Market Transparency 2021

ElCom Report

Bern, May 2022

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Foreword

2021 – like 2020 – was overshadowed by the COVID-19 pandemic. The secure and stable operation of the secure room continued to take top priority and – in addition to the regular futures and spot market reports – various other developments were also monitored, reviewed and reported on.

2021 began as 2020 ended – with negative prices. The study on negative prices in Switzerland, France and Germany between 1 January 2015 and 31 December 2020 published in January 2021 indicated that an increase in the number of hours with negative prices had been observed in various markets over recent years. This development is being driven by various factors: the expansion of renewable energies, particularly wind and solar power which are being entered in the order book with marginal costs of almost zero; regulatory framework conditions may result in plant operators continuing to produce in a negative-price environment; inflexible conventional power plants which do not restrict their power production on days when high levels of wind and solar power are being fed into the grid, whether due to technical restrictions and opportunity costs or on account of contractual obligations. In Germany, negative prices usually occur on days of low load and high feed-in of wind and solar power. Negative hourly prices occur less frequently in Switzerland and France than in Germany. The limited cross-border transmission capacity with Germany restricts the flow of inexpensive electricity to these countries. An increase in the number of hours with negative prices has nevertheless also been observed in Switzerland and France.

However, the negative price trend was reversed over the course of the year. There are also various reasons for the rise in energy prices (oil, gas and electricity). Demand for energy is rising generally as many states recover from the COVID-19 slowdown. Rising temperatures, interrupted supply chains and programmes to cut CO2 emissions are also fuelling electricity price rises. Even though Switzerland is faring comparatively well and an average Swiss household can expect an average rise in electricity costs of 3% in 2022, the level of increase is expected to differ from region to region. This trend does not look set to be reversed in 2022.

The development of commercial border capacity for the exchange of electricity with neighbouring countries is also being monitored. An analysis of the Swiss-German border for the period October 2021 shows cuts to capacity can result in – depending on the price situation in neighbouring countries – significantly higher electricity prices in Switzerland and also make the transport of electricity more expensive. The future development of the EU's internal electricity market – to which Switzerland currently only has limited access without an electricity agreement – may continue to play a major role in this respect.

The fact that ElCom still does not possess all the data required for comprehensive market surveillance remains challenging. While the REMIT Regulation in the EU means the national authorities can monitor the market transparently and impose high financial penalties in some cases in the event of violations of REMIT, the existing legislation in Switzerland only enables a limited insight into market developments. As a result, the electricity market is non-transparent and opportunity to identify and prevent system failures through market manipulation is limited. As before, market manipulation and insider trading on the electricity wholesale market are not prohibited in Switzerland. The impact of the extreme electricity price developments towards the end of the year and the parliamentary initiative submitted in December by National Councillor Jürg Grossen, which aims to achieve *greater transparency and integrity in electricity wholesale trading*, may result in ElCom obtaining all the data required for comprehensive market monitoring.

I hope you enjoy reading this Market Transparency Report which provides fascinating insights into ElCom's market surveillance activities.

Sita Mazumder

1 Market surveillance in Switzerland: Facts and figures

Based on Article 26*a* of the Electricity Supply Ordinance of 14 March 2008 (ESO; SR 734.71), market participants (legal entities or natural persons) domiciled in Switzerland which participate in an electricity wholesale market within the European Union and are obliged under Regulation (EU) No 1227/2011 on Wholesale Energy Market Integrity and Transparency (REMIT Regulation)[1] to provide information to the authorities of the EU or its member states must also provide the same information to ElCom at the same time and in the same format. This also includes registering with ElCom (Art. 26*a* para. 4 ESO) and submitting the relevant registration data.

At the end of 2021, 82 Swiss energy companies were registered with ElCom; see Figure 1. The change compared to 2020 is due to five new registrations and one deregistration.

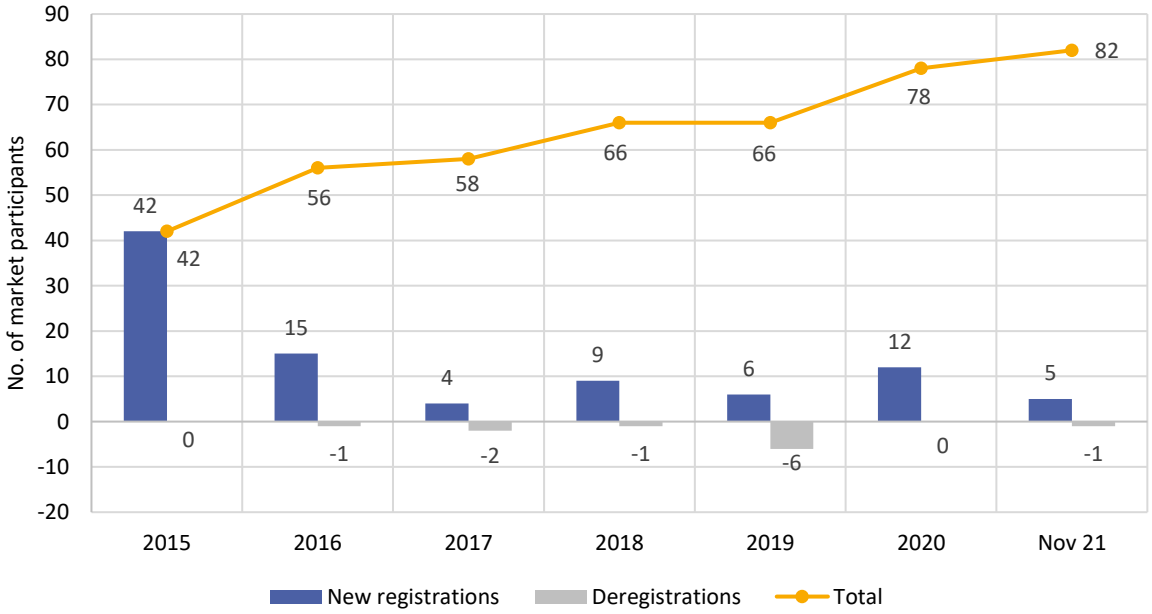

Figure 1: Number of Swiss market participants registered with ElCom as at 31 December 2021[2]

As in previous years, the new registrations are largely the result of the annual survey in which the withdrawal of market participants with their registered office or which are domiciled in Switzerland from the Centralized European Register of Market Participants (CEREMP) of the Agency for the Cooperation of European Energy Regulators (ACER) is compared in advance with the list from ElCom's registration tool. Those market participants which are registered with ACER but not yet with ElCom are requested in writing to also register with ElCom if the legal requirements are met.

The majority of companies registered with ACER but not with ElCom trade exclusively in commodities other than electricity – primarily natural gas, crude oil, liquefied natural gas (LNG), liquefied petroleum gas (LPG) or financial products based on these commodities – and are therefore not required by law to register with ElCom or to meet the obligation to provide information on their transactions on the EU trading markets.

A few of those registered are active on the electricity wholesale market but were unaware of the relevant legal obligations. This meant they did not register with ElCom until a later stage. They also then belatedly reported the mandatory data.

[1] Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency, EUR-Lex - 32011R1227 - EN - EUR-Lex (europa.eu), as at 1 February 2021
[2] If no data source is indicated, these are ElCom's own data-based evaluations.

With regard to the distribution of market participants according to the country where initial registration under REMIT took place, the German Federal Network Agency (BNetzA) remains, as in previous years, in first place with a total of 44 companies from Switzerland (the same as in 2020). This is followed by the UK regulator, the Office of Gas and Electricity Markets (Ofgem), with nine registered Swiss market participants in 2020.

This changed due to the UK's departure from the EU. Since the beginning of the year, the data on transactions on the UK electricity market has no longer been subject to mandatory reporting to the EU authorities in accordance with REMIT and will therefore no longer be reported to ElCom either. As a result, companies with their head office or registered in the UK had to register with another EU regulatory authority from 1 January 2021 in accordance with REMIT and re-register with ElCom using the ACER code issued by the authority concerned. Ten of the 78 market participants registered with ElCom are affected by this change.

The Dutch authority *Autoriteit Consument & Markt* (ACM) now occupies second place with nine registered Swiss market participants. The five market participants newly registered with ElCom mainly registered with the Dutch regulatory authority.

The Italian regulator *Autorità di Regolazione per Energia Reti e Ambiente* (ARERA) remains in third place with regard to registrations, followed by the French regulator *Commission de régulation de l'énergie* (CRE) with six market participants from Switzerland. Five Swiss market participants each are registered with the Austrian regulator *Energie-Control GmbH* (E-Control) and with Ofgem. The Polish (*Urząd Regulacji Energetyki*, URE) and Spanish (*Comisión Nacional de Energía*, CNE) regulatory authorities recorded one new registration each. There is also still one company listed in the overview which only conducts trading activities within Switzerland but has registered voluntarily with ElCom, see Figure 2.

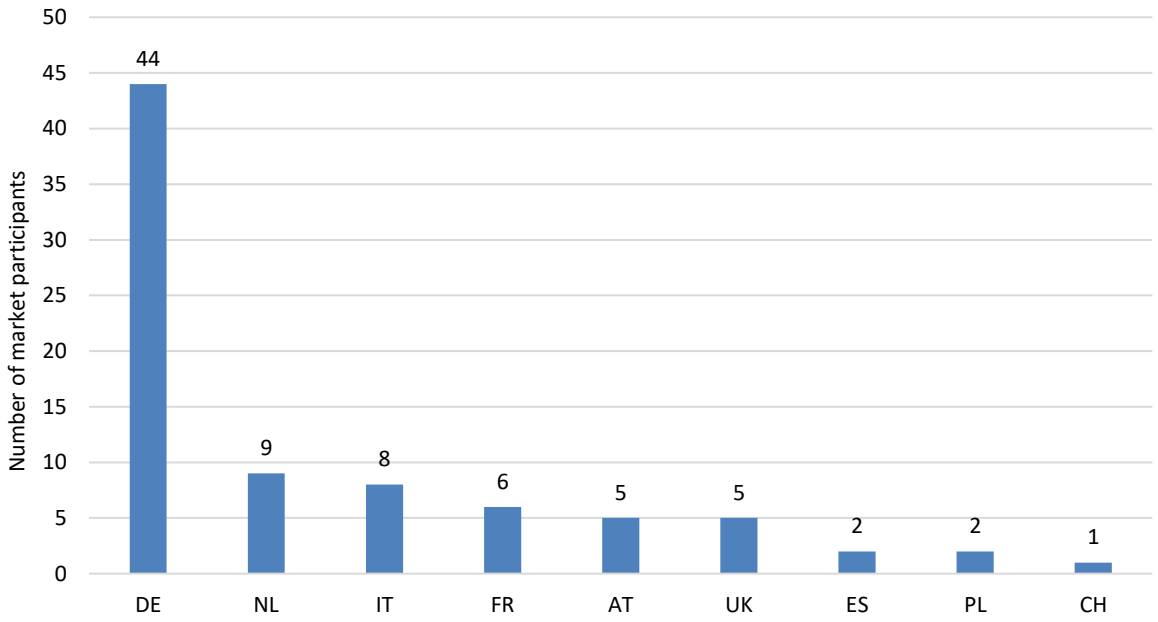

Figure 2: Number of Swiss market participants registered with EU regulators.

The market participants which have their registered office or who are domiciled in Switzerland provided information on energy trading transactions carried out on EU markets exclusively via external registered reporting mechanisms (RRMs). The number of RRMs registered with ElCom since last year is still nine, see Table 1. An overview of the RRMs linked to ElCom is published on ElCom's website.

No.	RRM	ACER code
1	EEX European Energy Exchange AG	B0000104M.DE
2	EPEX SPOT SE	B0000258F.FR
3	Equias B.V.	B00001014.NL
4	EXAA Abwicklungsstelle für Energieprodukte AG	B0000114T.AT
5	JAO S.A.	B0005876N.LU
6	Seeburger AG	B0000112P.DE
7	Total Gas & Power Ltd.	A0000208K.UK
8	Trayport Ltd.	B00001100.UK
9	Webware Internet Solutions GmbH	B0001064H.DE

Table 1: List of the RRMs linked to ElCom as at 31 December 2021

The market participants report all trading transactions via the RRMs. ElCom also receives the fundamental data and publications on insider information via specially created interfaces with the European Network of Transmission System Operators for Electricity (ENTSO-E) Transparency Platform (ENTSO-E TP) and the European Energy Exchange (EEX) Transparency Platform (EEX TP).

For the reporting of insider information, ElCom only accepts dedicated transparency platforms, known as inside information platforms (IIPs) which are listed with ACER. After selecting a transparency platform, the market participants must update the relevant information in the ElCom registration tool.

Reporting via companies' own websites or via social media can be used as an additional source for the publication of insider information from 1 January 2021 but is no longer sufficient and effective.

In addition to transaction data, the Market Surveillance Section also obtains further information, such as the settlement prices for electricity, gas and CO_2 from EEX or the coal prices from Refinitiv. These are used for reference in the analyses. Data on the levels of reservoirs in Switzerland, power plant availability in neighbouring countries and other information, some from public sources such as MeteoSwiss, are also retrieved and incorporated into the studies and analyses produced. This additional data and information was of major importance for comprehensive market surveillance, especially in view of the high-price situation that arose towards the end of the year.

In 2021, the 82 Swiss market participants reported 45.3 million transactions (trades and orders) via the nine RRMs registered with ElCom. That is over 500,000 more transactions than in the previous year. This once again confirmed the increasing data volume trend from previous years, although the number of trades – above all – fell by almost 1 million in the 4th quarter due to the extremely high prices. Interestingly, the number of orders remained constant over the same period.

The number of non-standard contracts reported rose by over 2,000 to 8,685. The higher number of non-standard contracts reported in the first quarter 2021 is attributable to correction reports.

A greater increase was reported in the fundamental data. Around 1.1 million or 20% more reports were registered than in 2020. However, this change is due to the adjusted settings for the retrieval of fundamental data predefined by ElCom.

A similar rise was recorded in insider information submitted. Almost 16% more events were reported in 2021 than in the previous year.

In total, just under 215 million items of data have been reported to ElCom since the reporting obligation was introduced in 2015. A detailed overview of the data submitted can be found in Figure 3.

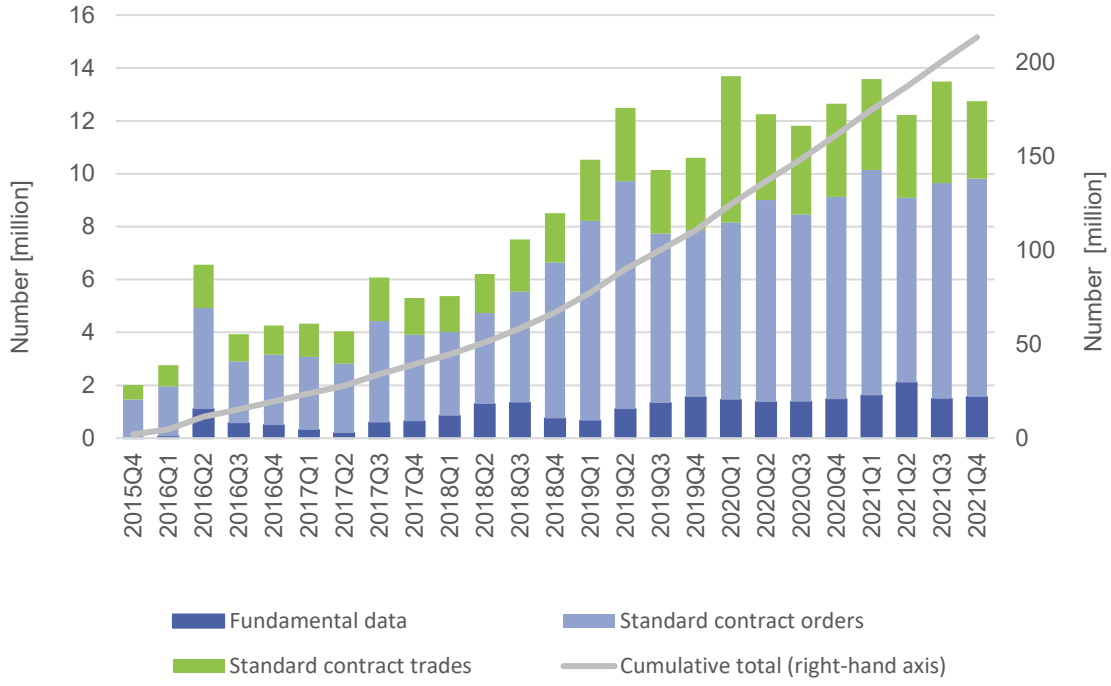

Figure 3: Data reported since the start of the reporting obligation. Fundamental data includes production data of power plants, load data, availability of cross-border capacity, commercial cross-border flows, reports on electricity infrastructure outages, etc.

In 2021, standard contracts again made up the majority of transaction reports at 87%. At 95%, the majority of the data here comes from spot trading. Compared to the previous year, there was a continual shift from spot trading auctions (2020: 41%) to spot trading continuous (2020: 53%).

Only 5% of the reports concern futures and forwards transactions, see Figure 4. Most futures transactions are executed via brokers or the EEX exchange.

