REPORT
ON THE ENERGY SITUATION
IN SLOVENIA

2021

Agencija za energijo

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Agencija za energijo

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DIRECTOR'S FOREWORD

MAG. DUŠKA GODINA

DIRECTOR

In recent years, society as a whole has been facing challenges that were unimaginable some time ago. The first challenge, which now seems to be under control, was the Covid-19 pandemic. This highlighted an important message for the energy sector - reduced energy use, especially in industry and transport, has reduced greenhouse gas emissions and environmental burdens. The claims of leading climate experts that human activities are the main cause of global climate change were confirmed, and the need for a transition to clean energy was reaffirmed.

The growth in global energy demand due to the post-pandemic economic recovery impacted energy price increases in the European wholesale markets. However, other factors of a more structural nature, linked to the shift towards a more sustainable mix of production sources, also greatly influenced these price increases. The insufficient generation of wind power plants and lower hydropower generation due to a hot and dry summer increased the demand for fossil fuels in the past year, despite the targets. In addition, record prices of emission allowances were causing price increases. Developments in the energy markets also led to high heating costs from district heating systems using natural gas or coal at the start of the heating season.

These trends have continued this year. The war in Ukraine led to renewed price increases in the already fully heated wholesale markets, which particularly raised concerns about energy security in the European Union. The recently published REPowerEU plan is a joint effort by the EU Member States to end dependence on Russian fossil fuels and to strongly accelerate the green transition. The transition must be performed simultaneously at several levels, with very ambitious targets at each level. Energy savings are expected to be as high as 13%; by 2030, 45% of all energy consumption in the EU should be from renewable sources. By that year, all the infrastructure to produce, import and transport up to 20 million tonnes of hydrogen should be in place, half of which should be produced in the EU. The plan is binding on us, and we can only contribute by accelerating the transition to clean energy.

This situation makes the case for changes in energy production and consumption even stronger while indicating the urgent need to accelerate the development of policies and measures that will provide answers to the question of how, once fossil fuels have been phased out, we will cope with the daily, seasonal and other fluctuations that result from the volatility of RES or their dependence on weather conditions.

Although Slovenia reached its target of 25% RES in final energy consumption in 2020, this was significantly due to the lower energy use due to the epidemic and the purchase of the missing share from another Member State. However, as nothing significant has happened in terms of the integration of new generation sources, the current estimate for 2021 is again 1.5% short of the target.

The European Commission has recognised a severe risk that Slovenia will not meet the 27% target by 2030 and has therefore called on us to take additional measures to facilitate the licensing of RES projects, including onshore wind and solar. The Energy Agency's analysis in 2019 showed that if all the projects selected in the calls for tenders were implemented in 2023 when the deadlines for most of the projects expire, we could more than double electricity generation from RES, most of it from the wind. In total, RES electricity generation could already exceed 1.3 TWH in 2023.

Unfortunately, nothing has changed in the implementation of the selected projects since 2019, and the key reason is precisely the siting of facilities, so the European Commission's call is highly justified.

However, there is still a lot of untapped potential for siting solar PV in degraded areas, as well as rooftop potential. We also need to work towards the accelerated, cost-effective deployment and integration of heat pumps, geothermal energy and solar thermal. The key will be to integrate the sectors and to plan and operate the system as a whole in a coordinated way, creating closer links between energy production (sources), transmission and distribution infrastructure, and all consumption sectors.

Changes in energy use and generation can benefit consumers and society as a whole. Still, they pose a significant challenge for Slovenia's electricity networks, as capacity is limited at various locations on the grid and could decrease the quality of supply, with a consequent impact on operators' costs and delays in connecting new consumers and self-supplying installations, which already numbered 14,451 at the end of 2021. Therefore, it is vital to manage these changes without incurring unnecessary additional costs, which can only be achieved by ensuring flexibility in the electricity system and active consumption.

European Directives oblige national regulators to create an enabling regulatory environment to ensure the efficient and flexible use of electricity networks. Tariffs for the use of networks should also reflect incentives to avoid unnecessary costs of investment in reinforcements or extensions to the network, thereby encouraging both electricity operators and consumers to play an active role. At this point, it is worth mentioning battery energy storage, which will increase in importance in proportion to the higher share of RES.

While energy-related issues have been the exclusive preserve of narrow decision-making circles in the past, decentralisation and democratisation in the energy sector are significantly increasing the role of citizens who, through active consumption, self-supply and other »behind the meter« technologies, are shaping the social and environmental aspects of the energy transition in the future. We have a significant way to go in raising awareness among individuals and society, and a change in the mindset and habits will also be needed among all other market stakeholders, including electricity operators.

Energy price rises are also a severe global and political problem, and we must not forget the most vulnerable groups and the long unanswered question of energy poverty. With the level of prosperity in today's society, no one should be left without a basic supply of energy, but this must be ensured through appropriate and long-term social policy measures for those who need help.

I hope this report will be a useful tool for all stakeholders in the energy market, as it contains data, analyses and trends on the state and development of the energy market. I want to thank the market participants for providing the data, my colleagues for their careful data collection and analysis and all their joint efforts to maximise the relevance of this Energy Report.

36.7% RES

PRIMARY ENERGY SOURCES
36.7% RENEWABLE ENERGY SOURCES
25.8% FOSSIL FUELS
37.5% NUCLEAR FUEL

7.9%

ELECTRICITY GENERATED FROM POWER PLANTS IN THE SUPPORT SCHEME

609 GWh

ENERGY SAVINGS FOR DISTRIBUTION SYSTEM LOSSES OVER THE LAST 10 YEARS

3.1% HIGHER

TOTAL ELECTRICITY CONSUMPTION

82.9%

COVERING ELECTRICITY CONSUMPTION WITH DOMESTIC PRODUCTION

Electricity - an essential part of modern life, technological development, and achieving climate neutrality

88.1% CONSUMERS ON THE DISTRIBUTION SYSTEM EQUIPPED WITH ADVANCED METERING DEVICES

RECORD WHOLESALE PRICE INCREASES

43% - INCREASE IN THE TOTAL NUMBER OF ELECTRIC VEHICLES

20% INCREASE IN QUALIFIED PROJECTS ON BIG DATA IN THE RESEARCH AND INNOVATION INCENTIVE SCHEME

FINAL ELECTRICITY PRICES FOR A TYPICAL HOUSEHOLD CONSUMER REMAIN BELOW THE EU AVERAGE

11.3% HIGHER FINAL ELECTRICITY PRICE FOR AN AVERAGE BUSINESS CONSUMER

7.4% HIGHER FINAL ELECTRICITY PRICE FOR A TYPICAL HOUSEHOLD CONSUMER

ELECTRICITY

Electricity Balance

Inputs and Outputs of Electricity in the System

In 2021, 14,423 GWh of electricity was delivered into the Slovenian electricity system from the generation units connected to the transmission or distribution system in Slovenia, which was 1325 GWh less than in 2020. The electricity balance of inputs and outputs shown in Figure 1 also includes the withdrawal of 21 GWh from battery storage in the context of generation within closed distribution systems. The delivery from facilities using RES amounted to 5292 GWh, which is 221 GWh less than the year before, while facilities using fossil fuels contributed 3720 GWh or 475 GWh less than in 2020. The Krško Nuclear Power Plant (NPP) delivered 5,411 GWh of electricity or 629 GWh less than the year before. These quantities are taken from the balance sheets of the electricity system operators and are based on physical flows.

14,423 GWh
of electricity delivered, 36.7% of which was generated in production facilities using RES

The quantity of electricity produced by facilities connected to the distribution system, including closed distribution systems (CDS), increased by 2 GWh to a total of 1091 GWh, or 1100 GWh if including the electricity drawn from battery storage. In the internal consumers' networks, an additional 418 GWh of electricity was consumed, which represents 28% of all the electricity generated in facilities connected to the distribution system and closed distribution systems.

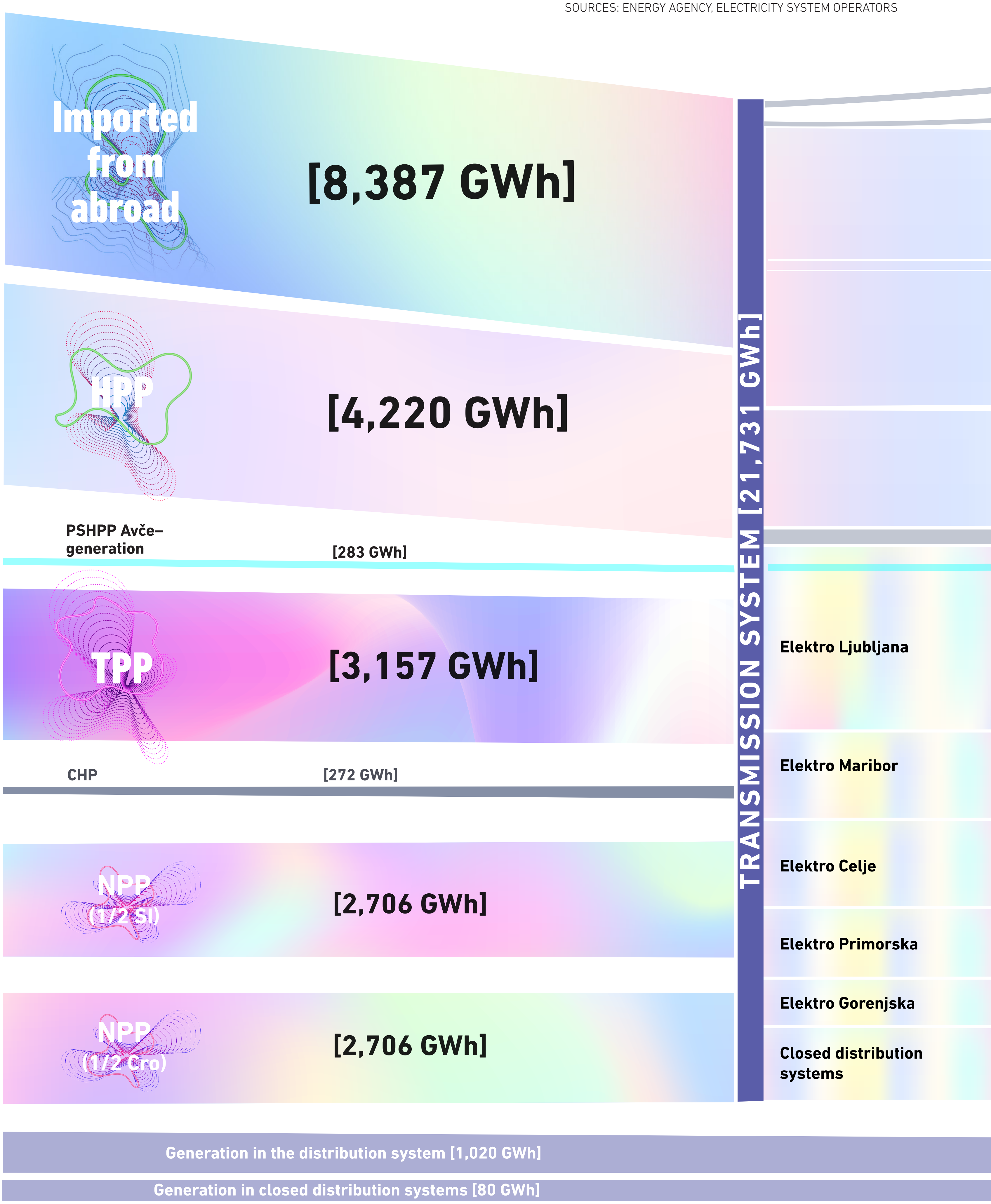
TABLE 1: ELECTRICITY INPUTS INTO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2017–2021 PERIOD, IN GWh

Electricity input into the transmission system [GWh]	2019	2020	2021
Dravske elektrarne Maribor	2,731	3,182	2,888
Savske elektrarne Ljubljana	335	327	340
Hidroelektrarne na spodnji Savi	542	525	550
Soške elektrarne Nova Gorica	415	423	443
Avče PSHPP in the generation regime	202	289	283
Total Hydro	**4,225**	**4,746**	**4,504**
Šoštanj TPP	3,663	3,582	3,112
Brestanica TPP	21.2	47.58	46.15
Trbovlje TPP	-1.43	-1.67	-1.61
Javno podjetje Energetika Ljubljana	264	245	272
Total TPP and CHP	**3,947**	**3,873**	**3,429**
Krško Nuclear Power Plant	**5,526**	**6,040**	**5,411**
Total electricity input into the transmission system	**13,698**	**14,659**	**13,344**
Electricity input into the distribution system [GWh]	**2019**	**2020**	**2021**
HPP up to and including 1 MW	196	199	211
HPP above 1 MW	154	160	166
Woody biomass-fuelled facilities	52	58	60
Wind farms	6.14	6.21	5.54
Solar power plants	239	250	253
Facilities using biogas	77	89	92
Waste-to-energy plants	4.85	4.46	0.94
Total RES	**729**	**767**	**788**
Total conventional sources	**314**	**322**	**291**
Battery storage			**21**
Total electricity input into the distribution system	**1,043**	**1,089**	**1,100**
TOTAL ELECTRICITY INPUT	**14,741**	**15,748**	**14,444**

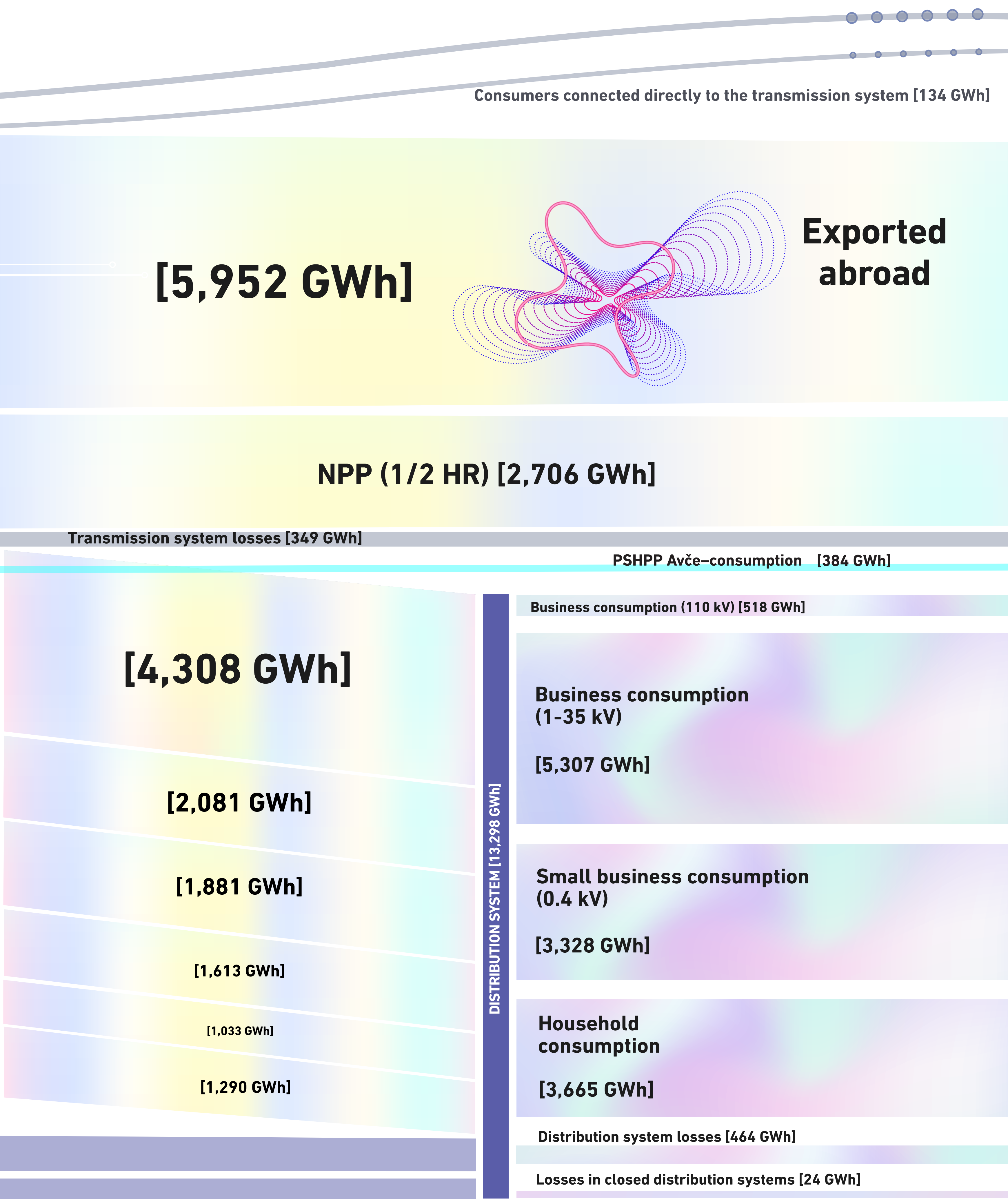
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

