffs significantly for 2025.

In contrast to system services costs, fluctuations on the energy markets have little effect on Swissgrid's network usage costs. They essentially represent estimated costs for expanding and main-taining the transmission network. The allocation of transmission network costs is governed by Article 15 paragraphs 1 to 3 of the Electricity Supply Ordinance (ESO). In accordance with paragraph 3, the costs not charged individually are billed at 30 % as working tariff, 60 % as power

tariff and 10 % as basic tariff. Even though the Federal Department of the Environment, Transport, Energy and Communications (DETEC) lowered the permitted imputed interest rate on operational asset values slightly for 2025, the network usage tariffs remain stable overall.

After the energy crisis, the Federal Council implemented various measures to improve security of supply. The Confederation's electricity reserve tariff is used to cover the costs of the hydropower reserve and of reserve and emergency generators. After the high costs incurred for the provision of the reserve power plants, the running costs are much lower. The meant the electricity reserve tariff could be lowered recently by just under 1 centime per kilowatt hour or by around 80 %.

The cost burden on Swiss end users has fallen overall. A household with annual consumption of 4,500 kWh will pay around CHF 77 for Swissgrid's services in 2025 (2024: CHF 92; 2014–23 average: CHF 49). The newly created electricity reserve only accounted for CHF 11 in the household budget in 2025 (2024: CHF 54).

3.4 Distribution network tariffs

3.4.1 Changes in 2025

The electricity price is made up of four elements: the network usage remuneration, the energy price, the fees paid to the state and the federal charges for the promotion of Swiss renewable energy. The network operators must publish the first three components each year no later than the end of August preceding the respective tariff year. They differ significantly depending on the network operator and location of electricity procurement.

Figure 3 shows the development of the cost components of the electricity invoice for an average household. ElCom's definition is based on a five-room apartment with an electric cooker and tumble dryer, but without an electric boiler, which consumes 4,500 kWh of electricity a year. ElCom defines the typical consumption profile of this kind of household as H4 on its electricity price website.

The median electricity costs for an average household fell by 10 % compared with 2024. The weighted average cost of capital (WACC) for the network decreased from 4.13 % to 3.98 %. With regard to energy, the extremely high price phase on the international electricity markets looks set to have a significant impact on tariffs for the final time in 2025 due to procurement opportunities and practices. The price level on the futures trading markets remained extremely high despite a degree of normalisation – the energy tariffs are not expected to drop to the pre-crisis level in the foreseeable future.

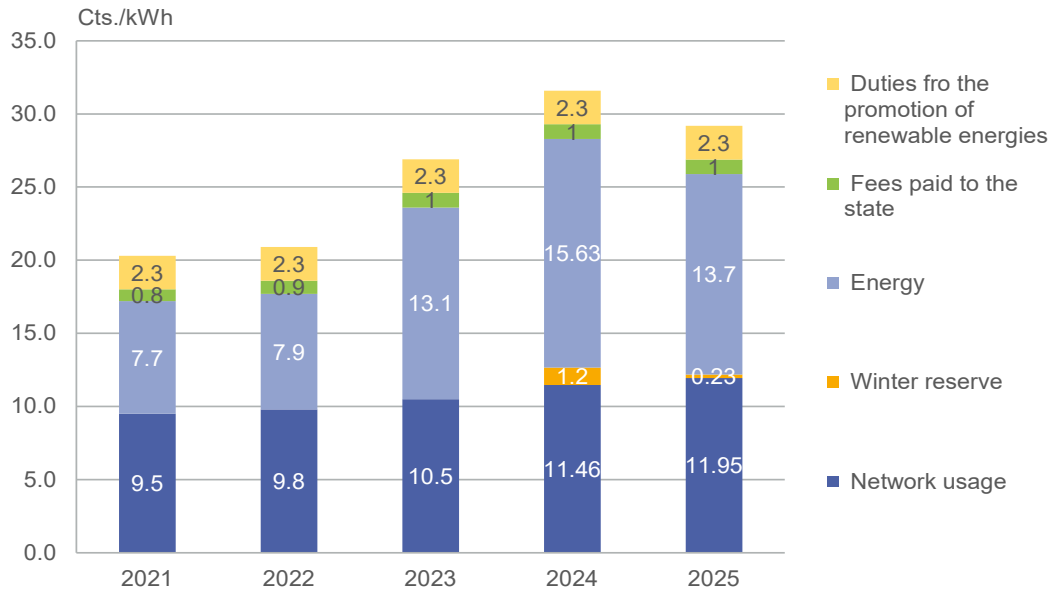


Figure 3: Development of the cost components (the median for each[1]) for an average household excluding VAT (consumption profile H4).

1 If Switzerland's resident population is broken down by the level of the cost components, half pay the same or more than the figure indicated in the year concerned, while the other half pay the same or less. For technical reasons, the breakdown was made according to the number of invoice recipients until the 2022 activity report.

3.4.2 2025 tariffs for an average household

The following sections illustrate the various electricity bill components for an average Swiss household in 2025. Deviations of over 5 % and 15 % from the national median are shown in a different colour. Detailed information on the tariffs of the individual communes and an interactive map can be found on ElCom's electricity price website.

Total

Figure 4 shows total electricity costs per commune. A wide range exists, although the distribution is similar to that of the previous year.

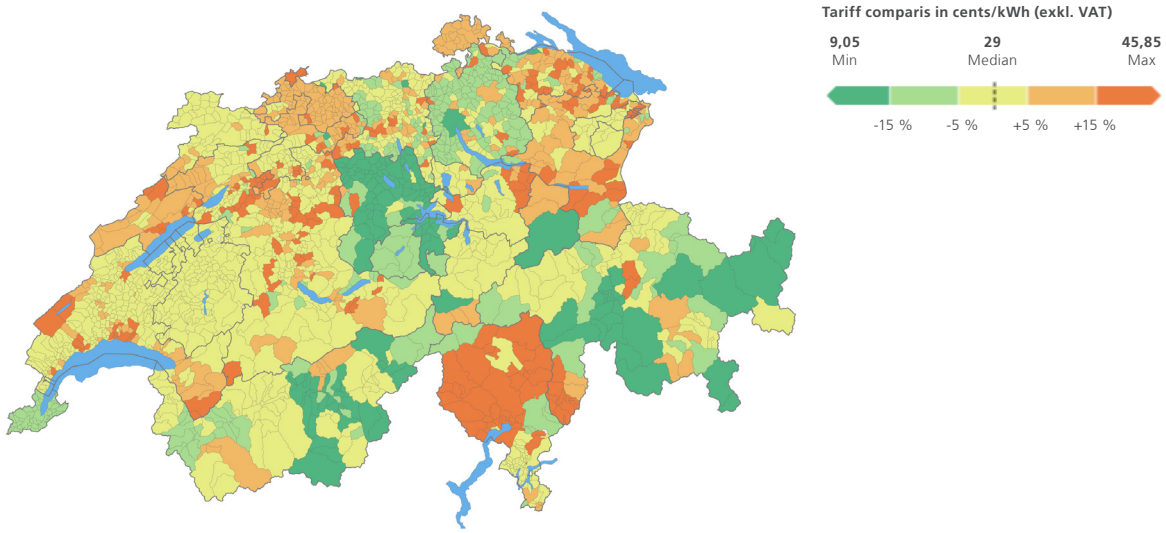


Figure 4: Total costs per kilowatt hour for average households on the standard product in 2025.

Network usage

The effect of network costs (Figure 5) on the electricity bill differs significantly from one commune to the next. Naturally, they have remained stable, with both the median and the extreme values falling slightly.

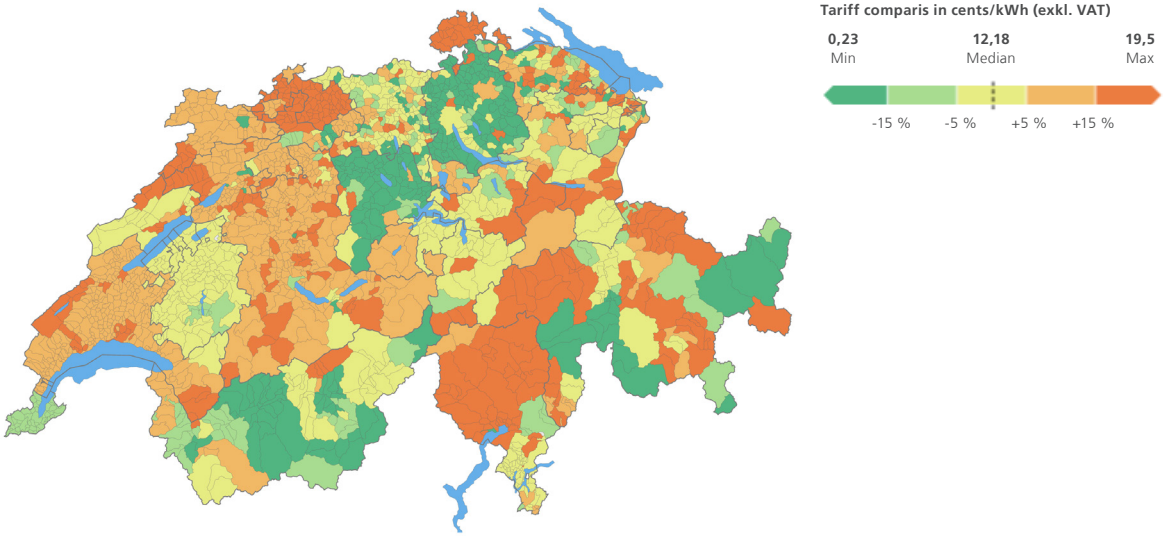


Figure 5: Network costs per kilowatt hour for average households on the standard product in 2025.

Energy

Figure 6 shows the energy costs per kilowatt hour by place of consumption. The impact of the high price phase on the international electricity markets remains clearly evident compared to the previous year. This electricity bill component may fall again in future due to procurement opportunities and practices.

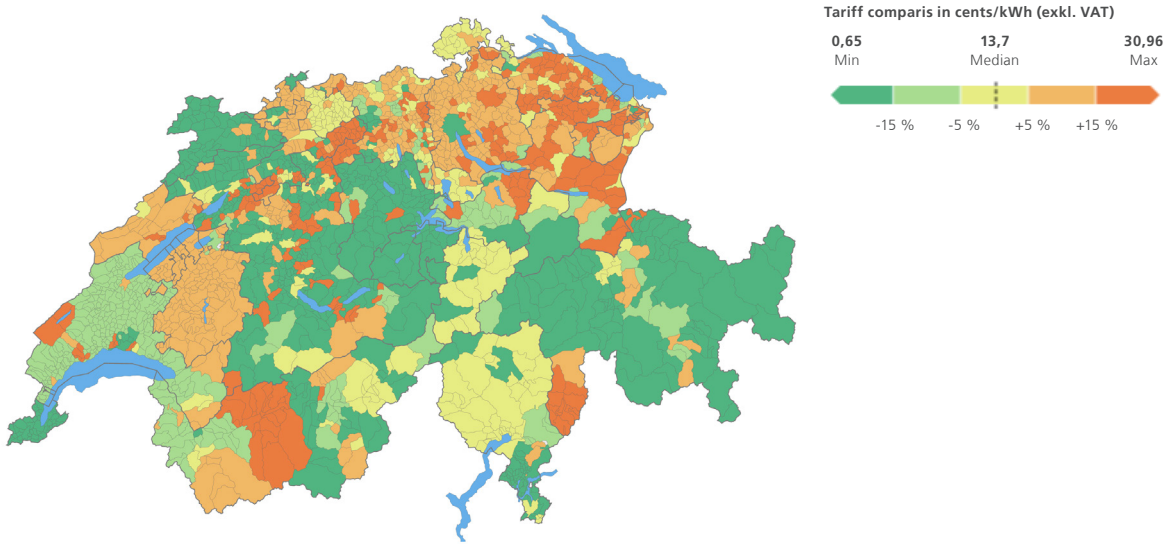


Figure 6: Energy costs per kilowatt hour for average households on the standard product in 2025.

Fees and payments to the state

Figure 7 compares the additional charges levied by the cantonal and communal authorities.[1] They are usually set very high or low to have an effect on electricity costs. ElCom does not exert any control over these.

1 The total amount shown in Figure 4 also contains a standard network surcharge of 2.3 centimes/kWh that applies throughout Switzerland.

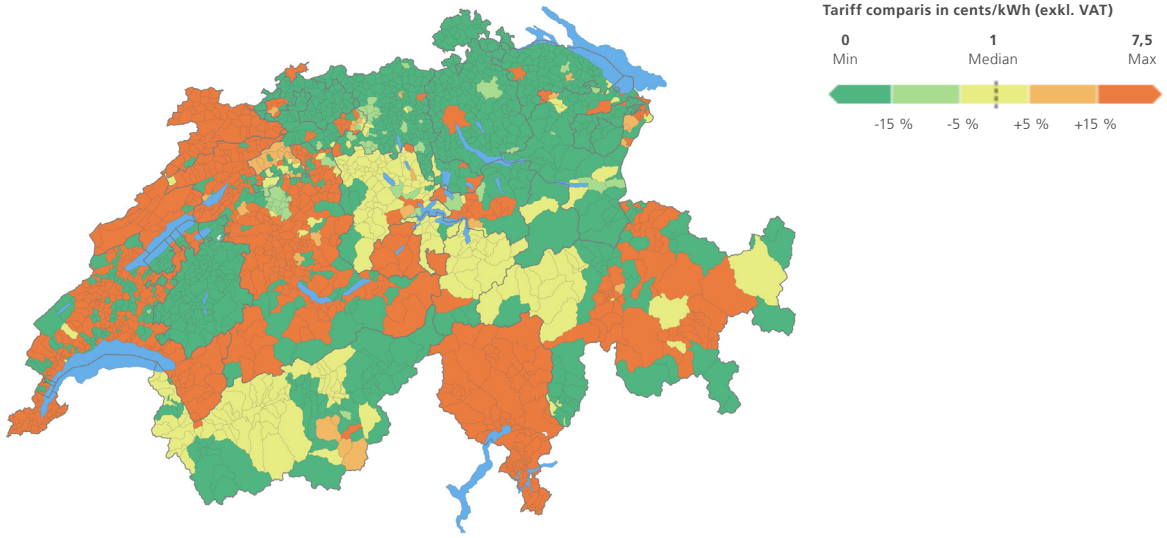


Figure 7: Fees per kilowatt hour for average households on the standard product in 2025.

3.4.3 Communication of tariff adjustments

Network operators must justify tariff adjustments. ElCom once again received numerous enquiries from citizens about tariffs in the year under review; the communication of tariff adjustments was high up on the list of concerns. In response, ElCom issued a directive on the minimum content requirements and form of tariff communication (see Section 3.7). It also produced and published an explanatory video and FAQ on tariffs.

3.5 Revenue structure in the distribution network

Network operators can include the costs for the electricity network and energy procurement or production plus an appropriate level of profit in the tariffs. Any shortfalls not covered by the tariff revenues may be charged for in the subsequent years as negative coverage differentials. Conversely, any excess revenues must be refunded through lower tariffs in future. In 2024, the distribution network operators declared revenues of CHF 13 billion for 2023. The network accounted for CHF 5.3 billion of this amount and energy for CHF 7.7 billion. The ten biggest network operators make up over 44 % of total revenues (based on their offtake).

3.6 Submission of cost calculations and tariffs via EDES

The network operators must submit their tariffs and comprehensive cost calculation data to ElCom annually. This information is submitted via a technical platform which was completely upgraded in the period 2021–2023. Many of the initial problems with EICom's new electronic data delivery system (EDES) were successfully resolved in 2024. The number of requests for corrections and support cases indicate that the network operators are experiencing far fewer issues with the new system and have become accustomed to using EDES. ElCom provided various support options to ensure a smooth process. Great use was made of the tutorials and events at which questions could be asked directly. EDES has laid the foundation for processing network operators' information as part of data analysis.

3.7 Examination of tariffs

While the situation on the energy markets has stabilised considerably, ElCom continued to focus on the high energy tariffs during the year under review. On the other hand, after around 16 years of regulatory activity, the core issues concerning the grid have largely been resolved, either through decisions by ElCom or court rulings. The sharp rise in wholesale electricity prices from the end of 2021 has also led to a significant increase in energy tariffs in basic supply.

ElCom received several hundred enquiries about high electricity tariffs in 2024 including requests for relief measures from energy supply

companies. However, ElCom does not possess any general authority to reduce tariffs. It can only intervene if network tariffs fail to comply with the law. The basic supply tariffs are based on the energy supply companies' production and procurement costs. While market participants with free market access can optimise their procurement strategy, basic supply customers are dependent on the strategies of the energy supply companies. They also contribute indirectly to measures aimed at promoting renewable energies. Fixed pricing for a year prevents short-term price fluctuations but can result in delayed adjustments long-term.

ElCom implemented various regulatory measures during the year under review. It lowered the threshold for the evaluation of costs from CHF 75 to CHF 60 per invoice recipient (CHF 60 rule). Cost reductions of around CHF 85 million a year are expected. Minimum requirements on transparent tariff communication were also issued.

ElCom investigated the impact of market volatility in 2022 and 2023 on Swiss distribution network operators. After carrying out over 100 risk analyses, ElCom conducted an in-depth evaluation of energy procured for basic supply at around 30 companies. A key element of this evaluation was prioritisation of companies' own electricity production in basic supply. Energy supply companies can choose between the provision of electricity based on market prices or fixed pricing. A change in this prioritisation can lead to tariff increases which is why a transparent approach towards customers is required. ElCom determined that numerous energy supply companies initially provided incorrect information about prioritisation and then made corrections at a later stage. A second investigation looked into the procurement strategies of energy supply companies that have increased their tariffs very sharply. This concerned smaller energy supply companies in particular, often due to procurement at unfavourable times. The analysis carried out revealed shortcomings in risk management and procurement processes, but no violations of the Electricity Supply Act (ESA). A third investigation focused on procurement within associated companies to identify excessive billing prices or extraordinary contractual practices. The analysis conducted to date has not provided any indication of illegal practices. The investigations have not resulted in any in-depth cost evaluations so far, but ElCom will continue its monitoring activities and will remain in contact with the energy supply companies concerned. It also produced a report on this matter. This report does not cover the aspects of security of supply or financial stability of electricity producers.

Energy is lost during the transport of electricity, particularly in the form of heat. These power losses are the difference between the electrical energy supplied to the network and the energy received by end users and further distribution customers (offtake less feed-in). The costs of compensating for power losses are recoverable operating costs in accordance with the ESA.