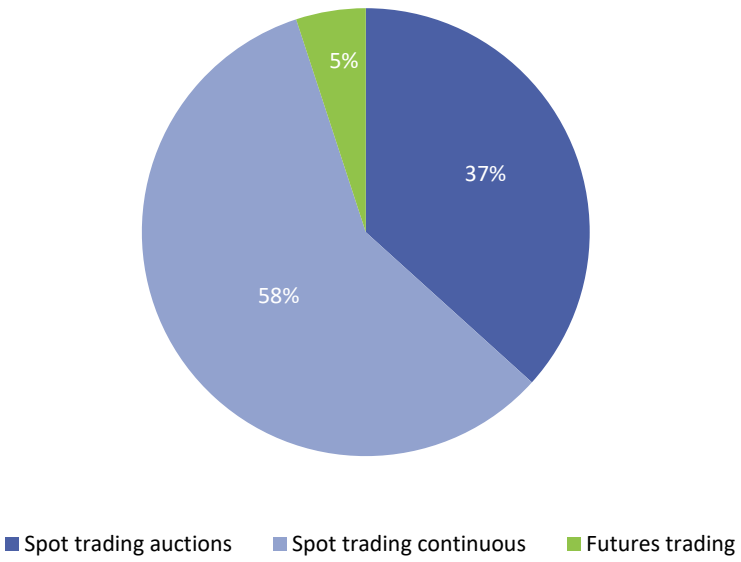

Figure 4: Breakdown of standard contracts by spot and futures trading

2 Market overview

In 2021, ElCom continued to publish spot and futures market reports. Each week, it shows and comments on the current status of electricity prices and their development in Switzerland and neighbouring countries (France, Germany, Austria and Italy) over the past few weeks. While spot market reports focus on hourly and weekly contracts, and explain the key fundamental data underlying the price movements, futures market reports focus on longer-term products, such as annual, quarterly and monthly contracts. The role of CO2, gas and coal – the major price drivers – is also outlined.

A summary of the changes and anomalies in price movements during 2021 deemed significant by ElCom are presented in the following section.

2.1 Spot market report – annual review 2021

While in 2020 spot prices were still low, 2021 saw high spot prices, particularly in the second half-year.

Table 2 reveals that this development was not anticipated on the futures market. It shows the average spot prices based on product supplied (year, quarter and month) and destination location – Switzerland (CH), France (FR) and Germany (DE) – for the 2021 supply year. The spreads with Switzerland are still explicitly calculated as CH-FR and CH-DE. A comparison with the futures market is also made in the table where the final closing price of the EEX before the first day-ahead auction is shown for the relevant product supplied. This is the futures market's last expected price for the product supplied. The difference between the final closing price on the EEX and the actual spot price is calculated. Values where trading was lower on the futures market than the spot market are shown in green, while values where trading was higher on the futures market than on the spot market appear in red. If the absolute price variation between the futures and spot market is greater than EUR 10/MWh, the entire cell is shaded accordingly (light: +/- EUR 10/MWh, medium: +/- EUR 20/MWh, dark: +/- EUR 50/MWh).

		Average of spot prices on the day-ahead auction in EUR/MWh by country of supply					Last EEX settlement price before spot trading (= reference price of futures market)	Date of last settlement price of EEX	Last EEX settlement price minus average of spot prices on the day-ahead auction
Supply period	Supply product	CH	DE	FR	CH-DE	CH-FR	CH	CH	CH
2021	Base	114.92	96.85	109.17	18.08	5.76	53.15	28.12.2020	-61.77
Q1 21	Base	56.94	49.57	53.02	7.36	3.91	61.08	28.12.2020	4.14
Q2 21	Base	64.92	60.27	63.87	4.65	1.06	49.67	29.03.2021	-15.25
Q3 21	Base	100.11	97.14	96.58	2.96	3.53	81.86	28.06.2021	-18.25
Q4 21	Base	235.93	178.97	221.48	56.96	14.45	192.92	28.09.2021	-43.01
Jan 21	Base	60.49	52.81	59.48	7.69	1.01	67.71	2020-12-28	7.22
Feb 21	Base	53.87	48.71	49.01	5.17	4.86	59.64	2021-01-29	5.77
Mär 21	Base	56.15	47.13	50.18	9.02	5.97	49.32	26.02.2021	-6.83
Apr 21	Base	63.63	53.61	63.10	10.01	0.52	51.41	31.03.2021	-12.22
Mai 21	Base	57.81	53.35	55.28	4.46	2.53	56.72	30.04.2021	-1.09
Jun 21	Base	73.58	74.08	73.51	-0.51	0.06	65.20	31.05.2021	-8.38
Jul 21	Base	80.96	81.37	78.37	-0.41	2.59	84.06	30.06.2021	3.10
Aug 21	Base	82.55	82.70	77.30	-0.15	5.24	80.12	30.07.2021	-2.43
Sep 21	Base	138.04	128.37	135.31	9.67	2.73	102.78	31.08.2021	-35.26
Okt 21	Base	198.31	139.60	172.57	58.71	25.74	188.85	30.09.2021	-9.46
Nov 21	Base	226.89	176.15	217.06	50.74	9.83	186.47	29.10.2021	-40.42
Dez 21	Base	282.29	221.06	274.67	61.23	7.62	282.09	30.11.2021	-0.20

Table 2: Daily average prices of the EPEX SPOT day-ahead auction vs. the last traded EEX futures market price by supply period and country to which the electricity is supplied

The average spot price for the 2021 supply year stood at EUR 114.92/MWh in Switzerland, which was higher than in Germany and France. At the end of 2020, the futures market calculated a price of EUR 53.15/MWh for base electricity supply in Switzerland for the 2021 supply year. This meant the futures market was trading at almost EUR 62/MWh lower than the spot market for the 2021 supply year. The product for the second, third and fourth quarters as well as the monthly products in September and November were also traded at a significantly lower price in advance on the futures market than they were subsequently on the spot markets when supplied. However, trading adjusted to the new situation for the monthly product in December. The divergence between futures and spot trading was much narrower in December.

Both demand and supply factors contributed to the rise in electricity prices. Demand for electricity recovered to the pre-pandemic level in 2021. As a result of this increase and the low level of wind power generation in summer 2021, gas-fired power plants became price-determining units on the energy wholesale markets. Gas prices rose very sharply from August at the short end (i.e. month ahead, quarter ahead). This had a major impact on the marginal costs of gas-fired power plants and, as a result, on the price of electricity. Figure 5 shows the marginal costs of the gas-fired and coal-fired power plants based on the rolling month-ahead contracts for gas, coal and CO2. This figure indicates that while the gas-fired power plants had lower marginal costs than their coal-fired counterparts at year opening, there was a reversal from August 2021 onwards. The gas month-ahead price peaked in December, pushing the marginal costs of the gas-fired power plants into EUR 400/MWh territory. This price increase is also reflected in the spot prices (see Figure 6 and Figure 7).

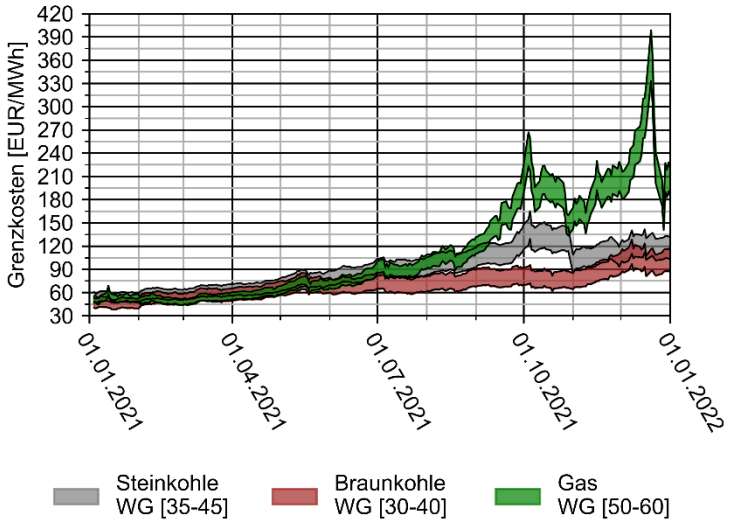

Figure 5: Marginal costs of brown coal (red), hard coal (grey) and gas-fired (green) power plants based on the month-ahead products for coal, gas and CO2

Figure 6 shows the average monthly prices on the Swiss day-ahead auction since 2015. The prices in 2021 are extraordinarily high, particularly from the second half of the year. The monthly average price peaked in December due to the high gas prices.

Figure 7 shows the day-ahead price trend for Switzerland, France, Germany and Austria. Swiss prices were higher than German and French prices over the entire year. It is clear that the spreads between Switzerland and its neighbouring countries were not as high up until October 2021. From October, the spot prices in Germany and Austria were generally significantly lower. High wind power feed-in in Germany from October pushed the German spot price down. Table 2 shows that from October the spread between Switzerland and Germany (CH-DE column) stood at over EUR 50/MWh on average. The highest Swiss day-ahead base price of the year was reached on 22 December 2021, standing at EUR 435.51/MWh.

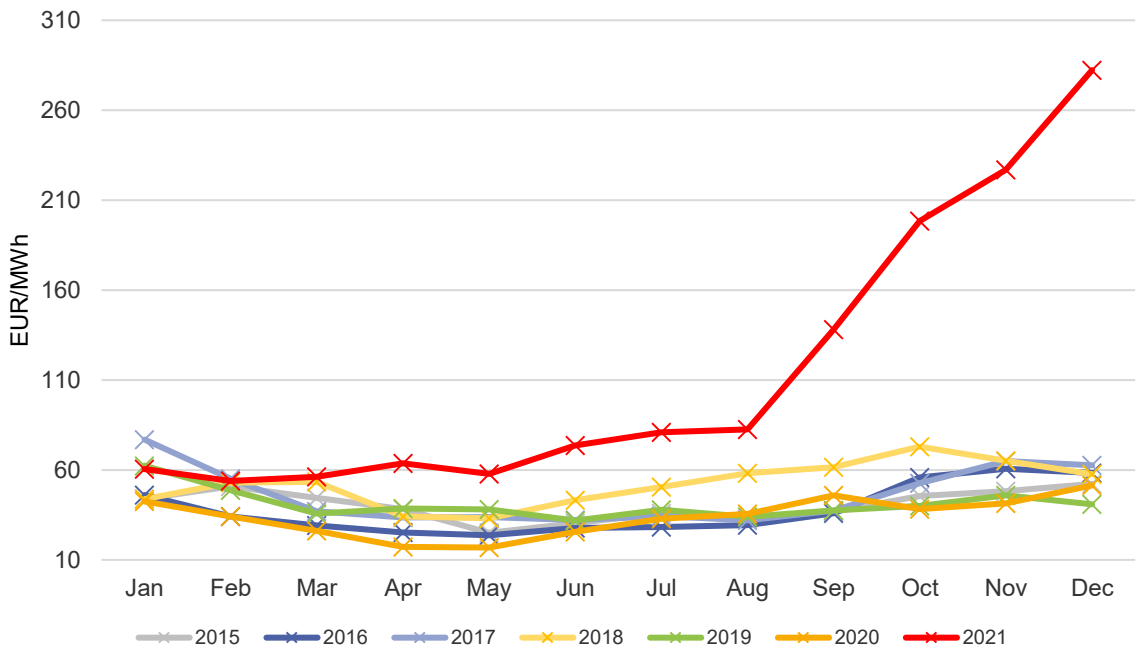

Figure 6: Monthly average spot prices on the Swiss day-ahead auction, data source: EEX

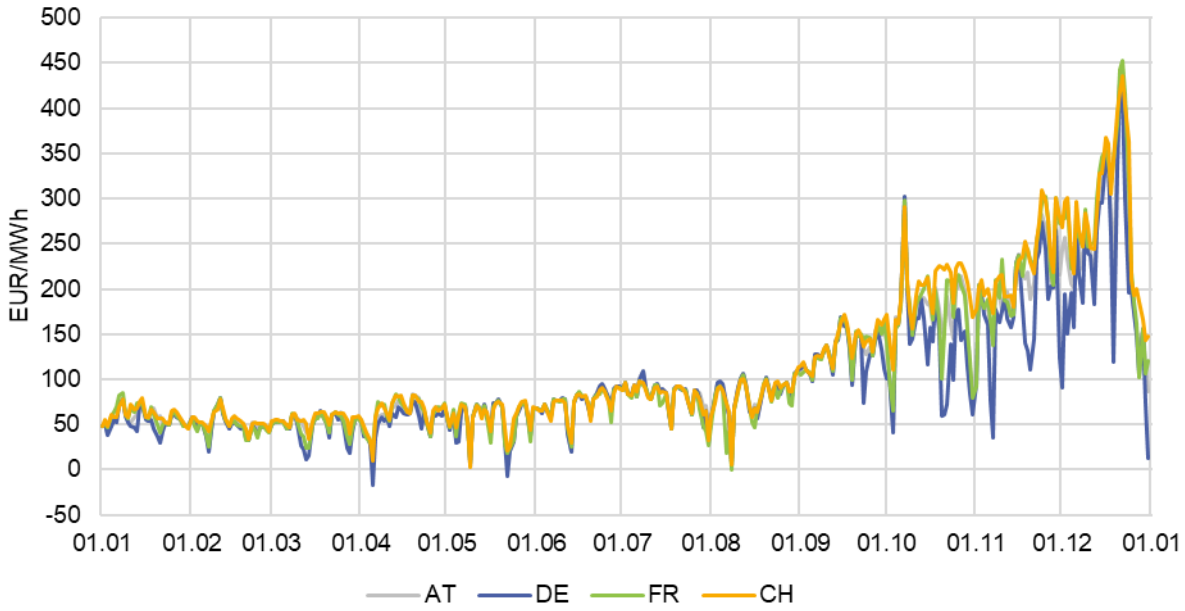

Figure 7: Day-ahead base prices for Switzerland (CH), Germany (DE), Austria (AT) and France (FR), data source: EEX

The comparison of the Swiss hourly prices with the previous year indicates the price level was extremely high in 2021. While in 2020, just 23 hours reached a price of over EUR 100/MWh, in 2021, there were 3,118 hours above EUR 100/MWh, 1,481 hours above EUR 200/MWh, 402 hours above EUR 300/MWh, 84 hours above EUR 400/MWh and six hours above EUR 500/MWh. The lowest prices were also more extreme in 2021, see Figure 8. The high gas prices from the second half-year, but also the higher coal and CO2 prices compared with 2020, a higher load than in 2020 and lower production from wind and solar power resulted in higher prices on the daily day-ahead auction.

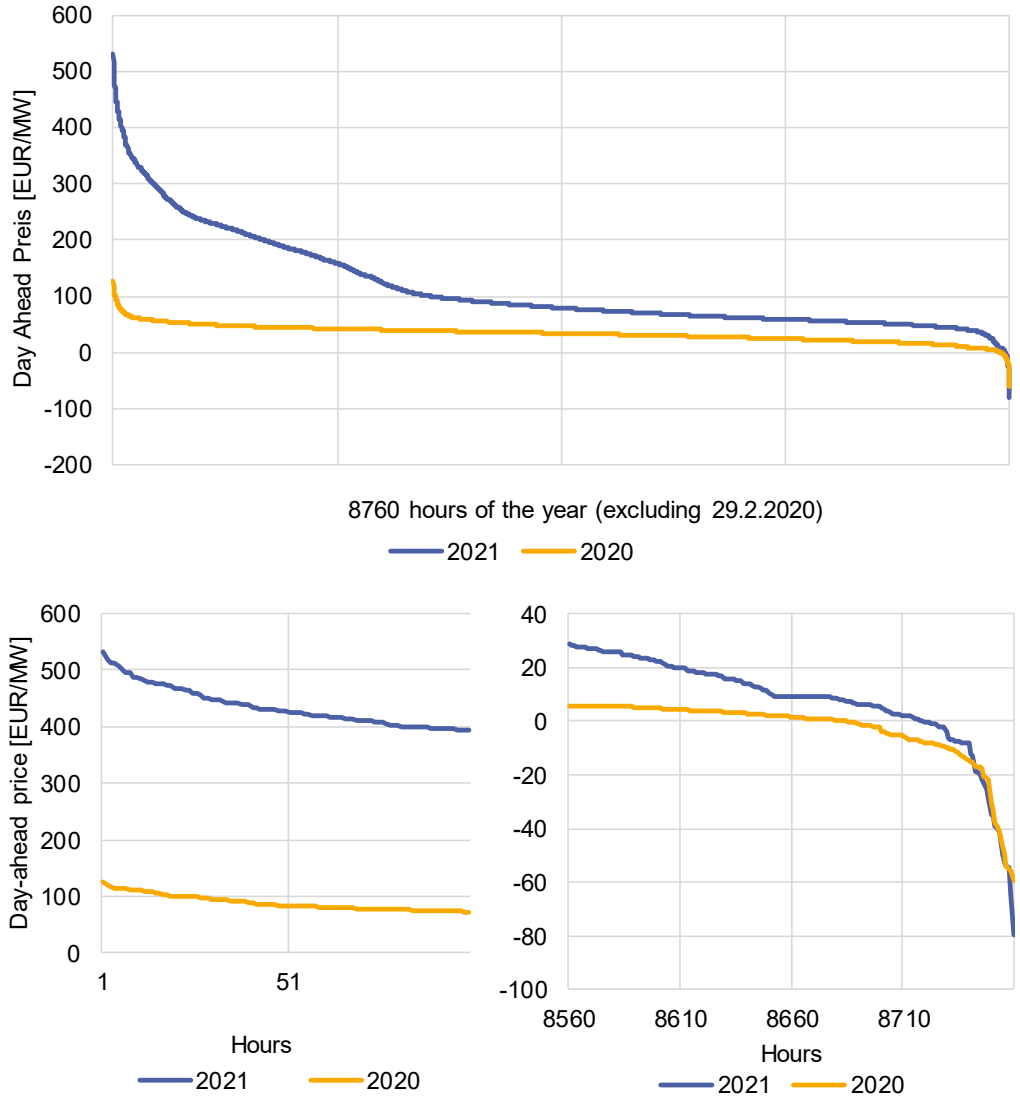

Figure 8: Price-duration curve of day-ahead prices in Switzerland, 2021 and 2020

Top: all hours of the year, sorted by price level; bottom left: the 100 hours with the highest prices; bottom right: the 200 hours with the lowest prices. Data source: EEX

Particularly in the fourth quarter 2021, price volatility increased sharply with rising prices. Volatility indicates the level of fluctuation of a series of trading prices over the course of time. Volatility is generally measured by the standard deviation. The actual current volatility for a certain period of time (in this case 30 and 100 days) is calculated based on the historic base day-ahead auction prices of the EPEX SPOT over the period indicated where the final observation is the most recent price. In Germany, the volatility of the base prices is very high due to the feed-in of renewable energies, particularly in the fourth quarter. If the level of wind is high in Germany, the hard-coal, and to some extent brown-coal, power plants are the price-setting power plants in the fourth quarter. If the wind level is low, it is the gas-fired power plants, like in Switzerland and France. As the marginal costs in Figure 5 show, the spread in marginal costs between the most inexpensive brown-coal-fired power plant and the most inexpensive gas-fired power plant in December 2021 was up to EUR 100/MWh. The high level of generation from renewable sources and mild temperatures during Christmas week led to significantly lower spot prices at the end of December than in early December. This also explains the high price volatility in December 2021.