FIGURE 1: THE BALANCE OF ELECTRICITY INPUTS AND OUTPUTS IN THE TRANSMISSION AND DISTRIBUTION SYSTEM IN 2021[1]

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS



1 Withdrawal of electricity from battery storage is covered in the chapter Generation in Closed Distribution Systems.

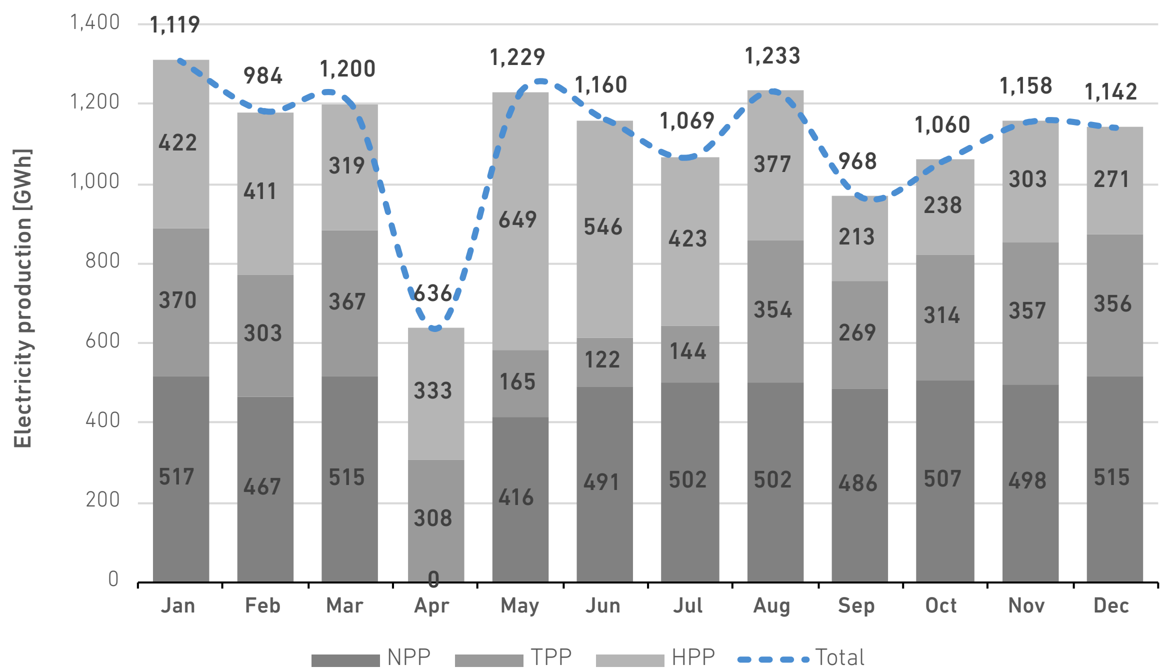

Consumers connected directly to the transmission system [134 GWh]
[5,952 GWh]
Exported abroad
NPP (1/2 HR) [2,706 GWh]
Transmission system losses [349 GWh]
PSHPP Avče–consumption [384 GWh]
Business consumption (110 kV) [518 GWh]
[4,308 GWh]
[2,081 GWh]
[1,881 GWh]
[1,613 GWh]
[1,033 GWh]
[1,290 GWh]
DISTRIBUTION SYSTEM [13,298 GWh]
Business consumption (1-35 kV)
[5,307 GWh]
Small business consumption (0.4 kV)
[3,328 GWh]
Household consumption
[3,665 GWh]
Distribution system losses [464 GWh]
Losses in closed distribution systems [24 GWh]

Domestic production sources – which include half of the production from the Krško NPP – contributed 11,718 GWh of electricity to the Slovenian electricity system, Demand from final consumers, including system losses, amounted to 14,173 GWh. In 2021, 82.9% of the electricity consumption by final consumers in Slovenia was covered using domestic production sources.

Figure 2 shows the monthly variation of electricity production in large power plants connected to the transmission system in 2021. In the first half of the year, favourable hydrological conditions led to an increase in hydropower generation. In April, the Krško NPP underwent an overhaul.

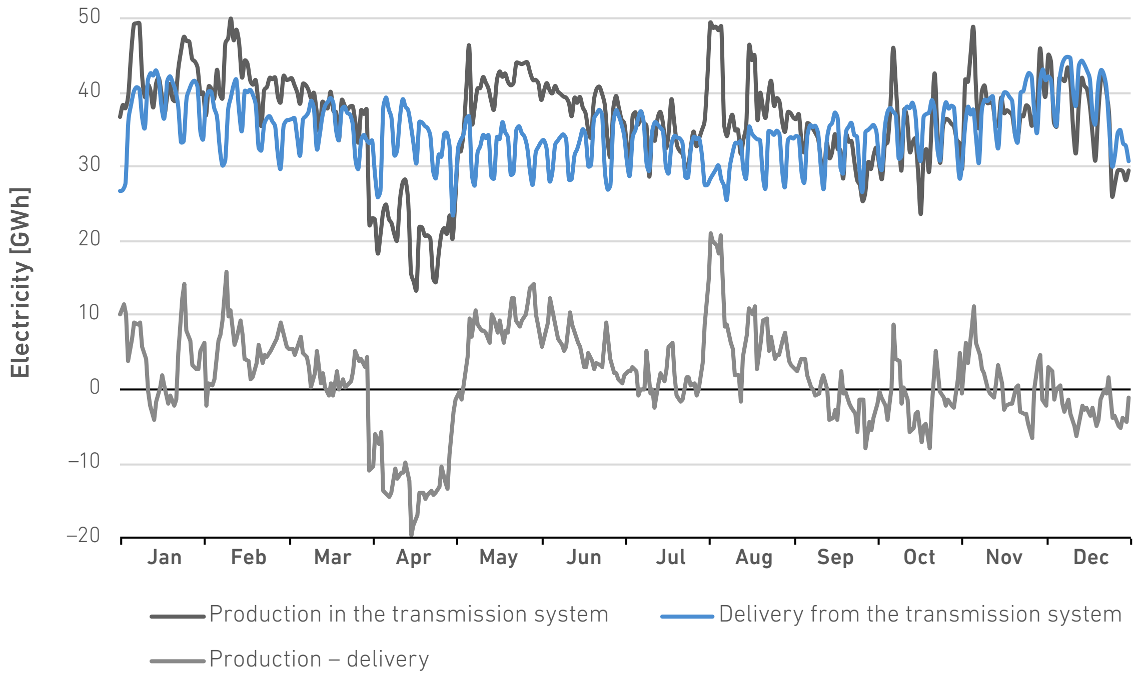
Figure 3 illustrates the daily variation of electricity production and delivery from the transmission system, showing that consumption was decreasing from the beginning of the year until the summer, then increasing towards the end of the year. Electricity consumption in the summer continued to be lower than in the winter. In the first two-thirds of the year, generation was able to cover the electricity demands of the final consumers in Slovenia nearly in full, except for April, when the Krško NPP was taken offline for an overhaul. In the final third of the year, there is a noticeable deficit in the amount of electricity consumption covered by domestic generation facilities connected to the transmission system.

FIGURE 2: THE MONTHLY VARIATION OF ELECTRICITY PRODUCTION IN LARGE POWER PLANTS CONNECTED TO THE TRANSMISSION SYSTEM



SOURCES: ENERGY AGENCY, ELES

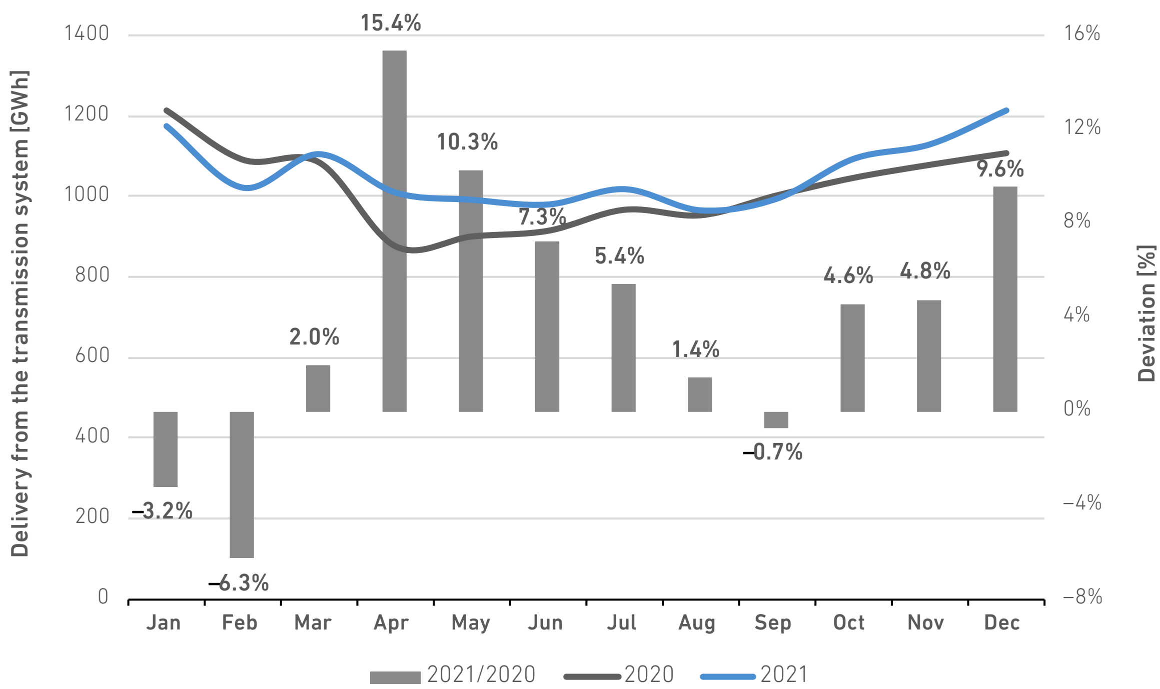
FIGURE 3: DAILY VARIATION OF ELECTRICITY PRODUCTION AND INPUT INTO THE TRANSMISSION SYSTEM



SOURCES: ENERGY AGENCY, ELES

Figure 4 shows the monthly variation in the delivery of electricity in 2020 and 2021. Shown separately is the monthly margin of production, which also clearly shows the impact of the epidemic on the electricity demand in 2020. The figure shows the increase in electricity delivery towards the end of 2021.

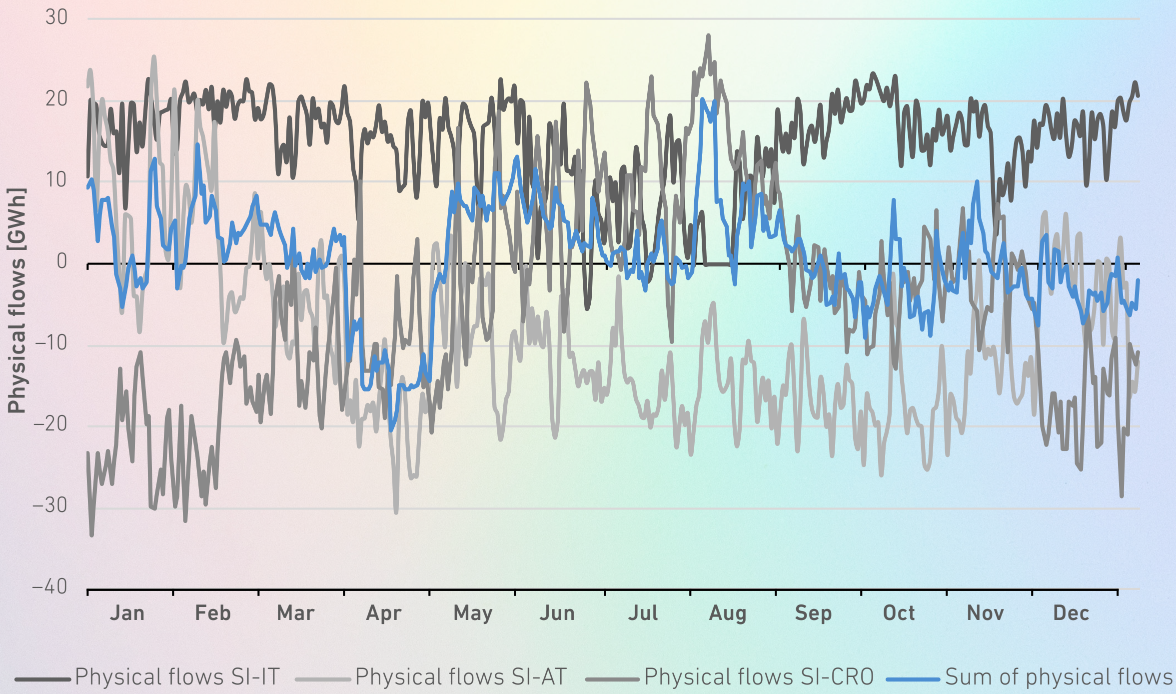
FIGURE 4: THE MONTHLY DELIVERY OF ELECTRICITY FROM THE TRANSMISSION SYSTEM IN 2020 AND 2021, ALSO SHOWING MONTHLY DEVIATIONS



SOURCES: ENERGY AGENCY, ELES

The Slovenian electricity transmission system is connected to the transmission systems of neighbouring countries on the borders with Italy, Croatia and Austria, and it will also be connected with Hungary in the future. Based on the sum of the physical flows at the borders, we can determine whether the need to balance the electricity system at a certain point in time led to the import of deficit or the export of surplus electricity from the transmission system. Figure 5, in addition to showing the movement of individual physical flows, also indicates the net sum of physical electricity flows across each of the three borders (SI-IT, SI-HR and SI-AT).