In 2023 and 2024, the Canton of Geneva's 'Cour des comptes' (CdC) carried out a specific investigation into power losses at Services Industriels de Genève (SIG). This concerned the power loss costs claimed by SIG during the period 2008–2021. The CdC requested administrative assistance from ElCom's Technical Secretariat on this matter. SIG had included the power loss costs incorrectly in the tariffs. At the end of the investigation, SIG was requested to refund the excess amounts charged.

In summer 2024, SIG refunded CHF 27 million to end users in its coverage area.

In 2024, ElCom also regularly carried out evaluations of subsequent adjustments to cost calculations or requests for subsequent adjustments of network costs – for example, the retrospec-

tive application of changes to accounting principles over several years or the subsequent amendment of profit in sales. Requests for retroactive cost adjustments at the expense of end users require substantial justification and are generally rejected.

3.8 Sunshine regulation

The Sunshine Regulation uses a transparent and standardised process to compare the quality, cost efficiency and tariffs of distribution network operators. As the name suggest, it aims to shed light in the dark. The direct comparison seeks to create incentives for improvements without laying down specific measures.

ElCom calculates the key figures using data submitted annually by the distribution network operators. This currently includes information on the product range and power outages in relation to services as well as data on network costs and the resulting network and energy tariffs with regard to costs. ElCom checks the key figures periodically.

The public availability of data meets the requirements of the Federal Act on the Use of Electronic Means to Carry Out Official Tasks (EMOTA), and Article 22a ESA now enables detailed disclosure broken down by distribution network operator. The data comes from the existing surveys and from the Federal Statistical Office (FSO). Basic supply providers can decide for themselves whether, how and to what extent they use the scope available to them for improvements. Both minimise the workload for ElCom and the sector.

To date ElCom has published Sunshine key figures in which operators are grouped together for comparison purposes. In 2025, it is making the same calculations available for each distribution network operator to prepare them for the signalling effect and – without naming and shaming them – to give them the opportunity to make corrections and improvements. In 2026, all Sunshine data will then be published in the same way as on the electricity price website of ElCom.

3.9 Metering and flexibility

ESA provisions on metering and use of flexibility revised and newly introduced under the Federal Act on a Secure Electricity Supply from Renewable Energy Sources (omnibus legislation) and the related ordinance amendments had not yet entered into force on 1 January 2025.

However, some specific Electricity Supply Ordinance (ESO) provisions on metering have already been amended. Article 8a was replaced by Article 8a^{sexies}.

80 % of metering systems must be smart meters by 1 January 2028 (Art. 31e para. 1 in conjunction with Art. 8a paras 1 and 2 ESO). ElCom answered numerous enquiries on the smart meter rollout. In particular, these concerned the issue of whether and under what conditions network operators can enforce the installation of smart meters if customers reject them or apply additional individual charges for customers wishing to keep conventional electricity meters. In ElCom's view, there is no right

to retain a conventional electricity meter. If end users refuse installation of a smart meter, network operators may either initiate proceedings or apply additional individual charges. At the request of network operators, ElCom has also initiated proceedings against persons who refuse the installation of a smart meter and to pay additional charges. It has reached an agreement in almost all cases and had to issue decisions in only a few cases

On 3 December 2024, ElCom issued the decisions 233-00103 and 233-00105 on the application of additional charges for customers who refuse installation of a smart meter (Art. 8a para. 3ter ESO). These have not yet entered into effect legally. Additional charges are defined as all costs incurred to enable the consumption of electricity in compliance with the law without the use of a smart meter. In ElCom's view, network operators must not apply punitive charges and must aim to ensure an efficient approach by using synergies with other readings and existing processes. The application of flat-rate charges is permitted. However, the additional charges must be clearly indicated and justified. End users have no right to take their own readings. Network operators may nevertheless choose to accept them.

In the case on which the decisions are based, the network operator applied additional charges of CHF 90 annually per meter for the following costs: 15 minutes of preparation work (providing instructions for staff), 30 minutes of travel time, 10 minutes to access the meter and take the reading and 10 minutes of administrative work to record the readings and update the meter data. ElCom decided that these costs constitute additional expenses in accordance with Article 8a para. 3ter ESO and that individual billing of CHF 90 per year is permitted

An appeal was made against an EICom decision concerning the legal validity of the data processing required for smart meters (Decision 233-00093 of 5 December 2023). The court ruling is still pending. ElCom also repeatedly received enquiries on potential health risks posed by electric radiation from smart meters and the so-called customer interface (Art. 8a para. 1 let. a No 3 ESO). This enables end users to view their meter data in real time in a standard international data format. However, what constitutes a standard procedure has not yet been defined. In terms of hardware, various communication interfaces are used for implementation, while the data formats are conventional and standardised (e.g. MBus). However, the lack of a standard and complete definition for software has resulted in the smart meters deployed using a range of different data formats. This makes the customer interface more difficult to use for customers and service providers other than the network operators.

The above-mentioned amendments to the ESA concern use of flexibility in addition to metering. Flexibility refers to influence over the feed-in of electricity, its storage or consumption by network operators or other actors. Smart control systems aim to provide the market and network with the flexibility required to balance out the fluctuations of renewable energy. The owners of the flexibility are the end users, producers and storage facility operators. This means the network operators and other third parties may only use the flexibility with their consent (Art. 17b para. 3 ESA). If network operators wish to install and use smart control systems, they must obtain consent and provide remuneration (Art. 8c para. 1 let. a–c ESO). Network operators may only install a smart control system without consent to prevent a direct, significant threat to secure network operation and may also use the system without consent if such a threat occurs (Art. 8c paras 5 and 6 ESO).

A network operator requested the installation of a control unit for the connection of a photo-

voltaic system that would enable the system's output to be controlled remotely and set to 100 % or 0 %. In its decision 212-00402 of 4 April 2024, ElCom ruled that the control unit fell under the definition of a smart control system and that a potential threat was sufficient for installation without consent. However, installation without consent must remain the exception and the network operator must be able to prove that the requirements for waiving consent are met. Taking account of the discretion afforded to network operators in relation to their responsibility for determining network planning principles (Art. 9b para. 1 ESA) and the special circumstances in relation to photovoltaic systems, ElCom decided that the network operator could install the control unit without the producer's consent. However, it may only use it without consent in rare exceptional cases not related to normal operation. If the network operator wishes to use flexibility to resolve foreseeable situations that arise during normal network operation, it must first obtain consent for such usage and provide remuneration. An example of such a scenario is the spikes in voltage due to high levels of feed-in from photovoltaic systems on sunny days.

All of the decisions referred to in this section can be found on ElCom's website.

3.10 Feed-in remuneration

The Federal Administrative Court issued a judgement (A-2790/2021) on feed-in remuneration in the summer of the year under review: unless the producer and network operator reach agreement, remuneration for the feed-in of renewable energies is only based on the procurement costs avoided by the network operator and not on the production costs. The Court ruled that Article 12 paragraph 1 of the ESO, according to which the feed-in remuneration is also based on the production costs, does not comply with the law.

Under the new Electricity Act, remuneration for the electricity fed in will from 2026 be provided at a standardised price applicable throughout Switzerland unless the producer and network operator agree otherwise. This remuneration will be based on the market price at the time of feed-in, which is determined quarterly. The Federal Council will set minimum levels of remuneration for installations with an output of up to 150 kW. Some network operators expected the new provisions to enter into force on 1 January 2025 and are already providing feed-in remuneration based on the market reference price. As producers and network operators can freely agree on this remuneration and the law only applies in the event of disagreement, the early adoption of this approach is permitted.

4 Market surveillance

DIn 2024, ElCom's Market Surveillance section focused on the development of prices for secondary control energy (SCE). As a short-term corrective measure, they implemented a price cap on certain SCE bids.

4.1 Market price developments on the wholesale market in 2024

European wholesale markets trended sideways in 2024 after a sharp fall in prices in 2023 and following the peak of the energy crisis in 2022. The downward trend on the futures markets continued initially before a reversal set in. Futures prices generally continued to follow the development of gas-fired power plant costs. However, the high level of availability of the French nuclear power plants saw prices fall on both the futures and spot markets. The futures market nevertheless remained well above the pre-crisis price level overall in 2024.

In 2024, the high production levels of Swiss hydro-power plants and low prices in France had a major impact on the spot market. This disrupted the usual foreign trade patterns, while exports to Germany rose. The change to border flows briefly led to a reduction in export capacity to Germany and more frequent export restrictions on the Italian border. The high level of hydropower production resulted in a decoupling of Swiss electricity prices from those of its neighbouring countries, particularly in July and August 2024, with export capacity being fully utilised. This meant lower prices in Switzerland during this period.

In addition to these fluctuations, there were several other notable events to report. The day-ahead auction on the EPEX spot market was decoupled from the SDAC mechanism (single day-ahead coupling – coupled auction of various trading platforms for day-ahead within much of the EU and Norway) on 25 June 2024. This resulted in very high surcharge prices for the following day on the platform. On 14 July 2024, the Swiss spot price hit a record low of –EUR 428/MWh after a high level of solar feed-in and low consumption in an hour.

Electricity prices in Germany attracted a great deal of attention after low levels of feed-in from renewable energy due to a so-called dunkelflaute on 12 December 2024 which saw them climb to EUR 936/MWh. The Swiss electricity price did not follow suit, standing at EUR 264/MWh in this hour.

4.2 Market transparency in wholesale electricity trading

In 2024, ElCom – as a member of the Council of European Energy Regulators (CEER) – once again participated in European cooperation in the Market Integrity and Transparency Working Group (CMIT). A key task was the design of a comprehensive survey looking at the activities of the individual EU regulators in relation to the implementation of the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) II. This survey provides a valuable overview of market surveillance activities in the EU.

During the quarterly CMIT meetings, ElCom reported on the latest price trends for various services and shed light on the reasons behind them.

Discussions with the energy regulators of neighbouring countries and a meeting with the Agency for the Cooperation of Energy Regulators (ACER) were also on the agenda.

The following topics were discussed:

- The effects and changes related to the entry into force of REMIT II for Switzerland and Swiss market participants
- Measures to manage high energy prices in the respective countries
- Analysis and discussion of current market events

Coordination meetings with relevant actors, such as FINMA, SIX, EPEX Spot and EEX, were also held. These meetings enabled coordination and in-depth discussions of key market issues and regulatory measures.

4.3 Market surveillance – facts and figures for 2024

The number of market participants registered with ElCom has continually increased after the introduction of the REMIT Regulation in 2015 and the subsequent implementation of Article 26a^{bis} of the Electricity Supply Ordinance for Swiss electricity companies trading on EU markets. As of 31 December 2024, a total of 101 market participants were registered with ElCom (Figure 8). This is eight more than in the previous year. Five further registrations are currently being processed. No participants deregistered over the course of the year. A full list of registered market participants can be found on ElCom's website in the 'Market surveillance' section.

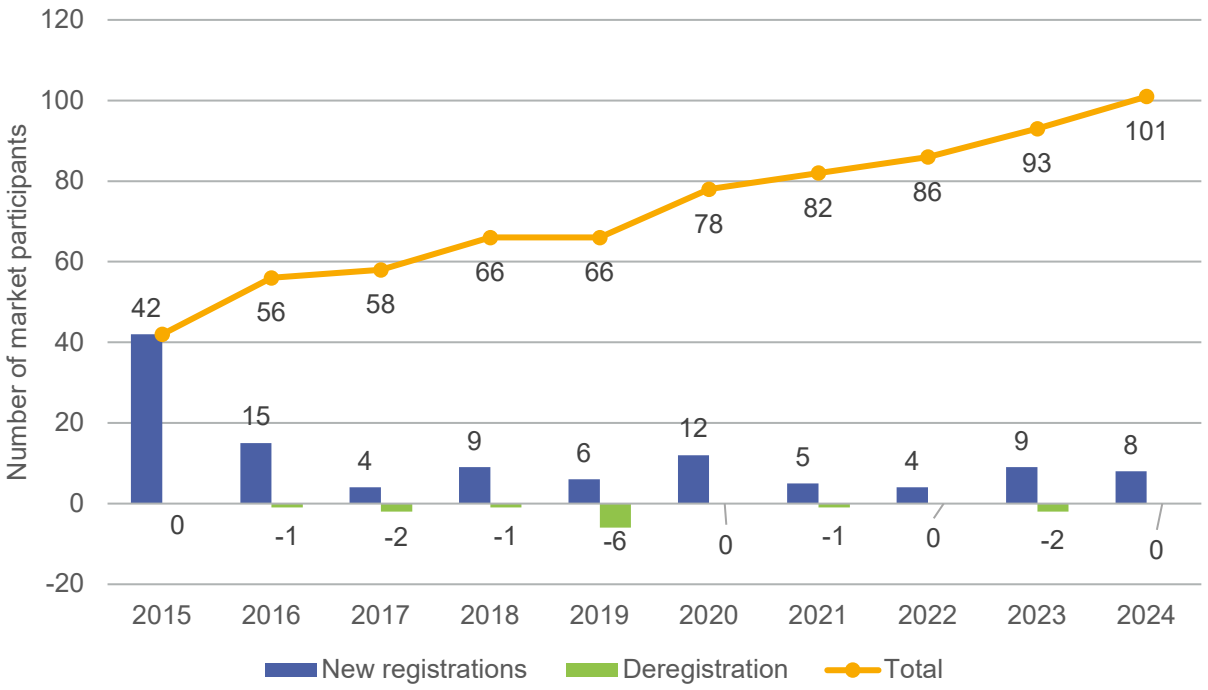


Figure 8: Development of the number of market participants registered with ElCom

In 2024, the information on the energy trading transactions subject to reporting obligations of the relevant market participants was once again exclusively transferred via the nine registered reporting mechanisms (RRM) connected to ElCom's IT systems. Two additional RRMs are also currently in the process of being connected which is scheduled for completion in 2025.

As in previous years, the fundamental data and the insider information published was sent via specially created interfaces. ENTSO-E and the EEX transparency platform were used to send this data to meet the relevant transparency requirements.

The number of market participants registered with ElCom has risen continuously since the introduction of the reporting obligations at the end of 2015. The amount of data sent via the RRMs on behalf of the market participants has also increased.

The majority of the reports submitted related to standard contracts once again in 2024. The trend was even clearer in the year under review: with over 751 million transactions (trades and orders), 654 million more reports were sent than in the previous year, representing an increase of 674 %. Reported orders alone accounted for 706 million – an increase of 838 % compared with the previous year. By contrast, the number of reported trades 'only' doubled compared with 2023.

This development is primarily explained by the increasingly frequent use of automated trading algorithms on the market with continuous trading. A trend towards increasingly short-term trading has also been observed.

Figure 9: Development of the number of transactions reported, order and trades (left scale), cumulative total (right scale)

This development can also be observed when comparing short-term trading with forward transactions for standard contracts. Short-term transactions accounted for 95 % of all reported standard contracts compared with 84 % in 2023.

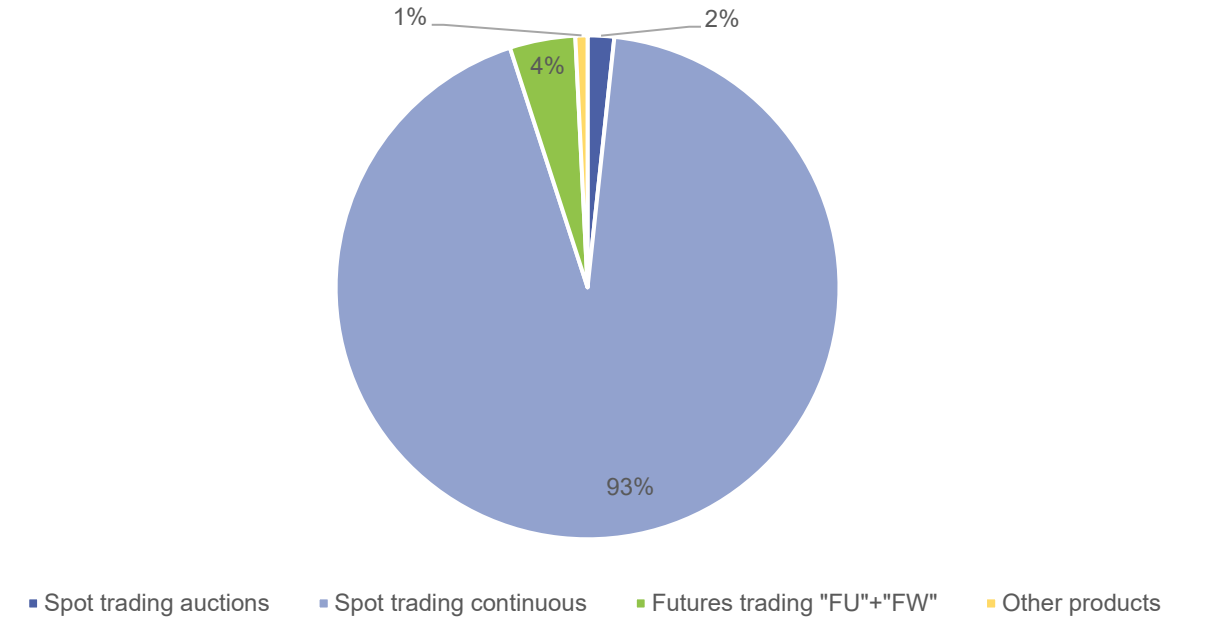


Figure 10: Breakdown of standard contracts by spot and futures trading

Fundamental data once again played a key role in the production of various reports in 2024, including the report on security of supply for the Swiss Federal Office of Energy (SFOE) as well as the weekly spot and futures market reports. These publications aim to improve transparency for market participants (both producers and consumers) and clearly set out market developments.

The availability of this data is important to the quality of ElCom's analyses and publications. The amount of fundamental data sent rose only slightly in 2024, while the volume of insider information increased five-fold. With around 900,000 more fundamental data and 37,000 more insider information reports than in 2023, this equates to an increase of 20 % and 539 % respectively. This increase is a result of backloading carried out at the start of the year.

ElCom's Market Surveillance section uses a wide range of data for its monitoring and surveillance activities. This includes settlement prices for electricity, gas and CO_2 of EEX and EPEX SPOT, coal prices of Refinitiv and information from European Commodity Clearing (ECC) and Gestore Mercati Energetici (GME), which are used for reference in reports and analyses. Data on the fill levels of Swiss reservoirs, power plant availability in neighbouring countries and information from public sources – such as MeteoSwiss – is also used. This data supplements market surveillance activities and makes a vital contribution to the quality and informative value of the analyses produced.

4.4 Analysis of price development in August 2022

Forward product prices rose extremely sharply on the electricity market over the course of 2022. The annual Swiss baseload product for 2023 reached a record high on 26 August 2022 with a closing price of EUR 1,081/MWh.