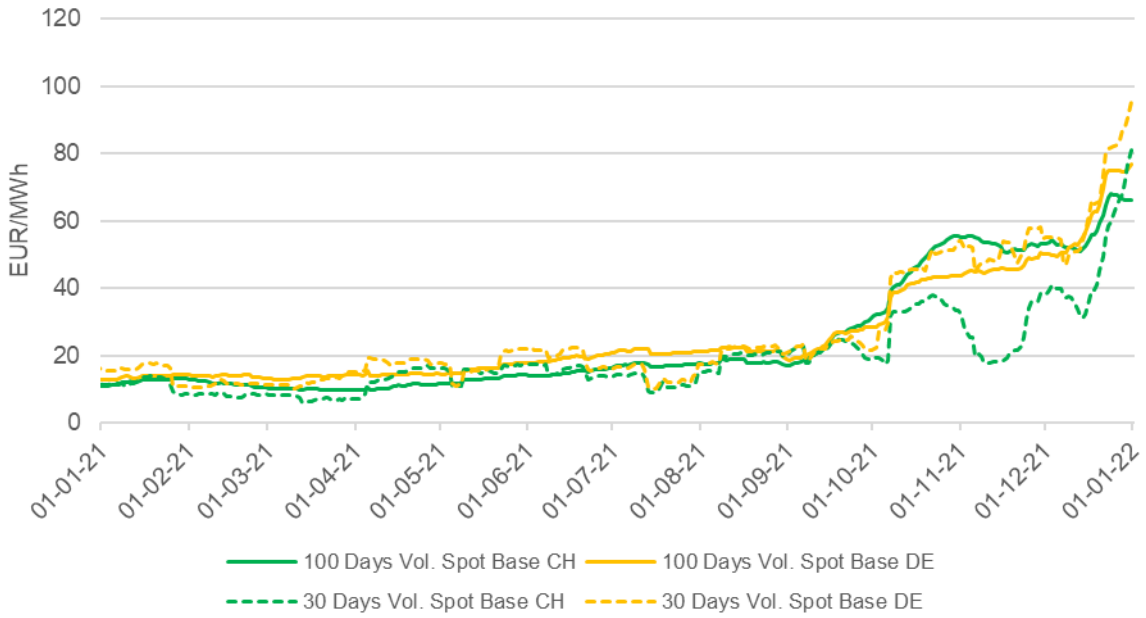

Figure 9: Current volatility for day-ahead base prices for Switzerland and Germany, data source: EEX

On the production side, the typical pattern emerged in Switzerland, see Figure 10. Nuclear energy produced the band load, with dips during annual maintenance on the nuclear power plants and reduced feed-in capacities due to unplanned outages. These are usually caused by technical problems. Hydropower (especially storage and pumped storage plants) then covered the peak load.

In 2021, the four Swiss nuclear power plants produced a net output of 18.6 million megawatt hours (MWh) of electricity (previous year: 23.1 million MWh). The decline was due to time-consuming upgrade projects at the Leibstadt nuclear power plant which shut down for a six-month period for maintenance work to be completed. In addition to maintenance and renewal projects, two major upgrades were also implemented at the power plant. As a result, total net output fell to 4.8 million MWh (previous year: 9.1 million MWh). By replacing the condenser and upgrading the reactor circulation system, the Leibstadt nuclear power plant brought two major components into line with the latest technical standards. The new, more efficient plant components enable Switzerland's most recent and powerful nuclear power plant to increase output with the same reactor performance. The Swiss nuclear power plants nevertheless generated around a quarter of electricity consumed in Switzerland in 2021.[3]

[3] Swissnuclear press release of 31 January 2022, Press release – swissnuclear, as at 31 January 2022

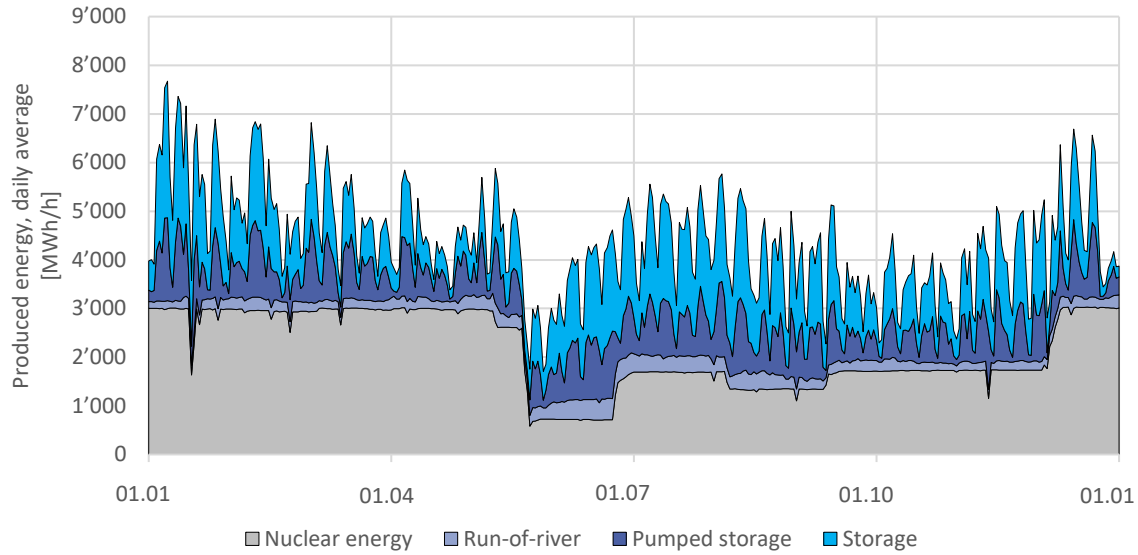

Figure 10: Daily average of current electricity production in Switzerland by type of production

As the share of new renewable energies in current electricity production in Switzerland is very low, it is not depicted in the figure. Data source: ENTSO-E

The levels of Swiss reservoirs followed the typical seasonal pattern of emptying until spring and filling following snow melt, which began later in 2021, see Figure 11. Compared to 2020, the year started with much less water and the total reservoir levels fell more sharply in April and May because the 2021 spot prices at this time were higher than in 2020 when the prices were generally low due to the coronavirus measures. At the end of 2021, more water was fed to turbines than during the same period in the prior year due to the high spot prices.

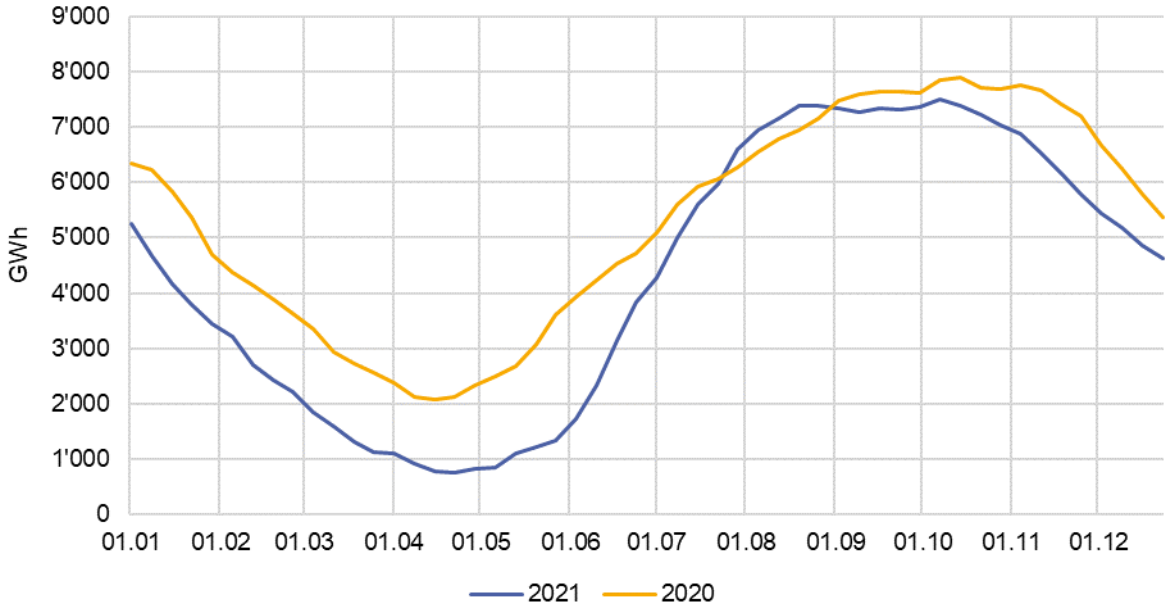

Figure 11: Swiss reservoir levels for 2021 and 2020, data source: SFOE

A major factor driving spot prices in Switzerland in winter is the availability of the nuclear power plants in France. Nuclear power plant production in France was low between March and mid-July in 2020 compared with 2019 due to the pandemic. The level remained low in early 2021 but in summer 2021 the availability of France's nuclear power plants was higher than in summer 2020, and the level only fell below that of the previous year from November 2021, also contributing to the high electricity prices.

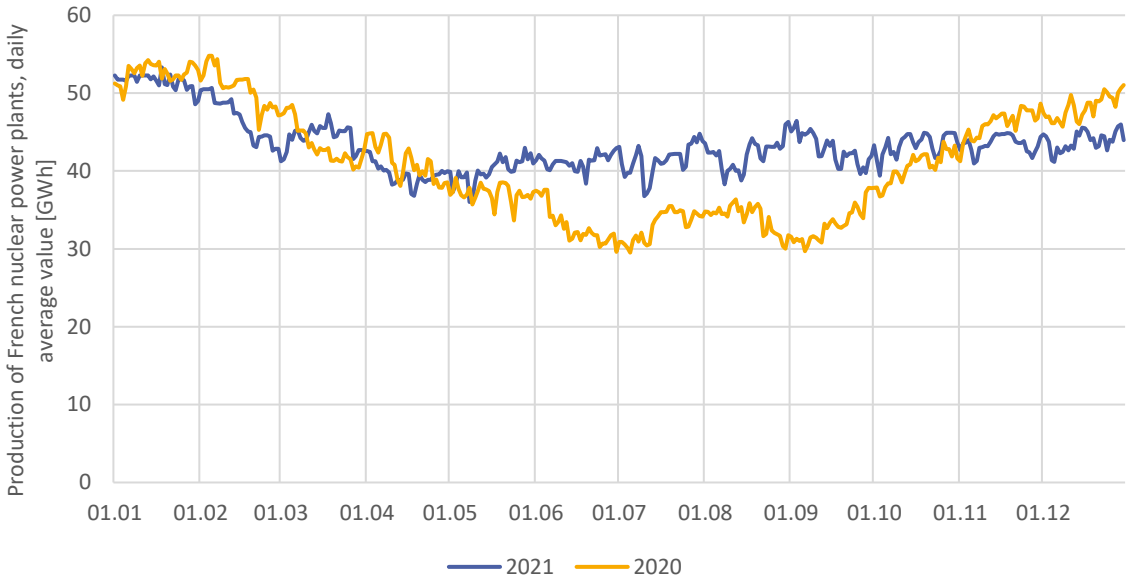

Figure12: Comparison of French nuclear power plant production in 2020 and 2021, data source: Refinitiv Power Research

Production from renewable energies in Germany has a major influence on spot prices in Germany, but also in Switzerland. Figure 13 shows monthly production from wind power in 2021 in Germany compared to the norm. Norm refers to wind power production expected for the month concerned based on the last ten years. As the graphic illustrates, 2021 did not have a high level of wind. Wind production was well below the norm in February, March, June and from September to December, which also contributed to higher spot prices.

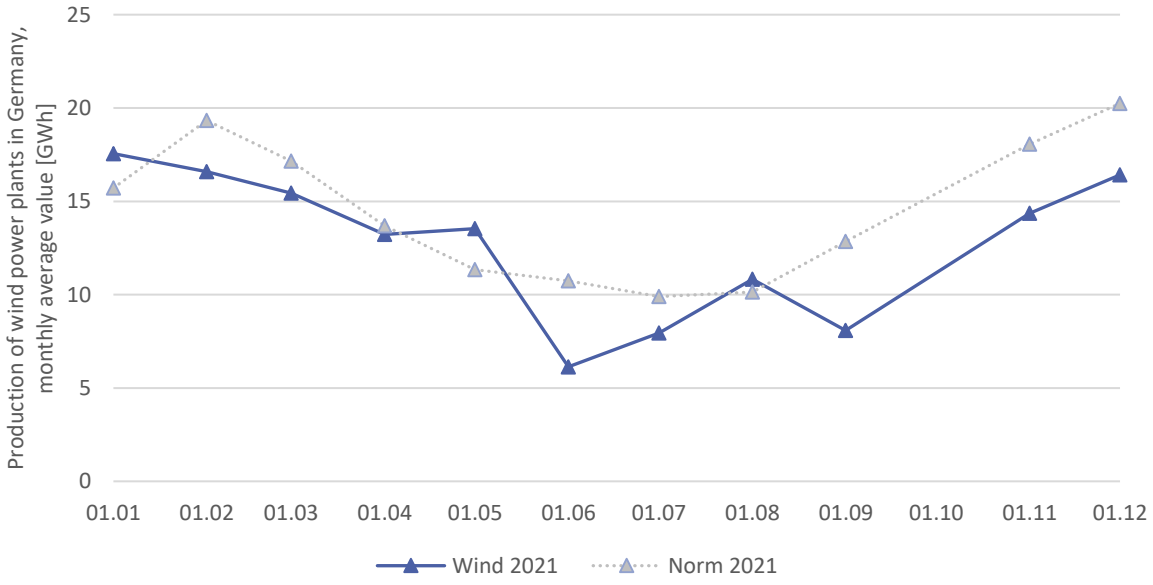

Figure 13: Production from wind power plants in Germany in 2021 vs. norm values, data source: Refinitiv Power Research

The residual load – the difference between the load and wind and solar power production – is of interest for the spot prices. This must be covered by conventional power plants. If the residual load is low, prices can fall into negative territory, as it is more worthwhile for certain thermal power plants to pay something

for their electricity to be purchased than to shut down the power plant for a short time (which incurs costs and puts a strain on the power plant's technical equipment).[4]

The relationship between residual load and spot prices in Germany can be seen in Figure 14. The greater the demand that must be met by conventional power plants, the higher the price as power plants with much higher production costs go online. At residual loads of less than 10GW, prices are generally negative.