FIGURE 5: PHYSICAL ELECTRICITY FLOWS AT THE BORDERS WITH NEIGHBOURING COUNTRIES AND THE NET SUM OF PHYSICAL FLOWS

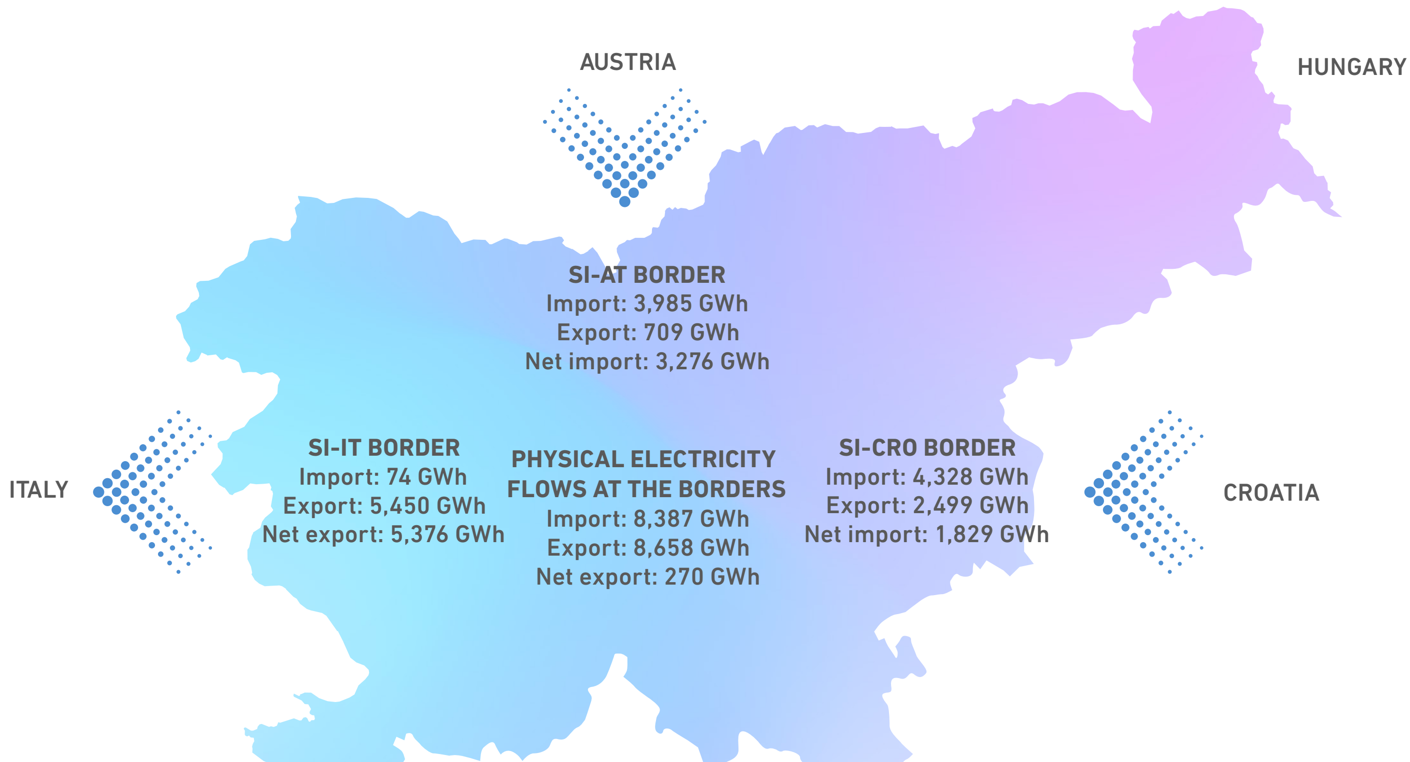


SOURCES: ENERGY AGENCY, ELES

To keep the electricity system balanced, it is important to exchange electricity with Austria, Italy and Croatia using cross-border interconnectors. Considering the separate observation of physical flows at individual borders with neighbouring countries in 2021, Slovenia was a net exporter of electricity to Italy and a net importer of electricity at the Austrian and Croatian borders. Slovenia was a net exporter of electricity in 2021 in terms of the total exchanges of electricity at the borders with neighbouring countries; it was a net importer, however, if the half of the production from the Krško NPP delivered to Croatia is taken into account. Figure 6 shows the annual volumes of physical flows at the borders with neighbouring countries.

In 2021, Slovenia was a net electricity importer

FIGURE 6: PHYSICAL ELECTRICITY FLOWS ACROSS THE BORDERS WITH NEIGHBOURING COUNTRIES

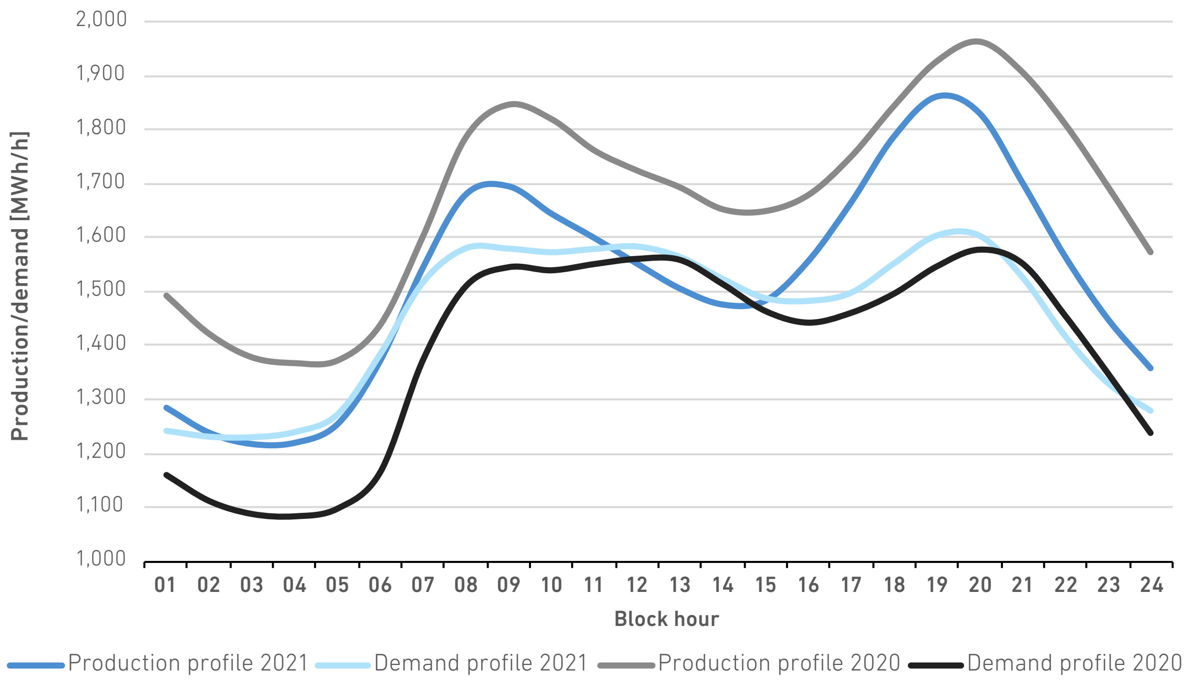


SOURCES: ENERGY AGENCY, ELES

Figure 7 shows the average daily profile of electricity generation and delivery in the transmission system in 2020 and 2021. In 2021, the transmission system saw the lowest load at night (between 03:00. and 04:00). There were two peaks, the first in the morning (between 08:00 and 12:00) and the second in the evening at 19:00. The profiles of generation and delivery in the transmission system also tell us that in 2020, the average hourly generation in the transmission system exceeded the average hourly demand in the transmission system in all block hours. This was not the case in 2021, however; in the morning hours between 03:00 and 06:00 and in the afternoon between 12:00 and 15:00, the generation in the transmission system was lower than the demand. As a rule, this can be attributed to the lower electricity prices during this time; hydropower producers in particular make use of the cheaper electricity to fill their accumulation basins.

The difference between the hourly generation and delivery averages in 2021 was the highest at 19:00, when it reached 260 MWh/h, while the lowest difference between delivery and generation in 2021 was 56 MWh/h, occurring at 13:00. The highest hourly load on the electric transmission system in 2021 was 2146 MW – 44 MW more than in 2020. This was reached on Wednesday, 9 December 2021, in the 12th block hour (between 11:00 and 12:00).

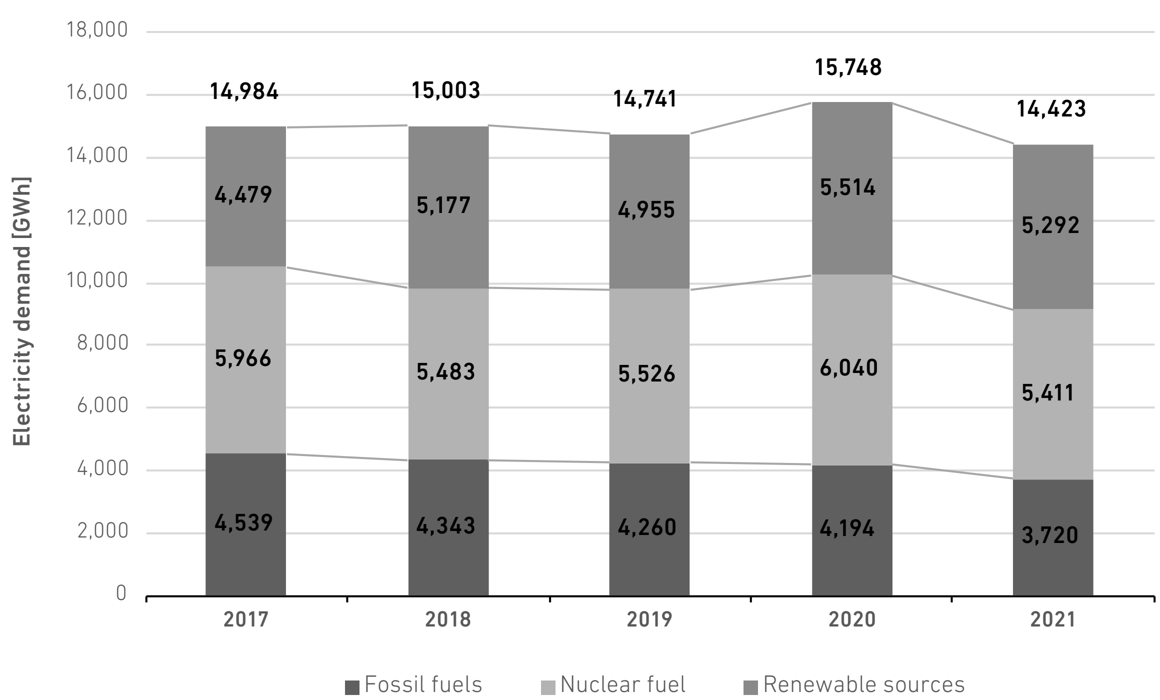
FIGURE 7: THE AVERAGE DAILY PROFILE OF ELECTRICITY GENERATION AND DELIVERY FROM THE TRANSMISSION SYSTEM IN 2020 AND 2021



SOURCES: ENERGY AGENCY, ELES

The share of electricity generated in hydro power plants and facilities using RES varies annually, depending on the hydrological and other conditions and investments in new generating facilities using RES. In 2021, this share was around 36.7% of all electricity produced in Slovenia, which is 1.7% more than the previous year. Fossil-fuel power plants contributed 25.8% of the total generation, 0.8% less than in 2020, while Krško NPP contributed 37.5% of the total electricity generation.

FIGURE 8: ELECTRICITY DELIVERED FROM THE GENERATION FACILITIES TO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 2: PRIMARY ENERGY SOURCES FOR ELECTRICITY GENERATION IN THE 2017–2021 PERIOD

Primary energy sources for electricity generation	2019		2020		2021	
	GWh	Share	GWh	Share	GWh	Share
Fossil fuels	4,260	28.9%	4,194	26.6 %	3,720	25.8%
Nuclear fuel	5,526	37.5%	6,040	38.4%	5,411	37.5%
Renewable sources	4,955	33.6%	5,514	35.0 %	5,292	36.7%
• Hydro	4,575	92.3%	5,106	92.6%	4,881	92.2%
• Wind	6.14	0.1%	6.21	0.1%	5.54	0.1%
• Solar	239	4.8%	250	4.5%	253	4.8%
• Biomass	134	2.7%	152	2.8 %	153	2.9 %
TOTAL ELECTRICITY INPUT	**14,741**		**15,748**		**14,423**	

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Losses in the Electricity System

The quantities of losses in the transmission system are determined based on the differences between the quantities of electricity produced in the transmission system and the quantities of electricity at the connection points between the transmission and distribution system and the direct consumption of electricity from the transmission system. Losses in the transmission system are determined based on the differences between the quantities of electricity at the borders between the transmission and distribution system and the quantities of electricity measured at the final consumers.

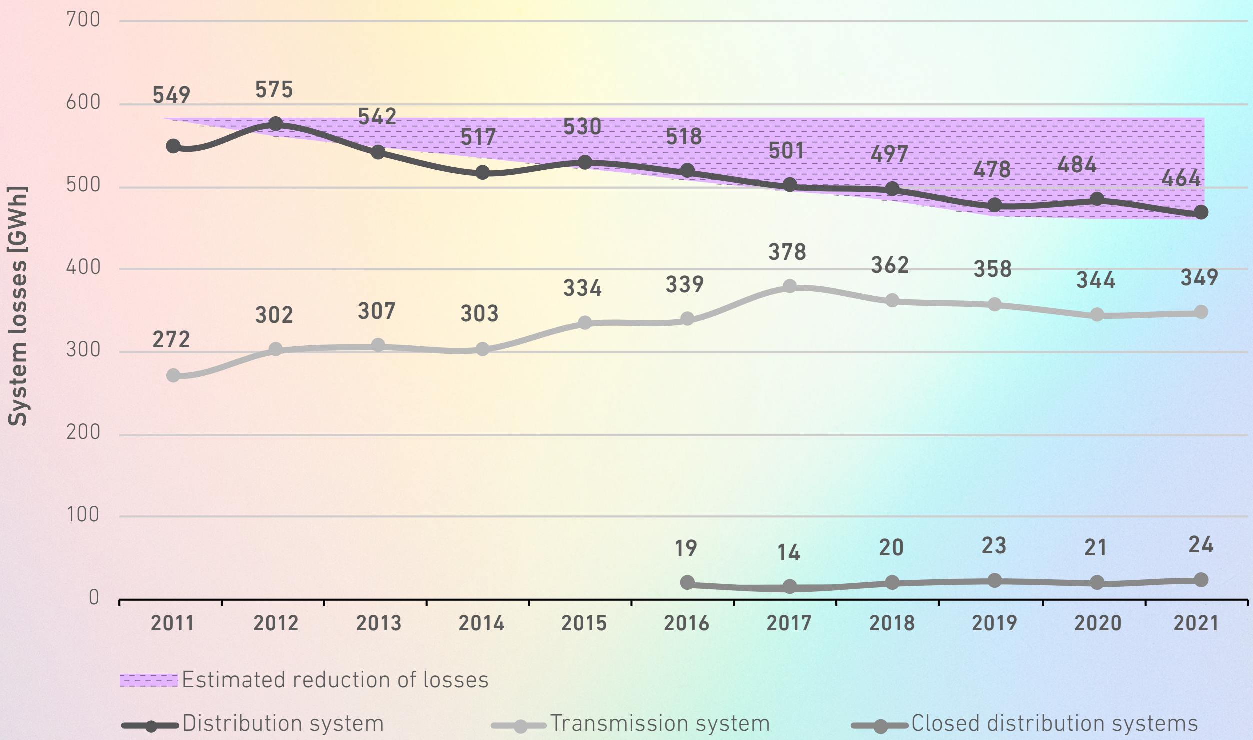
The data shows that after a minor rise in 2020, the amount of electricity losses in the distribution system in Slovenia has once again begun to decrease. This is a result of various measures, especially the introduction of advanced metering systems, which allow the better monitoring and control over commercial and technical losses, and the increasing share of underground cables in medium- and low-voltage networks. In the 2011–2021 period, these measures led to an estimated 609 GWh of savings in electricity to cover distribution system losses.

The varying amount of electricity losses in the transmission system is significantly influenced by the inclusion of the Avče PSHPP after 2014 and the increased share of cross-border electricity trading in exports, imports and transit. Electricity losses in transmission, distribution and closed distribution systems, along with an estimation of the savings in the 2011–2021 period, are shown in Figure 9.