In light of these extraordinary price trends, ElCom analysed the electricity price level of forward products in Switzerland over this period to determine whether this price level was justified or not. It carried out both a fundamental evaluation of market fluctuations as well as an analysis of the relevant trading activities of market participants.

However, it is important to note that based on Article 26a^{bis} of the ESO, only the transactions executed by Swiss market participants on the European markets are reported to ElCom. Transactions (trades and orders) on the Swiss market have not been reported to ElCom – with the exception of those executed by the three biggest Swiss energy companies – since the entry into force of the Federal Act on Subsidiary Financial Aid to support Systemically Critical Companies in the Electricity Industry (FiRECA).

The data collected enables analysis of the behaviour of these companies on the Swiss and foreign markets during this period – mainly in August 2022 – and the effects of the increase in prices on their strategies. This analysis also enables the issue of price volatility on a market with low liquidity levels, like the Swiss market, to be explored. In particular, the activities of Swiss market participants on the various future and forward markets were examined as well as the bidding behaviour and transactions actually executed.

This analysis has almost been completed and will be published in a report in 2025.

4.5 Analysis of secondary control energy

The analysis carried out by ElCom's Technical Secretariat indicate there is no fundamental justification for the significant increase in secondary control energy (SCE) prices since mid-2022 and, in particular, the sharp rise since spring 2024. This suggests the market mechanism for SCE is working to only a certain extent.

In response, ElCom has decided to assess all possible measures. It has introduced a temporary, differentiated price cap on a contractual basis as a short-term corrective measure. This has been set at EUR 1,000/MWh and only applies to binding SCE bids, i.e. SCE provided in conjunction with secondary control reserves (SCR). The agreement between Swissgrid and the system services managers enters into force in early March and applies until the end of 2025. The price and bid cap is only a short-term, temporary corrective measure.

Alternative measures are required medium and long-term to improve the efficiency of the SCE market and to reduce demand for control energy and control energy.

SCE is procured by the transmission system operator Swissgrid to offset short-term imbalances on the grid in order to maintain system stability. The energy and underlying capacity must be procured based on a market-oriented, transparent and non-discriminatory procedure in accordance with Art. 20 para. 2 let. b ESA and Art. 22 para. 1 ESO. Swissgrid holds tender procedures for this purpose.

4.5.1 Background

Until mid-2022, flat-rate compensation was provided for the SCE procured by Swissgrid based on a 20 % surcharge or discount on the spot market price. A tender procedure was only held for the related SCR. After the changeover from the Swiss procurement system to a harmonised design (PICASSO) provided for in the EU in mid-2022, a tendering model was also introduced for SCE under which SCE compensation is based on individual bid prices. After the change of procurement system, the SCE prices – and the related surcharges and discounts on spot market prices – increased significantly and, in turn, so too did SCE costs. In early summer 2024, SCE prices soared and subsequently re-mained at a high level. The following figures illustrate the increase in SCE activation prices since mid-2022, when the procurement system was changed, and the sharp increase from spring/summer 2024. Figure 11 compares simulated SCE surcharges on the spot market price under the old system (i.e. spot market price plus 20 %) with the effective surcharges on the spot market price which have been paid since July 2022. Abbildung 12 illustrates the related costs for SCE procurement, taking account of the amounts of energy used (please note: only the price and cost surcharges for positive SCE (SCE+: additional feed-in) on the spot market price are shown).

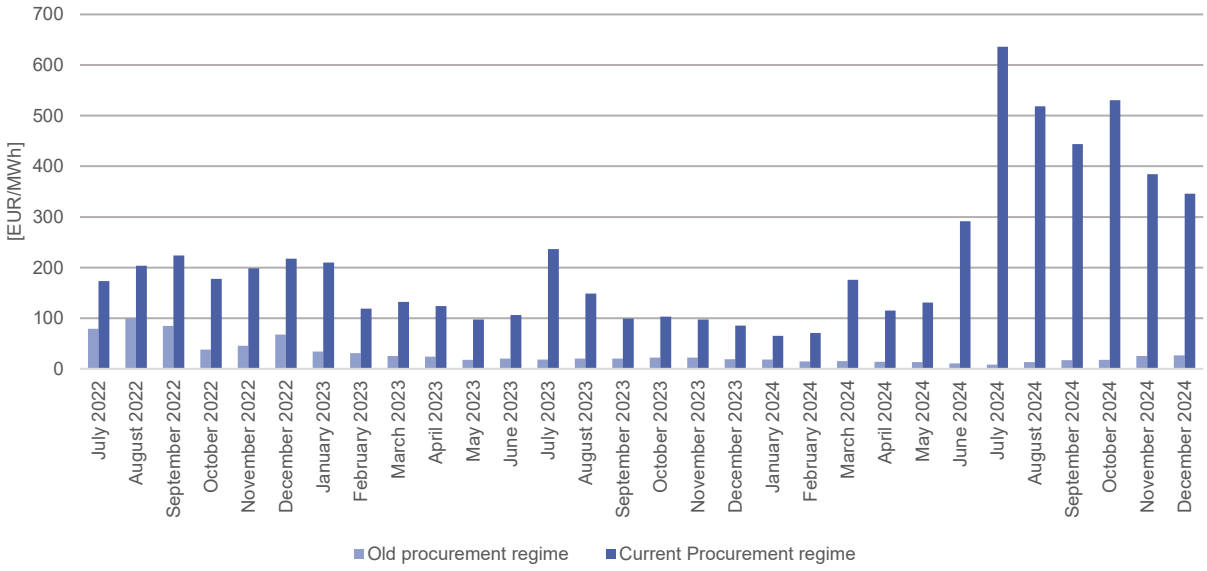


Figure 11: Comparison of the average monthly prices for using SCE+ (shown as surcharges on the spot market price in EUR/MWh) based on the effective surcharges under the current procurement system in relation to the simulated surcharges under the old procurement system (spot market price plus 20 %).

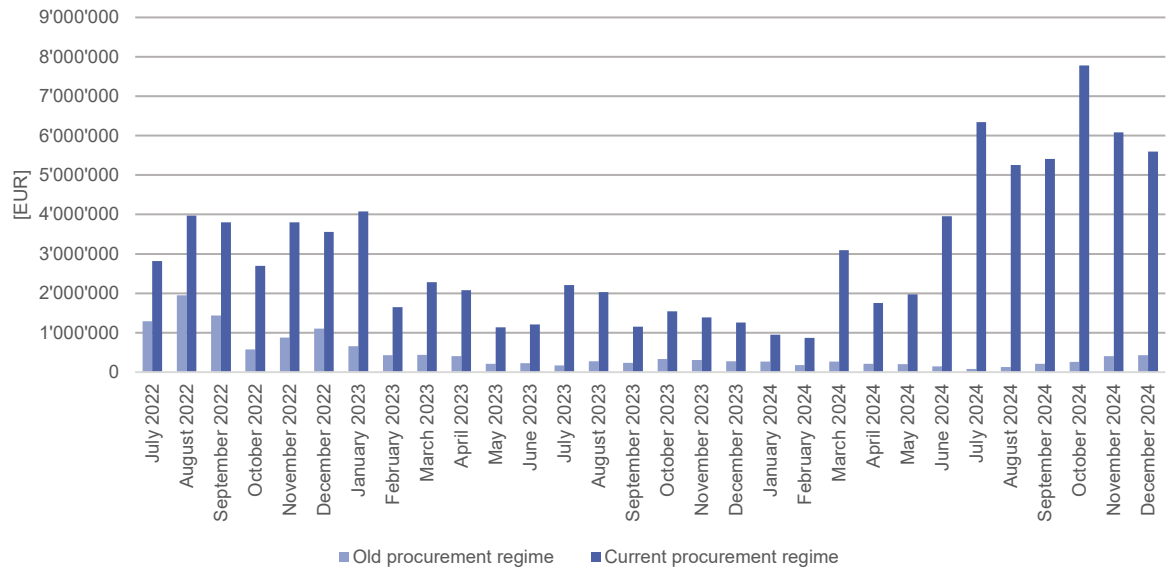


Figure 12: Comparison of the absolute monthly costs for the activation of SCE+ (shown as surcharges on the costs based on the spot market price in EUR/MWh) under the current procurement system in relation to the simulated costs un-der the old procurement system.

The development of the monthly average prices of SCE is shown in Figure 13.

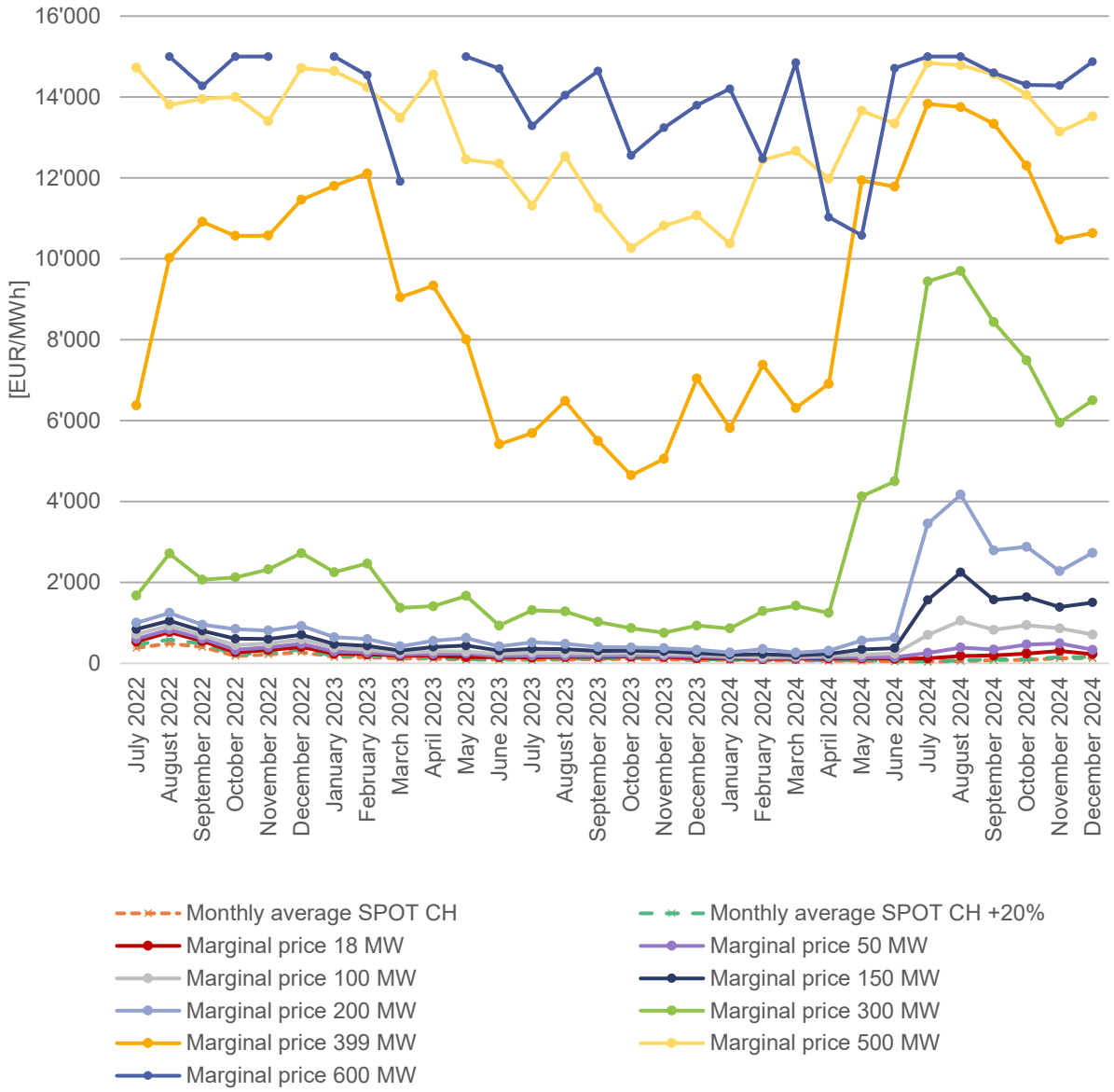


Figure 13: Marginal prices for SCE+ (up to 600 MW).

A sharp increase in imbalances on the Swiss control zone has been observed recently. As a result, Swissgrid has used more control energy. This led to higher SCE costs at the expense of end users. Greater imbalances could present a liquidity risk for market actors and pose a threat to market stability.

4.5.2 The Technical Secretariat's approach

In view of its general responsibility for enforcing electricity supply legislation and supervisory authority over the procurement of SCR and SCE, ElCom may intervene if findings indicate that procurement is not being carried out in a market-oriented way and is therefore inefficient. It is important to note that SCE prices have a direct effect on balancing energy prices and consequently also on electricity prices for end user.

The increase in SCE prices and surcharges on the spot price led to the submission of enquiries to the Technical Secretariat in early 2023, prompting it to carry out an analysis of price-setting for SCE. Further analysis was conducted due to the extremely sharp price rises which began in early summer 2024. The Technical Secretariat concluded that the significant increase in surcharges on the spot market price for SCE since mid-2022 and, in particular, the further rise in SCE prices since spring 2024 cannot be justified by fundamental factors. It has concluded that competition on the SCE market is working to only a limited extent and SCE procurement is not producing market-oriented results. The Technical Secretariat published a notification on 31 October 2024.

In early October, the Technical Secretariat informed the system services managers about its analysis and presented a proposal on a short-term corrective measure using a contract-based price cap for SCE. It also requested the system service managers (SSM) to provide a written statement on the reasons for the increase in SCE prices and to indicate their willingness to accept a price cap implemented on a contractual basis between Swissgrid and the SSMs.

The Technical Secretariat evaluated the SSMs' responses, carried out further analysis – also based on their feedback – and defined a differentiated model for a price cap on SCE

4.5.3 Introduction and structure of the SCE price cap

The temporary SCE price cap is a limited and differentiated form of intervention. The cap only applies to supply-side prices for the delivery of energy (SCE) and does not affect the offered capacity (SCR) or tertiary control (TCR and TCE). The price cap only applies to some of the SCE bids, i.e. binding bids. Most bids fall into the binding category. A contract has already been awarded for the offered capacity (SCR) and the system service managers are obliged to make the energy available. The power plant operators have already covered most of their opportunity costs through SCR offsetting. However, the cap does not apply to optional bids (which are not tied to SCR premium).

The price cap for binding SCE bids is now set at EUR 1,000/MWh (previously EUR 15,000/MWh) under the agreement. As a preparation period was required for technical implementation, the cap did not enter into force until calendar week 10 in 2025 (3 March 2025). It is also limited to the end of calendar week 52 in 2025.

4.5.4 Implementation of the price and bid limits

The Technical Secretariat then presented the temporary supplementary agreement based on these key values concerning the introduction of a cap to the system service managers for signing. Swissgrid and all the system service managers – with the exception of one market actor – have now signed the supplementary agreement. This means it has entered into force. To ensure equal treatment and market-oriented and efficient procurement of SCE, Swissgrid terminated the framework agreement with the system service manager that refused to sign the agreement. It will have the opportunity to sign a framework agreement with Swissgrid for participation in secondary control energy (including the supplementary agreement) at any point.

The Technical Secretariat regards the temporary and differentiated price cap as a necessary and proportionate measure. This differentiated cap structure is expected to have a substantial effect on SCE costs and ultimately ease the cost burden on end users, particularly in industry. The differentiated approach also minimises any risks or distortions as the cap does not generally restrict the level of the SCE price. The price cap can also be adjusted in the event of extraordinary market volatility.

4.5.5 Further measures required

The Technical Secretariat believes the introduction of the price cap is a necessary short-term, temporary corrective measure. However, additional or alternative measures are required medium to long-term to improve the efficiency of the SCE market and reduce demand for control energy. Improving the efficiency of the SCE market primarily involves lowering market entry barriers by providing simplified conditions of participation, ensuring more efficient processes and increasing liquidity and competitiveness on the market. In this regard, ElCom – in collaboration with the SFOE – is assessing whether amendments to the legal framework are required and appropriate, such as making it easier for alternative providers of negative control energy to participate in the SCE market. The measures to improve the balancing of the control zones include increasing the quality of data and forecasting, such as the specification or adjustment of balance management processes or introduction of better incentive mechanisms. For example, the latter could be achieved by updating the balance energy price mechanism.

4.6 Liquidity monitoring in accordance with FiRECA

Since the introduction of FiRECA in 2022, systemically critical companies have submitted the data required under Article 19 on a monthly basis, but the formats and content used vary. These variations are due to the different types of company-specific, internal data available. ElCom's experiences indicate that additional information is required to implement FiRECA and to further improve liquidity monitoring. In 2024, EICom held both bilateral discussions and joint coordination sessions with all relevant systemically critical companies. The aim was to reach agreement on the data to be submitted and to work towards standardised data formats.

A key milestone was reached in October 2024: the systemically critical companies began to transfer the requested data to ElCom and the SFOE in the agreed format. However, there are still differences in terms of the content of the data submitted which requires further harmonisation and stabilisation. ElCom aims to incorporate this data into a new, comprehensive report to improve transparency and efficiency in the implementation of FiRECA on a long-term basis.

4.7 Outlook in relation to new legal provisions

FiRECA, which acts as a backstop, entered into force on 1 October 2022. Originally introduced in response to the extreme price rises in summer 2022, it only applies until 31 December 2026. The aim is to create a permanent regulation from 2027, as required by the Herzog motion 22.4132.

A key element of the succession regulation is the Federal Act on Supervision and Transparency on the Energy Wholesale Trading Markets discussed in Parliament. This aims to increase transparency in energy trading, improve supervision and strengthen system stability and security of supply.

From March to June 2024, the Federal Council carried out a consultation procedure on amendments to the ESA which address the specific requirements that systemically critical companies must meet. Liquidity requirements for systemically critical companies will be revised to ensure a balance between the effectiveness of the provisions, the workload for the companies concerned and ElCom and the feasibility of supervision. The bill also includes specific reporting obligations, requiring regular reporting to ElCom on the liquidity, equity and debt situation to ensure transparency.

4.8 Impact of REMIT II on Swiss market participants

After the entry into force of Regulation (EU) 2024/1106 of 11 April 2024 (known as REMIT II) amending Regulations (EU) No 1227/2011 (REMIT) and (EU) 2019/942, ACER made changes to the registration of market participants which are largely reflected in the European register (CEREMP). This means similar changes are required to the registration with ElCom of market participants whose head office is in Switzerland. They mainly concern information on algorithmic trading and direct electronic access (DEA). The market participants concerned must now indicate whether they use or provide these services.