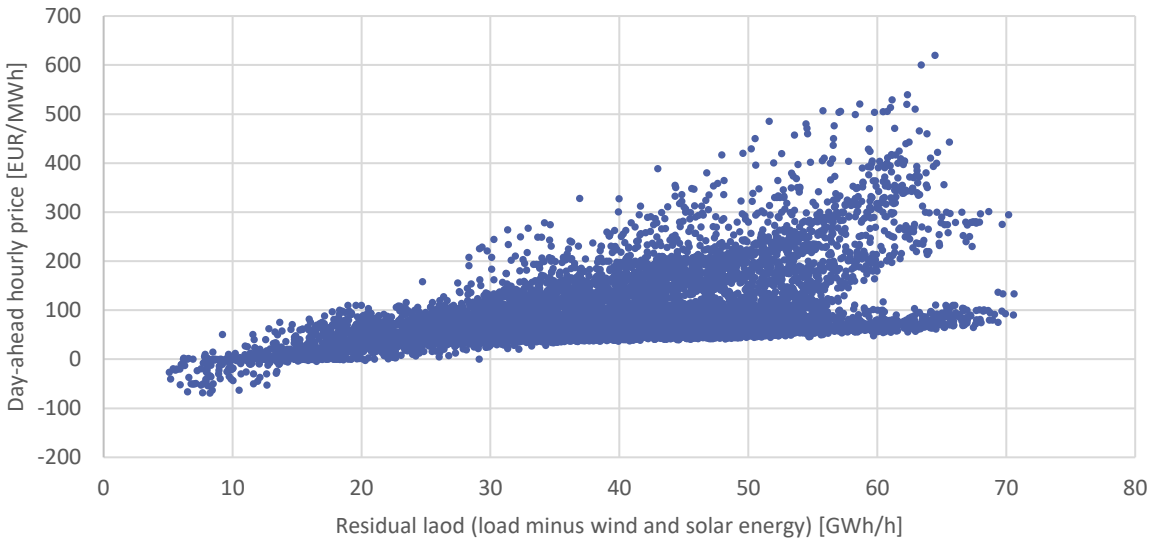

Figure 14: Residual load versus day-ahead hourly price in Germany for 2021, data source: EEX, ENTSO-E

If the electricity can be produced more cheaply in neighbouring countries than in Switzerland, it is imported within the limits of the available cross-border capacities. If the situation is reversed (lower prices in Switzerland), electricity is exported to neighbouring countries. This is typically the case in times of high load, as prices abroad then exceed the price level in Switzerland. Switzerland regularly exports to Italy. Italian power plants are largely gas-fired and generally have high production costs which is why electricity is supplied from Switzerland to Italy.

The overview of the course of the year in Figure 15 shows that Switzerland not only regularly exports to Italy, but also regularly imports from France. This is partly explained by the large number of nuclear power plants in France whose electricity production costs (marginal costs) mean a lower price level than in Switzerland. From November – with the exception of the Christmas week – exports from Switzerland to Italy fell sharply. The high prices in Switzerland saw the spreads with Italy narrow, making exports less attractive.

As can be seen in Figure 15 and Figure 16, the seasonal pattern was confirmed for Germany in 2021. In Switzerland, electricity is more expensive in winter, so Switzerland imports from Germany. In spring and sometimes in summer, on the other hand, cheap Swiss hydropower often results in electricity being cheaper in Switzerland, and so Switzerland then exports to Germany. Since a large and increasingly greater volume of electricity is produced from German wind and solar power plants, it is generally more common for Switzerland to export to Germany, even in winter, when less wind and/or solar energy is produced there.

[4] Also see the ElCom study: 'Analyse der negativen Preise für die Schweiz, Frankreich und Deutschland' (Analysis of negative prices for Switzerland, France and Germany), https://www.elcom.admin.ch/elcom/de/home/dokumentation/berichte-und-studien.html, as at 1 February 2021.

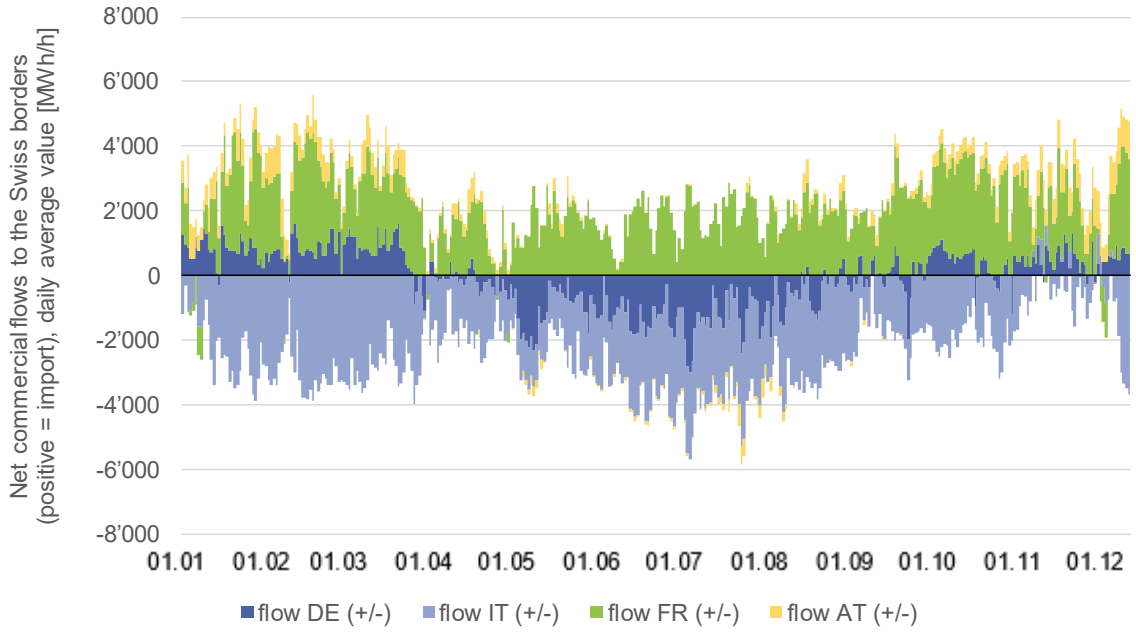

Figure 15: Net commercial flows on the Swiss borders, data source: EEX

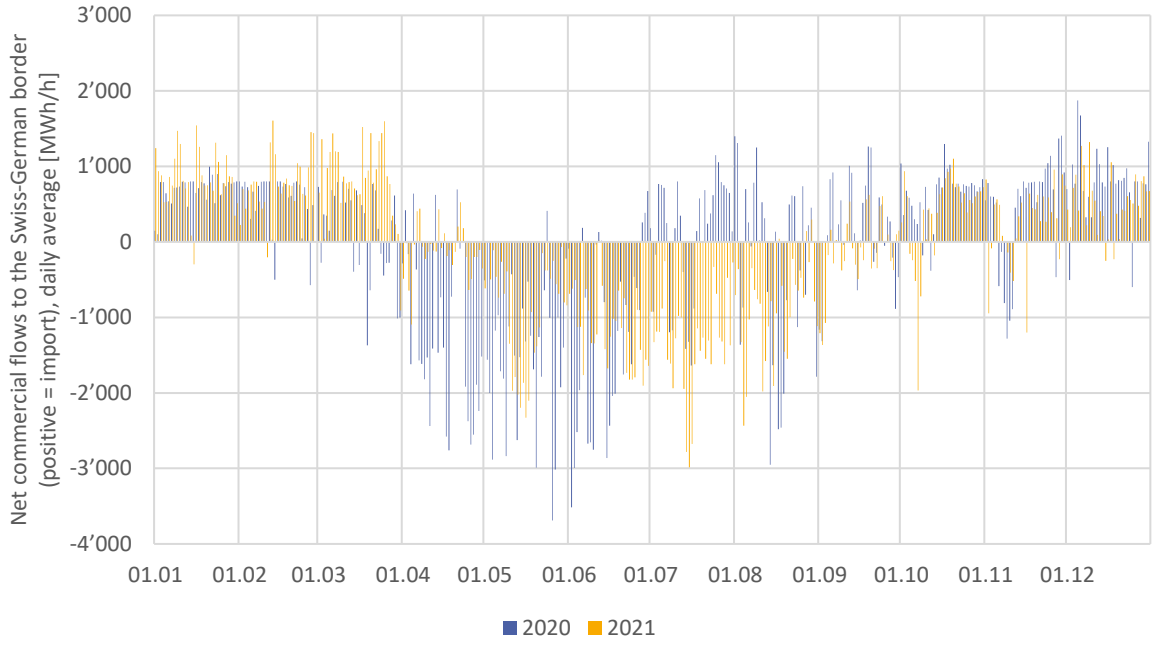

Figure 16: Net commercial flow on the Swiss-German border, data source: ENTSO-E

An annual net total of 0.77TWh was exported to Germany, representing a slight increase compared to the previous year (0.56TWh).

The net cross-border flow across all Swiss borders shows the same seasonal pattern as the Swiss-German border, see Figure 17. This is not surprising as regular exports to Italy are roughly offset by regular imports from France. Net imports were nevertheless significantly higher in Q4 2021 at 4TWh because less energy was transported to Italy due to the high prices. Switzerland was a net importer over the entire year with just under 0.93TWh.

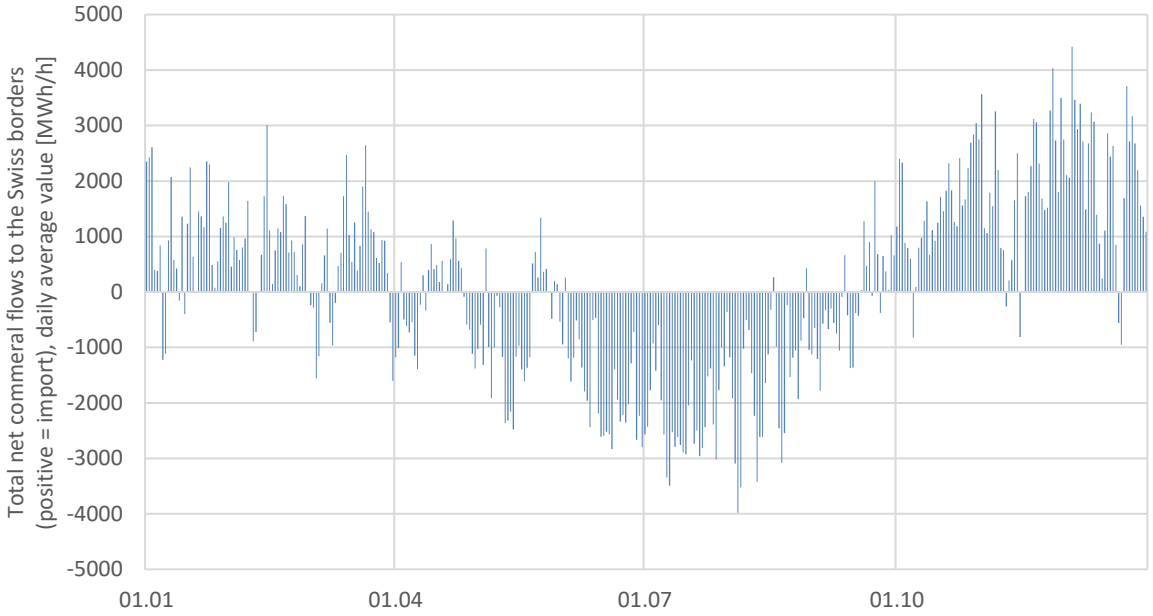

Figure 17: Total net commercial flows on the Swiss borders in 2021, data source: ENTSOE

2.2 Futures market report – 2021 review

In 2021, Swiss electricity prices for the calendar year 2022 continued to develop in parallel with prices in the neighbouring countries of Germany, France and Italy. 2021 saw a historically unprecedented increase in prices from July 2021. While the price for Switzerland's year-ahead product fluctuated in a price range of around EUR 15/MWh in 2020 (EUR 38 to 53/MWh), prices for the annual product 2022 hit unprecedented highs in 2022, peaking in a price for the year ahead for France of over EUR 400/MWh (Figure 18). Shortly after peaking, prices fell sharply again until the year-end but this still represented an increase from EUR 53/MWh to EUR 229/MWh for the Swiss year-ahead product by the end of 2021, equating to a rise of over 330%.

As in recent years, the Italian base year-ahead product was the most expensive until the end of September, while its Swiss counterpart was trading at the second highest level, closely followed by the French year-ahead product, whereas the German year ahead – as is the case historically – was available at the lowest prices. This situation was reversed to some extent following the sharp price rise. Firstly, the French trading product for electricity supplies (Cal 22 Base) was more expensive than the Swiss Cal 22 Base in 2022, and in November the French Cal 22 Base also overtook the Italian Cal 22 Base which, as a result, was even cheaper at times than its Swiss counterpart and the German base supply year 2022.

With regard to the quarterly products, the prices for the Q4 2021 product (fourth quarter 2021) and the Q1 2022 product (first quarter 2022) rose most sharply. While quarter 2 and 3 2022 prices also rose, the increase was relatively moderate.

The development of electricity prices in 2021 for the year-ahead base supplied to Switzerland, Germany, France and Italy is graphically depicted in Figure 18.

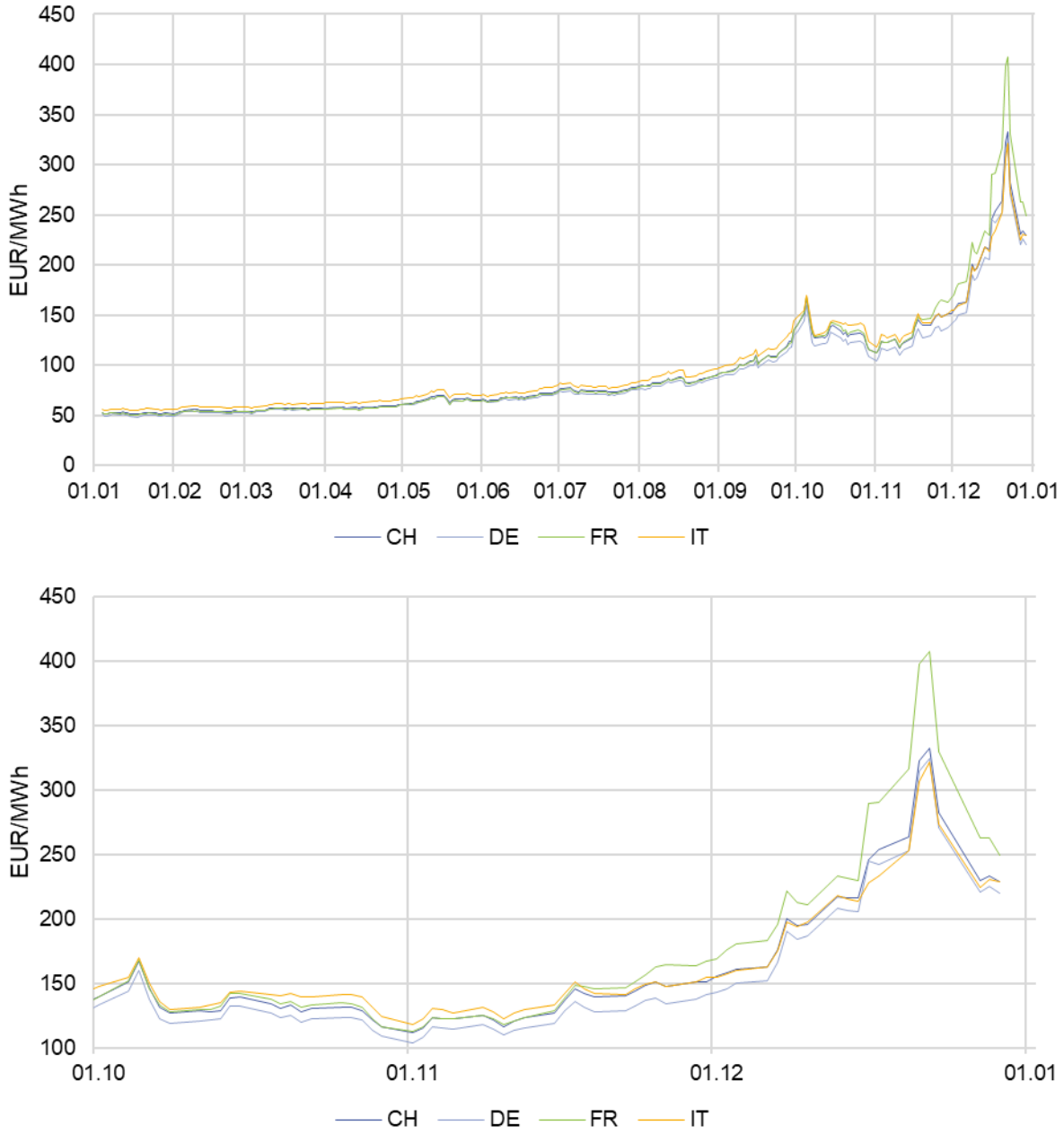

Figure 18: 2021 price trend for year-ahead base electricity contracts in 2022. The sharp price rise in the last quarter from 1 October to 31 December 2021 is shown below to provide greater clarity. Data source: EEX

The prices for the annual products Cal 23 Base and Cal 24 Base supplied to Switzerland did not follow the pattern of the strong upward price trend (Figure 19) as the market deemed the sharp upturn in prices temporary. Cal 23 Base peaked at just under EUR 150/MWh, remaining around EUR 200/MWh below Cal 22 Base. Cal 24 Base rose even more moderately, not even reaching EUR 100/MWh.