609 GWh

less electricity to cover distribution system losses in the 2011–2021 period

FIGURE 9: THE QUANTITIES OF ELECTRICITY LOSSES IN TRANSMISSION, DISTRIBUTION AND CLOSED DISTRIBUTION SYSTEMS IN THE 2011–2021 PERIOD AND AN ESTIMATE OF THE REDUCTION IN LOSSES



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

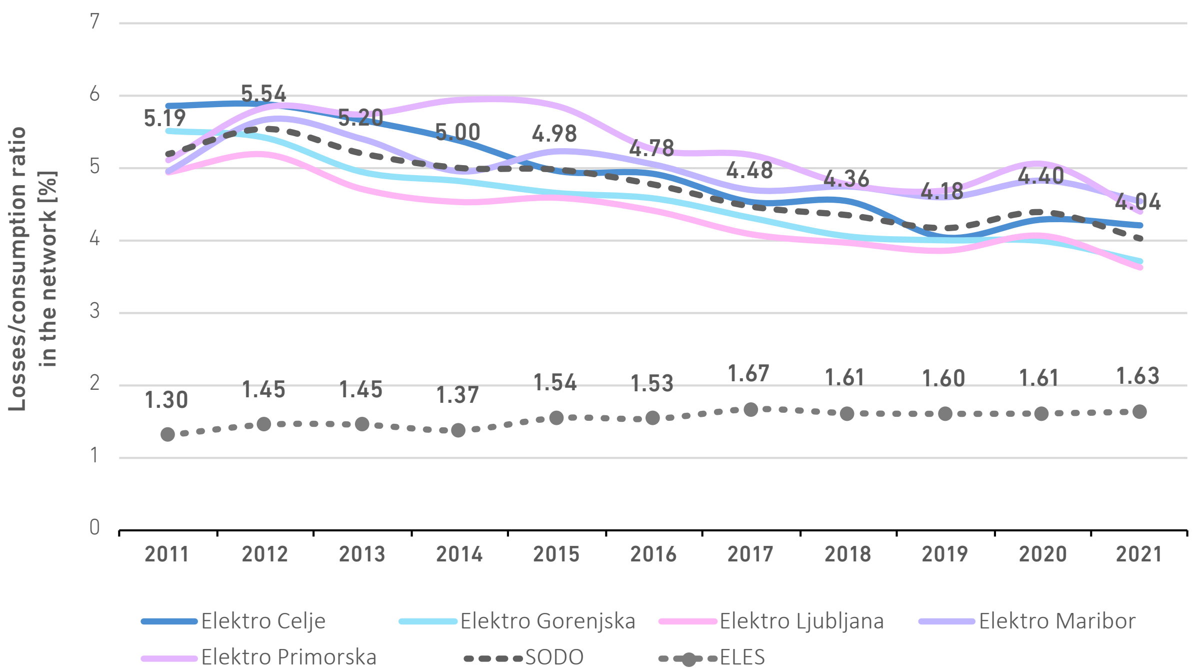
The task of effectively managing and reducing losses falls to ELES and SODO, who are also responsible for covering the electricity losses in the electricity system. As the electricity needed to cover losses need to be provided in a transparent and market-efficient manner, both operators must strive to achieve the lowest possible price when purchasing such electricity. In doing so, operators choose various marketing strategies that take into account the mechanisms for forecasting the required quantities of electricity and the diversification of (long-term and short-term) purchases. In this way, the two operators can have a significant impact on the cost of electricity for covering losses, which in the tightening conditions in the electricity market, represent an increasing share of the eligible costs of the electricity system operators.

The share of losses is calculated based on the quantities consumed from the transmission or distribution system. We have been recording a decrease in the share and amount of losses in the distribution system for many years. While the distribution system losses in 2020 rose by 0.32 percentage points due to the increased electricity consumption in the low-voltage network, they once again declined in 2021, reaching their lowest value yet. In recent years, ELES has managed to reduce the share and amount of losses in the transmission system, where the amount of the losses had been increasing for multiple years due to the increased transit of electricity across the country.

Figure 10 shows the shares of losses for ELES, SODO and distribution companies in the 2011–2021 period.

In 2021, the losses in the distribution system dropped to their lowest level

FIGURE 10: SHARES OF LOSSES FOR ELES, SODO AND DISTRIBUTION COMPANIES IN THE 2011–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Electricity Generation

In 2021, there were nine companies operating production facilities with an installed capacity of more than 10 MW in the Slovenian market. One of them is Energetika Ljubljana, while the rest are consolidated into one of two groups: HSE, which represents the first energy pillar of the Slovenian wholesale market, and GEN, representing the second energy pillar. The GEN group also owns 51% of HESS, while the remaining part of this company belongs to the HSE group.

TABLE 3: INSTALLED CAPACITIES OF THE PRODUCTION FACILITIES AND THE QUANTITY OF ELECTRICITY PRODUCED

PRODUCER	Installed capacity [MW]	Share – installed capacity, all producers in Slovenia (%)	Production [GWh]	Share – generation, all producers in Slovenia (%)
HSE, d.o.o.	**1,928.7**	**51.0%**	**6,877.3**	**55.7%**
Hydropower plants	937.6		3,709.8	
Thermal power plants	990.0		3,166.4	
Other (CHP, SP, WP ...)	1.1		1.1	
GEN-Energija, d.o.o.	**1,034.9**	**26.9%**	**3,664.7**	**29.7%**
Hydropower plants	279.9		902.0	
Thermal power plants	406.0		52.3	
Nuclear power plant*	348.0		2,709.3	
Other (CHP, SP, WP ...)	1.0		1.1	
Javno podjetje Energetika Ljubljana (JPEL)	**129.2**	**3.4%**	**320.8**	**2.6%**
CHP	120.3		267.6	
Generation using woody biomass	8.9		53.2	
Other small producers in the distribution network and in closed distribution systems * **	**760.7**	**19.7%**	**1,492.9**	**12.1%**
Hydropower plants	127.2		437.3	
Solar power plants	459.0		420.5	
Wind farms	3.3		5.5	
Woody biomass-fuelled facilities	15.8		99.9	
Geothermal power plants	0.0		0.0	
Facilities using biogas	16.7		90.8	
CHP	134.3		438.8	
Other	4.4		0.1	
Total in Slovenia	**3,853.5**	**100%**	**12,355.7**	**100%**
- in the transmission system	**3,092.8**		**10,862.8**	

* taking into account the 50% share of Krško NPP's installed capacity and production
** other minor producers connected to CDSs (Talum, Acroni, Ravne, Štore and Jesenice)

SOURCES: PRODUCERS, BORZEN, ELECTRIC SYSTEM OPERATORS

In contrast to the previous year, there were practically no changes in the installed capacities operated by the HSE group and the Energetika Ljubljana company. On the other hand, the installed capacity in the GEN energija group increased by 6.8%, mostly due to two new gas-fuelled units coming online in the Brestanica TPP. The installed capacity in the transmission system increased by 3.7%.

The aforementioned producers generated 8% less electricity in 2021 compared to 2020. Electricity production by the HSE group decreased by just over 9.8% compared to the previous year, in large part due to the lower hydropower output. Electricity production by the GEN group decreased by slightly less than 6.8% compared to the previous year, mostly due to the 10% decrease in the output from the Krško NPP. By contrast, the JPEL company produced 10.3% more electricity in 2021 than in the year before.

Most of the electricity generated by small producers connected to the distribution system and to the closed distribution systems is produced in industrial CHP plants; this is followed by small hydro and solar power plants. In 2021, small producers generated just over 12% of the electricity. Data on the installed capacities of these production facilities is taken from the data provided in the connection approvals for individual production facilities.

Due to the intergovernmental agreement between Slovenia and Croatia, half of NEK's production belongs to Croatia, which reduces the Krško NPP's share in actual Slovenian electricity production. In 2021, power plants in Slovenia thus generated a total of 15,065 GWh of electricity, while Slovenia's actual electricity production was lower, at 12,356 GWh. Compared to 2020, production increased by 959.4 GWh, which represents 7.2%.

Electricity Consumption

The total electricity consumption in Slovenia (taking into account consumption by Avče PSHPP) in 2021 was 14,173 GWh, or 13,336 GWh without counting the transmission and distribution system losses. Compared to 2020, the total consumption increased by 427 GWh, which represents 3.1%.

3.1%
higher consumption by final consumers

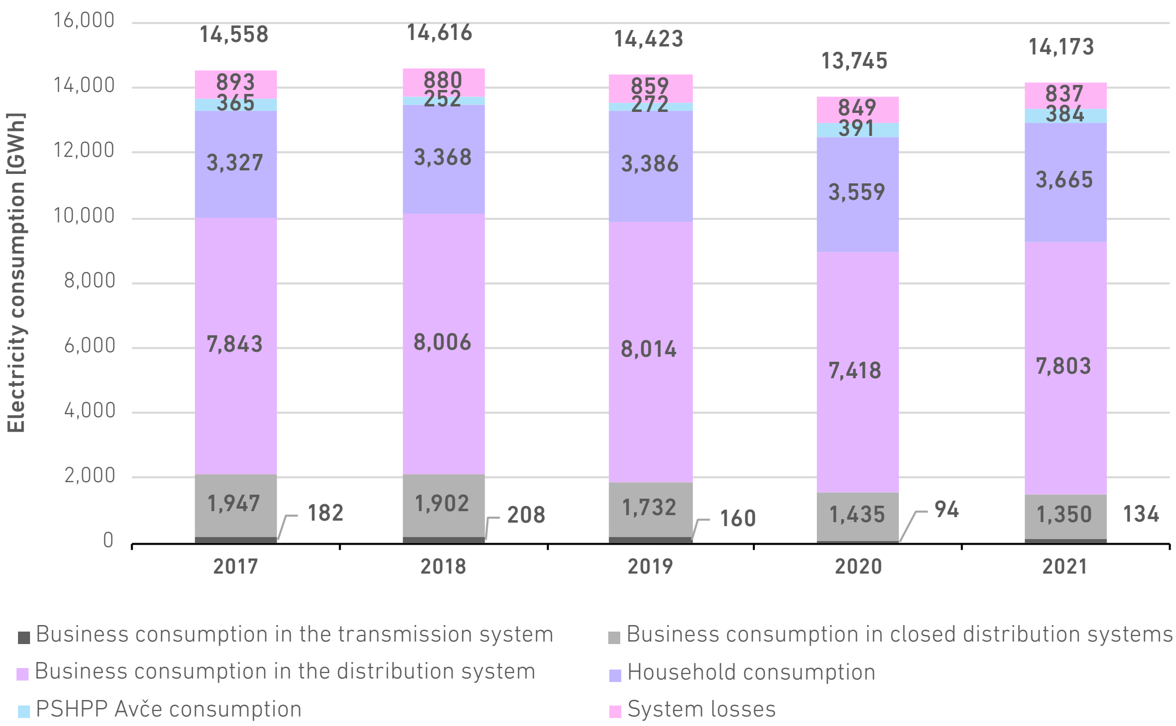
The Avče pumped-storage hydro power plant consumed 384 GWh for pumping water into the storage basin, 7 GWh more than the year before. Electricity losses in the transmission and distribution system amounted to 837 GWh; this includes losses due to imports, exports and the transit of electricity.

Consumption by business and household consumers in the distribution system was 11,467 GWh, which represents an increase of 4.5% in comparison with 2020. In 2021, household consumers consumed 3664 GWh of electricity, an increase of 3% compared to the previous year. Consumption by business consumers in the distribution system in 2021 was 7,803 GWh, which is 5.2% more than in 2020. The total consumption by all final consumers in 2021 (not including losses and consumption by Avče PSHPP) was 3.5% higher than in 2020.

There are three direct consumers connected to the transmission system, who consumed 103 GWh of electricity in 2021. 30.9 GWh of electricity was exported to Italy through the distribution system from DTS Vrtojba and DTS Sežana. The consumption of electricity by consumers in closed distribution systems was 1,350 GWh, 85 GWh less than in 2020, mainly due to lower consumption in CDS Talum.

3% higher consumption by household consumers
5.2% higher consumption by business consumers

FIGURE 11: ELECTRICITY CONSUMPTION IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 4: ELECTRICITY CONSUMPTION IN THE 2019–2021 PERIOD

ELECTRICITY CONSUMPTION [GWh]	2019	2020	2021
Business consumption in the transmission system	160	94	134
Business consumption in the distribution system	8,014	7,418	7,803
Business consumption in closed distribution systems	1,732	1,435	1,350
TOTAL BUSINESS CONSUMPTION	**9,906**	**8,946**	**9,287**
TOTAL HOUSEHOLD CONSUMPTION	**3,386**	**3,559**	**3,665**
• single-tariff metering	877	902	916
• dual-tariff metering	2,509	2,656	2,748
Total consumption by final consumers	**13,292**	**12,505**	**12,952**
Avče PSHPP consumption in the pumping regime	272	391	384
Losses in the transmission and distribution system	859	849	837
Total electricity consumption	**14,423**	**13,745**	**14,173**

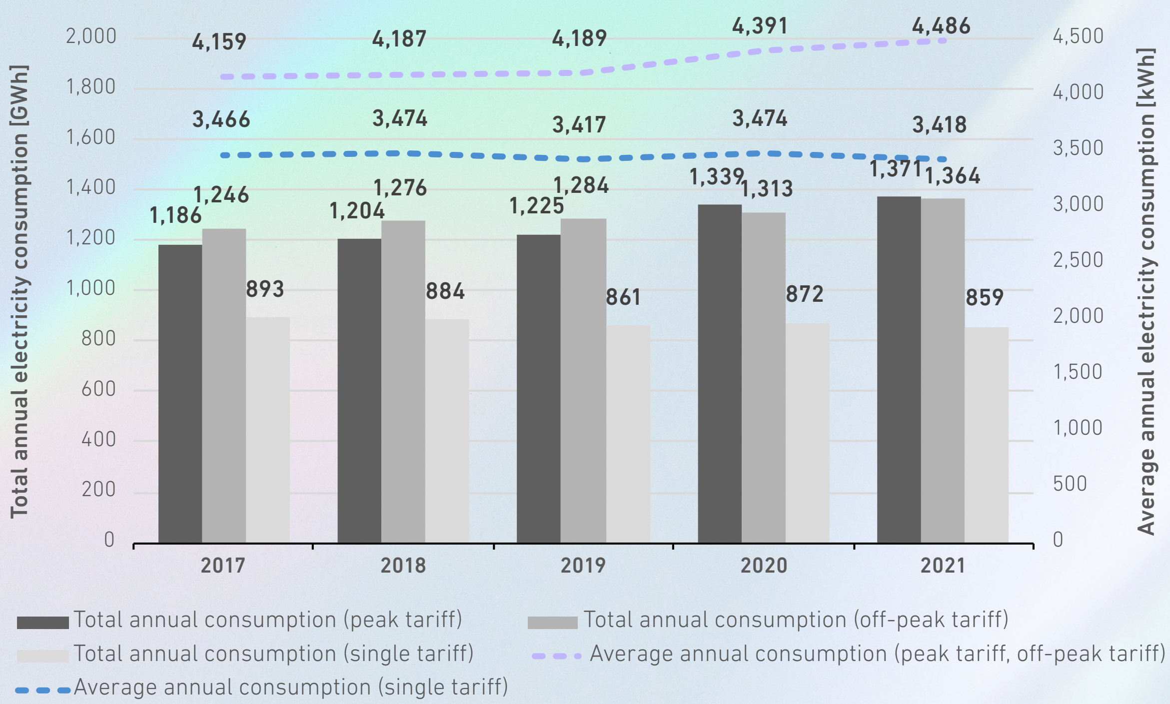
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Figure 12 shows the total and the average annual electricity consumption by household consumers with single- and dual-tariff metering; when calculating the average annual consumption, we are also taking into account the number of household consumers with each metering type.

For household consumers with dual-tariff metering, steady increases in the total and average annual electricity consumption were recorded over a five-year period. The number of household consumers with dual-tariff metering is also increasing by an average of one percentage point per year.

In 2021, electricity consumption by household consumers with single-tariff metering reached the lowest level in the last five years. That said, the number of these household consumers has been declining by an average of 0.6 percentage point per year.