Following the update at ElCom, the indication of the platform for publication of insider information is also mandatory. Swiss market participants are now strictly obliged to indicate the platform on which they publish their insider information. In particular, this generally includes unscheduled power plant outages.

Another change made after REMIT II requires market participants resident or legally established in third countries to designate a representative in an EU member state. This representative must be authorised to act on behalf of the market participant to ensure efficient and timely cooperation with the relevant national regulatory authority (NRA) and compliance with decisions or requests for information made by them or by ACER. This regulation applies to all market participants with their head office in Switzerland. The representative in the relevant EU country must be entered in ElCom's registration tool.

In accordance with REMIT, the organised marketplaces (OMP) or third parties obliged to carry out reporting duties on their behalf must now report all trading data directly to ACER. This represents an extraordinary situation for market participants with their head office in Switzerland. They previously received the data on their activities on the OMP from the OMP and could then transfer the relevant data to ACER and ElCom simultaneously via the RRM of their choice. Following the change, Swiss market participants are now unable to meet their legal reporting obligations towards EICom in accordance with Article 26abis ESO without the support of the OMP. ElCom has called for the OMPs to continue preparing the mandatory reporting data in the same way, at the same time and in the same format as before the change to the reporting procedure and making it available to Swiss market participants as before. The market participants organise the subsequent transfer of the data to ElCom via their RRM themselves.

EICom will offer support for OMPs considering providing Swiss market participants with a service for direct reporting to ElCom with the connection to ElCom's system. As the Implementing Acts for REMIT II have not yet been defined and introduced, further changes and adjustments are expected over the course of 2025.

5 Security of supply

Switzerland is sometimes referred to as the reservoir of Europe. A significant portion of the country's electricity comes from hydropower. The image depicts Lake Gelmer in the Bernese Oberland.

5.1 Introduction

Under the Electricity Supply Act (ESA, Art. 22 paras 3 and 4), ElCom is responsible for monitoring security of supply. If there are any indications of a significant threat to domestic supply in the medium or long term, Article 9 ESA stipulates that ElCom must propose suitable measures to the Federal Council. These may concern efficient electricity use, the procurement of electricity or upgrading and expanding the electricity networks. Security of supply is assured if the required quantity of energy is available at the applicable quality standard and at reasonable tariffs across the entire electricity grid at all times.

As in previous years, the conflict in Ukraine had a negative impact on security of supply in the year under review. Price levels on the European and Swiss electricity markets remained high, while the market and supply situation was generally still quite tight. In view of this situation, ElCom continued to monitor the supply situation very closely, including as part of the security of supply working group.

5.2 Review of winter 2023-24

The political tension triggered by Russia's invasion of Ukraine, including sanctions in the energy sector, caused great turmoil on the (European) energy markets in 2022. The reduction of energy imports from Russia due to sanctions imposed resulted in substantial price volatility and uncertainty on the energy markets. Throughout Europe – including in Switzerland

– measures were taken to secure energy supply, particularly for winter. The measures taken and also implemented in 2023–24 to shore up security of supply are set out below. The list focuses on measures in which ElCom was involved either directly or indirectly.

5.3 Incidents over the course of the year

The security of supply working group led by ElCom met continuously over the summer to closely monitor the electricity supply situation – which continued to be reflected in the high price level – and its development.

The gas supply situation was very satisfactory, not least thanks to extensive improvements across liquid gas supply chains and planned provisioning in EU gas storage facilities. There is nevertheless still uncertainty over gas supply.

The normal availability of the Swiss and French nuclear power plants contributed significantly towards the easing of the situation. However, persistently high summer temperatures can also affect operations at Swiss nuclear power plants if production has to be reduced or suspended to avoid high river water temperatures. During the summer of 2024, ElCom constantly monitored the situation at the Beznau nuclear power plant. The weather conditions meant that production had to be restricted only briefly due to temperatures in the year under review.

To improve energy supply for winter, the opportunity to temporarily increase the voltage on the Gemmi line from 220 to 380 kV was made available on the transmission network in the year under review in addition to the various production reserves (see the following section). However, this measure may only be used in extreme emergency situations.

If Switzerland provides neighbouring countries with support to resolve network problems during the winter half of the year through frequent positive redispatch activations at Swiss power plants, this can have a negative effect on the storage fill level in Switzerland. In total, around 40 GWh of electricity (5 GWh of which on 16 December 2024) was produced for this purpose in Switzerland between October and December 2024 (see Figure 21, Section 7.1). This energy, which equates to around a quarter of Switzerland's daily consumption, flowed directly abroad. This system of mutual support between neighbouring countries and their transmission system operators increases the resilience of the region's electricity system and also provides Switzerland with support if required.

Significant imbalances have occasionally occurred in the Swiss control zone in the past. However, the trend has increasingly developed over the years and was very pronounced in 2024. On 22 April 2024, for example, lots of the Swiss balance groups all had a low level of energy in their balance portfolios at the same time, creating an imbalance in the Swiss control zone of up to 1,400 MW. Production from photovoltaic plants throughout Switzerland was also much lower than expected on this date. The activation of much control power resulted in the use of very expense control energy. The use of control energy on this date cost around CHF 7.1 million[1].

Figure 14[2] provides an overview of the long-term trends in imbalances. The following aspects are of particular note: Firstly, a long-term trend towards higher and higher imbalances has emerged with increasingly flatter and broader distribution and is continuing. Secondly, the extreme events are clearly evident and attracted lots of media attention again in 2024, but they

do not really change the fundamental assessment of the situation much as the long-term trend can still be observed even without these extreme events. All imbalances must be offset by using control energy (secondary and tertiary control energy), international cooperation initiatives, such as the Frequency Containment Reserve (FCR, primary control energy), and imbalance netting (IGCC project). An initial clear consequence of the high level of imbalances is greater demand for and use of control energy.

1 Swissgrid charged the balance groups around CHF 8.5 million for balance energy based on the applicable mechanism. The difference between these amounts (CHF 1.4 million) is incorporated into the tariff calculation by Swissgrid in accordance with the ESA and is used to cover the costs incurred in relation to the provision of control power by the power plant operator.

2 Dilt shows the normal distribution adjusted to the control zone's measurement data. A positive position means the control zone is long (i.e. more energy is produced or imported than consumed or exported), whereas a negative position means that it is short.

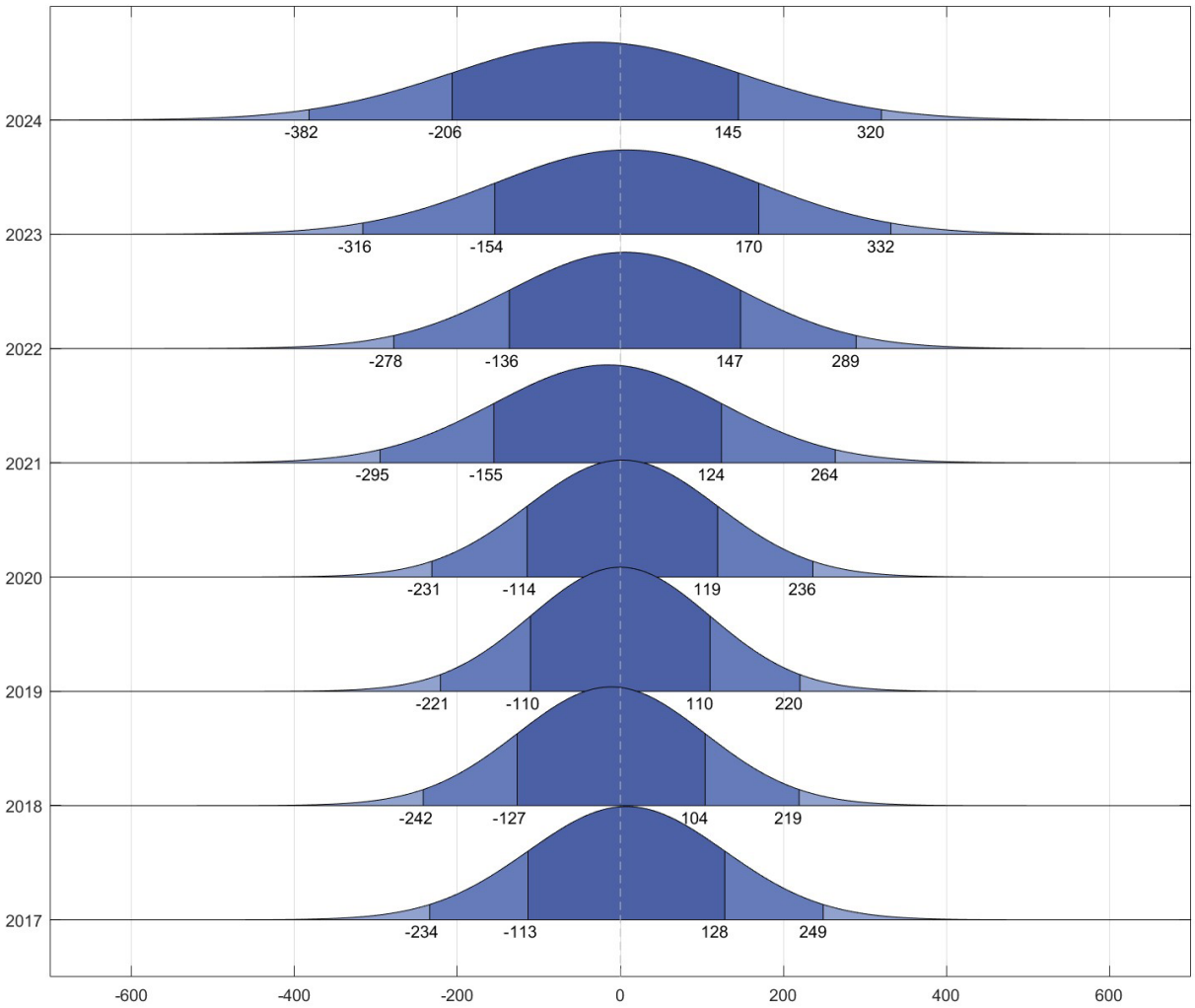


Figure 14: Distribution of all system imbalances in the Swiss control zone in MW. The distribution is shown in different colours indicating the standard deviation (σ) double standard deviation (2σ) and adjusted normal distribution.

Further observations can be made based on analysis of the data. The mean value has fluctuated around zero over the course of the years (see Table 2). The relatively high negative value for 2024 (μ_{H1_2024} = –30,9 MW) should be noted and monitored.

		2024	2023	2022	2021	2020	2019	2018	2017
Mean (μ)	MW	–30,9	7,9	5,6	–15,7	2,4	–0,3	–11,3	7,4
Standard deviation (σ)	MW	175,5	161,9	141,9	139,6	116,9	110,2	115,3	120,7

Table 2: Imbalances, mean value and standard deviation of the distribution in MW.

5.4 Reserves

In order to prevent an electricity shortage, particularly towards the end of winter, the Federal Council already initiated the construction of a reserve power plant in Birr (AG), the provision of additional reserve power plants in Cornaux (NE) and Monthey (VS) and emergency generators as supplementary reserves for winter 2022–23. It also tasked ElCom with creating a hydropower reserve. This measure was not relinquished for the winters of 2023–24 and 2024–25. ElCom has governed use of the reserves in the directives 5/2023 and 6/2024 concerning the 'Order on access of the power plants for the winter reserve'.

5.4.1 Hydropower reserves

For winter 2024–25, ElCom approved the procurement of a hydropower reserve of 300 GWh ± 100 GWh for the period from 1 February 2025 to 12 May 2025 with the Directive 5/2024 Eckwerte für die Errichtung einer Wasserkraftreserve im hydrologischen Jahr 2024/2025 (Key figures for the establishment of a hydropower reserve in the hydrological year 2024–25). Procurement was carried out in three staggered partial tender procedures in summer 2024. The first round was successfully completed on 24 July 2024. Contracts were awarded for 63 GWh. The cost of the first round came in at EUR 3.3 million. The second round for the hydropower reserve was completed on 14 August 2024. Contracts were awarded for an additional 82 GWh, costing EUR 5.6 million. In the third and final round of the tender procedure held on 28 August 2024, contracts were awarded for 105 GWh. The cost of this third round was an additional EUR 7.6 million. The capacity procured from the three rounds totalled 250 GWh at a total cost of EUR 16.5 million.

5.4.2 Additional reserves

The three reserve power plants have a total capacity of 326 MW, which was available again for winter 2024–25. ElCom played a leading role in supporting the relevant testing in February 2024. Contracts with pooled emergency generators with an output of 266 MW were also concluded in 2023–24, which are also available in emergency situations in accordance with the order on access.

5.5 Outlook

Even though prices remained at a high level over the year under review, security of supply was always guaranteed. As in the year under review, escalation of the geopolitical situation in Ukraine remains an unpredictable factor. If a shortage of gas or disruption to electricity supply were to affect all of Europe, this would probably have a negative impact on Switzerland's security of electricity supply too.

In addition to its own assessment for the Federal Department of the Environment, Transport, Energy and Communications (DETEC), ElCom has also commissioned and started an update of the adequacy study to analyse security of supply at Swissgrid in order to assess the demand for the tendering of replacement plants in the additional reserves. The results are expected in 2025.

ElCom has addressed the issue of the Swiss control zone's significant imbalance, which has grown over the years (see Section 5.3), both with the balance group managers that have output points and Swissgrid as well as in two public notifications on balanced control zones and the urgent need for improvement of data quality.

Various measures were undertaken to tackle imbalances. The review of the balance energy price mechanism is already under way and Swissgrid is holding discussions with the balance group managers. Another key priority is the availability of the information required and quality of the measurement data that is not just used for billing, but also for the balance groups' consumption and production forecasts. These forecasts are calculated daily and are based on up-to-date measurements that reflect the actual situation. With regard to discussions with the distribution network operator balance group, ElCom has already established that the legal requirements on unbundling do not create an obstacle to ensuring the exchange of information required. A systematic review of the existing processes and regulations involving balance group managers, sub-balance groups and distribution network operators would appear a necessary and worthwhile step.

Finally, it is important to mention optimisation of fore-casting. Improvements are already being made, including on the basis of meteorological data. Due to the events in 2024 and in view of the high expansion rate of photovoltaic systems, an analysis is required to determine how the existing weather data and forecasts from numerical weather prediction models can be incorporated into production forecasting. In particular, the inclusion of changes to weather forecasts at weekends is a measure that could help to improve the situation significantly. ElCom will continue to monitor the subsidiary measures taken by the actors concerned. It is focusing on rapid optimisation of the existing processes.

5.6 Cyber security

Electricity networks are increasingly controlled and monitored using smart information and communications technology. These systems offer network operators more control options and enable more efficient system operation as well as the opportunity to provide new services. Greater use of IT networks also increases the risk of deliberate or unintentional cyberincidents, compromising the availability, integrity or confidentiality of data or damaging technical installations. In extreme cases, this could result in extensive power outages and consequential damages. This means cybersecurity is a key issue in ensuring security of supply.

After the entry into force of Article 8a ESA and Article 5a ESO, network operators, producers, storage facility operators and service providers (subsequently referred to as 'companies') must take appropriate protective measures to combat cyberthreats and meet minimum standards. In accordance with Article 22 paragraph 3 ESA, EICom monitors the electricity markets to ensure that secure and affordable supply is available in all parts of Switzerland and that the cybersecurity requirements under the new legal provisions are met. This means changes for both the companies concerned as well as for ElCom. ElCom must align its current monitoring of cybersecurity measures with the new provisions. It has developed a risk-based supervisory concept in cooperation with the Swiss National Cyber Security Centre (NCSC). This concept is made up of three complementary supervisory instruments (also see Directive 1/2024 'ElCom's supervision of cybersecurity'): awareness-raising meetings, the 'Monitoring Cyber' survey and audits. EICom set up the new 'Data analysis and cybersecurity' unit at the Technical Secretariat during the year under review to enable it to successfully perform these extended duties.

ElCom is holding awareness-raising meetings with the companies required to ensure stable operation of the system. These meetings are based on a questionnaire produced together with the NCSC using the cybersecurity framework of the National Institute of Standards and Technology (NIST). These meetings provide ElCom with a good insight into how cybersecurity is being carried out by the companies surveyed on site. ElCom held meetings with around a third of the companies in the year under review. The remaining meetings will be held in 2025. EICom plans to hold the meetings on an annual basis. To monitor the minimum standards, EICom also created the 'Monitoring Cyber' survey on the DETEC eGovernment portal as a self-assessment tool. The survey will be carried out in early 2025 and, unlike the awareness-raising meetings, must be completed by all companies. This survey will also be conducted annually to assess the development of maturity. These two instruments will be supplemented by audits. In 2025, a concept will be produced to gain an in-depth insight into the technical implementation of cybersecurity measures at certain companies

ElCom will still require the efficient, risk-based implementation of relevant documents. These include the Association of Swiss Electricity Companies (VSE) industry documents 'ICT Continuity', Handbuch Grundschutz für Operational Technology in der Stromversorgung (Handbook on Basic Protection for Operational Technology in Electricity Supply), Leitfaden und Werkzeuge zur Steigerung der IKT-Resilienz in der Strombranche (Guidelines and tools for increasing ICT resilience in the electricity sector) and Richtlinien für die Datensicherheit von intelligenten Messsystemen (Guidelines for the Data Security of Smart Measurement Systems) in accordance with the Critical Infrastructure Protection (CIP) guidelines of the Federal Office for Civil Protection (FOCP).

ElCom stepped up its international cybersecurity networking activities during the year under review. This involved participation in the Cybersecurity Workstreams meetings of the Council of European Energy Regulators (CEER) and the organisation of cybersecurity training by CEER. In 2024, the Network Code on Cybersecurity (NCCS) entered into force as part of EU legislation. For 2025, this will mean supporting the relevant agreements between Swissgrid and the European transmission system operators from Switzerland's neighbouring countries.

5.7 Quality of supply

5.7.1 Availability of the network

The quality of supply is defined to some extent by network availability. For this purpose, ElCom uses the two internationally recognised indices, System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI). SAIDI quantifies the average duration of interruptions per enduser, while SAIFI indicates the average frequency of interruptions per end user. Figures concerning all unscheduled interruptions lasting longer than three minutes and that occur as the result of natural phenomena, human error, operational problems or external influences are factored into the calculations for both indices.

	2020	2021	2022	2023	2024[1]	Einheit
SAIDI	12	8	7	8	-	Minutes per enduser
SAIFI	0,21	0,16	0,14	0,16	-	Interruptions per enduser

Table 3: Supply quality in Switzerland from 2020 to 2024 (unscheduled interruptions only

1 The figures on supply quality for 2024 will be available in June 2025 and published on ElCom's website

In 2023, the average duration of unscheduled interruptions per end user was eight minutes. This meant this indicator increased by one minute nationwide compared with the previous year. The average frequency of unscheduled interruptions per end user in 2023 was 0.16, which was higher than in the previous year. Network availability remains very good in Switzerland. The high quality of supply in Switzerland is also confirmed by international comparisons. According to the CEER 7th Benchmarking Report on the Quality of Electricity and Gas Supply, Switzerland is among those countries with the highest quality of electricity supply in Europe.