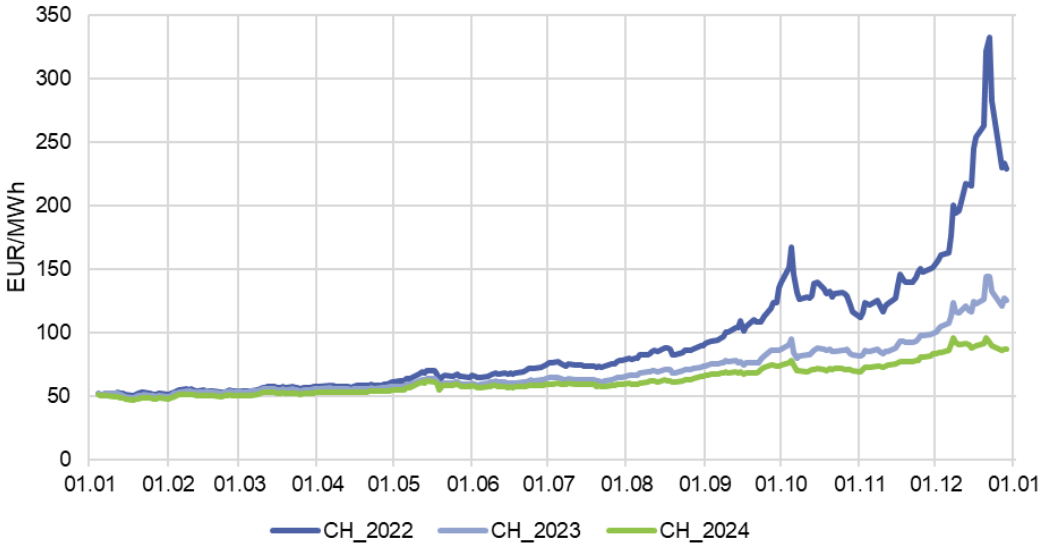

Figure 19: 2021 price trend for base electricity annual contracts 2022–24 with Switzerland as the supply destination, data source: EEX

Electricity prices on the futures market depend heavily on the prices for the three commodities of gas, coal and CO2 (Figure 20).

CO2 certificate prices underwent an initial upturn from EUR 35/t to a price bandwidth of EUR 50 to 65/t from the beginning to the middle of the year. A major driving factor was the negotiation of the European Commission's 'Fit for 55' legislative package during spring and summer 2021. This sets out the European Commission's plans to cut CO2 emissions by 55% by 2030, which is much more than the 40% previously discussed. Thirteen measures were defined in the summer to achieve this goal. The effect of the discussions and the adoption of the measures triggered the sharp upturn in CO2 prices during the first half-year.

During the second half-year, the further increase in CO2 prices was spurred on by the sharp rise in gas prices. This improved the competitiveness of the coal-fired power plants in relation to their gas-fired counterparts and meant more electricity was produced through coal-fired generation. As coal-fired power generation has higher CO2 intensity than the gas-fired variant, demand for CO2 certificates rose accordingly, supporting CO2 prices. The United Nations Climate Change Conference was held in Glasgow (COP 26) in November and the measures and obligations discussed there also had an impact on price. CO2 prices peaked at just under EUR 90/t shortly before year-end and ended 2021 at a level of around EUR 80/t.

Gas prices also rose continuously from the start of the year. Low storage levels and events, such as the blockage of the Suez Canal by the Container ship Ever Given, also drove prices up. There was an historically unprecedented rise in gas prices from the middle of the year. Various factors contributed to this increase. The economic upturn after coronavirus in 2020 led to stronger demand for gas, particularly in Asia. There was also less liquefied natural gas (LNG) available on the global market, partly because hurricanes in the USA had reduced supply. Demand for liquefied natural gas also rose in Brazil as gas-fired power generation was used to make up a shortfall in electricity production from hydropower plants due to a drought. The liquefied natural gas available was also increasingly supplied to Asia as the Asian LNG prices were usually higher than in Europe.

Later in the autumn, there were increasing reports that gas supplies through the new Nordstream 2 pipeline would be delayed as the registration process with the German regulator (BNetzA) would be protracted. At the same time, gas storage levels in north-western Europe fell to an historical low, principally because the storage facilities managed by Gazprom were not filled as usual and because the

autumn was colder than normal, which meant storage facilities were emptied to a greater extent. Then came news that Russian gas supplies via existing pipelines (for example Yamal) would be reduced or perhaps not arrive at all and fears that the refugee crisis on the Belarus border or the Ukraine conflict would hamper or rule out gas supplies from Russia. The tight supply situation with the winter approaching saw concerns over gas supply bottlenecks start to mount on the market, causing the price of the 2022 annual product on the German hub NCG[5] to increase from just under EUR 30/MWh to over EUR 140/MWh. The high degree of volatility on the gas market when prices reached a high level was clearly evident. News such as statements by Russia's President Putin, the postponement of the commissioning of Nordstream 2 and a fall in capacity bookings by Gazprom for gas transport via the Yamal pipeline triggered sharp price fluctuations. The price of the year-ahead product closed the year at just under EUR 100/MWh.

After falling briefly initially, international coal prices also rose over the course of the year. In spring, various factors, such as the relaxation of the Chinese import ban or the temporary outage of the Australian coal infrastructure (loading stations in Newcastle, interrupted domestic supply lines after flooding), drove on the rise in prices. The economic recovery in Asia also saw demand for coal grow. This was a major factor in the increasingly strong rise in the second half-year: coal production in China failed to keep up with constantly growing demand despite the efforts of the Chinese government which drove up Chinese coal prices and saw China's import needs climb. As China accounts for a large share of the global coal market, it also has a major impact on European coal prices. Over the course of the year, the coal price rose from just under EUR 60/t to just short of EUR 80/t with temporary highs of over EUR 100/t.

The price trend in 2021 for the 2022 product for CO2 (EUA[6]), gas (NCG/THE[7]) and coal (ARA[8] region) is shown in Figure 20.

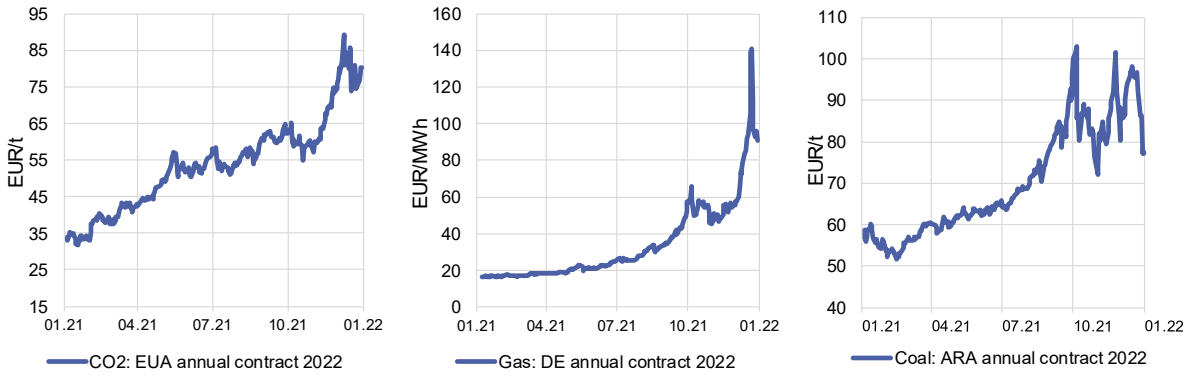

Figure 20: 2021 price trend for the 2022 product for CO2 (EUA), gas (NCG) and coal (ARA region), data source: EEX and Refinitiv Power Research

Figure 21 shows that gas prices have the greatest correlation to electricity prices. Particularly when prices were very high, gas price fluctuations were a decisive factor in the development of electricity prices as the gas-fired power plants set the price. There is a levelling-off of coal prices from an electricity price level of around EUR 100/MWh, but there is a strong correlation with the electricity price below this price. There is only a strong correlation with CO2 prices in narrow electricity price ranges and they correlate least with electricity prices over the entire year. One reason is that the influence of CO2 costs on the variable costs of gas-fired power plants is much less significant than gas costs, particularly when gas prices are high.

[5] Net Connect Germany (NCG) merged with the Gaspool hub on 1 October 2022. The merged HUB is now called Trading Hub Europe (THE).
[6] EUA: European emission allowances.
[7] NCG: Reference price for the German gas price of the market operator NetConnect Germany and Trading Hub Europe.
[8] ARA: Reference price for thermal coal delivered to one of the coal terminals in Amsterdam, Rotterdam or Antwerp, Europe's main coal market.

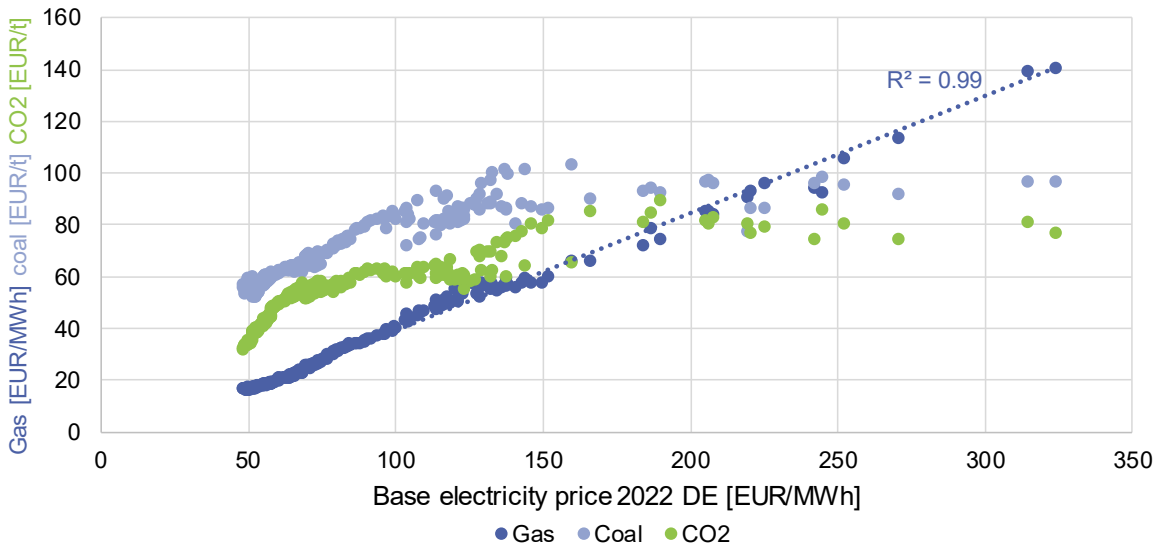

Figure 21: Correlation of electricity prices for the base 2022 product (supplied to Germany) with the commodities gas (base 2022 NCG/THE), coal (base API 2) and CO2 (EUA Dec. 2022)

Futures market prices can also be influenced by other factors. The reduced availability of the French nuclear power plants also contributed to the price increase, especially during the high-price phase at the end of 2021. Weather forecasts (temperature, wind, sunshine) also influence the price of shorter-term futures market products.

2.3 To what extent have the actual spot prices reflected the Swiss futures market prices over recent years?

Futures market contracts can provide protection against long-term price fluctuations. Producers can secure their power plant positions several years in advance at a price known today. The electricity supplier's sales department can secure the volumes required for its customers in advance on the futures market at a fixed price and pass this onto its customers plus its margin. Large consumers (e.g. industrial companies) can also buy electricity ahead on the futures market at fixed prices.

The spot market's day-ahead auction enables the closure of hourly positions based on the merit-order principle.

Futures markets reflect the expectations of market participants and future fundamental influencing factors and therefore the spot prices anticipated in future. As the contracts on the futures market are traded up to three years in advance, fuel costs and CO2 prices can fluctuate significantly over three years and as normal solar and wind power generation as well as normal consumption levels are assumed long-term, prices on the futures market are obviously not always in line with the actual spot prices paid. The analysis aims to show the price trading range of annual, quarterly and monthly contracts on the Swiss futures market over the past five years and to outline the average spot prices for the supply periods concerned.

Below the focus is placed solely on quarterly products.

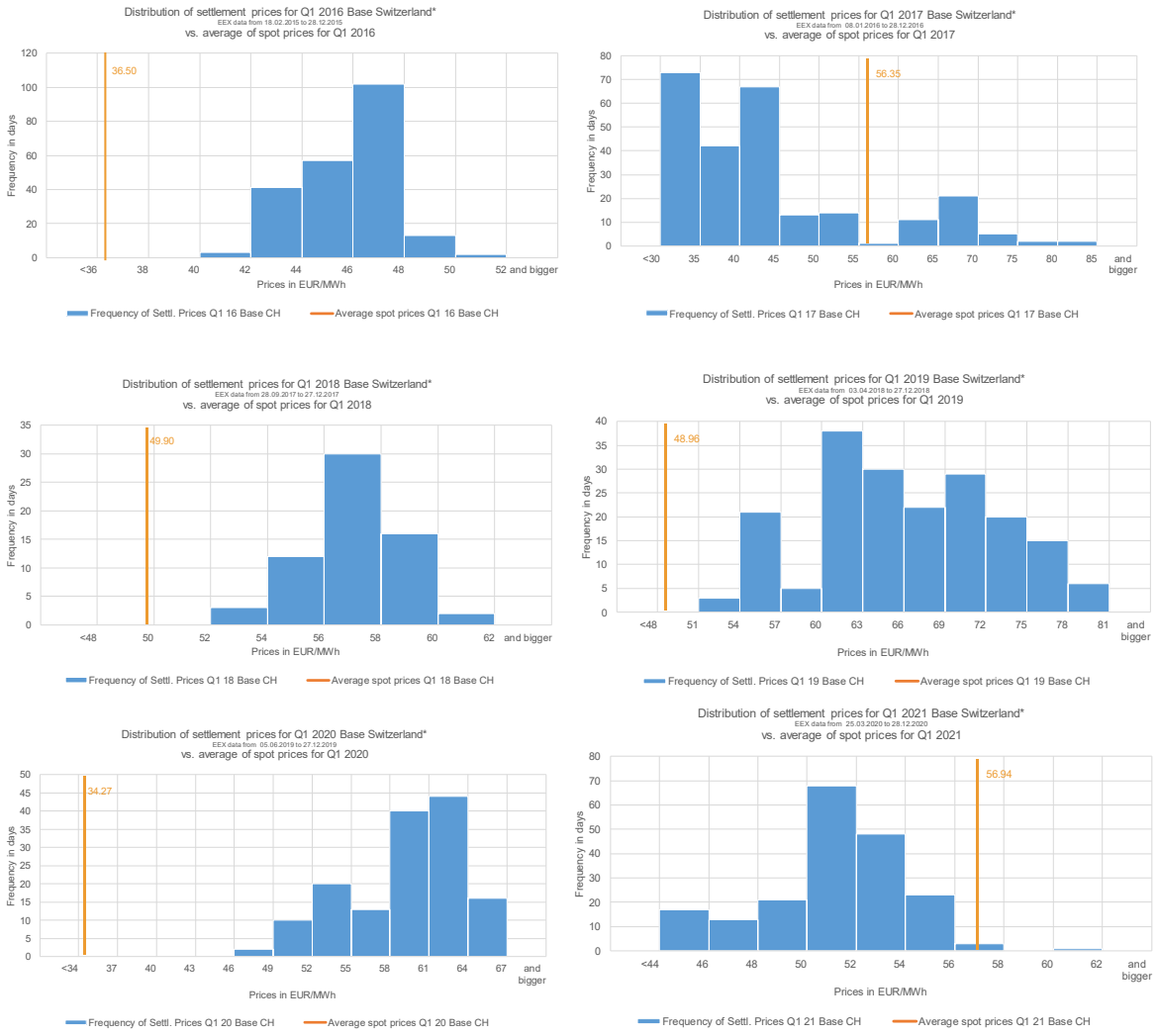

Figure 22: Distribution of EEX settlement prices for the first quarter base CH vs. the average of the spot prices for the first quarter of the supply years 2016 to 2021

Since 2016 the futures market has tended to overestimate the spot prices for the first quarter (Q1) – (see Figure 22). The actual spot prices for Q1 for the supply years 2016, 2018, 2019 and 2020 were well below the minimum price traded in advance on the futures market of the EEX exchange. In the 2017 supply year, the average spot price stood at EUR 56.35/MWh which was in the price range traded on the futures market for Q1 17. EUR 56.94/MWh was paid at the day-ahead auction in Q1 2021 which was at the top end of the price range at which this product was traded on the futures market.