FIGURE 12: THE TOTAL AND THE AVERAGE ANNUAL ELECTRICITY CONSUMPTION BY HOUSEHOLD CONSUMERS WITH SINGLE- AND DUAL-TARIFF METERING IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Demand Covered by Domestic Production

Demand covered by domestic production represents the ratio of electricity consumption by final consumers to electricity production in Slovenia. As shown in Table 5, the largest contributors to domestic production are the large hydropower plants, thermal power plants and the nuclear power plant (with half of its generation), which are connected to the transmission system in Slovenia. A small part of domestic production is connected to the distribution system.

82.9%

electricity demand covered with domestic production

TABLE 5: CONSUMPTION, PRODUCTION AND THE COVERAGE OF DEMAND WITH DOMESTIC PRODUCTION IN THE 2017–2021 PERIOD

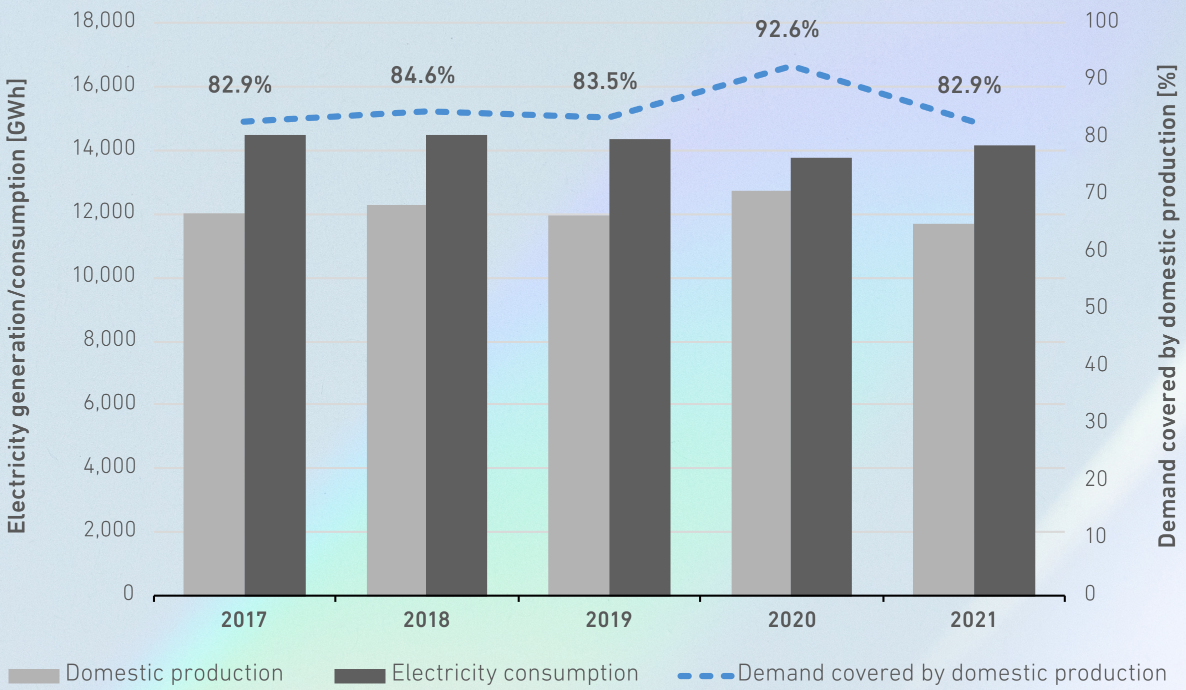
	2017	2018	2019	2020	2021
Generation in the transmission system [GWh]	**10,969**	**11,212**	**10,934**	**11,639**	**10,638**
• hydropower plants	3,725	4,421	4,225	4,747	4,504
• thermal power plants	4,262	4,049	3,946	3,872	3,429
• nuclear power plant (50% share)	2,983	2,742	2,763	3,020	2,706
Generation in the distribution system [GWh]	**1,032**	**1,050**	**1,044**	**1,088**	**1,079**
Total domestic production [GWh]	**12,001**	**12,262**	**11,978**	**12,727**	**11,717**
Total electricity consumption [GWh]	**14,468**	**14,501**	**14,341**	**13,744**	**14,142**
• total consumption by final consumers	13,300	13,484	13,292	12,506	12,952
• system losses	893	880	858	849	837
• Avče PSHPP consumption	365	252	271	391	384
• export to Italy (DTS Vrtojba and Sežana)	–90	–115	–81	–2	–31
Demand covered by domestic production	**82.9%**	**84.6%**	**83.5%**	**92.6%**	**82.9%**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

In the 2017–2021 observation period, we observe inter-annual fluctuations in the amount of demand covered by domestic production. This amount is also directly affected by changes in electricity consumption. The dynamics and structure of the total demand are explained in more detail in the previous chapter. In addition to consumption by final consumers in the transmission and distribution system, the total electricity demand also includes losses in the entire electricity system. The quantities of electricity exported to Italy through the distribution system via DTS Vrtojba and DTS Sežana are not counted as final consumption in Slovenia.

As figure 13 illustrates, the proportion of the demand covered by domestic production during the observation period peaked in 2020 (92.6%). In 2021, consumption covered by domestic production was 82.9%, which is roughly the same level as in 2020.

FIGURE 13: CONSUMPTION, PRODUCTION AND THE COVERAGE OF DEMAND WITH DOMESTIC PRODUCTION IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Consumers in the Electricity System

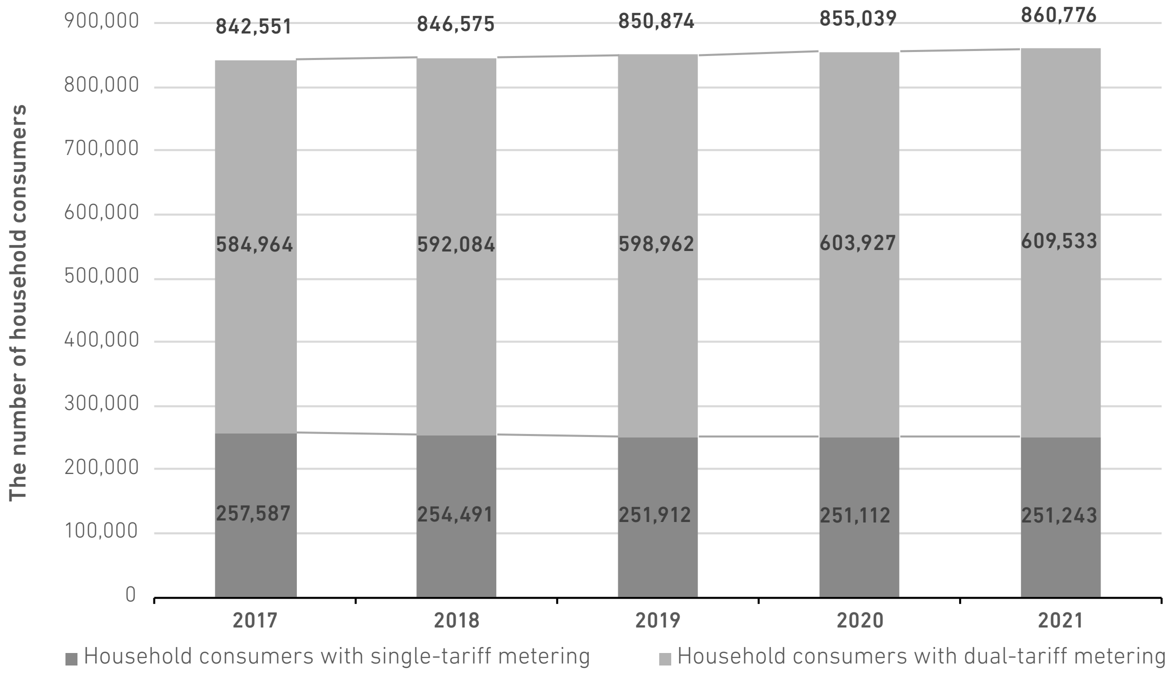
By the end of 2021, 971,749 final consumers of electricity were connected to the Slovenian electricity system. Their number has increased by 7,970 or 0.8% compared to 2020.

Figure 14 shows the evolution of the number of household consumers in the 2017–2021 period. The total number of household consumers increased by an average of 0.5% per year during this period, with the number of household consumers with single-tariff metering increasing by 0.1% in 2021 after several years of slow decline. An analysis of the consumer structure data shows that this unusual reversal is due to the increasing number of consumers switching to self-supply with annual consumption netting and single-tariff metering.

2.1%

more business consumers of electricity

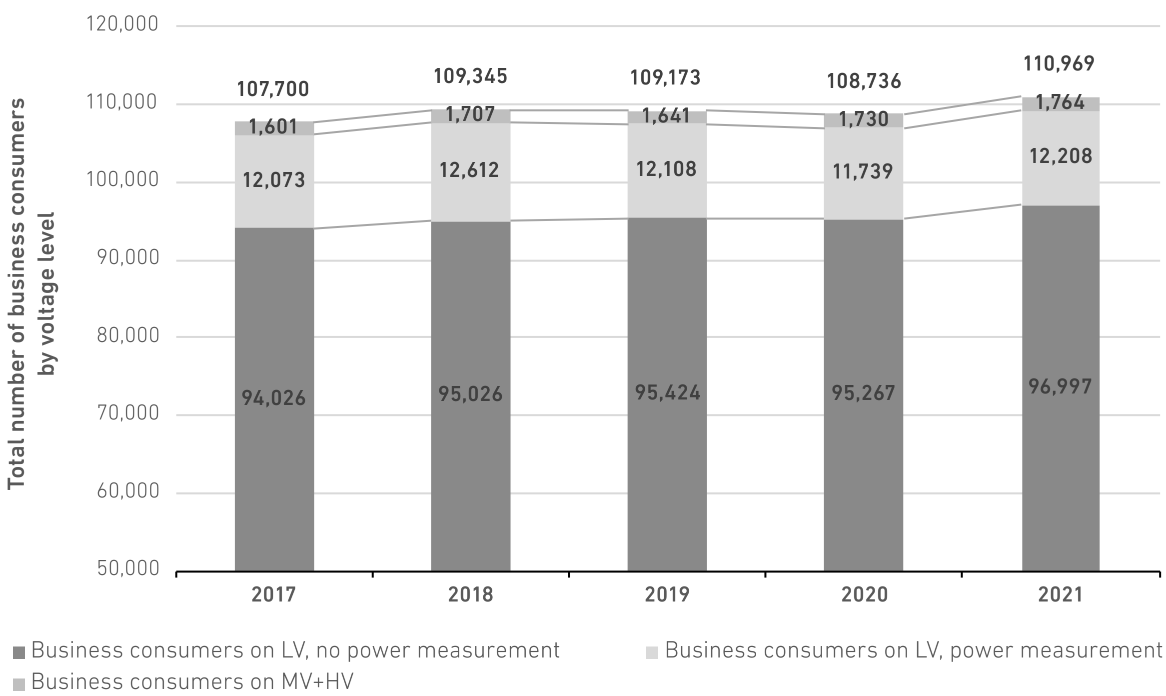
FIGURE 14: THE NUMBER OF HOUSEHOLD CONSUMERS IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Figure 15 shows the evolution of the total number of business consumers in the distribution system and in closed distribution systems, shown by individual voltage level. After a decrease in the number of business consumers in 2020, we recorded a noticeable increase in the number of consumers in 2021. The increase occurred everywhere except at the HV level, where the number of business consumers has remained the same for many years. Representing the largest share of business consumers, at 87.5%, is the LV consumer group, whose consumption is not measured directly, but instead determined on the basis of the current limiting device rating.

FIGURE 15: THE NUMBER OF BUSINESS CONSUMERS IN DISTRIBUTION SYSTEMS AT DIFFERENT VOLTAGE LEVELS IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

In 2021, 712 business and 107 household consumers with an installed production unit were connected to the distribution system under the PS.2 connection scheme and 874 business and 14,025 household consumers were connected in the self-supply system with annual consumption netting. 1.6% of all consumers in the distribution system were both consumers and producers of electricity, an increase of 0.6 percentage points compared to the year before. The distribution system also saw an increase of roughly 2% in the number of business consumers.

The number of business consumers connected to the transmission system remained unchanged from the previous year. They were three business consumers at five delivery points, as well as four closed distribution system operators at five locations supplying electricity to 203 business consumers, six of which have an installed production unit.

The accelerating growth in the number of self-supply devices being connected leads to an increasing share of consumers with single-tariff metering.

TABLE 6: THE NUMBER OF FINAL CONSUMERS OF ELECTRICITY BY TYPE OF CONSUMPTION IN THE 2019–2021 PERIOD

The number of final consumers of electricity by type of consumption	2019	2020	2021
Business consumers in the transmission system	3	3	3
Avče PSHPP consumption in the pumping regime	1	1	1
Total number of final consumers in the transmission system	**4**	**4**	**4**
Business consumers in the distribution system	108,943	108,505	110,766
Household consumers	850,874	855,039	860,776
• single-tariff metering	251,912	251,112	251,243
• dual-tariff metering	598,962	603,927	609,533
Total number of final consumers in the distribution system	**959,817**	**963,544**	**971,542**
Business consumers in closed distribution systems	230	231	203
Household consumers	0	0	0
Total number of final consumers in closed distribution systems	**230**	**231**	**203**
TOTAL NUMBER OF FINAL CONSUMERS	**960,051**	**963,779**	**971,749**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 7: THE NUMBER OF FINAL CONSUMERS OF ELECTRICITY BY TYPE OF CONNECTION IN THE 2019–2021 PERIOD

TYPE OF FINAL CONSUMER CONNECTION	Final consumers in the distribution system			Final consumers in closed distribution systems			TOTAL		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Without grid-connected production facilities									
Business	108,094	107,326	109,180	209	209	197	108,303	107,535	109,377
Household	846,248	846,783	846,606	0	0	0	846,248	846,783	846,606
TOTAL	954,342	954,109	955,786	209	209	197	954,551	954,318	955,983
Installed production unit									
Business	649	717	712	12	13	6	661	730	718
Household	102	49	107	0	0	0	102	49	107
TOTAL	751	766	819	12	13	6	763	779	825
Self-supply									
Business	200	462	874	9	9	0	209	471	874
Household	4,524	8,207	14,063	0	0	0	4,524	8,207	14,063
TOTAL	4,724	8,669	14,937	9	9	0	4,733	8,678	14,937
Final consumers in the distribution system and in the closed distribution systems									
Business	108,943	108,505	110,766	230	231	203	109,173	108,736	110,969
Household	850,874	855,039	860,776	0	0	0	850,874	855,039	860,776
TOTAL	959,817	963,544	971,542	230	231	203	960,047	963,775	971,745
Final consumers in the transmission system							**4**	**4**	**4**
TOTAL NUMBER OF FINAL CONSUMERS							**960,051**	**963,779**	**971,749**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Renewable Sources

Share of Renewables in the Final Consumption

23.5%

– estimated RES share in 2021

Slovenia achieved a 25-percent total share of electricity from renewable energy sources (RES) in the final consumption in 2020, fulfilling its commitments under the EU Climate and Energy package, the objectives of which were a 20-percent increase in the share of RES in the final consumption, a 20% increase in energy efficiency and a 20% decrease in greenhouse gas emissions. The realised share of energy from RES achieved in 2020 was 24.1%, 2.1% higher than in 2019, largely due to the lower final consumption during the COVID-19 epidemic. Making up the difference to the 25% share of RES was a statistical transfer of 465 GWh of energy from RES from another EU member state, namely the Czech Republic. The mechanism of statistical transfers of RES energy from other EU member states was introduced with the entry into force of the Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE) in June 2021.

Slovenia has set out its objectives, policies and measures in the areas of decarbonisation, energy efficiency, energy security, the internal market, research, innovation and competitiveness up to 2030 in the Integrated National Energy and Climate Plan (NECP).