5.7.2 Import capacity

In addition to network availability, the available import capacity is also a key factor in ensuring Switzerland's security of power supply. The Swiss electricity sector can also use import and export capacity to execute transactions on the European market and take advantage of its competitiveness.

The net transfer capacity (NTC) indicates the level of cross-border transfer capacity that can be used by traders for commercial exchanges – for both imports and exports – with neighbouring states without violating the safety standards. Swissgrid determines the hourly values for the four Swiss electricity borders together with transmission network operators in neighbouring countries. The proportion of the import and export capacity of the Principality of Liechtenstein, which belongs to the Swiss control zone, is included in the calculation of the import and export capacity from Austria.

Table 4 provides an overview of the average changes in available import capacity, on the one hand for all borders combined, the northern border, and on the other for each individual border between Switzerland and its neighbouring countries. Evaluated on an hourly basis, the NTC can be more volatile than reflected by average import and export figures shown for the year.

In view of the growing challenges in relation to the security of the Swiss network on the northern border, import capacity declined in 2024 and 2023 due to lower import capacity from France and Germany.

IMPORT NTC (MW)	2020	2021	2022	2023	2024
Total	**6 982**	**6 562**	**6 838**	**6 297**	**6 105**
Northern Border (AT, DE, FR)	5 260	4 841	5 117	4 576	4 385
France	2 944	2 923	3 018	2 691	2 530
Germany	1 264	1 347	1 341	1 124	1 074
Austria	1 052	571	758	761	781
of which Italy	1 722	1 721	1 721	1 722	1 720

Table 4: Available import capacity (NTC) for Switzerland, 2020 to 2024 (average of hourly NTC for the year; source: Swissgrid).

5.7.3 Export capacity

Due to high transit flows through Switzerland from north to south, the export capacity, particularly to Italy and France but also to Germany and Austria, is of particular importance to the network and supply security of Switzerland and its neighbouring countries. The volume of export capacity to Italy also has a major influence over the utilisation of Switzerland's import capacity on its northern borders with France, Germany and Austria.

In 2024, Switzerland's capacity did not reach the level of 2022–23 due to lower export capacity to Germany and, to a lesser extent, Italy too. It was only partially offset by the moderate rise in export NTCs to Austria and France (see Table 5).

EXPORT NTC (MW)	2020	2021	2022	2023	2024
Total	**8 658**	**8 289**	**8 845**	**8 985**	**8 584**
Northern Border (AT, DE, FR)	5 928	5497	6023	6075	5 841
France	1 136	1 209	1 194	1 131	1 224
Germany	3 708	3 629	3 946	3 924	3 526
Austria	1 084	659	883	1 020	1 091
of which Italy	2 730	2 792	2 821	2 910	2 743

Table 5: Available export capacity (NTC) for Switzerland, 2020 to 2024 (average of hourly NTC for the year; source: Swissgrid).

5.8 System services

Sufficient electricity production capacities must be available to guarantee security of supply, while adequately sized transmission and distribution networks are required for the supply of energy to customers. Since electricity cannot be stored in the network, the quantity of energy fed into the grid always has to be equal to the quantity that is taken out of it. Despite the production and consumption forecasts provided by energy suppliers, precise forward planning is not feasible. This means that all deviations have to be balanced out on an ongoing basis. Generally, this balancing process involves bringing the production of electricity into line with the current level of consumption. Flexible power plants whose production can be really well controlled are required for this constant balancing. The control power provided by these power plants is purchased in a market-based procedure, and the costs incurred are passed on to customers via the general system services tariff. This is used for charging for other services required for safe operation of the grid, including balance management, black start and independent operation capability, voltage stability and compensation of active power losses. However, control energy is the biggest element of system services in financial terms.

The costs for control energy stood at around CHF 120 million in the year under review, which was CHF 351 million less than in the previous year. The sharp rise in electricity prices on the wholesale market in 2022 was a key factor in the high prices in 2022 and 2023. The annual result for 2024 is below the annual costs of 2021. Figure 15 shows the price trend for control energy costs over the past five years.

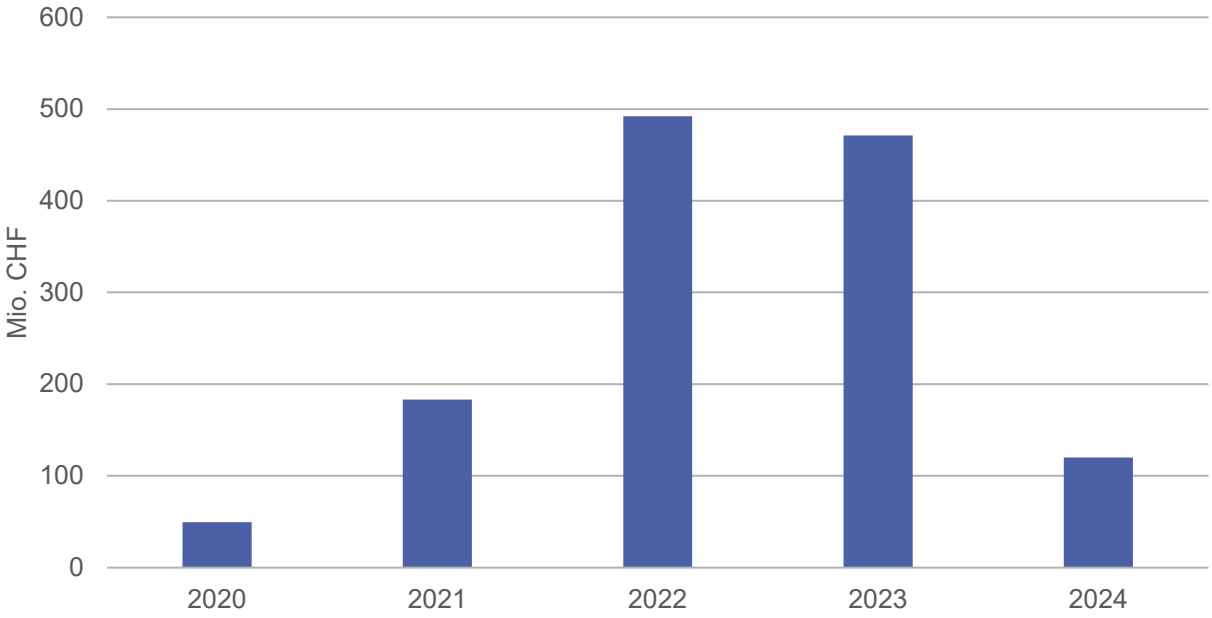


Figure 15: Price of control energy from 2020 to 2024

The provision of control energy means Swissgrid always has enough control energy to stabilise the control zone. Compensation for control energy, which means the effective use of control reserves, is provided separately. The introduction of PICASSO in July 2022 is the most significant change in recent years on the secondary control energy market. This new system has provided various benefits, such as the opportunity to use more control energy than just those coupled to the provision of capacity. However, the results of procurement under the new system have led to a fundamentally unjustifiable increase in procurement costs, pointing to a sub-optimal mechanism. Both short-term measures to contain rising balance power costs, such as the price cap (see Section 4.5), and other key measures to increase liquidity on these markets long-term were required during the year under review. They will be monitored over the coming years. The interfaces to the rising demand for control energy due to the challenging balancing situation in the control zone are outlined in Sections 5.2 and 5.5.

6 Networks

The 45km-long Bassecourt–Mühleberg line connects the cantons of Jura and Bern. Having operated at 220 kV since 1978, the voltage was increased to 380 kV in late November 2023 to enhance grid stability and supply security across Switzerland.

6.1 Facts and figures about the Swiss electricity networks

As part of annual cost accounting reporting ElCom surveys the Swiss electricity grid according to various installation classes. The Swiss electricity network (i.e. distribution and transmission network) extends over a total length of 214,000 kilometres, which is almost five times the circumference of the Earth. Of this, the local distribution networks (network level 7) account for 71 %, while Swissgrid's national transmission network (network level 1) accounts for slightly more than 3 % with around 6,700 kilometres. The remaining kilometres are made up by the medium-voltage levels (network levels 3 and 5).[1]

The total value of the Swiss electricity grid stands at around CHF 21.5 billion. The distribution network accounts for around 90 % of this figure. The largest 100 network operators own around 85 % of the declared installation values, of which the 10 largest network operators in Switzerland alone own about 43 % of all installation values. The approximately 480 small and very small operators therefore only own about 15 % of the installation values. This is around the same as five years ago.

1 The network operators submit their data annually on 31 August of the year following the last completed financial year. This means the figures in ElCom's 2024 activity report reflect the actual values for 2022.

Installation class	2019	2020	2021	2022	2023	Unit
Conduit length HV (NL3), MV (NL5) and LV (NL7)	124 941	130 205	131 705	148 824	134 983	km
HV cable (NL3)	2 053	1 968	2 099	2 028	2 335	km
MV cable (NL5)	36 433	36 428	37 725	40 221	38176	km
LV cable (NL7)	82 179	81 264	82 653	94 104	82 766	km
LV building connection cable (NL7)	58 891	59 108	62 518	68 285	63 103	km
HV overhead lines (NL3)	6 788	6 658	6 773	6 623	6 594	Strand-km
MV overhead lines (NL5)	9 346	8 818	8 751	8 307	8 154	Strand-km
LV overhead lines (NL7)	7 899	6 972	6 760	6 276	6 297	Strand-km
NL2, NL3, NL4 and NL5 substations	825	823	862	833	854	Number
NL2 transformers	147	149	152	144	145	Number
Switching field NL2[1)]	163	168	178	163	142	Number
NL3 transformers2)	76	87	86	85	74	Number
Switching field NL3[1)]	2 680	2 431	2 506	2 363	2 233	Number
NL4 transformers	1 153	1 143	1 186	1 133	1 152	Number
Switching field NL4[1)]	2 929	2 246	2 333	2 230	2 292	Number
NL5 transformers[2)]	74	77	74	77	61	Number
Switching field NL5[1)]	39 486	39 411	40 068	40 516	39 650	Number
NL6 transf. stat.	54 850	54 142	55 546	54 862	56 624	Number
NL6 mast transformer stations	5 487	4 993	5 049	4 751	4 565	Number
LV cable distribution cabinets (NL7)	182 325	191 488	199 412	181 967	186 517	Number
Measurement points (all consumers)	5 779 344	5 715 085	5 951 287	5 817 870	5 848 104	Number

1) Switching fields encompass the upper and lower field at the respective network level, except in the case of network level 2, for which the upper switching field is allocated to network level 1 in accordance with Art. 2 para. 2 ESO

2) Despite the fact that transformation generally takes place on the even network levels, transformation also takes place on odd levels in certain cases – such as to balance out different voltage series within the same network levels (e.g. at NL 3, between 110 and 50 kV).

Table 6: Installations on the Swiss electricity grid. All details are based on the information provided by the network operators themselves. Any gaps between the years may be due to self-declaration or measurement unit errors.

Figure 16 shows the development of the various network cost components. The distribution network operators declared total network costs (including fees, charges and surcharges on the transmission network) of almost CHF 5.5 billion for 2023.

Network costs account for the greatest share; they are based on the operating and capital expenditure of a secure, high-performance and efficient network in accordance with the ESA. The biggest network cost components on the distribution network are operating and capital expenditure, making up a share of 70 %, which equates to around CHF 3.8 billion. Of this figure, over CHF 1.8 billion is attributable to capital expenditure and CHF 2 billion to operating expenditure (33 % and 37 % respectively). Direct taxes account for CHF 73 million or 1.3 %.

In addition to the network costs, there are almost CHF 1.6 billion in public charges: fees and payments to the state, including licences, amounting to over CHF 425 million or 7.8 % as well as almost CHF 1.2 billion or 21.3 % of surcharges on the transmission network to promote electricity production from renewable energies and water remediation in accordance with Article 35 of the Energy Act (EnA).

This amount does not include the availability costs incurred by the individual network operators as these are entered as revenues for the respective provision, which means the position is neutral overall. After regular increases up to 2018, the share of fees and payments (including the network surcharge in accordance with Art. 35 EnA) has changed very little year-on-year over the last five years, reaching 1 % in 2023 (see Figure 16, Direct taxes.

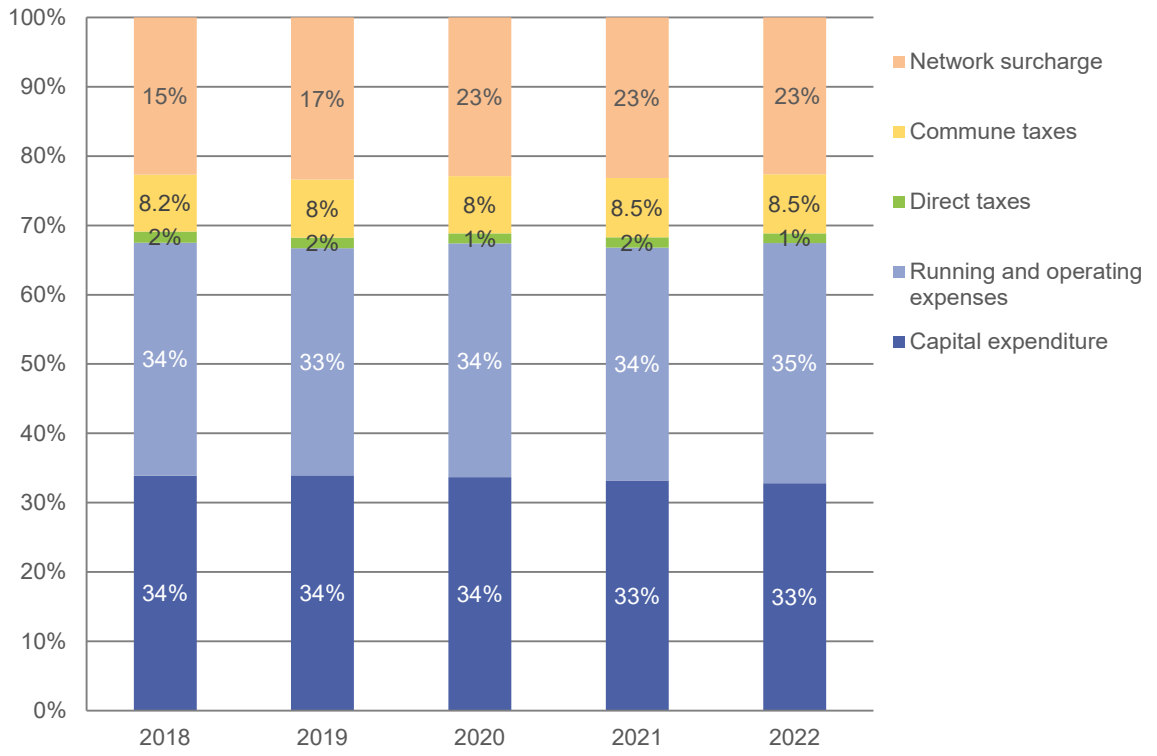


Figure 16: Composition of distribution network costs from 2019 to 2023.

In its 2023 Annual Report, Swissgrid reported network usage costs of CHF 492 million, system services costs of CHF 684 million and now also reserve power costs of CHF 8.2 million. The high energy prices since 2022 have had a significant effect on system services (see Section 5.8). The costs for 2023, estimated and factored in during spring 2022, were much lower which meant there was a considerable shortfall for 2023. The effect of this is a further increase in tariffs. If the distribution network costs of slightly over CHF 5.5 billion are added to these cumulative costs of almost CHF 1.2 billion, the overall costs for the Swiss electricity grid come in at around CHF 6.7 billion. Figure 17 shows how these are distributed over the individual network levels (NL). The local distribution network (NL7) accounts for over half of the costs at around CHF 3.1 billion. At slightly under CHF 1.2 billion, almost another fifth of the costs are incurred on NL5. The high-voltage network (NL1 network usage incl. NL1 system services and now also power reserve) operated by Swissgrid makes up 18 % of the total costs for the Swiss electricity grid.

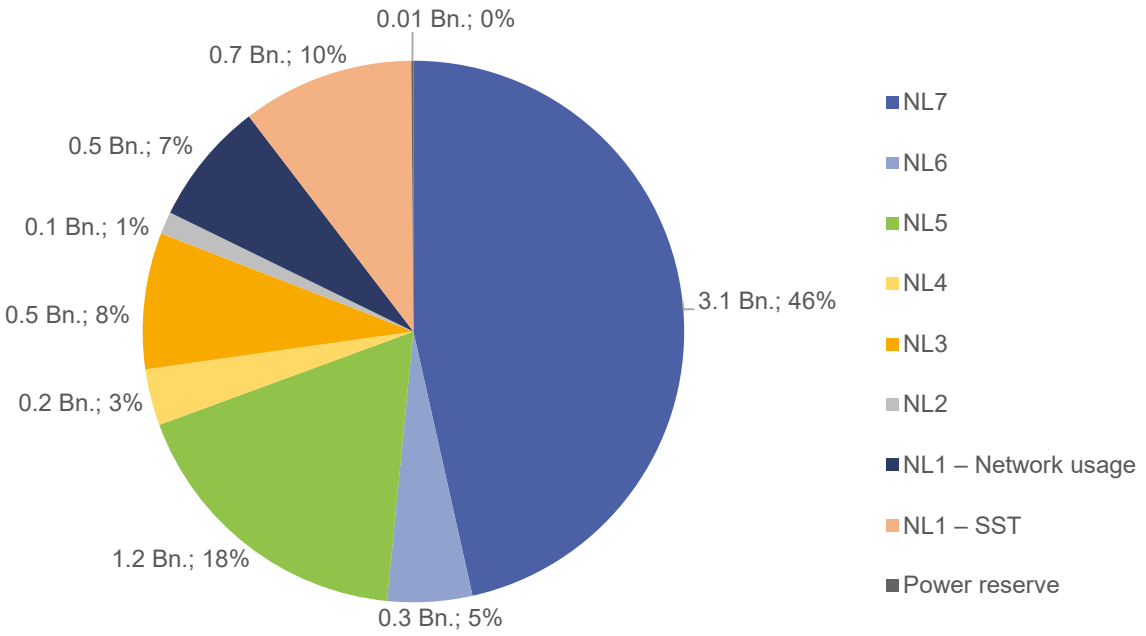


Figure 17: Costs in CHF billion and breakdown of the cost shares of the Swiss electricity grid (including fees and charges as well as surcharges on the transmission network) by transmission network (NL1) and distribution network (NL2 to NL7), 2023.