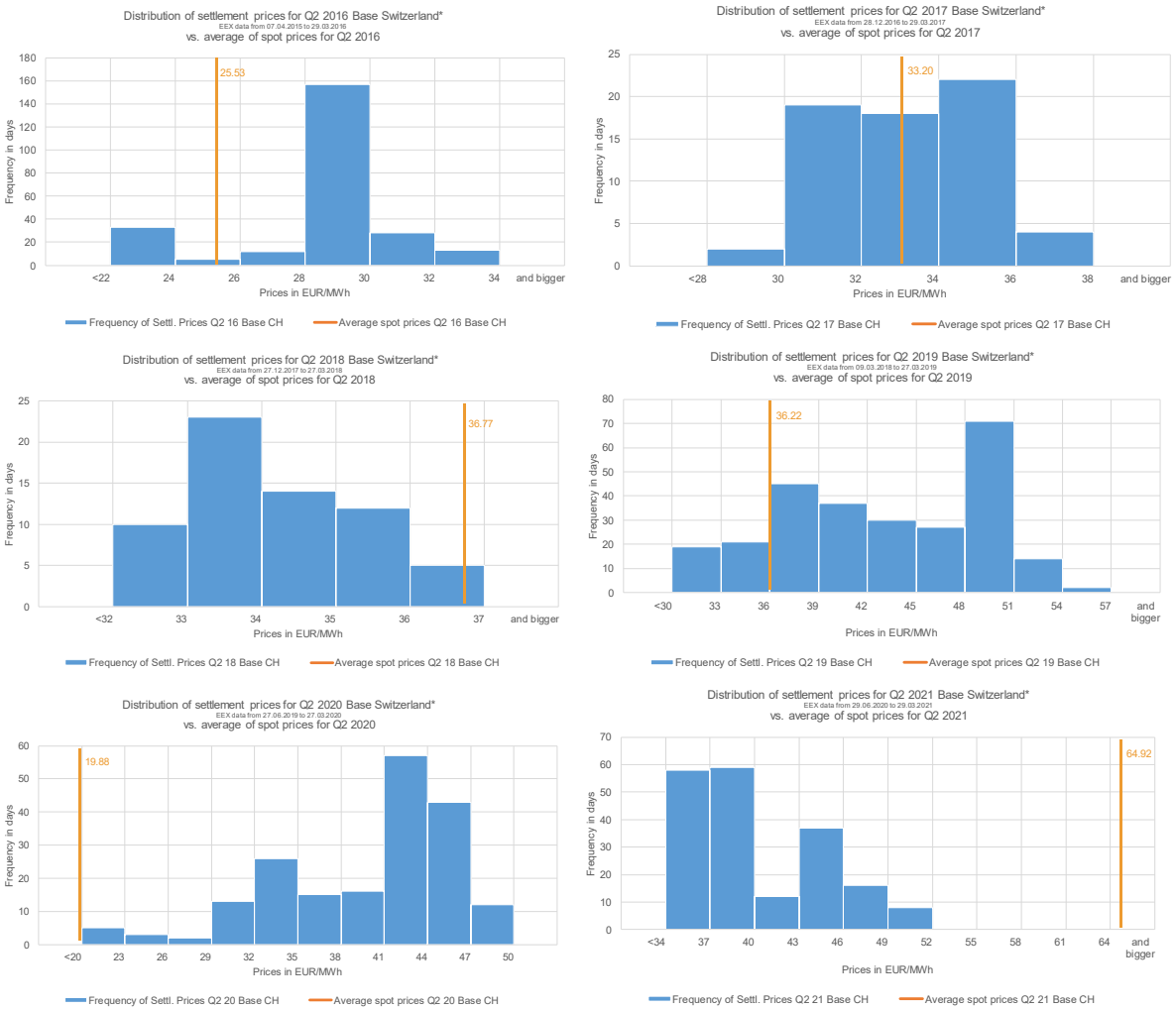

Figure 23: Distribution of the EEX settlement prices for the second quarter, base CH vs. average of spot prices for the second quarter of the supply years 2016 to 2021

Figure 23 shows that – with the exception of 2020, the year of coronavirus, and the supply year 2021 – the average of the spot prices for the second quarter lay within the price trading range of the prices traded on the futures market. In Q2 2021, the average spot price was EUR 64.92/MWh which was over EUR 14/MWh higher than the maximum price this supply product was traded at on the futures market of EUR 50.31/MWh.

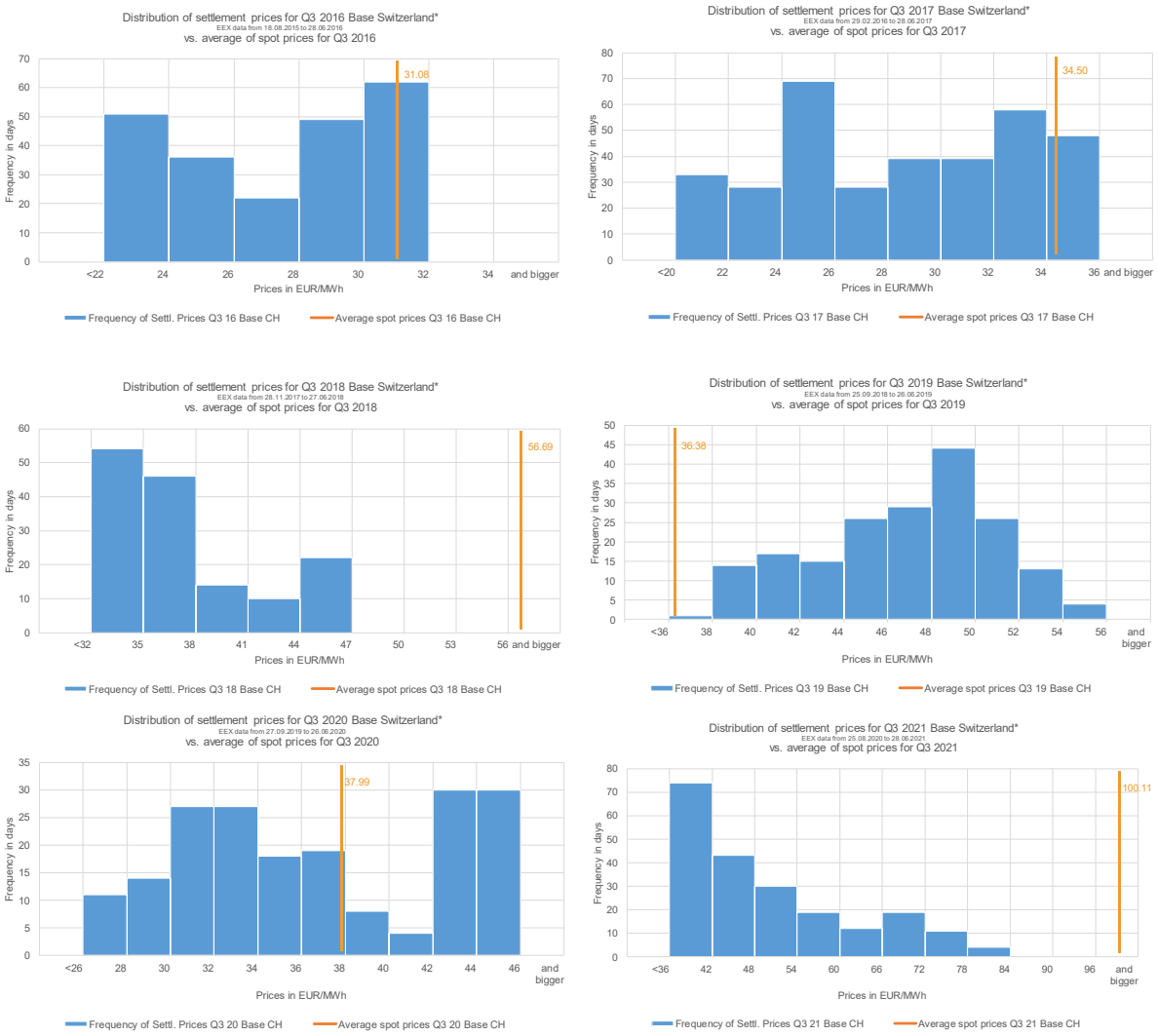

Figure 24: Distribution of the EEX settlement prices for the third quarter base CH vs. the average spot prices for the third quarter of the supply years 2016 to 2021

Figure 24 shows the exceptionally high level of the spot prices for Q3 2021 compared to previous years. It is clear that the average spot price of EUR 100.11/MWh in Q3 2021 was significantly higher than the prices traded on the futures market. The highest settlement price for this trading product on the EEX was EUR 82.02/MWh. The spot prices exceeded that by EUR 18/MWh.

The futures market also considerably underestimated the spot prices for the third quarter Q3 2018. The actual spot prices were at the upper end of the futures market's price trading range for the supply years 2016 and 2017. The spot prices were in the middle of the price trading range in 2020. In Q3 2019, the spot prices were lower than anticipated on the futures market.

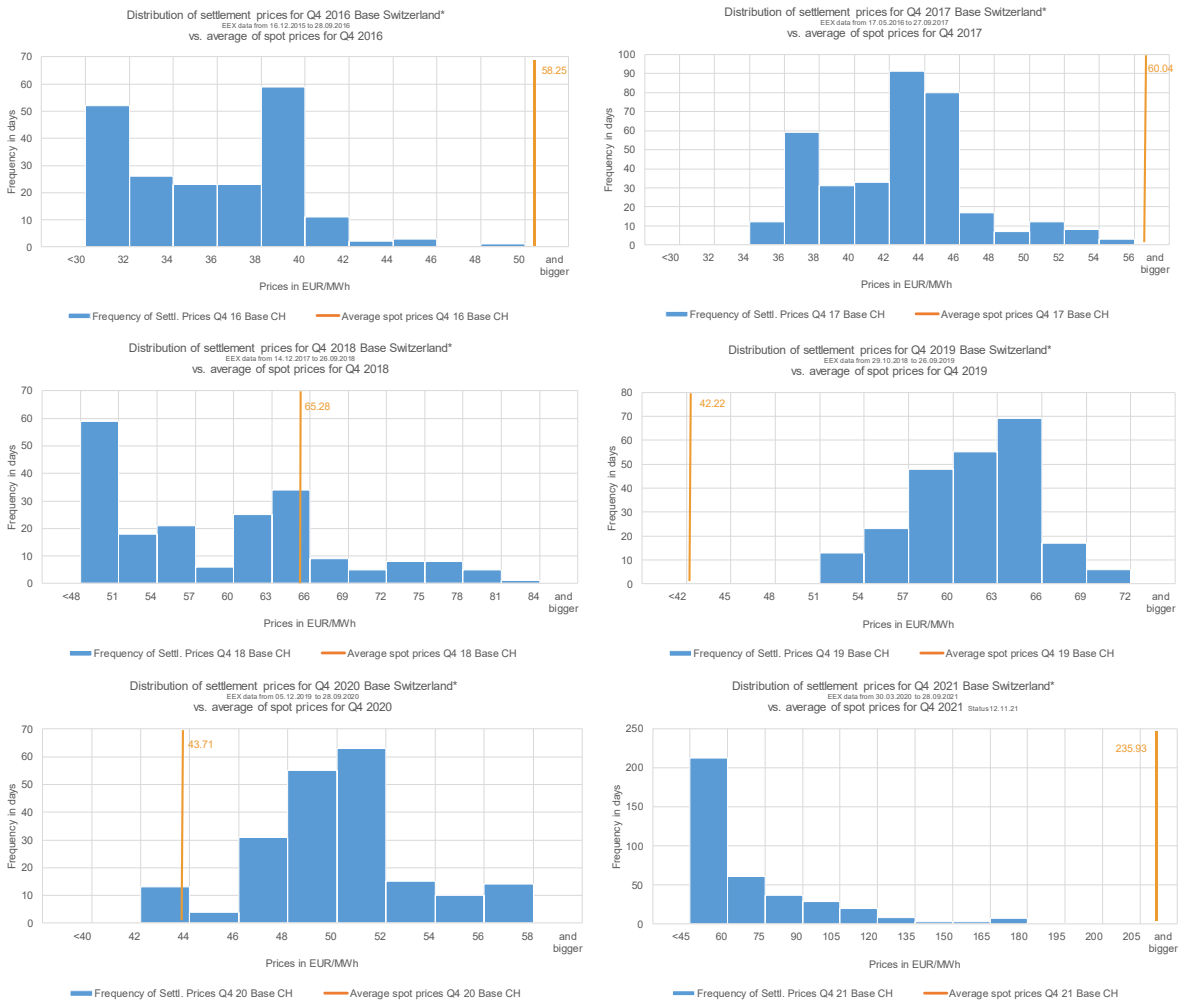

Figure 25: Distribution of the EEX settlement prices for the fourth quarter – base CH vs. the average spot price for the fourth quarter of the supply years 2016 to 2021

The fourth quarter 2021 also stands out in Figure 25. The average spot price of EUR 235.93/MWh was well above the highest price reached on the futures market. The futures market tended to underestimate the fourth quarter in the supply years 2016 and 2017, whereas the fourth-quarter prices were generally overestimated in 2019 and 2020.

3 ElCom's key market monitoring activities

3.1 Analysis activities and statistics

Article 26*a* of the Electricity Supply Ordinance establishes an obligation for market participants (legal entities and natural persons) which have their registered office or who are domiciled in Switzerland and participate in a wholesale electricity market in the EU to provide information to ElCom at the same time and in the same format as to EU authorities. The data submitted to ElCom includes information about wholesale products, fundamental data and – if published – insider information.

As market prices in Switzerland are strongly influenced by developments and events in neighbouring countries, this information is important for market surveillance and also for assessing security of supply in Switzerland. The processing and analysis of the data collected makes it possible to evaluate what is effectively happening on the (European) wholesale electricity markets.

The Market Surveillance Section carries out its analysis activities using market monitoring systems (MMS). The data provided is processed and evaluated using alerts according to certain pre-defined

criteria, with particular regard to suspicious phenomena which could indicate market manipulation or insider trading.

ElCom also receives notifications of suspicious transaction and order reports (STORs) involving Swiss market participants from the trading monitoring bodies of the organised marketplaces.

As in 2020, ElCom was notified of three such incidents in 2021. The information and anomalies from the STORs are examined in detail and, if necessary, analysed with additional information available at ElCom. Depending on the results of these analyses and in order to clarify any questions, direct contact is made with market participants.

In addition to the investigations triggered by the MMS alerts or initiated on the basis of STORs, ElCom also conducted a number of ad-hoc analyses regarding various topics in 2021. One less analysis was carried out in 2021 than in the previous year.

In a shortened version, this Market Transparency Report provides an update on the development of the high prices. It mainly focused on the extremely high gas and electricity prices and their impact on network operators, industry and end customers. It also included an analysis of the effects of wind-related, cross-border capacity reductions on the day-ahead spread for Germany/Switzerland.

The detailed analysis on the high electricity prices in Switzerland and the EU and information about the use of the Swiss borders between 2018 and 2021 are covered in the ElCom Activity Report 2021.

Figure 26 provides a detailed overview of the Market Surveillance Section's analysis activities.

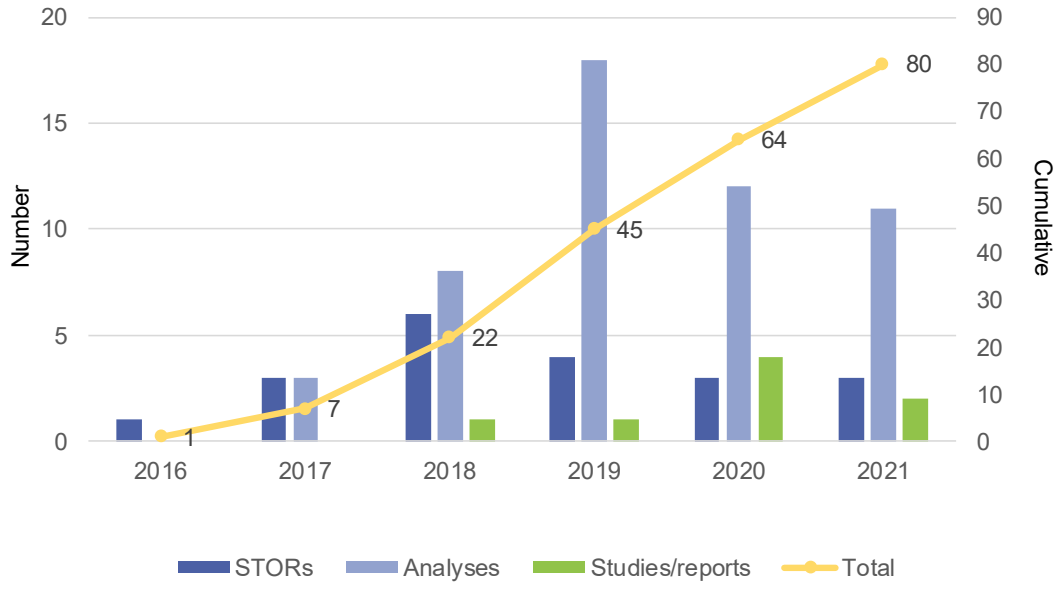

Figure 26: Overview of the STORs received by ElCom

3.2 Analysis of price developments in 2021

3.2.1 Analysis of price erosion on the futures market for Germany base year ahead on 18 to 19 May 2021

The price volatility on the futures market was not as high in the first half-year as in the second. Price erosion for the German base year ahead generated a price alert on 18 and 19 May which the Market Surveillance Section examined more closely.

The year ahead base for 2022 being supplied to Germany was still being traded at between EUR 67.5 and 68.5/MWh on 17 May. On the morning of 18 May, Swiss market participants were still trading Cal 22 Base Germany at EUR 68.2/MWh. At 5.50pm, the same product was trading at EUR 64.90/MWh which was EUR 3.3/MWh lower than at market opening. On 19 May, the first trade appeared in the market monitoring system at EUR 64.15/MWh. At 6.00pm on 19 May, the product was being traded at EUR 60.5/MWh.

This meant the value of the German year ahead had fallen by EUR 7.7/MWh within two trading days and in the evening on Wednesday 19 May was 11.3% down on Tuesday morning. This significant fluctuation in an electricity annual base product was extraordinary at the time and was consequently investigated more closely. The trading activities of Swiss market participants on these two days were also analysed in greater depth.

The main driver for the significant price movement on the electricity market was the CO2 prices. Figure 27 shows the price movement of the CO2 contract with supply in December 2022 in trading intervals of 30 minutes from 3 May 2021 to 21 May 2021. Figure 27 clearly shows that CO2 was being traded at a price of EUR 57/t on Tuesday 18 May. EUR 52/t was still being paid in the evening. On Wednesday 19 May, the price of the contract temporarily fell below EUR 50/t before rising to EUR 53/t on 20 May. The volume traded in the CO2 contract was extremely high on both 18 and 19 May.