Slovenia has committed to reducing the total greenhouse gas emissions by 36%, improving energy efficiency by at least 35% (the objective adopted at the EU level is 32.5%) and achieving at least a 27% share of energy from RES in the final consumption (the EU-level objective is 32%) with respect to the 2005 baseline. The sectoral target shares for 2030 specified by the NECP, which together amount to a 27% share of energy from RES in the gross final consumption, are as follows: a 43% share of RES in the electricity sector, a 41% share in the heating and cooling sector and a 21% share in the transport sector.

The estimated RES share in 2021 is 1.5% lower than the RES share in 2020, which was 23.5%. A significant reason for the reduced share is the increased energy consumption in 2021 compared to 2020, when energy consumption dropped sharply due to the COVID-19 epidemic.

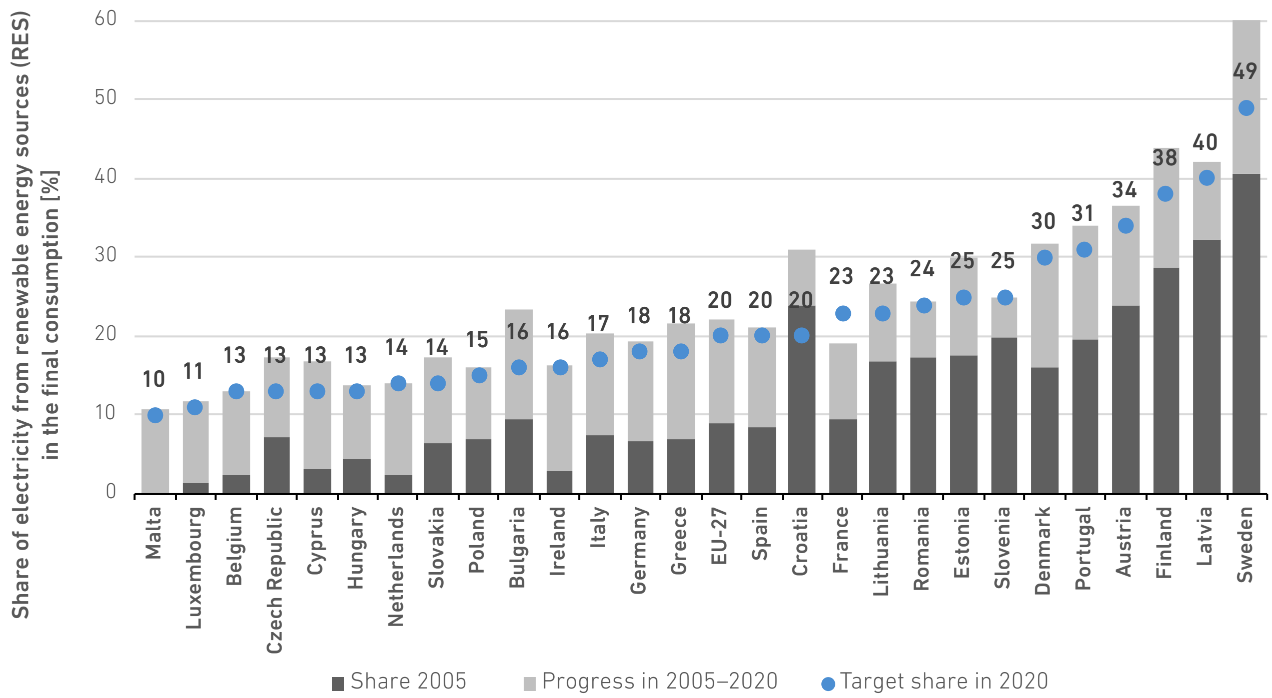
TABLE 8: RES TARGETS ACHIEVED IN 2005 AS THE BASE YEAR AND IN THE 2010–2020 PERIOD, ALONG WITH AN ESTIMATE FOR 2021

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2020	2021	2030
RES share [%]													Target share	estimate	Target share
RES share	**19.8**	**21.1**	**20.9**	**21.6**	**23.2**	**22.5**	**22.9**	**22**	**21.7**	**21.4**	**22**	**25**	**25**	**23.5**	**27**
RES – heating and cooling	26.4	29.5	31.8	33.1	35.1	34.6	36.2	35.6	34.6	32.3	32.2	32.1	30.8	31.8	41
RES – electricity	28.7	32.2	31	31.6	33.1	33.9	32.7	32.1	32.4	32.3	32.6	35.1	39.3	34.9	43
RES – traffic	0.8	3.1	2.5	3.3	3.8	2.9	2.2	1.6	2.6	5.5	8	10.9	10.5	11.1	21

SOURCES: THE JOŽEF STEFAN INSTITUTE, SURS (STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA)

Figure 16 shows that with the exception of France, all EU members achieved their national RES targets for 2020, with many even exceeding them. The total RES target share for the EU was also exceeded by 2.1%, amounting to 22.1%. While Slovenia did reach its 2020 target share of RES, its progress since 2005 has been the slowest among all EU countries.

FIGURE 16: PROGRESS IN ACHIEVING THE TARGET RES SHARE IN THE 2005–2020 PERIOD FOR VARIOUS EU COUNTRIES

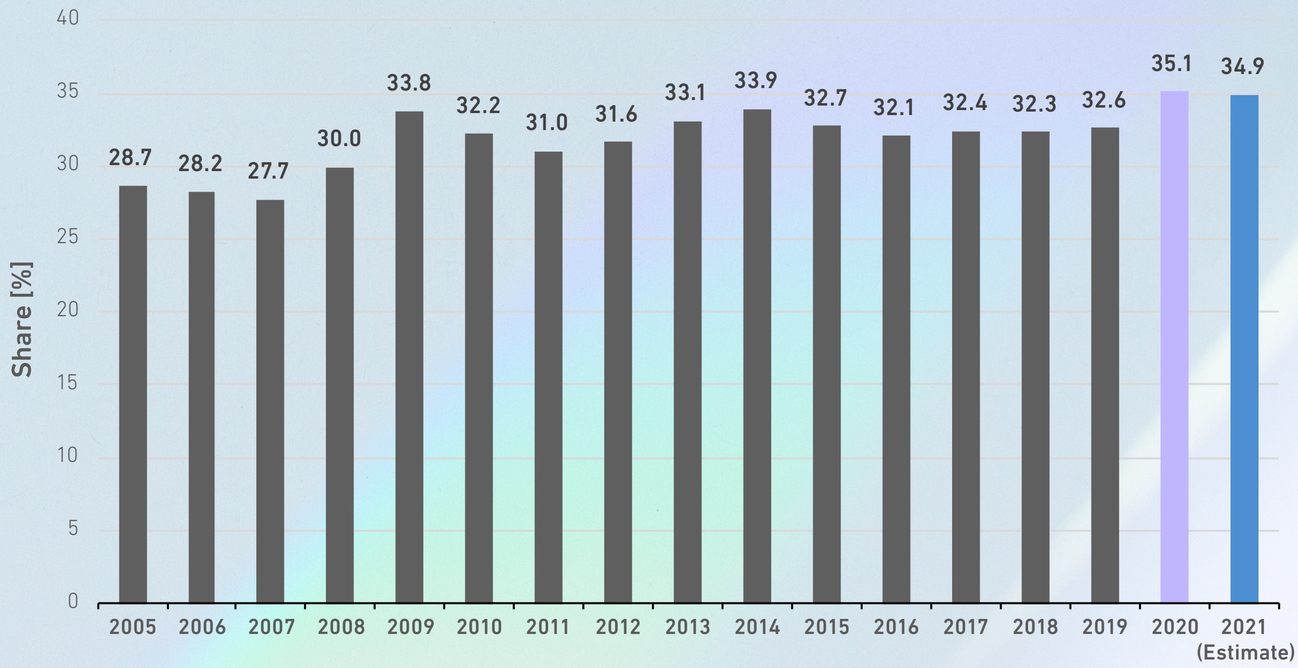


SOURCE: EUROSTAT

Share of Renewables in the Electricity Sector

In addition to measures to improve energy efficiency, electricity production from RES is key to achieving the target share of electricity from RES in the final energy consumption in the electricity sector. Until 2020, Slovenia was bound in terms of the target share of electricity from RES by the Renewable Energy Action Plan for the 2010–2020 period (AN-OVE 2020), which required it to achieve a 39.3% share of electricity from RES in the final energy consumption in this sector by 2020. The sectoral targets for the post-2020 period are set out in the NECP, which stipulates a 43% target share of electricity from RES in the electricity sector by 2030. While the share of RES in the final energy consumption in the electricity sector increased by 6.5% over the 2005–2020 period, it fell short of its 2020 target by 4.2%. However, with 34.9%, the estimated RES share in 2021 is only 0.2% lower than that achieved in 2020, when the reduction in electricity use strongly impacted the RES share in the gross final electricity consumption.

FIGURE 17: RES SHARES IN THE ELECTRICITY SECTOR IN THE 2005–2021 PERIOD



SOURCES: THE JOŽEF STEFAN INSTITUTE, SURS

The biggest advancement in terms of actual RES utilisation in the electricity sector took place in the 2007–2009 period. The advancement was, to a large extent, related to the calculation methodology, which does not take into account the actual annual electricity production; instead, the quantity of electricity produced from RES is determined in accordance with the methodology[2] prescribed in Directive 2009/28, which, for example, excludes the impact of variable hydrology in the case of hydropower plants, where the bulk of the energy from RES in Slovenia is produced.

Production from Renewable Sources

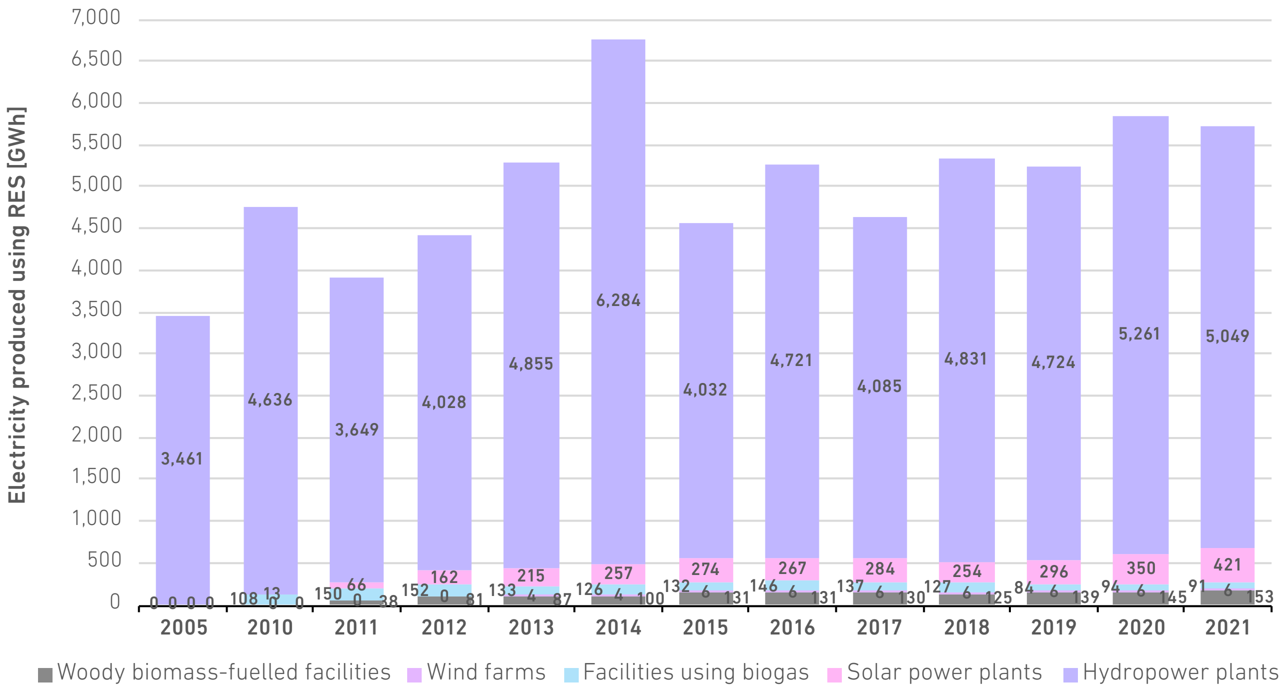
Production of electricity from RES in the 2010–2021 period and for the base year used to define the target share is shown in Figure 18. On average, hydropower accounts for more than 90% of electricity production from RES in Slovenia. Production from hydropower and solar power plants is weather-dependent, as it is influenced by hydrological conditions and insolation, respectively. While wind power is also subject to weather factors, wind energy utilisation in Slovenia remains negligible despite the strong interest of the investors.

90% of energy from RES is produced in hydropower plants

The introduction of the RES and CHP support scheme in 2009 provided an incentive for investors to invest in electricity generation from other RES, including biomass and biogas, which are not directly dependent on weather factors.

2 The normalised generation by hydropower plants is taken into account, which is derived by multiplying the actual output of the hydropower plants (excluding pumped storage facilities) in the current year by the average of the operating hours in the last 15 years. It is important to note that in the base year for determining the RES share, i.e. 2005, the 15-year average of annual operating hours of hydropower plants according to Eurostat data was 4,225 hours; by 2018, this had decreased by 7.9% to 3,893 hours, This was part of the reason for the lower contribution of hydropower plants to the RES share.

FIGURE 18: ELECTRICITY PRODUCTION USING RES IN THE BASELINE YEAR 2005 AND IN THE 2010–2021 PERIOD



SOURCES: ENERGY AGENCY, BORZEN, ELECTRIC SYSTEM OPERATORS, SURS

Incentives for Production from Renewable Sources

In order to help the member states achieve the production targets for electricity from RES, a number of measures are made available to them, including state aid. The main criterion taken into account when approving state aid is whether it will have an incentive effect, meaning that without the aid, the measure would not be carried out, or would not be carried out to the same extent.

Since 2009, Slovenia has had a state aid scheme, a support scheme for electricity production using RES and CHP in the form of guaranteed prices and premium tariffs. In addition to state aid, funds for RES development are also available in the form of investment incentives, mostly as part of cohesion policy measures.

Self-supply by final consumers has also had an important influence on the development of RES in recent years. This is implemented on the basis of the Decree on the self-supply of electricity from renewable energy sources and is aimed at household and small business consumers who connect production facilities to generate electricity from RES for the internal network of the buildings where they are installed. With the entry into force of the ZSROVE in 2021, a new Decree on the self-supply of electricity from renewable energy sources was enacted in early 2022. A major change with respect to the current regime is the revised calculation of network charges and levies for all production facilities entering the self-supply system after 2023. Until the end of 2023, household and small business consumers can still enter the self-supply system under the previous regime.

RES and CHP Support Scheme

With the state aid scheme introduced in 2009, Slovenia already had an energy policy measure that significantly contributed to the development of the distributed generation of electricity from RES. The support scheme was initially open to any producer of electricity using RES or CHP who installed a production facility and had a declaration issued for it. Since the adoption of the Energy Act (EZ-1) in 2014, the support scheme can only be entered following successful participation in an open call in which production facility projects are selected in a competitive selection procedure on the basis of the offered price of the electricity generated by the production facility. Producers are eligible for support covering the portion of the costs of electricity production, including the normal market return on the invested capital, which cannot be covered by selling that electricity on the market due to the market price of electricity being lower than the production costs.

The Projects for RES and CHP Production Facilities Chosen in Open Calls

In keeping with the plan of operation of the RES and CHP support scheme for 2021, which was outlined in the 2020 Energy Balance of the Republic of Slovenia, two open calls inviting investors to apply with their RES and CHP production facility projects for admission to the support scheme were published by the Energy Agency in 2021. The first was published in July and the second in December. Each of them was allocated €10 million in funds.