6.2 Network expansion and planning

6.2.1 Multi-year planning of the transmission Network

In accordance with Article 9a ESA, the Swiss Federal Office of Energy (SFOE) produces a set of scenarios as a basis for the planning of the transmission and distribution grids. The federal government's energy policy objectives, macroeconomic data and the international environment must be taken into account. When producing these scenarios, the SFOE consults appropriately with the cantons, the national grid operator (Swissgrid), the other network operators and other stakeholders. Article 5a of the Electricity Supply Ordinance (ESO) states that the scenarios must be reviewed every four years and updated where necessary. The Federal Council approved the set of scenarios for 2030/2040 at its meeting on 23 November 2022.

Under Article 9d ESA, Swissgrid must present its multi-year plan to ElCom for inspection within nine months of approval of the last set of scenarios by the Federal Council. The content of this multi-year plan is described in Article 6a ESO. Swissgrid submitted the first multi-year plan in 2024. The results will be published in 2026.

Swissgrid's past multi-year plans have been based on the Strategic Grid 2025 report, completed in early 2015. It enables coordinated planning of the transmission grid throughout Switzerland and essentially fulfils the requirements of the Electricity Supply Act (Art. 8 para. 2, Art. 20 para. 2 let. a ESA). In ElCom's view, this represents a major milestone. The report can also contribute towards improving cross-border coordination on the usage and financing of the network. It is important to note that some of the plans set out in the report have not yet been implemented. The reasons for this are varied and complex. In the case of line construction projects, for example, they include the extensive analysis and weighing-up of various environmental aspects, protracted, multi-layer authorisation procedures and judicial reviews. The level of investment for the expansion and maintenance of the network appears plausible. The preservation of the value of the transmission network can be assured on the basis of the defined planning. In essence, the Strategic Grid 2025 report fulfils the requirement for balanced investments (Art. 22 para. 3 ESA).

6.2.2 Maintenance and replacement of the transmission network

Swissgrid's transmission network contains around 12,000 support structures, over 60 % of which are between 50 and 80 years old. In light of the 80-year lifespan recognised by the industry for support structures and based on their condition, Swissgrid anticipates greater renewal requirements over the next 20 to 30 years. This would mean a four-fold increase in the number of power line projects and related procedures. These procedures are often protracted and resource-intensive which is why maintenance and replacement projects required for reliable and secure network operation are often postponed. ElCom is closely monitoring this issue as part of its duty to assess the condition and maintenance requirements of the transmission network.

Consultations are currently being held on amendments to the Electricity Act and its related ordinance to speed up the procedures involved in restructuring and expanding the electricity networks. ElCom welcomes and supports these efforts but has considerable reservations over whether the procedure and measures proposed will actually achieve the level of acceleration required.

6.2.3 Participation in SÜL and PAP pocedures

In the procedures for the Transmission Lines sectoral plan (SÜL) and the planning approval procedure, ElCom checks compliance with the criteria set out in the ESA for a secure, high-performance and efficient network. In 2024, ElCom participated in the support group for the following Transmission Lines sectoral plan (SÜL) procedures as part of its statutory duties: All'Acqua – Magadino, Vallemaggia, (SÜL 109), Marmorera – Tinzen (SÜL 701.1), Innertkirchen – Mettlen (SÜL 202), Flumenthal – Froloo (SÜL 900). The first two procedures mentioned were completed in December 2024 with the definition of the line corridor in the sectoral plan by the Federal Council. ElCom also issued several opinions on projects as part of planning approval procedure.

6.3 Investments in the network infrastructure

As part of its surveillance duties, ElCom monitors whether sufficient investment is being made to ensure the electricity grid remains in good condition.

6.3.1 Investments in the transmission network

The actual amount invested in the transmission network in 2023 stood at CHF 220.6 million. During the period 2019 to 2023, the average annual level of investment in the transmission network stood at CHF 173.4 million.

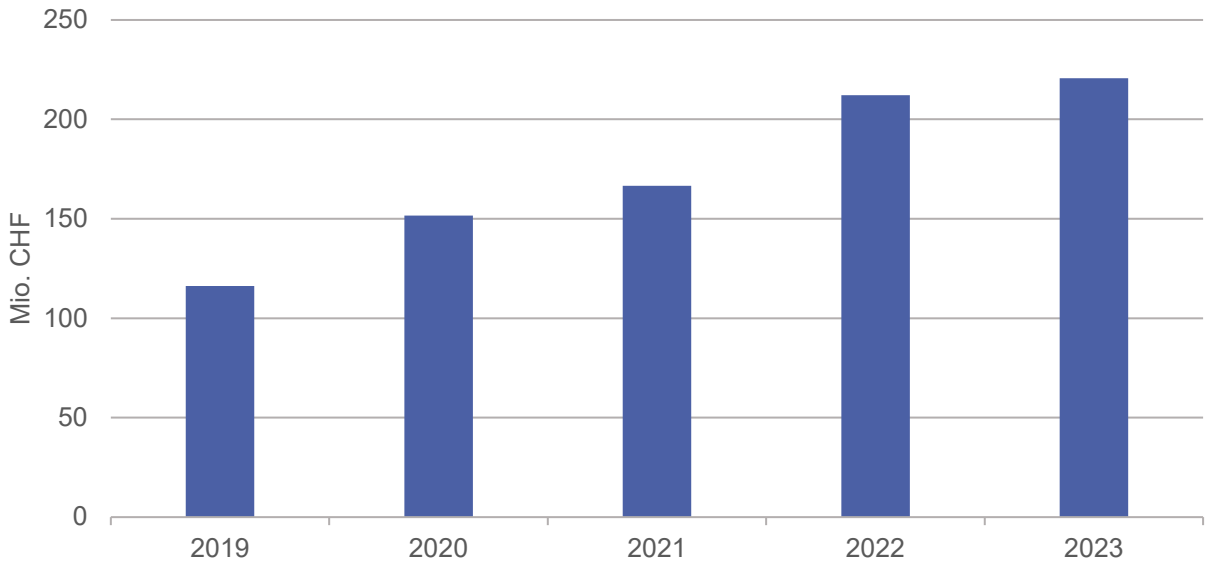


Figure 18: Investment in the transmission network from 2019 to 2023.

6.3.2 Investments in the distribution network

The distribution network operators have invested around CHF 1.4 to 1.6 billion in the last five years (see Abbildung 1). However, there were write-downs of 60 % on these figures, producing an investment surplus of around CHF 0.6 billion a year. Development is naturally stable as most of the assets have a long lifespan.

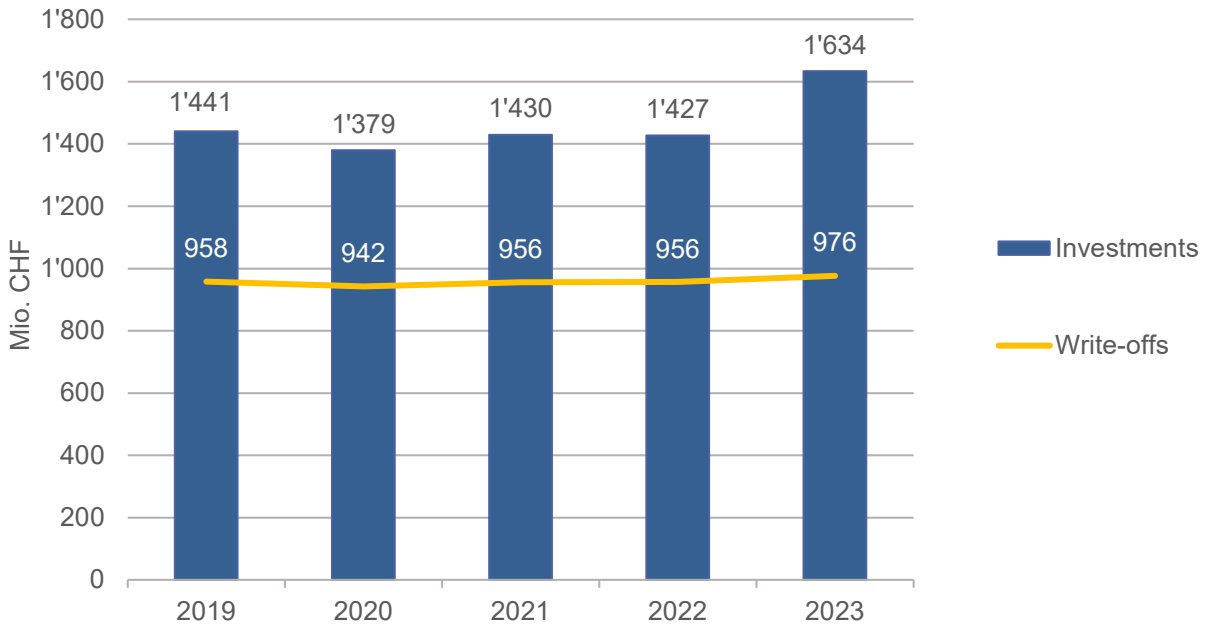


Figure 19: Investments and write-offs in the distribution network 2019–23.

The cost burdens on the distribution network look set to increase. The drivers on the supply side are, for example, the expansion of power production from photovoltaic systems, on the demand side the growth in electric mobility and heat pumps and in terms of management the increasing number of actors operating in the same network area. The SFOE estimated in 2022 – depending on the scenario – investment requirements of CHF 45 to 84 billion[1] in real terms by 2050.

The regulatory installation values (such as kilometres of line) are continually increasing. However, they are not enough alone to classify the expansion as sufficient as increases in network capacity are funded by third parties, for example. ElCom nevertheless considers investment in the distribution network at the moment to be sufficient based also on the reliability of the Swiss electricity networks.

1 A detailed description of the WACC calculation can be found here.

6.3.3 WACC imputed interest rate for the network

According to Article 13 paragraph 3 letter b of the ESO of 14 March 2008 (SR 734.71), the imputed rate of interest on the aforementioned operating assets corresponds to the weighted average cost of capital (WACC).

The WACC network is made up of two components as in the past. Firstly, the equity capital cost rate which is factored into the WACC based on equity's share of total capital. Secondly, the debt capital cost rate is factored in based on debt capital's share of total capital.

With the revision of the Electricity Supply Ordinance, the SFOE made amendments to the existing calculation for the transmission and distribution network for the 2026 tariff year during a consultation procedure as part of an office consultation. ElCom issued a position statement on the planned amendments as part of the consultation. As previous reports on ElCom's activities clearly indicate, ElCom has taken a critical view of the WACC calculation for many years and believes the resulting WACC is too high.

The consultation procedure on the revision of the ESO (interest on the capital in the electricity network and the subsidised installations for power generation from renewable energies) was initiated on 14 June 2024 and ran until 4 October 2024. On 2 July 2024, ElCom submitted a position statement. It made the following proposals on the draft ordinance: in order to determine the imputed corporate risk, the equity capital interest rate is based on the unlevered beta which is made up of a peer group of European transmission and distribution network operators. ElCom has expressed the view several times in the past that the imputed corporate risk for Swiss electricity network operators is too high. In turn, this means the resultant WACC is also too high. EICom welcomed the prospect of an adjustment to the peer group in the draft ordinance to better reflect the risks facing Swiss electricity network operators. It should now focus on European transmission system operators. To date their unlevered beta has produced a slightly lower value than that of the previous peer group as a whole. This may be due to the regulatory incentive instruments proving less effective in practice – given the low number of transmission network operators (generally one operator per country) – than for distribution network operators, especially since there is a lack of comparative data. These adjustments to the peer group may better reflect the corporate risks of Swiss electricity network operators which are regulated based on their costs (cost+ regulation). However, ElCom has also highlighted the fact that, even when focusing on transmission network operators, the unlevered beta derived may still be distorted by risks related to incentive regulations. There is also a risk of having too few transmission network operators to provide a meaningful peer group. In response, ElCom proposed the inclusion of distribution network operators too, provided the specific regulatory practices based on their proximity to cost-based regulation (such as the number of regulatory periods) are taken into account and the business models (share of third-party business exposed to higher risks) are weighted.

The total market return (TMR) approach also replaces the previously used equity risk premium (ERP) method in the draft ordinance to determine the general market risk premium. The removal of the previ-ously used technical upper and lower limits on the risk-free interest rate for equity capital would be a positive effect of this change. ElCom welcomed this proposal as during the prolonged period of low interest rates in recent years the lower limit meant the WACC was systematically too high. However, in general ElCom took a critical view of the limited economic foundation for the TMR approach and called for the previous ERP method to be retained. This is subject to the technical limits for the risk-free interest rate being removed regardless of the method selected.

Finally, ElCom called for the level of the surcharge for emissions and procurement costs to be aligned with existing regulations in the telecoms sector to avoid placing an unnecessarily high cost burden on consumers. After a revision of the draft ordinance based on the position statements issued during the consultation procedure, ElCom had the opportunity to issue an opinion in the subsequent office consultation procedure. The ordinance will enter into force in 2025 and will then apply from the 2026 tariff year.

6.4 Increase in network capacity

Additional network capacity may be required in order to connect producers of electricity from renewable energy to the distribution network. Swissgrid refunds the costs to the network operators by incorporating them into its calculation of the system services tariff. ElCom must approve the compensation. Here it relies on a directive that serves as a guideline for network operators when submitting applications.

This directive also defines the criteria for the assessment of such applications. In the year under review, ElCom assessed 167 applications for the remuneration of costs associated with increases in network capacity.

ElCom has issued a total of 1,236 decisions over the past 16 years (see Fig. 20 and Table 7).

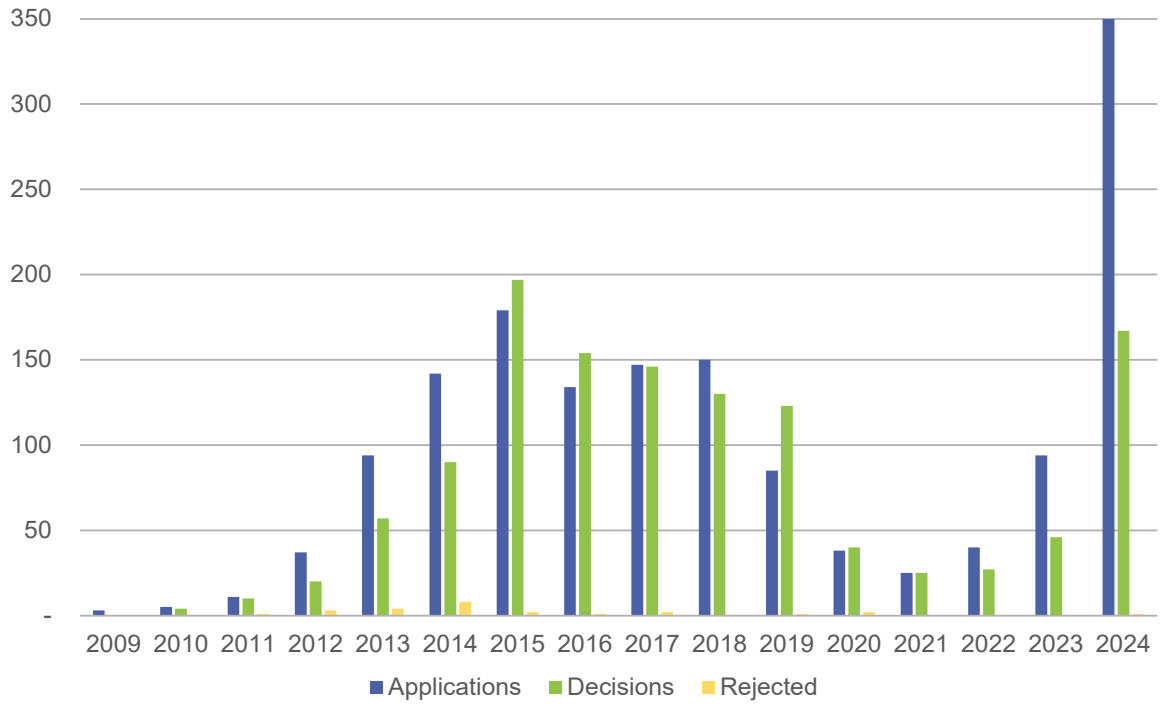


Figure 20: Number of submitted and rejected applications and decisions concerning remuneration for increases in network capacity 2009–24

Total costs for network capacity increases stood at around CHF 147.57 million at the end of 2024 and the related power plant output amounted to 428.6MW in total. Table 7 provides an overview of the key figures on decisions on remuneration applications for necessary network capacity increases for the period 2009 to 2024.

	Total	Photo-voltaic	Hydro-powerr	Wind	Other[1]
Number decisions	1'236	1'153	38	4	29
Minimum installation output [kW][2, 3]	43	4	36	1'500	22
Maximum installation output [kW][2, 3]	2	2	29	1'500	16
Total installation output [kW][3]	74'000	8'303	14'726	16'000	74'000
Minimum cost[CHF][2]	428'613	183'471	86'709	30'000	128'433
Maximal costs [CHF][2]	3'500	3'500	12'277	1'151'165	18'069
Total costes [CHF]	9'262'389	746'912	3'117'452	9'262'389	2'117'200
Average costs [CHF][4]	147'566'668	87'282'689	28'487'144	19'853'343	11'943'492
Minimum relative costs [CHF/kW][5]	3	3	5	451	3
Maximum relative costs [CHF/kW][5]	26'029	26'029	4'148	1'116	4'299
Average relative costs [CHF/kW][5]	344	476	329	662	188

Table 7: Figures relating to decisions on network capacity increases issued between 2009 and 2024.

1) For example, biomass and different types of installations

2) Per application/decision

3) In the case of hydropower plants, installation output refers to mean gross mechanical output. With other categories of generation plant output, installation output is measured in terms of generator output

4) Corresponds to the average value of approved network reinforcement amounts per decision

5) Relative costs = ratio of costs to installation output

7 International activities

Switzerland connects to its European neighbours through several dozen power lines. It is therefore crucial that the country maintains representation in relevant committees. Until an electricity agreement with the European Union is reached, technical agreements addressing specific issues remain essential.

7.1 Congestion management and auction proceeds

The Swiss transmission network is connected to the networks of neighbouring countries via 41 cross-border transmission lines. In cooperation with the neighbouring transmission system operators, Swissgrid determines how much import and export capacity is made available on the market for international trading and allocates it at explicit auctions. ElCom decides how the auction proceeds are used and pursues the goal of achieving long-term tariff stability. The proceeds amounted to EUR 450 million in 2024. After deduction of implementation and redispatch costs, Swissgrid was able to use all proceeds – exceptionally – for the short-term coverage of recoverable costs. This step was taken due to external effects and to counteract the higher tariff burden on end users.