Figure 27: Price for CO2 contract with delivery in December 2022 from 3 May 2021 to 21 May 2021 (orange line) and trading volume in the contract concerned (violet bars), data source: Refinitiv Coal Research

18 May was the date when the UK launched its own emissions trading system (ETS). Profit-taking and the transfer of hedging transactions by suppliers with commitments in the UK ETS were probably the trigger for the strong pressure to sell. Although there is no link between the EU emissions trading system and its UK counterpart, the sharp fall on Tuesday and Wednesday was probably due to providers with activities in the UK using the record-high price to dispose of their hedges before entering the UK system. This means the price trend on the electricity market was in line with that on the CO2 market where the market reaction was attributable to changes in the system.

The analysis also revealed that the trading activity of Swiss market participants for the German year ahead 2022 during the period from 18 May 2021 to 21 May 2021 was relatively high compared to the preceding and subsequent periods (see Figure 28). No anomalies were identified.

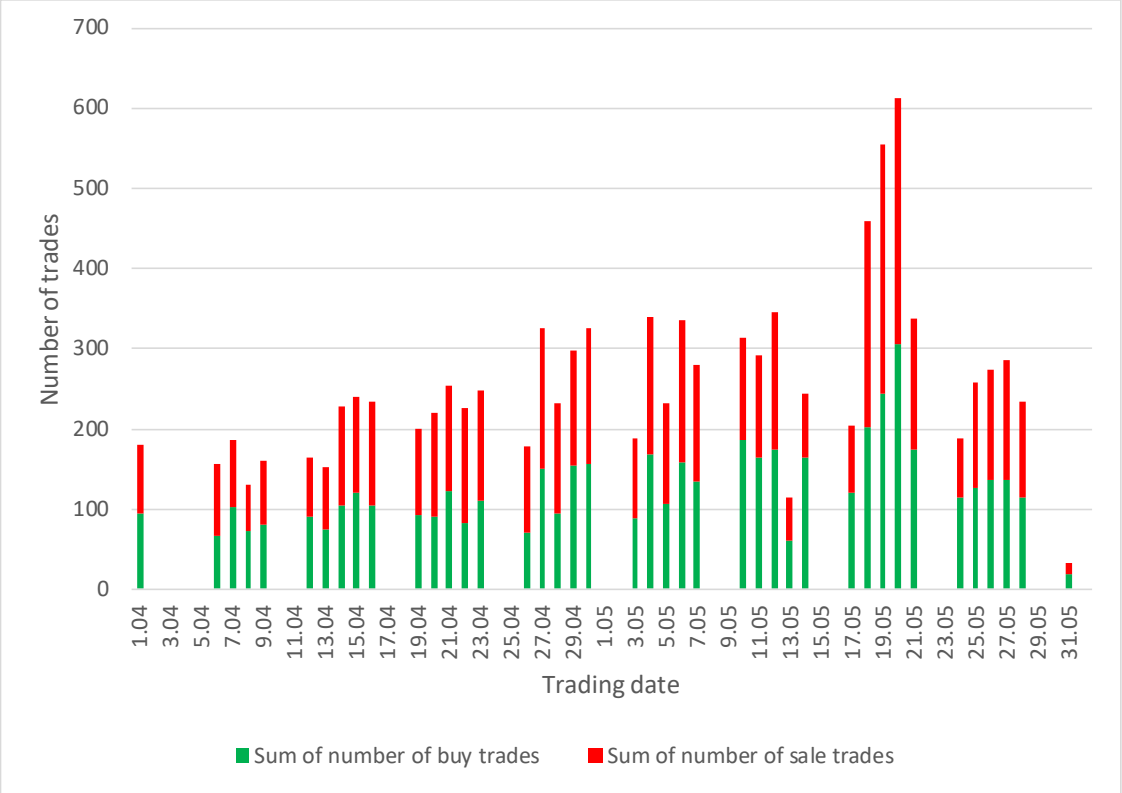

Figure 28: Number of trades of Swiss market participants in the 2022 calendar year for German base

3.2.2 Analysis of the extraordinarily high gas and electricity prices and their impact on network operators, industry and end customers

By September, the Market Surveillance Section had already looked at the high gas and electricity prices and analysed the potential impact on network operators, industry and end customers. In a first stage, the analysis briefly outlined the extent to which the gas and electricity prices, but also coal and CO2 prices on the energy wholesale markets had risen since year-opening. The reasons for the increase were also explained. This was covered in section 2.2 Futures market report – annual review 2021.

The potential effects on network operators were explored in a second stage. In October, the consequences of the high prices were already critical in the UK. Various energy providers had filed for bankruptcy.

The situation for Swiss energy providers is not as critical as abroad. In Switzerland, energy providers can pass on their energy costs to end customers under universal service provision through cost-plus invoicing. This means there are few incentives for speculating in universal service provision (i.e. not purchasing all the universal service requirement for the next year on the market at the time of the tariff publication). Most small energy providers in Switzerland fall under full supply or structured full supply. Under full supply, they select a delivery model within which the agreed price applies for consumption without the consumption volume being fixed. This means the prices are established before supply and are not exposed to any balancing risks. The risk of high spot prices/balancing energy prices is borne by their supplier which is usually a larger energy provider or a producer. The suppliers are often producers which means they are currently benefiting greatly from the high prices.

However, there were also individual energy providers (at least one written enquiry was submitted to ElCom) who had not procured the full volume at the time of the tariff publication and had to buy at much higher prices than planned which means the tariffs calculated and approved by ElCom could prove to be too low. ElCom's Technical Secretariat has a longstanding and well-established policy on subsequent

or intra-year tariff adjustment. Subsequent adjustment of the energy tariffs published is not permitted under this policy. This is due to the legal deadline for the publication of the tariffs which could be avoided by the option of making subsequent adjustments at will. The published energy tariffs also constitute a decision-making basis for (eligible) end consumers wishing to switch provider. In the context of rising electricity prices, adjustment of the energy tariffs after publication at the end of August is not permitted under this policy. The energy provider can balance out the differences between the tariff revenues and the actual procurement costs as usual via the coverage differential over the following years.

However, such significant price fluctuations can increase credit and liquidity risks for Swiss energy providers (larger providers and producers) which participate very actively in the wholesale market. Electricity is mainly traded over the counter (OTC) in Switzerland despite trading via the stock exchange increasing over recent year. See the next section: Liquidity risks related to hedging activities.

Credit risk for Swiss energy providers has also increased considerably recently. If counterparties default due to bankruptcy, already concluded futures market transactions may have to be covered again on the market at significantly higher conditions. This can present financial issues.

Liquidity risks related to hedging activities

To protect against dramatic price fluctuations and to reduce market risk, power plant operators sell their electricity production three years before physical delivery on the electricity wholesale market. This makes future cash flows more plannable and ensures a certain level of profitability. Reducing market risk through hedging nevertheless means increasing exposure to other risks, particularly credit and liquidity risks. Executing sales transactions of the power plant position on the OTC market increases credit risk. Executing them on the stock exchange eliminates credit risk but means full exposure to liquidity risk. Credit risks can be reduced at the expense of liquidity risks, such as on the stock exchange through EFET supplementary agreements like the credit support annex.

The clearing house for the EPEX SPOT (spot market) and EEX (futures market) stock exchange is the ECC. As the main counterparty, the ECC assumes the counterparty risk for all transactions executed on its partner markets. In the event of the default of a clearing member, the ECC ensures payments are made to non-defaulting clearing members. This means the management of the counterparty risk is a key element of the ECC's activities. Market actors are required to provide financial collateral in order to trade on the stock exchange. The payments associated with the market valuation are called variation margin where unfavourable market developments result in payment requests while advantageous ones appear as credit in the margin account. The cumulative variation margin represents profit and loss which means the cumulative variation margin on the due date constitutes the total loss of an unprofitable position held until due date and the total profit of a profitable position. If a market participant sells 1 MW Cal 22 base (8760MWh) on the EEX and the annual product's electricity price rises by EUR 100/MWh, the market participant must provide EUR 876,000 as collateral. That is the amount now at risk for the exchange. The collateral is returned to market participants upon supply of the energy. The market participant must also provide an initial margin as collateral for the event that the price changes significantly over the course of time up to the supply of electricity. Market volatility plays a key role in calculating the initial margin.

As electricity prices have risen sharply recently, the market value of sales transactions executed at an earlier date on the EEX is well into negative territory for electricity supplies in future. The price for the 2022 and 2023 supply years was much lower two years ago. As a result, the stock exchanges and the counterparties, with which a credit support annex has been signed, require margin call payments to cover the unrealised hedge losses. The higher the price fluctuations and the greater market volatility is, the higher the increase in the margin call payments. This liquidity requirement should not be underestimated as it can lead to insolvency in the worst-case scenario.

It is important to understand that the value of the power plants – especially hydro and nuclear power plants – has risen as a result of the high prices. As producers generally sell electricity up to three years in advance on the futures market, the positive effect of the price increase is delayed for producers. The challenges on the liquidity side are due to stock exchange regulation as much more collateral now suddenly has to be provided. This is then returned to market participants involved in energy trading as soon as the electricity has been supplied. The funds are put in a blocked account until contract fulfilment. This system aims to protect other market participants against financial losses in the event of a market participant defaulting. This gives the system legitimacy. The challenge is now assessing whether the system needs to be modified for the energy sector to prevent profitable companies running out of liquidity in the event of extreme price rises, jeopardising security of supply.

The high prices are also impacting on industry. Some industrial and agricultural sectors abroad have temporarily shut down production due to the high gas price, including a major fertiliser manufacturer. The European fertiliser giant Yara International announced plans to cut ammonium production by 40% due to the high costs.[9] The impact on Swiss industry depends on how many companies rely on the free market as well as on their procurement strategy. If they have purchased heavily in advance on the futures market, they will feel the impact of the price rise much less than if their energy costs are based on the day-ahead market index. ElCom is unaware of any companies in Switzerland having shut down operations due to rising energy costs.

Various informal talks were held with energy supply companies to assess the impact on Swiss end customers. The rising energy prices will be passed onto end and industry customers via tariffs with a delayed effect. However, if provider tariffs are based purely on production costs, the price changes on the wholesale market should not impact on their tariffs.

3.2.3 Analysis of the effects of wind-related cross-border capacity reductions on the day-ahead spread for Germany/Switzerland

In October 2021, when electricity prices rose sharply, the spreads between Germany and Switzerland on the day-ahead auction reached values of over EUR 200/MWh. This is explained by several reasons.

Firstly, it is worth noting that capacity to transmit electricity from Germany to Switzerland is heavily dependent on the power production of wind power plants in Germany. This is highlighted by Figure 29.

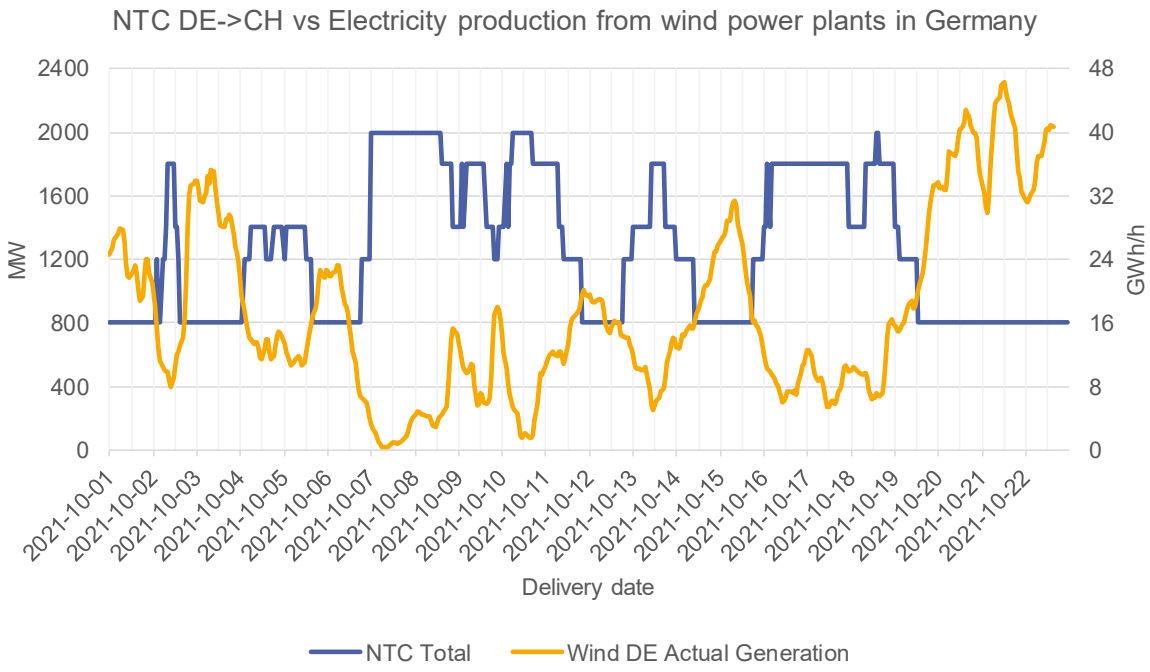

Figure 29 – left axis: Total cross-border transmission capacity DE->CH (NTC total), right axis: Hourly electricity production from wind power plants (onshore and offshore)

The greater the electricity production from wind power plants, the smaller the capacity available to import electricity from Germany.
The reason for the reduction is the load of the grids. If Switzerland requires a high level of (cheap) electricity from Germany when German wind power production is high, domestic German grid capacity reaches its load limit. Wind power cannot be transported south and to Switzerland. Reserve power plants in southern Germany must produce electricity to meet Swiss demand. This results in high grid costs in

[9] https://www.agrarheute.com/markt/diesel/diesel-heizoel-strom-so-verdammt-teuer-585701

Germany. To avoid this situation, cross-border capacity to Switzerland is reduced in the event of high wind power production to prevent high power flows to Switzerland.

Figure 30 illustrates that the spreads were much higher at times of reduced cross-border capacity than when lots of cross-border capacity was available. The graphic shows that the price for cross-border capacity from Germany to Switzerland auctioned on the previous day was also very high at times of reduced capacity supply (NTC day-ahead).

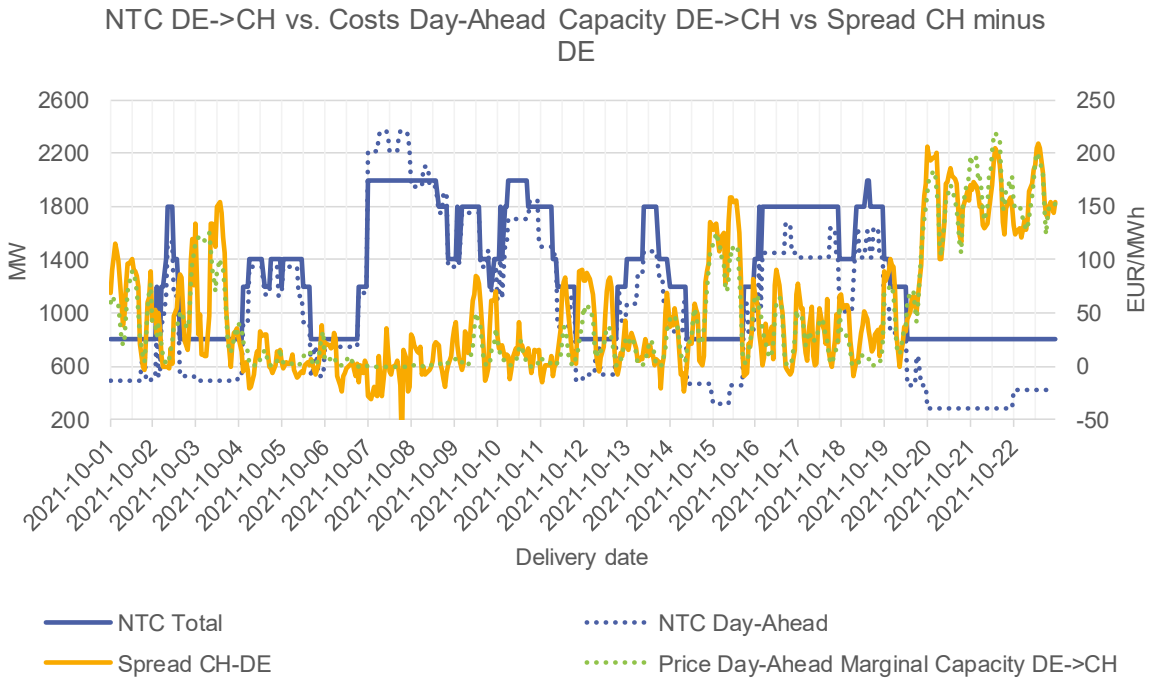

Figure 30 – left axis: Total cross-border transmission capacity DE->CH (NTC total) and cross-border transmission capacity DE ->CH auctioned on the day-ahead capacity auction (NTC day-ahead). Right axis: Costs of the transmission grid capacity (price of day-ahead cross-border capacity) and energy price spread between Switzerland and Germany at the day-ahead auction for the period 1 October 2021 to 22 October 2021.

When there are high levels of wind in Germany, brown-coal power plants generally set the price. By contrast, it is the marginal costs of the gas-fired power plants that determine the price in France and Italy when demand is high and/or supply low. They were well above the marginal costs of the brown-coal power plants in October due to the high gas prices (Figure 5).