For projects whose implementation is subject to a building permit, it was necessary to attach a valid building permit when applying for the open call. An exception is made in the case of a promoter, which may submit a project to the open call to be implemented in whole or in part by the promoter itself with the promoter as the investor, or by a different investor, under the conditions set out for the promoter in the decision approving the project. In order for the project approval decision to be valid, the promoter must provide the Energy Agency with insurance amounting to 2% of the investment value of the project within 30 days of the date of notification of the decision.

There were 48 submissions to the first open call, 34 of which were for RES facilities and 14 for CHP facilities. Seven of the applying projects involved the renovation of existing production facilities. The second open call, concluding in April 2022, received 46 submissions. Of those, 34 again were for RES production facilities and 12 for CHP facilities. The applicants submitted eight projects for the renovation of existing production facilities.

TABLE 9: AN OVERVIEW OF THE PRODUCTION FACILITY PROJECTS APPLYING TO OPEN CALLS IN 2021, GROUPED ACCORDING TO THE TECHNOLOGY EMPLOYED FOR ELECTRICITY GENERATION

		Open call – July 2021		Open call – December 2021	
Technology	**Renovated/ New**	**No. of projects**	**Installed capacity (MW)**	**No. of projects**	**Installed capacity (MW)**
Hydropower plants	**New**	0	0.00	0	0.00
Hydropower plants	**Renovated**	1	0.09	2	1.20
Solar power plant	**New**	32	11.39	31	9.51
Wind farms	**New**	0	0.00	0	0.00
Facilities using biogas	**New**	1	0.44	1	0.44
Facilities using woody biomass	**New**	0	0.00	0	0.00
Woody biomass-fuelled facilities	**Renovated**	0	0.00	0	0.00
Fossil fuelled CHP	**New**	8	26.65	6	2.98
Fossil fuelled CHP	**Renovated**	6	1.34	6	1.40
Total number of applications		**48**	**39.90**	**46**	**15.53**

SOURCE: ENERGY AGENCY

All the applying projects included in the selection process met the formal conditions and were selected. Of the €20 million total available, only €883 thousand was administratively allocated in the two open calls, €705 thousand in the first and €178 thousand in the second. In the July open call, 41 of the applying projects were selected, totalling 36.88 MW of rated electrical capacity. This included 34 RES projects with a total rated electrical capacity of 10.11 MW and 11 CHP projects with a total rated electrical capacity of 26.77 MW. In the December open call, 38 of the applying projects were selected, totalling 13.57 MW of rated electrical capacity. This included 33 RES projects with a total rated electrical capacity of 11.45 MW and 5 CHP projects with a total rated electrical capacity of 2.12 MW. It should be pointed out that the projects selected in the first open call included four projects by promoters, totalling 24 MW of rated electrical capacity, which were selected under the suspensory condition of submitting adequate insurance. Since the promoters failed to submit the insurance within the set deadline, the approval decisions for these projects are no longer valid. An additional influence on the low share of administratively undistributed funds, in addition to the low interest of the applicants, is the high reference price of electricity, which affects the necessary amount of state aid and is set at €120.67/MWh in 2022. This price was already taken into account in the December open call. In 2021, the reference price of electricity was €48.04/MWh.

TABLE 10: AN OVERVIEW OF THE PROJECTS FOR PRODUCTION FACILITIES SELECTED IN THE OPEN CALLS IN 2021 GROUPED ACCORDING TO THE TECHNOLOGY EMPLOYED FOR ELECTRICITY GENERATION

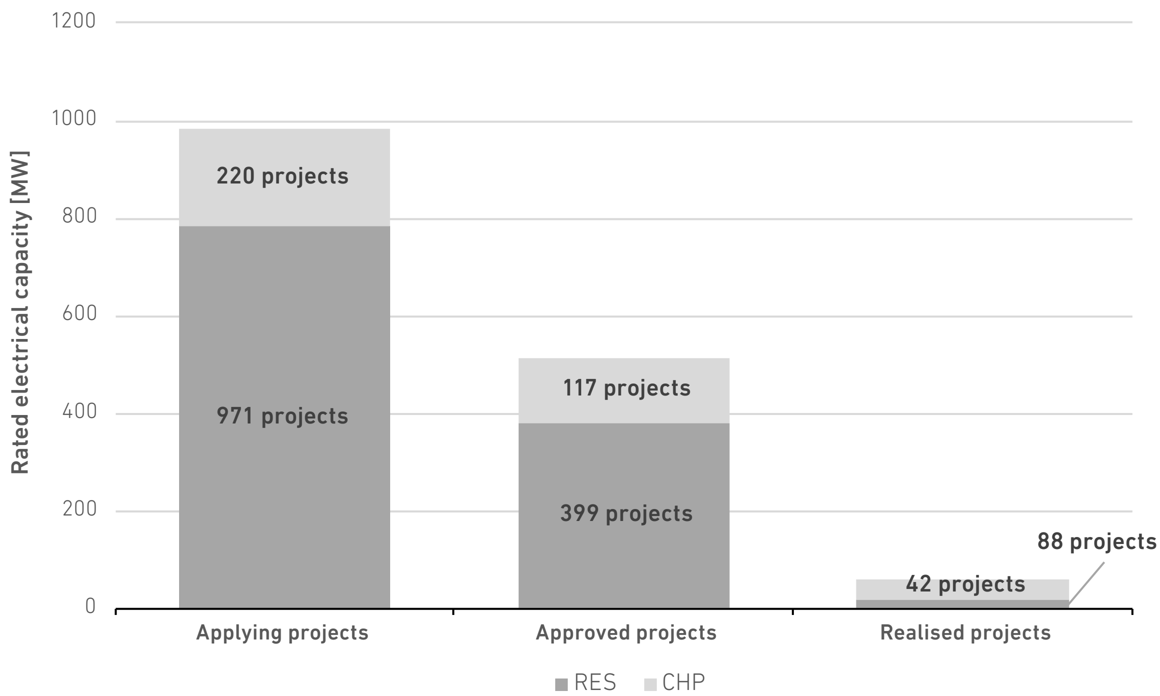
		Open call – July 2021		Open call – December 2021	
Technology	Renovated/ New	No. of projects	Installed capacity (MW)	No. of projects	Installed capacity (MW)
Hydropower plants	**New**	0	0.00	0	0.00
Hydropower plants	**Renovated**	1	0.09	2	1.20
Solar power plant	**New**	28	9.58	30	9.26
Wind farms	**New**	0	0.00	0	0.00
Facilities using biogas	**New**	1	0.44	1	0.99
Woody biomass-fuelled facilities	**New**	0	0.00	0	0.00
Woody biomass-fuelled facilities	**Renovated**	0	0.00	0	0.00
Fossil fuelled CHP	**New**	7	26.05	3	0.92
Fossil fuelled CHP	**Renovated**	4	0.72	2	1.20
Total for all selected projects		**41**	**36.88**	**38**	**13.57**
Total RES		**30**	**10.11**	**33**	**11.45**
Total fossil fuelled CHP		**11**	**26.77**	**5**	**2.12**

SOURCE: ENERGY AGENCY

Since 2016, when the Energy Agency held the first open call after the changes to the support scheme came into force, there have been ten open calls for participation in the support scheme in total. The number of projects applying to these calls was 1191 in total, for 906.49 MW of rated electrical capacity. Of these, 516 ended up being selected, totalling 514.65 MW of rated electrical capacity. This included 382.22 MW in the total of RES production facility projects and 132.43 MW of CHP projects. Only 130 of the selected projects were realised, with a total rated electrical capacity of 58.65 MW. The realised projects consist of 88 RES production facility projects with a total rated electrical capacity of 20.11 MW and 42 CHP production facility projects with a total rated electrical capacity of 38.54 MW.

Only 20.11 MW of the total 382.22 MW of the selected RES projects ended up being realised

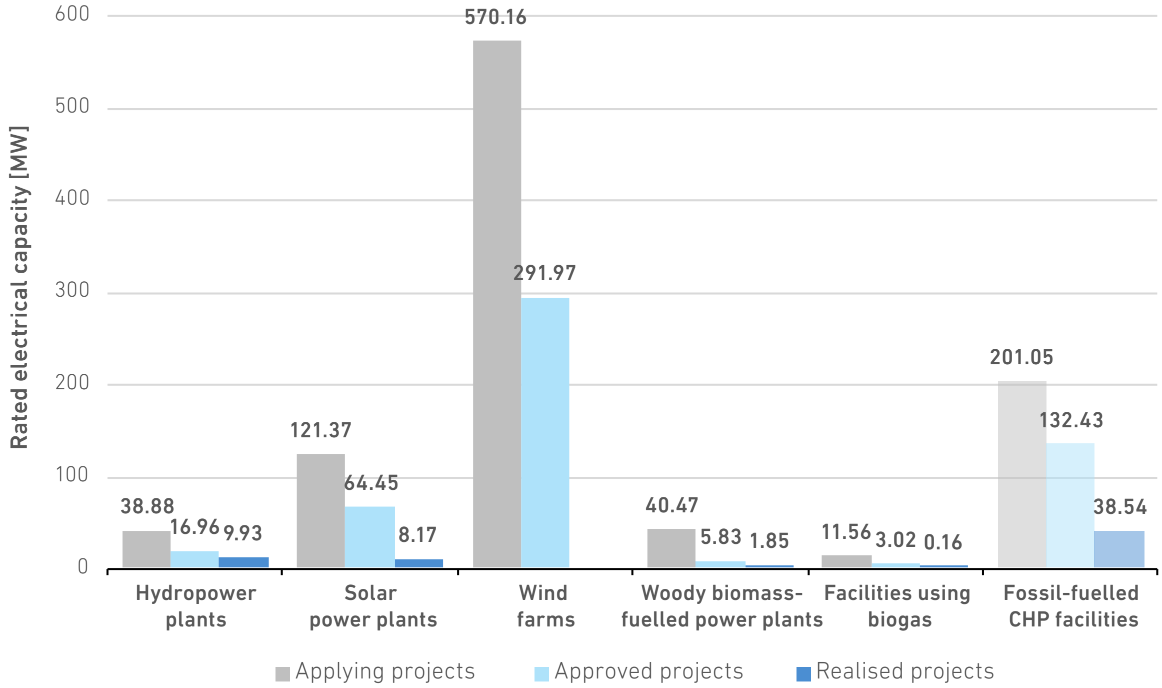
FIGURE 19: THE NUMBER AND RATED ELECTRICAL CAPACITY OF THE PROJECTS FOR RES AND CHP PRODUCTION FACILITIES THAT APPLIED AND WERE SELECTED AND CARRIED OUT OVER ALL THE OPEN CALLS



SOURCE: ENERGY AGENCY

Wind farms are the dominant technology among the applying and selected projects in terms of the rated electrical capacity; the total capacity of the wind farm projects applied thus far is 570.16 MW, and 73 of these projects were approved, totalling 291.97 MW. In light of the green transformation, it is worrying that not a single wind farm project has been realised and that for most of them, the deadline for realisation is in 2023. The selected projects must be realised within three years (five years for complex projects) of the date on which the applicant was notified that their project was selected. If this deadline is missed, the electrical energy generated by those production facilities is no longer eligible for state aid. Solar power plants dominate in terms of the number of projects that applied and were selected. In total, 510 solar power plant projects applied to the open calls that have already closed, and 217 were approved, totalling 64.45 MW. The realisation of the approved projects employing this technology is likewise negligible, as only 41 projects have been carried out, totalling 8.17 MW. Only fossil-fuelled CHP projects have achieved a significant share of realised projects, where 38.54 MW of the production facilities were realised. This includes 25.76 MW of projects involving a renovation of an existing CHP facility.

FIGURE 20: RES AND CHP PROJECTS THAT APPLIED TO THE OPEN CALLS AND WERE SELECTED AND CARRIED OUT, GROUPED BY THE TECHNOLOGY EMPLOYED, ALONG WITH THEIR RATED ELECTRICAL CAPACITY



SOURCE: ENERGY AGENCY

Production Facilities Included in the RES and CHP Support Scheme, their Total Rated Electrical Power and the Quantity of Electricity Generated

At the end of the year, 3811 production facilities were taking part in the support scheme, with a total rated electrical capacity of 415.26 MW. There were 51 production facilities newly included in the support scheme, totalling 14.03 MW of rated electrical capacity.

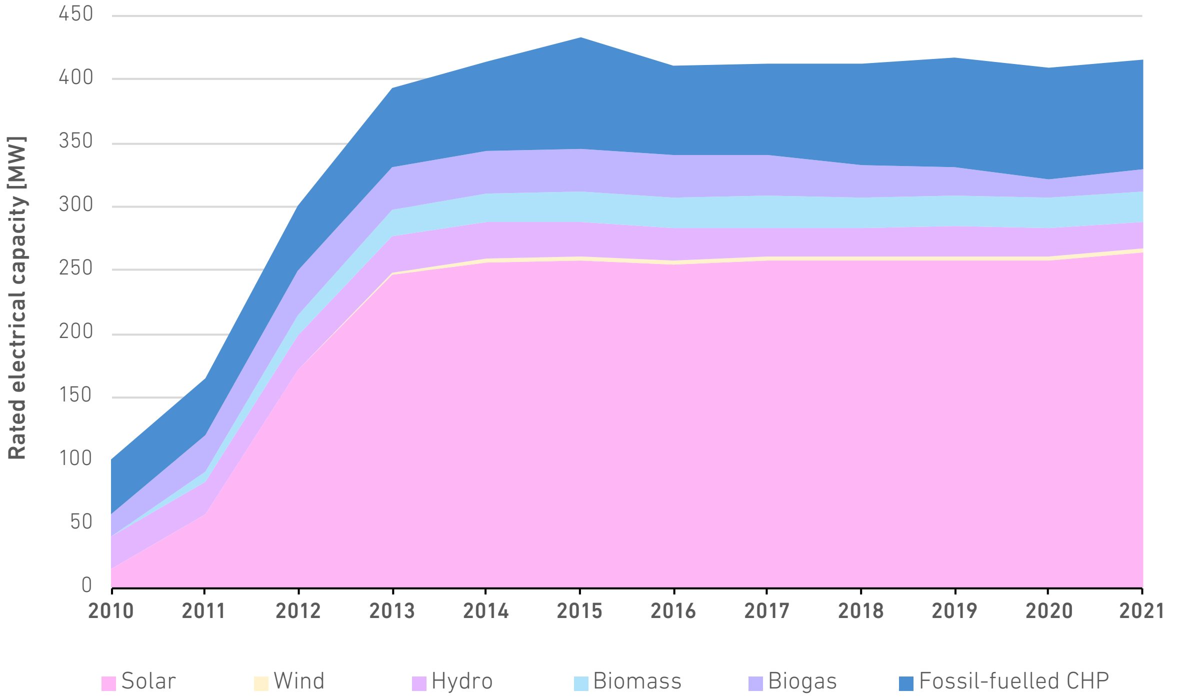
TABLE 11: THE NUMBER OF PRODUCTION FACILITIES IN THE SUPPORT SCHEME AND THE DYNAMICS OF THEIR INCLUSION IN THE 2010–2021 PERIOD

Source	The number of facilities participating in the support scheme											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Solar	381	975	2,406	3,218	3,319	3,339	3,323	3,312	3,301	3,304	3,297	3,286
Wind	3	4	3	5	4	9	7	7	6	4	4	3
Hydro	105	109	108	106	106	106	98	91	93	92	90	92
Biomass	0	3	5	10	19	43	44	43	44	46	40	40
Biogas	13	26	31	31	31	33	32	31	27	24	22	24
Fossil fuelled CHP	26	46	89	184	270	390	384	380	388	388	386	366
Total	**528**	**1,163**	**2,642**	**3,554**	**3,749**	**3,920**	**3,888**	**3,864**	**3,859**	**3,858**	**3,839**	**3,811**

SOURCES: ENERGY AGENCY, BORZEN

While there were 28 fewer production facilities included in the support scheme compared to 2020, their total rated electrical capacity was higher. The lower number of production facilities included is due to the expiration of the support eligibility period or cessation of operation.