Overloading of network elements and network congestion can occur in real-time operation. Transmission system operators implement relief measures to counteract such incidents. These measures – including the distribution of costs – are agreed with the sector at various working groups. ElCom supports these activities. A key measure is the activation of redispatch energy: production is reduced at one particular power plant while it is increased at another. Figure 21 shows how much redispatch energy was activated in 2024 at Swiss power plants due to congestion in Switzerland (blue) and congestion abroad (yellow). Network congestion incidents in Switzerland usually occur in summer when export levels are high. High flows from France to Germany, in particular, put additional pressure on the Swiss network this summer. More redispatch energy than ever before was used in 2024.

The development of EU regulations and methods (such as the 70 % rule) may result in greater congestion on the Swiss network and increased use of relief measures. In 2022 work began on implementing a new international method to optimise relief measures jointly at regional level. Switzerland

intends to participate in these activities. ElCom is supporting the preparatory work at national level and represents Switzerland's interests at EU level in the discussions between the regulators.

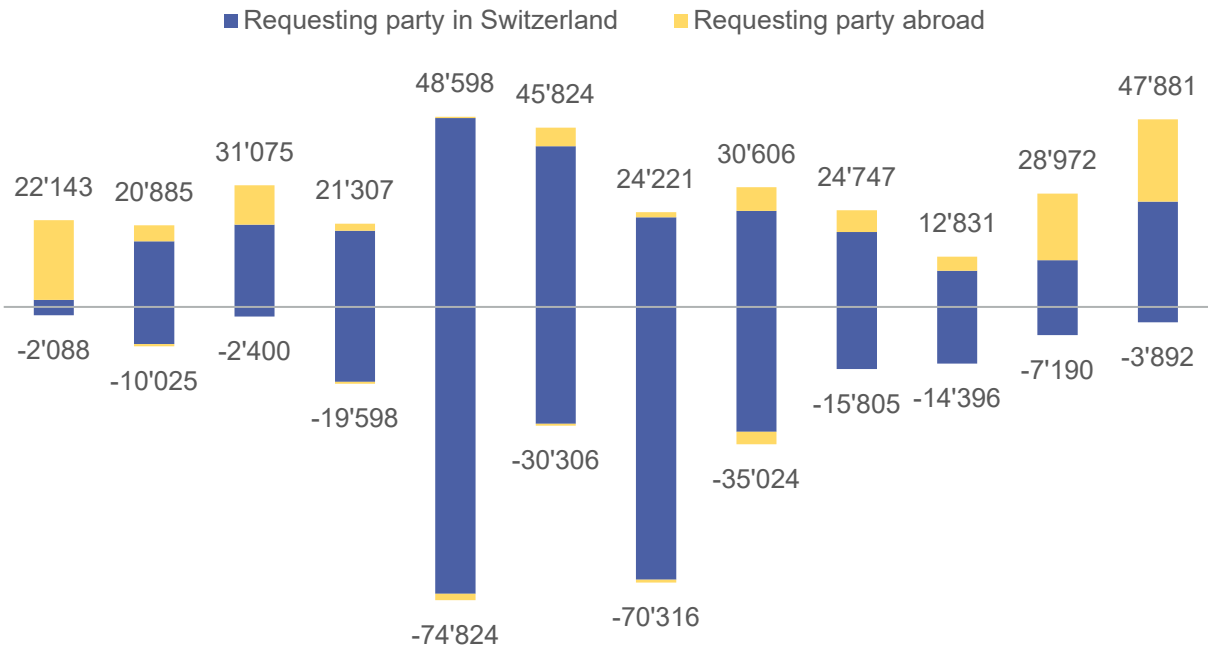


Figure 21: Total amount of activated redispatch energy per month in 2024 in MWh (source: Swissgrid AG).

7.2 CORE technical agreement and merger

After the introduction of flow-based market coupling (FBMC) in the Central Western Europe region with the exclusion of Switzerland, trading capacity from Germany to France increased significantly. This resulted in some congestion incidents on the Swiss network in winter. In June 2022, the FBMC was extended to the CORE region, consisting of 13 countries from France in the west to Romania in the east. This created an additional degree of uncertainty.

After several years of negotiations with the transmission system operators and the regulatory authorities in the participating countries, an agreement was signed in November 2024 on the inclusion of the Swiss network in the CORE capacity calculation region. It governs the determination of border capacity on Switzerland's northern border and creates a higher degree of security in terms of network stability on a cross-border basis throughout the entire region. The agreement has not yet been implemented.

As a transitional solution until the conclusion of an electricity agreement with the EU, the agreement improves legal certainty, particularly in view of the imminent introduction of the 70 % rule. The transitional phase, which began in 2019, will end on 1 January 2026. All EU mem-

ber states will then have to make at least 70 % of the capacity of their network elements available for trading between EU member states. Unless Switzerland is included in the European capacity regions, this could result in more unplanned electricity flows on the Swiss network and less import and export capacity. In this scenario, Swiss power plants would have to be used for stabilisation which would then not be available for supply. Both aspects entail economic disadvantages and could jeopardise Switzerland's security of power supply. The EU also plans to extend the FBMC to Italy over the medium term. This is being strongly driven by ACER, and the first steps for the merger of the 'Italy North' and CORE regions into a 'Central CCR' (Central Capacity Calculation Region) have been taken. The merger will initially be limited to the capacity calculation method for the day-ahead time horizon. The merger means balanced mutual inclusion in the capacity calculations between Switzerland and its EU neighbour is now even more important to network stability in the region. The agreement reached with CORE at the end of 2024 provides a solid foundation for this step.

7.3 Switzerland–EU electricity agreement

An electricity agreement with the EU would probably have far-reaching effects on network and market integration and the opening-up of the end customer market. Better integration into the European mechanism for determining cross-border network capacity would produce benefits for security of supply. By contrast, the potential risks presented by complete market liberalisation for small-scale consumers compared to the current system of partial market liberalisation are negligible – they could benefit from a lower cost burden. This outcome would be even more likely if complete market liberalisation was accompanied by the right to freely choose whether or not to remain under regulated basic supply and by consumer protection measures. In view of this situation, ElCom is satisfied with the outcome of the negotiations. The recently reached technical agreement primarily ensures short-term security. However, it does not represent a sustainable, stable basis for secure and plannable integration into the European electricity grid on a medium and long-term basis as it must be renewed on an annual basis and only covers some aspects. This situation underlines the need for an overarching electricity agreement with the EU at institutional level.

7.4 Merchant lines

Merchant lines are cross-border transmission lines. In the event of an exemption, there is no requirement to grant network access to third parties on electricity transmission lines such as these. While the transmission capacity is managed by the network operators, its utilisation is reserved for the investors. These exemptions are limited to a specific time frame upon expiry of which the line is transferred to the ownership of the national grid operator. In the preceding reporting year, ElCom was asked to grant one exemption from network access as a merchant line. Assessment of the request is based on the DETEC Ordinance on Exceptions to Network Access and to Allowable Network Costs in the Cross-Border Transmission Network (NetCEO). The definition of the decision-making basis was begun which will hopefully allow an initial preliminary decision to be made in the following year.

7.5 Border power plants

There are 30 hydropower plants along Switzerland's borders that produce electricity from watercourses adjacent to neighbouring countries. Border power plants, which are used for the supply of the contractually agreed volume of energy to the neighbouring state on the cross-border transmission network, are generally given priority allocation of the transmission capacity required.

As the German transmission system operators and authorities have deemed priority capacity allocation impermissible for some time, in 2023 ElCom determined by means of decision in two proceedings how entitlement to the border power plants on the Swiss-German border is to be met: the operator companies initially purchase the transmission capacity required in the regular auction procedure. Then once cross-border delivery has been made, they can claim back the Swiss share of the auction proceeds from Swissgrid. In September 2024, the Federal Administrative Court rejected an appeal against one of the decisions. This means both decisions are legally valid.

With regard to the 'Gemeinschaftskraftwerk Inn' joint-venture power plant, ElCom approved prioritisation in 2024 based on actual value activation: Due to the power plant's extraordinary production profile, in this exceptional case the Swiss share of the energy produced in Austria is treated as though it were fed directly into the Swiss control zone from a measurement perspective.

7.6 International platforms for control energy

The control energy must balance out sudden fluctuations in electricity consumption and generation, making it a vital component of electricity supply security. The EU's third internal market package systematically extends the procurement and use of the control energy beyond national borders. This means that the market now offers price advantages for procurement (and thus ultimately for end users) and better protection against potential congestion.

Dedicated international trading platforms are set up for this purpose. The platforms for the exchange of primary control energy (the frequency containment reserve, FCR) and imbalance netting (IN) are operational and will be expanded as necessary. Two further platforms went into productive use in 2022: the PICASSO platform for the exchange of secondary control energy and MARI for rapid tertiary control energy. Switzerland is separate from the latter two platforms for the time being, but the same mechanisms have been introduced for the local market. This situation will continue for as long as on-going court proceedings or the lack of an electricity agreement prevent participation.

The general trend, which is seeing balancing activities increasingly shift towards real time, is resulting in regular adjustments to the structure of reserve power products and their platforms. Examples of this are the introduction of MARI and PICASSO and the reduction of the cross-zonal intraday gate closure time to 30 minutes before real time from 1 January 2026 in accordance with the Electricity Market Design Reform (EMDR) adopted on 21 May 2024. The latter point is extremely relevant because it is incompatible with the operation of an RR platform. This has the undesirable consequence that the TERRE platform will close on 1 January 2026. Discussions between the RR transmission

system operators and the regulatory authorities were stepped up in the year under review to coordinate legal, financial and operational aspects and to ultimately ensure the project is successfully concluded.

Switzerland's participation on the three platforms for RR/TERRE, aFRR and mFRR is subject to an EU legal proviso according to which the European Commission decides on participation based on opinions from the ENTSO-E association and the European association ACER. ENTSO-E issued a positive opinion in September 2017, as did ACER in April 2018. However, access to the platforms is not guaranteed and depends heavily on the political relationship between Switzerland and the EU. In relation to participation on the TERRE platform, the European Commission's Directorate General for Energy has continued to cast doubt over Swissgrid's long-term participation.

ElCom supports Swiss participation on the platforms as it sees considerable risks to secure network operation from non-participation. In specific terms, these may consist of the very short-term occurrence of unscheduled, unannounced, large electricity flows via the Swiss network, which can lead to congestion and outages. This situation could also jeopardise the system security of the entire region surrounding Switzerland.

7.7 International bodies

According to Article 22 paragraph 5 Electricity Supply Act (ESA), ElCom has to coordinate its activities with foreign regulatory authorities and represent Switzerland on all relevant committees and organisations.

In 2024, the EU completed the revision of its relevant legislation for the electricity (new EU Electricity Market Design), gas and hydropower sectors as well as for wholesale market supervision (REMIT II). These reforms took account of geopolitical and economic uncertainty, the conflict in Ukraine, the widespread energy crisis since 2022 and plans to prepare for the risk of future crises.

The main reason for these reforms is the short-term electricity market's dependence on volatile fossil fuel prices (particularly gas). The EU has implemented various measures to address this situation – they include.creating.more.liquid.futures markets, promoting the generation of.renewable.energies.through.differentiated.pricing.contracts,long-termelectricitysupplycontracts, fixed and dynamic price contracts for end customers, increasing the flexibility of the electricity system,.expanding.(smart).power.grids and improving consumer protection in the energy sector.

The main goals are preventing excessive price rises on the customer market and securing electricity production to provide industry and consumers in the EU with more secure, sustainable and affordable energy supply. The European Commission and EU agency ACER will be given greater influence and powers in the energy sector to create a genuine EU internal market for electricity with competitive prices.

ElCom will monitor the implementation and development of the new EU electricity framework and its implications for the Swiss energy market. The conclusion of the bilateral negotiations between Switzerland and the EU and the related electricity agreement open up the prospect of participation in the European Electricity Regulatory Forum (Florence Forum) and most of ACER's activities again.

ElCom is also attempting to make up for the lack of information at EU and ACER level through bilateral exchanges and by continuing to successfully represent Switzerland's interests. Meetings at commission level are held with the regulators of neighbouring countries at regular intervals. A bilateral meeting with ARERA was held in Lugano in 2024, another at technical level with the French energy regulation commission (CRE) in Paris and one with E-Control at the same level via video conference. A meeting scheduled for October 2024 in Bern with the President of BNetzA was postponed to the beginning of January 2025.

ElCom also has observer status at the Council of European Energy Regulators (CEER) which celebrates its 25th anniversary in 2025. Like ACER, CEER and its affiliated regulatory authorities have faced major challenges since 2022 as a result of EU legislative reforms on electricity and gas and the management of the energy crisis. ElCom's Technical Secretariat participated for the first time in the CEER report which looks at network losses every three years and is set to be published in early 2025. In 2024, CEER published additional reports, some in collaboration with ACER.

CEER also issued a position statement on the energy-related aspects of the 'Draghi' report which aims to reinvigorate the EU's competitiveness and innovation capability. The second Von der Leyen Commission will set these goals out in specific terms. It was approved by the new European Parliament in November and took up office on 1 December for the term 2024–29.

In 2024, ElCom was also represented at the two meetings of the OECD's Network of Economic Regulators (NER) in Paris with other regulators from the network industries (energy, electronic communication, transport and water resource management). The NER presented a report on the role of regulators in the green energy transition.

At the invitation of the CRE, ElCom attended a workshop held by the RegulaE.fr network in Paris with other regulators, mainly from French-speaking countries. This workshop covered relevant topics on the regulation of the energy sector, such as infrastructure investment and cybersecurity. Finally, ElCom participated via conference call in parts of the annual Citizen's Energy Forum (Dublin Forum) which focused on end customer markets and protection of electricity and gas customers.

8 Outlook

Security of supply and international affairs
Even though the security of supply situation has eased compared to previous years, there are still significant uncertainties and risks in both the short and medium term. This means ElCom's activities will continue to focus heavily on security of supply issues in 2025. This includes an update of the setting of the power plant reserves required over the medium term. Several analyses are being carried out on security of supply, including a winter production analysis, covering various resilience benchmarks, as well as an adequacy analysis in cooperation with Swissgrid. The results of these analyses will provide the basis for an ElCom recommendation on the size of the reserves required over the medium term.

With regard to the short term, it will focus on implementation of the new framework for creating the hydropower reserve. This will no longer be based on a tendering procedure: instead, a binding model will be used for procurement. Flat-rate compensation will be paid for energy provisioning. ElCom will define the benchmarks for the binding hydropower reserve. It will also determine the levels required for the coming winter, taking account of the current supply situation and additional (thermal) reserves available.

Swissgrid foresees challenges in ensuring network security this summer. A number of scheduled shutdowns combined with high exports forecast from France to Germany and the lack of a coordinated capacity calculation with the CORE region (set to enter into effect in 2026 at the earliest) are all key factors here. When assessing potential operational measures, ElCom weighs up the need for efficiency, performance and security.

Market surveillance
Market surveillance activities once again addressed issues related to network stability and system services in 2025. After ElCom introduced a temporary price cap in the market for secondary control energy (SCE) due to high prices that were fundamentally unjustifiable, it has continued to closely monitor developments on this market. The price and bit caps are only a short-term and temporary corrective measure. Alternative measures are required medium and long-term to improve the efficiency and competitiveness of the SCE market and to reduce demand for control energy and control energy. ElCom will evaluate and implement potential measures in 2025 in close consultation with the relevant market actors.

Market surveillance activities also continue to monitor the wholesale market. ElCom is publishing a report on the price trends during the crisis and on extreme market volatility in 2022. This examines the reasons for and plausibility of the actions of market participants in the context of short-term extreme price fluctuations on the electricity exchanges.

ElCom may play a more significant role in market surveillance if the Parliament adopts the Federal Act on Supervision and Transparency in the Energy Wholesale Markets in 2025. Firstly, the new legislation prohibits market manipulation and insider trading in Switzerland, while also introducing new reporting obligations for the relevant market participants in the electricity and gas markets. It aims to improve transparency on the Swiss energy market.

Prices and tariffs
The new framework created by the omnibus legislation presents a major challenge for monitoring prices and tariffs of networks and basic supply. Specific tariff evaluations covering previous years will continue to be carried out based on the old legal basis in 2025. At the same time, the network operators will now also submit their tariffs for 2026 in 2025 under the omnibus legislation. ElCom is modifying the systems for the

submission of cost and tariff data. Various clarifications and specifications on the interpretation and implementation of the new legislative principles were also required which were provided in the form of guidelines, notifications, directives and Q&As etc. ElCom anticipates various enquiries from network operators about the specific implementation of the new provisions.

In parallel, ElCom will continue its monitoring activities in 2025, especially on basic supply tariffs. In particular, it will focus on the issue of product quality and associated (additional) costs. Data analysis monitoring and surveillance activities for cost and tariff evaluations focusing on risk and effectiveness will also be developed in 2025.

Legal proceedings

In relation to legal proceedings, ElCom continues to address the implementation of the average price method. This concerns the allocation and inclusion of costs for procurement and internal power production in basic supply tariffs. Some proceedings concerning the reduction in shortfalls are still pending. Various disputes concerning the installation of smart meters or the assumption of additional costs for the manual reading of conventional meters are still to be decided. Many of them have been resolved amicably. Numerous proceedings on compensation for expansion of network capacity will be addressed in the coming year too.

Over 250 proceedings are currently still pending and the receipt of further applications from network operators is expected on an ongoing basis. Finally, the implementation of the Federal Act on a Secure Electricity Supply from Renewable Energy Sources will raise numerous new issues which ElCom will have to address – possibly also as part of new proceeding.

Digital and data

As well as answering enquiries on the implementation of the new legislation, ElCom will also incorporate the new provisions into its survey and regulatory instruments. This includes IT systems in particular. For example, the omnibus legislation establishes the legal basis for publishing the results of the Sunshine Regulation and comparisons of companies based on various indicators. This information is to be published in early 2026 with an upgrade of ElCom's existing electricity price website. The IT systems for market surveillance must also be continually upgraded and updated to perform and meet an increasing number of duties and requirements.

Data plays a key role in ElCom's regulatory activities. In 2024, ElCom upgraded its capacities in this area to ensure adequate use of data for regulation and high data quality and to take full advantage of analysis opportunities. These tasks will become a key part of ElCom's activities in future, particularly in view of the sharp increase in data quantities.