The price in Switzerland is in turn heavily dependent on the marginal costs of the hydropower plants. These marginal costs depend on how much electricity can be imported from abroad and at what price and how high the prices are on the futures markets in Europe. A hydropower plant will sell its electricity at the best-possible price which is why the supply of hydropower plants on the day-ahead auction also depends on the price at which the electricity can be sold on the futures markets. The futures market prices rose sharply again in October, also see section 2.2 and 3.2.3.

If the cross-border capacity from Germany to Switzerland is reduced, not enough (cheaper) German electricity can be imported to meet demand in Switzerland. More power must be generated in Switzerland itself or power must be imported from other countries at higher prices. The price for the electricity in Switzerland is then based on much higher prices.

The review of the situation during the same period in 2020 in Figure 31 illustrates that the reduction of the NTCs in the tight price situation in October 2021 on the futures markets led to significantly greater spreads between Switzerland and Germany. In the same period in the previous year of 2020, the energy price spread was generally below EUR 50/MWh during periods with reduced cross-border capacity.

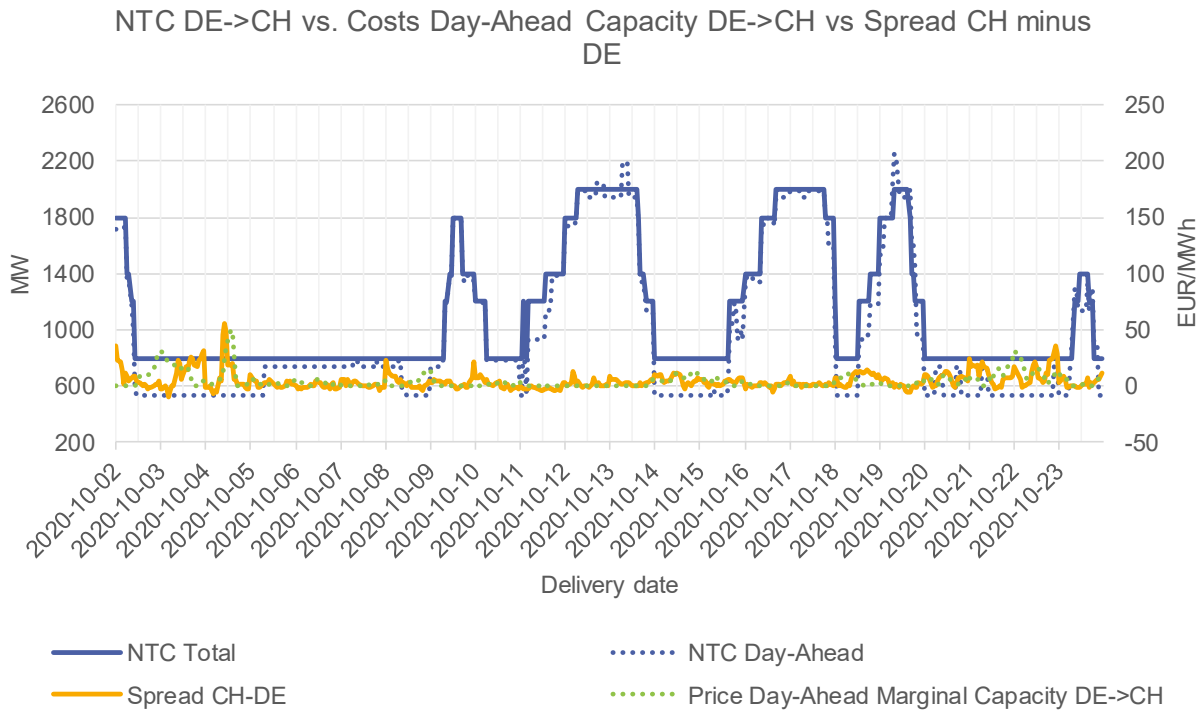

Figure 31 – left axis: Total cross-border capacity DE->CH (NTC total) and cross-border capacity DE ->CH auctioned on the day-ahead capacity auction (NTC day-ahead). Right axis: Costs of the transmission-grid capacity (price of day-ahead cross-border capacity) and the energy-price spread between Switzerland and Germany of the day-ahead auction. Period: 2 October 2020 to 23 October 2020

If the import capacity from Germany to Switzerland is reduced frequently or even permanently due to, for example, a lack of an electricity agreement or the 70% MinRAM rule[10], greater spreads with Germany – in addition to lower security of supply – can increasingly be anticipated, leading to much higher prices in Switzerland.

4 The Electricity Supply Act: the legal basis for market surveillance

The legal basis for market surveillance is defined in the Electricity Supply Act in Article 26*a* – *c*. This states that the same data on transactions of wholesale products and availability of power plants, in accordance with (EU) Regulation No 1227/2011 (EU-REMIT Regulation) must be sent to ElCom as to the EU authorities. ElCom has an information system and can process the data.

In this regard, National Councillor Jürg Grossen – together with 17 co-signatories – submitted a parliamentary initiative on 7 December 2021 entitled *'Mehr Transparenz und Integrität im Stromgrosshandel sorgt für faire Preise für Stromverbraucher'*[11] *(Greater transparency and integrity on the electricity wholesale market ensures fair prices for electricity consumers).* The initiative text states:

The legal basis must be established for effective monitoring of the electricity wholesale market. In particular, it will contain provisions on punishment of market manipulation and exploitation of insider information.

The reasons for the initiative include the risk of price distortions through insider trading and undetected price manipulation. Distorted prices send out false signals to investors, jeopardising investments in new

[10] Also see ElCom report Inclusion of the Swiss grid in the EU's capacity calculation, https://www.elcom.admin.ch/elcom/de/home/dokumentation/berichte-und-studien.html

[11] https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaeft?AffairId=20210510

renewable energy sources, key replacement investments and the renewal of power supply infrastructure. Price manipulation can also result in higher electricity prices for end consumers. The growing decoupling of the Swiss market from the EU is also leading to a reduction in liquidity on the Swiss market which is why monitoring electricity wholesale trading is becoming increasing relevant.

The parliamentary initiative aims to create transparent and integrated electricity wholesale trading in Switzerland which prevents misconduct, guarantees fair prices and contributes to optimal electricity supply for the economy.

The parliamentary initiative had not been addressed at the time when the Market Transparency Report was drawn up, and a date for addressing it has not yet been set. Adoption of the parliamentary initiative would permit ElCom to monitor Swiss wholesale trading more effectively. This would enhance the credibility of price signals and confidence in an effective and fair wholesale market. The alignment of the legal basis in Switzerland with that of the EU would also facilitate collaboration with electricity regulators in neighbouring countries.

5 Other activities on market transparency and market surveillance

5.1 Cooperation in Switzerland and abroad

Communication with energy regulators from neighbouring countries was carried out virtually again in the second year of the coronavirus pandemic. Various approaches to market surveillance and monitoring were discussed at these coordination meetings. Current market events and developments were also discussed. Towards the end of the year, discussions began focusing on the impact of the high prices, not just for electricity, but other commodities too, on the market and on market participants.

The Market Surveillance departments of EPEX Spot and ElCom meet once or twice a year to discuss matters of joint interest and current developments.

The usually annual bilateral meeting with SIX was held twice this year. This was due to market surveillance at SIX being taken over by Christian Müller, who has introduced new systems and undertaken infrastructure modifications. The market surveillance tool, which is now based on artificial intelligence, was presented live at a second meeting.

Topics covered at the annual discussions with the Swiss Financial Market Supervisory Authority (FINMA) on experience of methods included greater use of algorithms and high-frequency trading and their impact on market surveillance.

Topic-based discussions with Swissgrid were held throughout the entire year.

Work at European level was also carried out without any restriction. ElCom continued to take part in the meetings of the Council of European Energy Regulators' (CEER) Market Integrity and Transparency Working Group (CMIT). It once again conducted a survey amongst national regulatory agencies (NRAs) on the implementation status of the REMIT Regulation in EU member states. Even though national legislation rather than REMIT applies in Switzerland, ElCom has supported the initiative from the outset and is also taking part in the evaluation and analysis of the information submitted – from this year onwards – in addition to the drafting of the survey. This year's survey indicated the implementation status of the REMIT Regulation in the individual EU countries has been very different to previous years EU-wide in terms of the level of human resources deployed, technical equipment and exchange with ACER. Progress was achieved overall but the surveillance activities of the EU energy regulators were hampered by the COVID-19 pandemic and the restrictions imposed as a result.

ElCom's Technical Secretariat also took part in the REMIT forum organised online by ACER this year. This year's event mainly focused on ten years of REMIT. This anniversary provided an opportunity to

celebrate, reflect on what has been achieved and where problems lie, as well as to look to the future at what steps can be taken to improve the regulatory system. The major future challenges facing REMIT over the next two to three years were discussed, such as, for example, the shift of trading activities to increasingly short-term and, as a result, more flexible markets. How these challenges can be best addressed was explored by various panels. Whether there should be a REMIT II and what form the proposed changes should take was also openly discussed.

In this respect, ACER also introduced a procedure to request additional information from the nominated electricity market operators (NEMOs) operating on the single intraday coupling (SIDC) market. This information is required to recreate the trading dynamic and the local perspective of the joint order book in the SIDC market and to enable ACER to fully exercise its mandate of monitoring the energy wholesale markets in accordance with Article 7 of REMIT. The provision of the relevant information to ACER enables the agency to monitor the integrity and transparency of the European wholesale market, in particular the uniform intraday market, effectively in accordance with REMIT provisions.

As market surveillance and market integrity are cross-border issues, topic-specific communication with the market surveillance departments of other regulatory authorities is of great importance and ElCom will continue to maintain such exchange virtually.

5.2 Other activities related to market transparency and market surveillance

The coronavirus pandemic once again had an impact on market surveillance activities in 2021. Despite work-from-home restrictions being imposed for a period, the secure room maintained the operational activities and monitoring of the Swiss electricity wholesale market and the activities of the Swiss market participants in the European Union unlike some neighbouring regulatory authorities.

One of the highlights was the holding of the market surveillance workshop which had been cancelled in the previous year due to the pandemic. As had been planned in the previous year, the workshop looked at the topic: ‘Algorithmic trading – impact on energy trading’ and was held online for the first time on 28 May 2021. The key aspects of the Market Transparency Report 2020 and two current market monitoring analyses were presented in the first part of the workshop. The second part of the event focused on algorithmic energy trading from various perspectives. Algorithmic trading was explored from an academic perspective and the effects of the greater use of algorithms on stock exchange trading were outlined. ElCom also presented the results of the survey carried out on the use of algorithms in electricity trading by Swiss market participants and its communication on algorithmic trading. Finally, the federal network agency presented a REMIT case concerning the use of algorithms in gas trading in Germany and provided some practical examples from the perspective of a market participant compliance officer. The more certain markets can be served just with algorithms, the greater the danger of smaller companies not being able to trade as the cost of setting up algorithm operation is too high. A follow-up survey indicated that there was great interest in updating the 2019 survey on the use of algorithms in energy trading. It would be interesting to see how the figures have changed over the years.

It was also interesting to observe the impact that the partial solar eclipse around midday on 10 June 2021 had on market prices. There was a small peak on the day-ahead market in Germany where the market price rose from EUR 73/MWh to EUR 82/MWh. However, the impact on prices was not as great as during the last solar eclipse. This was clearly evident, especially in the intraday prices. The lower impact on market prices is probably due to the fact that there are now many options available for absorbing short-term changes to feed-in and demand, such as the 15-minute intraday auctions on the previous day and improved forecasting which means market participants are better prepared. The impact on the day-ahead price in Switzerland was negligible due to the low level of photovoltaic power feed-in.

The spot and futures market prices on the wholesale market rose sharply, particularly from August 2021 (in the 2022 calendar year, base Switzerland was being traded at around EUR 52.5/MWh at the start of

the year and stood at EUR 229/MWh at the end of 2021). This explains why from this period onwards there were more enquiries from journalists and end customers about the effects of the high electricity and gas prices on end-customer tariffs. All enquiries were answered in full. More information about the reasons behind these price developments can be found in section 3.2.2.

In addition to the weekly spot and futures market reports with market commentaries and the Market Transparency Report 2020, the Technical Secretariat also published other studies and communications produced by the Market Surveillance Section which contribute towards improving transparency for production and consumption-side market participants. They have been published on ElCom's website under the 'Reports and studies' section.

6 Outlook

Will wholesale market prices remain at the current high level? This remains to be seen. Forecasting how key price-influencing factors – such as the Ukraine crisis, the start of gas supplies through the new Nordstream 2 pipeline, the availability of the French nuclear power stations, political decision-making on the CO2 market and temperatures, solar radiation and wind levels – will change over longer-term horizons is subject to a great degree of uncertainty. At the moment, the market still does not believe the situation will ease judging by the prices for the 2023 annual product which is currently still being traded at well over EUR 100/MWh.

In view of the rising and volatile price trends towards the end of 2021, there is a question not just over whether the production and grid aspect requires monitoring in relation to security of supply but also the extent to which the commercial and financial requirements of stock exchanges and clearing houses could create a systemic problem and jeopardise security of supply.
The margining rules implemented since the financial crisis may cause extremely high (daily) liquidity requirements in the event of high prices and great volatility on the market. The problem for energy traders is that they do not have large cash funds available like banks and their liquidity is instead tied to their assets.

The central clearing houses and stock exchanges are subject to EU financial market regulation which means no exceptions can be granted for commodity traders. To avoid such developments longer-term, changes to clearing regulations for commodity traders may be required or the opportunity to evaluate whether clearing houses can adjust the parameters of their margin models in extreme situations in agreement with their supervisory authorities within a defined framework.

ElCom is currently unable to predict and assess market developments and any resultant consequences as electricity transactions (orders and trades) with Switzerland as the supply destination do not currently fall under Article 26*a* ff. of the Electricity Supply Ordinance (ESO) and are therefore not reported to ElCom. This means ElCom is unable to perform this task. The forthcoming revision of the Electricity Supply Act in 2022 provides an opportunity to change this.

There were several new cases of market manipulation in 2021 on the energy wholesale market in the EU. ACER had opened 61 new cases by the end of the third quarter 2021 and conversely closed 41 cases during the same period. More sanctions are being issued EU-wide for violations of REMIT, sometimes with high fines.

In this regard, it is interesting to note that Ofgem penalised a third case of market manipulation concerning the provision of misleading information to system operators on the balancing market. Based on REMIT, regulatory authorities in the EU can identify market mechanisms that could potentially jeopardise supply security by detecting such cases and reduce the risk of future misconduct.

With regard to the next steps in the development of REMIT, the question was raised as to whether greater centralisation of enforcement powers and harmonisation of sanctions is necessary. REMIT needs to be developed to retain market confidence. In this respect, REMIT reporting could benefit from

greater flexibility in terms of data collection. For example, greater flexibility in terms of application, the underlying definitions and how data is reported would enable REMIT to keep pace with market developments more effectively which are being driven by greater market integration, such as market coupling and the expansion of SIDC and the creation of balancing market platforms. This means the number of reported data sets will constantly continue to rise over the coming years. Increased use of algorithmic trading and technological development, such as artificial intelligence (AI), machine learning (ML), etc. will lead to further changes.

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Glossary

AI	Artificial intelligence
ACER	Agency for the Cooperation of Energy Regulators
ACM	Autoriteit Consument & Markt (Netherlands regulator)
ARA	Reference price for thermal coal delivered to one of the coal terminals in Amsterdam, Rotterdam or Antwerp
ARERA	Autorità di Regolazione per Energia Reti e Ambiente (Italian regulator)
API2	Rotterdam Coal Futures Index
BFE	Swiss Federal Office of Energy
BNetzA	Bundesnetzagentur (German regulator)
CEER	Council of the European Energy Regulators
CEREMP	Centralised European Register of Energy Market Participants
CMIT	CEER Market Integrity and Transparency Working Group
CNE	Comisión Nacional de Energía (Spanish regulator)
CRE	Commission de régulation de l'énergie (French regulator)
E-Control	Energie-Control GmbH (Austrian regulator)
EEX	European Energy Exchange (European electricity exchange for futures contracts)
EEX TP	European Energy Exchange Transparency Platform
ElCom	Swiss Federal Electricity Commission
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSO-E TP	European Network of Transmission System Operators for Electricity Transparency Platform
ENVI	EU Committee on the Environment, Public Health and Food Safety
EPEX SPOT	European Power Exchange for spot and intraday
ESO	Electricity Supply Ordinance
EU	European Union
EUA	European Emission Allowances
FINMA	Swiss Financial Market Supervisory Authority
GW	Gigawatt
GWh	Gigawatt hour
IIP	Insider information platform
IPCEI	Important Projects of Common European Interest
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MIT	Market integrity and transparency
ML	Machine learning
MW	Megawatt
MWh	Megawatt hour
NCG	Reference price for the German gas price from the market area operator NetConnect
NEMOs	Nominated electricity market operators
OCG	Self-consumption groups
Ofgem	Office of Gas and Electricity Markets (UK regulator)
OMP	Organised market places
OTF	Organised trading facility
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency
RRM	Registered reporting mechanism
SIDC	Single intraday coupling
STOR	Suspicious Transaction and Order Report
Terna	Gestore della rete di trasmissione italiana (Italian grid operator)
TTF	Virtual trading point in the Dutch gas network and reference price for the gas market in the Netherlands
TWh	Terawatt hour
URE	Urząd Regulacji Energetyki (Polish regulator)
VPP	Virtual power plant
XBID	Cross-border intraday