9 About ElCom

The Commission from left to right: Laurianne Altwegg (Vice President), Felix Vontobel, Werner Luginbühl (President), Katia Delbiaggio, Jürg Rauchenstein, Sita Mazumder, Andreas Stöckli

ElCom has the task of monitoring the Swiss electricity market and ensuring compliance with the electricity supply and energy laws. It supervises electricity prices and tariffs and decides on disputes over network access. ElCom also monitors the situation regarding electricity supply security and regulates matters relating to international electricity transport and trading. Finally, ElCom deals with purchase and payment disputes concerning small production plants and decides between consumers of their own production and network operators in certain cases.

Key electricity sector data
ElCom supervises wholesale electricity trading and the electricity sector, including Swissgrid. Its supervisory activities cover network usage tariffs, electricity tariffs for fixed end users, security of supply, the condition of the electricity networks and the allocation of network capacities in the event of congestion at the country's borders.

Number of network operatos: 586
Number of network levels: 7
Kilometres of electricity networks (overhead lines and cable, incl. building connections): Total approx. 214,000k | network level 1 – approx. 6,700km | network level 3 – approx. 8,929km | network level 5 – approx. 46,330km | network level 7 – approx. 152,166km

Number of measurement points: 5,85 Mio.
Number of invoice recipients: 5,35 Mio.

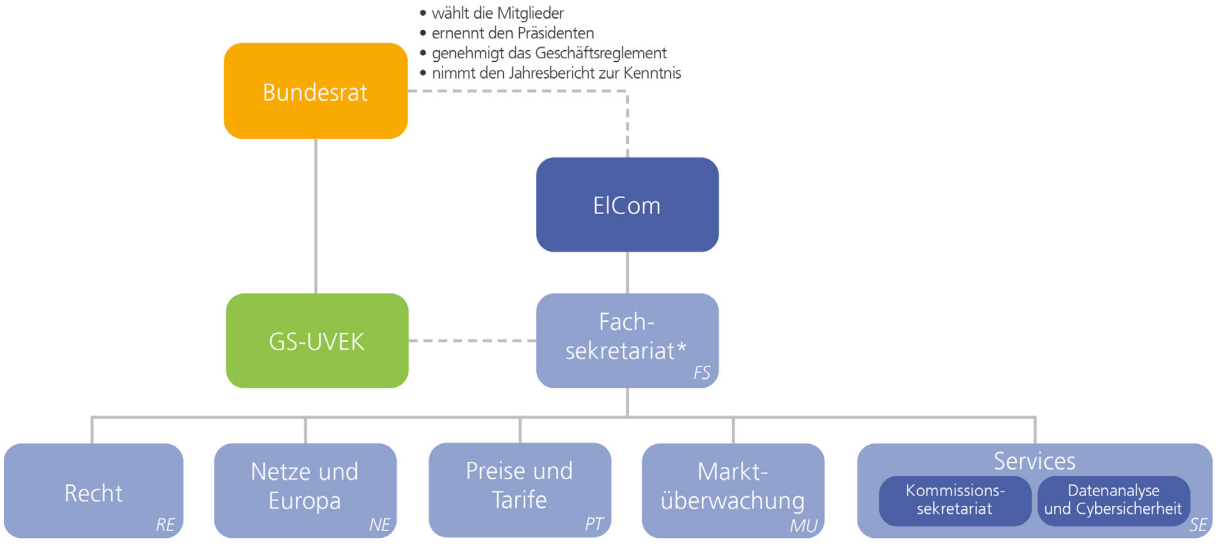
Annual investments in the network infrastructure: around CHF 1,9 billion, of which:
- Annual investments in the distribution network: CHF 1.6 billion
- Annual investments in the transmission network: CHF 221 million

Annual electricity consumption: 2022 57 TWh | 2023 56.1 TWh

Production: 2022 63,5 TWh | 72,1 bn. KWh (incl. consumption by storage pumps)
Electricity imports: 2022 33,1 TWh | 27,5. kWh
Electricity exports: 2022 29,7 TWh | 33,9 kWh

9.1 Organisation and personnel

ElCom is made up of five to seven independent members appointed by the Federal Council, plus a Technical Secretariat. It is not subject to any directives of the Federal Council and is independent of the administrative authorities.



*Administrative Angliederung an GS-UVEK

Figure 22: ElCom organisational chart

The Commission Secretariat section at the Technical Secretariat was renamed 'Services' and a 'Data Analysis and Cybersecurity' unit. was added to it in the year under review in view of new responsibilities.

9.1.1 Commission

The Commission meets once a month in plenary session at the Commission meetings. The Commission members also meet on the expert committees 'Pricing and Tariffs', 'Networks and Security of Supply', 'Law'. 'International Relations' and 'Market Surveillance':

President

- Werner Luginbühl (since 2020): former member of the Council of Statest

Vice president

- Laurianne Altwegg (since 2015): Political science graduate, responsible for energy, environment and landscape at the Consumers Association of Western Switzerland (FRC)

Members

- Katia Delbiaggio (since 2020): PhD in political science, Professor of Economics at the School of Business, Lucerne University of Applied Sciences and Arts

- Sita Mazumder (since 2018): PhD in economics, Professor of Economics and Computer Science at the Lucerne School of Information Technology, Lucerne University of Applied Sciences and Arts
- Jürg Rauchenstein (since 2022): Degree in electrical engineering (ETH), Development Engineer at ABB
- Andreas Stöckli (seit 2019): Dr. iur., Rechtsanwalt, Professor für Staats- und Verwaltungsrecht an der Universität Freiburg
- Felix Vontobel (since 2020): Dipl. El. Ing. FH

Committees
In the year under review, the Commission's committees were as follows:

Pricing and Tariffs
- Katia Delbiaggio (chairperson)
- Laurianne Altwegg
- Sita Mazumder
- Andreas Stöckl

Legal Affairs
- Andreas Stöckli (chairperson)
- Werner Luginbühl
- Lauriane Altwegg
- Jürg Rauchenstein

Networks and Supply Security
- Jürg Rauchenstein (chairperson)
- Werner Luginbühl
- Katia Delbiaggio
- Felix Vontobel

International Relations
- Felix Vontobel (chairperson)
- Werner Luginbühl
- Laurianne Altwegg
- Jürg Rauchenstein

Market Surveillance
- Sita Mazumder (chairperson)
- Katia Delbiaggio
- Andreas Stöckli
- Felix Vontobel

9.1.2 The Technical Secretariat

The Technical Secretariat provides the Commission with technical and specialist support, prepares ElCom's decisions and implements them. It manages administrative law proceedings and carries out clarifications. It is independent of any other authorities and is solely subject to the directives of the Commission. At administrative level, the Technical Secretariat is affiliated to the DETEC General Secretariat as a service recipient. As of 31 December 2024, the Technical Secretariat had 50 permanent employees and five interns in full and part-time positions. This corresponds to 43.2 full-time equivalents (FTE), excluding interns. The average age of all employees is 45.

Director of the Technical Secretariat (55 employees)

Urs Meister
Dr. oec. publ
Doctor of economics

Networks and Europe (10 employees)

Michael Bhend
Degree in engineering
ETH Zürich

Pricing and Tariffs (13 employees)

Barbara Wyss
Dr. oec. publ.
Doctor of economics

Legal Affairs (11 employees)

Nicole Zeller
lic. iur., attorney-at-law

Market Surveillance (8 employees)

Cornelia Kawann
Degree in engineering,
Doctor of technology, MBA

Services (12 employees)

Simon Witschi
M.A.

9.1.3 Independence and vested interests

Commission members work for ElCom on a part-time basis and may carry out other professional activities on the side. However, they may not belong to any legal entities operating in the electricity sector and may not provide any services for such entities. ElCom members are subject to the general duty of recusal. ElCom has tightened up these obligations and introduced additional rules on abstention. ElCom members are asked to indicate any vested interests annually which are transparently declared.

A code of conduct also applies to Technical Secretariat employees which they must sign when entering into an employment relationship with ElCom.

9.2 The Federal Administration's communication and principle of freedom of information

As part of the Federal Administration, ElCom is subject to the Federal Act on Freedom of Information in the Administration (Freedom of Information Act; FoIA). This Act provides the public with access to official documents. If the request for access concerns the data of third parties (e.g. a network operator), they must be consulted. They must always be granted the opportunity to appeal before access is granted. In the year under review, ElCom received several applications under the principle of freedom of information and was also consulted on applications received by other administrative units.

9.3 Finance

In the year under review, ElCom had a budget of CHF 13.6 million at its disposal. The available funds barely covered expenses in the year under review, including the costs on ElCom's expensive and complex IT systems (in particular, the EDES data submission system and MATCH market surveillance system for Switzerland. On the income side, ElCom received a total of around CHF 5.5 million, the main sources of which were payments of supervisory fees by Swissgrid for ElCom's cooperation with authorities abroad and court costs paid by parties involved in legal proceedings.

9.4 Events

ElCom Forum 2024

The 14th ElCom Forum was held on 15 November 2024 at the AHA in Aarau. Around 300 guests from the energy sector attended presentations and discussions on the topic of 'Flexibility as the new currency on the electricity market'. Speakers from industry, government and the academic community reviewed the current situation and discussed current and future challenges. The ElCom Forum 2025 is scheduled to take place on 14 November in Pratteln.

Information events for network operators

ElCom held a total of four virtual information events for network operators during 2024. These events covered current issues relating to pricing and tariffs, high market prices and legal developments. A total of around 600 people attended the events held in three languages. Both the participants and employees of ElCom once again welcomed this opportunity to share professional experience.

Market Surveillance workshop

This year's workshop held by ElCom's Market Surveillance section focused on Switzerland's control energy markets. Swissgrid provided a comprehensive overview of the historic development on the control energy markets and the current challenges being faced in terms of frequency stability, while ElCom presented the latest findings from monitoring of the control energy markets and issues related to market transparency.

10 Annex

10.1 Facts and Figures

A total of 493 new cases were received in 2024 and 374 cases were brought forward from the previous year. Of these cases, 138 were concluded in the reporting year. Most of these cases concerned applications to expand network capacity. General enquiries are those submitted via the contact form on the ElCom website or by email and which deal with routine matters.These enquiries generally take a few hours or days to deal with. Very occasionally, general enquiries may also lead to proceedings. In 2024, 792 such general enquiries were received. All but 24 of the general enquiries received were dealt with in full.

Type of transaction	Carried forward from previous years	Received 2024	Dealt with in 2024	Carried forward to 2025
Tariffs	85	23	1	107
Increase in network capacity	147	394	100	441
Remainder (e.g. OC and SÜL/ PGV)	142	76	37	181
Total	**374**	**493**	**138**	**729**
General inquiries	35	781	792	24
Total including general enquiries	**409**	**1274**	**930**	**753**

Table 8: ElCom activities: statistics for 2024

10.2 Meetings

In the year under review, the members of ElCom (in various compositions) attended a total of 12 full-day and 26 half-day meetings within Switzerland. ElCom holds its retreat once a year. In the reporting year the Commission held its retreat in Lachen (SZ).

10.3 Publications

Directives

08.02.2024	ElCom's supervision of cybersecurity
05.03.2024	WACC Production
05.03.2024	Network and energy coverage differentials from the previous years
04.06.2024	Communication of tariff adjustments
24.06.2024	Benchmarks for establishing a hydropower reserve in the 2024–25 hydrological year
16.10.2024	Order on access of the power plants for the 2024–25 winter reserve
17.12.2024	Basic supply of energy – applicable law

Notifications

16.01.2024	ElCom position statement on the draft version of the Switzerland-EU negotiating man-date
07.05.2024	Consultation procedure on the implementation of the omnibus legislation at ordinance level – ElCom position statement
05.06.2024	Consultation procedure on the Electricity Supply Act (requirements for systemically critical companies) – ElCom position statement
25.06.2024	Coverage differentials – model calculation and reduction of coverage differential energy for the period 2024–29
25.06.2024	Metering – mandatory use of smart meters in accordance with Articles 8a and 8b Electricity Supply Ordinance for unrestricted consumers and newly connected production plants
02.07.2024	Control zones – balance
02.07.2024	Position statement on the WACC consultation procedure
25.07.2024	Hydropower reserve factsheet
05.09.2024	Questions and answers on Energy Strategy 2050 (update)
15.10.2024	Consultation procedure on the Electricity Act (accelerated expansion and restructuring of the electricity networks) – ElCom position statement
24.10.2024	Frequently asked questions on metering/smart meters
31.10.2024	High prices for secondary control energy (SCE)
13.11.2024	Consultation procedure on the ordinance on the operation of reserve power plants in a severe electricity shortage – ElCom position statement
15.11.2024	Urgently required improvement in the quality of measurement data used for forecasting
18.12.2024	High prices for secondary control energy (SCE): Introduction of a temporary price cap

Reports and studies

24.10.2024	Frequently asked questions on metering/smart meters
31.10.2024	High prices for secondary control energy (SCE)
13.11.2024	Consultation procedure on the ordinance on the operation of reserve power plants in a severe electricity shortage – ElCom position statement
15.11.2024	Urgently required improvement in the quality of measurement data used for forecasting
18.12.2024	High prices for secondary control energy (SCE): Introduction of a temporary price cap

10.4 Glossary

ACER	EU Agency for the Cooperation of Energy Regulators
aFRR, mFRR	Automatic / manual frequency restoration reserve
Balance management	Measures for constantly maintaining the electricity and capacity balance in the electricity system, including timetable, measuring data and balance compensation management.
BEPM	Balance energy price mechanism
CEER	Council of European Energy Regulators
CIP	Critical Infrastructure Protection Strategy
CMIT	CEER Market Integrity and Transparency Working Group
Congestion management	Ensures the secure operation of the network can be maintained through preventive measures (e.g. NTC specification, capacity auctions) and operational measures (e.g. re-dispatch, reduc tions).
Control zone	Zone in which the national network operator is responsible for network control. This zone is physically defined through meas urement stations.
CORE	The CORE capacity calculation region consists of the former CWE (Central Western Europe) and CEE (Central Eastern Europe) regions
CRE	French energy regulatory commission (Commission Régulation de l'Energie)
Day-ahead	The trading of electricity for the next day where the prices and amounts are determined 24 hours in advance
DETEC	Federal Department of the Environment, Transport, Energy and Communications
Distribution network	High, medium or low voltage network for the purpose of supplying electricity to end users or electricity supply companies
DNO	Distribution network operator

ECC	European Commodity Clearing – a clearing house specialising in energy and commodity contracts
EDES	ElCom data delivery system
EEX	European Energy Exchange
ElCom	Swiss Federal Electricity Commission
EMOTA	Federal Act on the Use of Electronic Means to Carry Out Official Tasks
EnA	Energy Act
End users	Customers who buy electricity for their own consumption. This does not include power plants that buy electricity for their own consumption or to power pumps at pump storage power plants.
EnO	Energy Ordinance
ENTSO-E	European Network of Transmission System Operators for Electricity
EPEX SPOT	European Power Exchange
ESA	Electricity Supply Act
ESC	Energy supply company
ESO	Electricity Supply Ordinance
EU	European Union
FCR	Frequency-controlled normal operation reserve
FINMA	Swiss Financial Market Supervisory Authority
FiRECA	Federal Act on Subsidiary Financial Aid to support Systemically Critical Companies in the Electricity Industry
FOCP	Federal Office for Civil Protection
FSO	Federal Statistical Office
GATE	Federal Act on Supervision and Transparency in the Wholesale Energy Markets

GME	Gestore Mercati Energetici
GWh	Gigawatt hour
H4 but	5-room apartment with an electric cooker and tumble dryer, without an electric boiler
HV	High voltage
ICT	Information and communications technology
IN	Imbalance netting
kVA	Kilovolt ampere
kWh	Kilowatt hour
kWp	Kilowatt peak
LV	Low voltage
MARI	Platform for the exchange of fast tertiary control energy
Median	Value in the middle of a data series arranged by size, i.e. half of all the observations are less than or greater than the median value (unlike the mean value, the median is resistant to statisti cal outliers).
MV	Medium voltage
MVA	Megavoltampere
MW	Megawatt
MWh	Megawatt hour
NCCS	Network Code on Cybersecurity
NCSC	National Cyber Security Centre
NER	OECD Network of Economic Regulators
NESA	National Economic Supply Act
Net transfer capacity (NTC)	Maximum exchange programme between two network zones that complies with the safety standards of both zones and

	which takes technical uncertainties regarding future network situations into account.
Network access	Right to use a network in order to obtain electricity from any s upplier or to feed electricity into a network.
Network usage	Physical use of a network system based on feed-in or withdraw al of electricity.
NIST	National Institute of Standards and Technology
NO	Network operator
NPP	Nuclear power plant
NRAs	National regulatory authorities
OMP	Organised marketplaces
PGV	Planning approval procedure (Plangenehmigungsverfahren)
PICASSO	Platform for the exchange of secondary control energy
PV	Photovoltaic
PVS	Photovoltaic system
Refinitiv	One of the world's largest providers of financial market data and infrastructure
REMIT	Regulation on Wholesale Energy Market Integrity and Transpar ency): Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on Wholesale Energy Market Integrity and Transparency
Reserve power supply	Power supply that can be drawn on automatically or manually by power plants to maintain the scheduled level of electricity exchange and ensure the continued safe operation of the network.
RRM	Registered reporting mechanism
SAIDI	The System Average Interruption Duration Index (SAIDI) indi cates the average duration of interruptions in supply to an end user in an electricity supply system.

SAIFI	The System Average Interruption Frequency Index (SAIDI) indicates the average frequency of interruptions in supply to an end user in an electricity supply system.
SCE	Secondary control energy
SCR	Secondary control reserve
SFOE	Swiss Federal Office of Energy
SIX	The company that provides the infrastructure for the Swiss financial marketplace and operates SIX Swiss Exchange
SSM	System service manager
SSM	System service manager
SÜL	Electricity Transmission Lines sectoral plan
System services	The ancillary services necessary for the safe operation of net works. The main components are system coordination, balance management, provision of balancing capacity, self-contained start and independent operation capability of generators, voltage stability (including reactive energy), operational meas urements and compensation of active power losses.
TCR	Tertiary control reserve
TERRE	Platform for the exchange of slow tertiary control energy
Transmission network	Network used for the transmission of electricity over large distances within the country and for connection to networks outside the country, usually operated within the range of 220 to 380 kV. The following items are integral parts of the transmis sion network: a) transmission lines and support structures; b) coupling transformers, switching systems and measurement, control and communication equipment; c) systems that are used jointly with other network levels, mainly in association with the transmission network or without which it is not possible to operate the transmission network safely and efficiently; d) switching fields before the transformer at the transfer point to another network level or a power plant.
TSO	Transmission system operator

TWh	Terawatt hour
VSE	Association of Swiss Electricity Companies
WACC	Weighted Average Cost of Capital

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