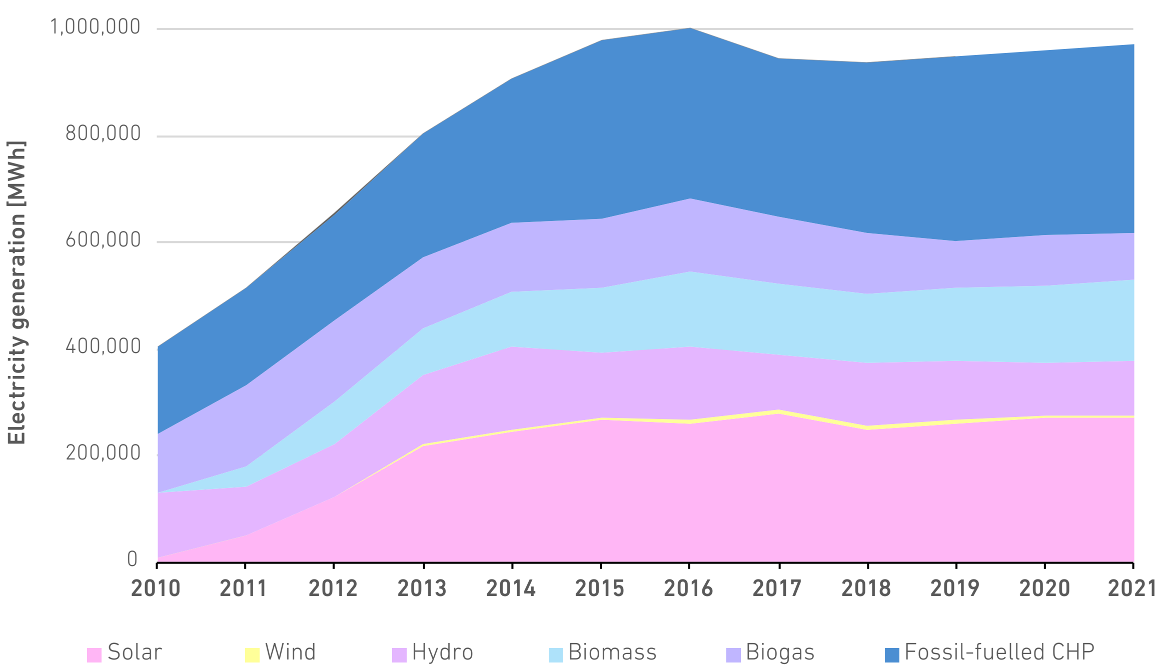
FIGURE 21: THE TOTAL RATED ELECTRICAL CAPACITY OF THE PRODUCTION FACILITIES INCLUDED IN THE SUPPORT SCHEME IN THE 2010–2021 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

Although the number of facilities covered by the scheme fell for the sixth consecutive year, the 3,811 production facilities generated a total of 973.2 GWh of electricity, an increase of more than 10 GWh compared to 2020, when 962.2 GWh of electricity was produced by the production facilities covered by the scheme. RES facilities generated 617.7 GWh of electricity, while CHP facilities generated 355.5 GWh. Once again, the bulk of electricity was generated in co-generation plants, followed by solar power plants, which generated 268.9 GWh, and biomass-fuelled production facilities with 153.1 GWh of electricity. Hydropower plants generated 102.2 GWh and biogas facilities 87.9 GWh of electricity.

FIGURE 22: ELECTRICITY PRODUCTION ELIGIBLE FOR SUPPORT IN THE 2010–2021 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

In 2021, power plants included in the support scheme accounted for 7.9% of the total electricity production in Slovenia in the year in question. This share, as well as the share of installed capacity included in the support scheme, has not changed much since 2017, as shown in Table 12.

TABLE 12: THE SHARE OF INSTALLED CAPACITY AND ELECTRICITY PRODUCTION INCLUDED IN THE SUPPORT SCHEME

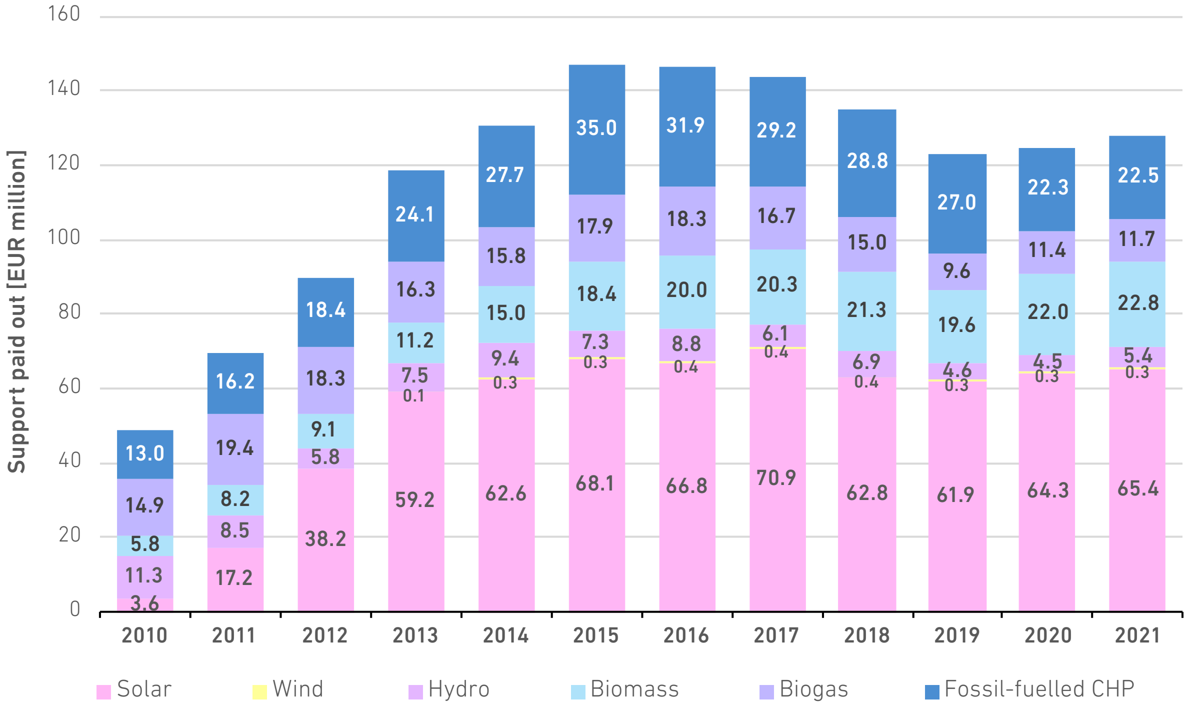
Year	Installed capacity included in the support scheme (MW)	Total installed capacity in Slovenia (MW)	Share of the installed capacity included in the support scheme	Generated electricity included in the support scheme (MW)	Total Slovenian electricity generation (GWh)	Share of the generated electricity included in the support scheme (MW)
2017	412.3	3,490.7	11.8%	944.9	12,456.7	7.6%
2018	412.4	3,584.0	11.5%	937.9	12,578.8	7.5%
2019	417.1	3,617.7	11.5%	947.5	12,511.1	7.6%
2020	408.9	3,581.0	11.4%	962.2	13,220.7	7.3%
2021	415.3	3,853.5	10.8%	973.2	12,355.7	7.9%

SOURCES: ENERGY AGENCY, BORZEN

Support Paid Out—Support Scheme Costs

In 2021, the producers eligible for support for electricity generated in RES and CHP production facilities received €128.1 million, which is €3.3 million more than the year before. The electricity generated in RES facilities received 82.44% of the funds, amounting to €105.6 million in support payments. Of these, by far the largest amount of support was for electricity generated by solar power plants – as much as 51.1%, or €65.4 million. This is followed by woody biomass-fired power plants, accounting for 17.79%, or €22.8 million, of the support payments, and hydropower plants with 4.19%, or €5.4 million. The electricity generated in fossil-fuelled CHP facilities received 17.56% of the funds, amounting to €22.5 million in support payments. Producers who secured support for the electricity generated in production facilities that were previously selected in the open call received €6.4 million. From 2010 until 2021, a total of €1.414 billion in support has been paid to the electricity producers for a total of 10.03 TWh of electricity.

FIGURE 23: THE VALUE OF SUPPORT PAY-OUTS IN THE 2010–2021 PERIOD

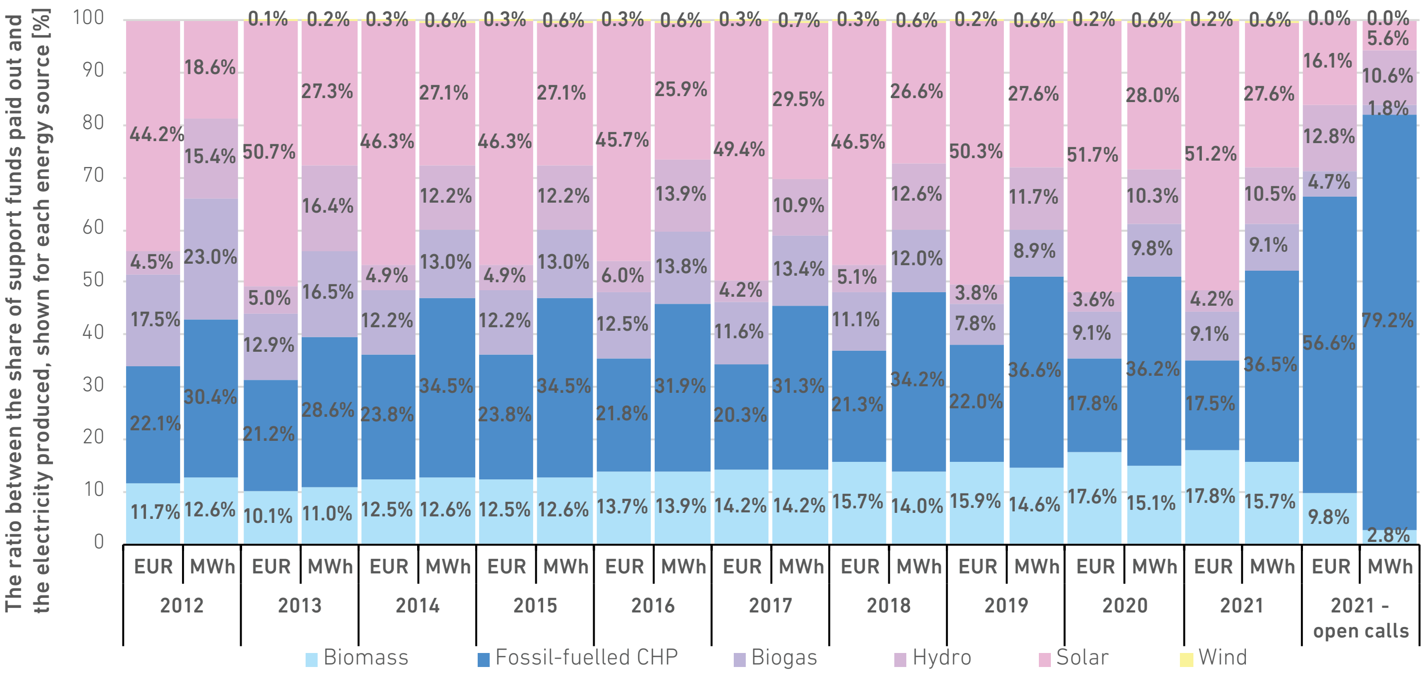


SOURCE: BORZEN

Another factor in the increase in support payments, besides the additional 10 GWh of electricity produced in 2021, is the lower reference price for electricity, which was €48.04/MWh in 2021 compared to €60.50/MWh the year before. The premium tariff is received by approximately 70% of those eligible, meaning that the pay-outs depend on the annual reference price of electricity, which has to be subtracted from the recognised support amount. The large reduction in the reference price of electricity, by as much as 20.6%, therefore had a significant impact on the increase in support payments in 2021. This is because the lower reference price of electricity leads to more state aid being allocated to the producers who are recipients of premium tariffs.

The ratio, by individual sources, between the share of support pay-outs and the share of electricity produced, did not change significantly in 2021 compared to previous years. In 2021, as in previous years, this ratio (illustrated in Figure 24) was once again most favourable for hydropower plants and fossil-fuelled CHP production facilities; accordingly, the support pay-outs for these methods of electricity generation are lower, on average, than for other methods included in the support scheme. The least favourable ratio between support paid out and electricity produced is still found in the solar power plants that were admitted to the support scheme before the introduction of competitive procedures for selecting production facility projects in open calls, as well as for some smaller woody biomass-fuelled production facilities. An exception to this is solar power plants built in projects that were pre-selected in open calls; the amount of support per unit of electricity produced by those is considerably lower than that for electricity produced in solar power plants built in the 2010–2012 period.

FIGURE 24: THE RATIO BETWEEN THE SHARE OF SUPPORT FUNDS PAID OUT AND THE ELECTRICITY PRODUCED, SHOWN FOR EACH ENERGY SOURCE IN THE 2010–2021 PERIOD



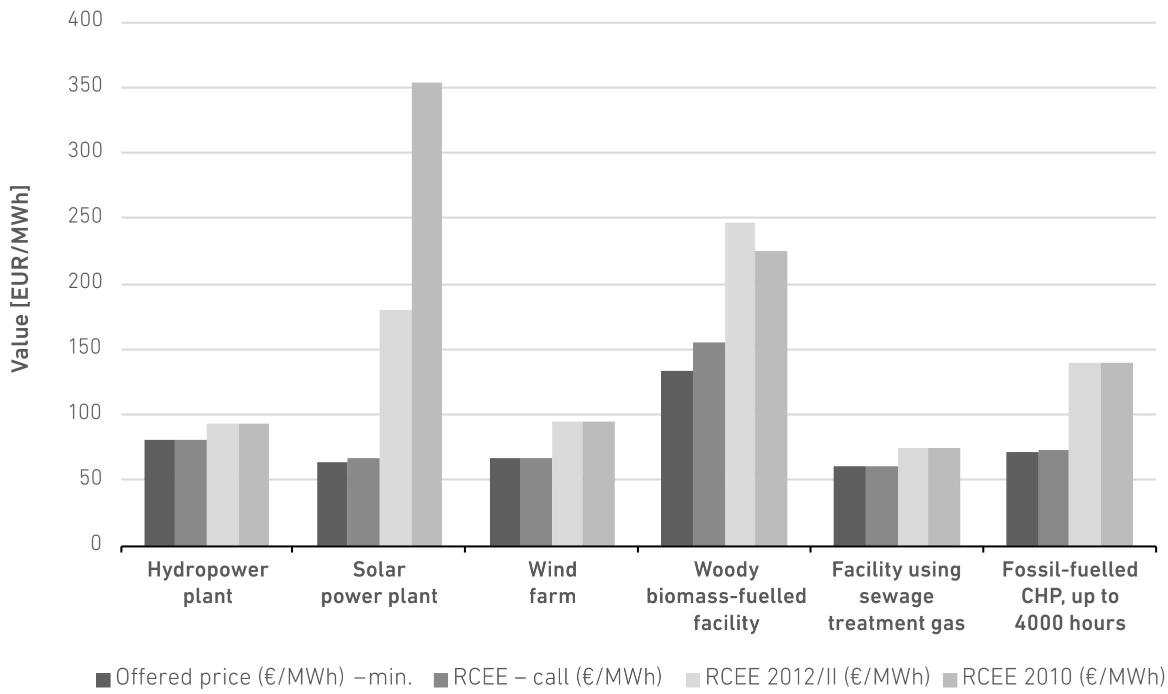
SOURCES: ENERGY AGENCY, BORZEN

The falling market prices of components used for individual technologies and the introduction of competitive procedures have resulted in lower support amounts, most notably for electricity produced in solar power plants, but also in woody biomass power plants and CHP facilities (Figure 25). The values have been adjusted in line with the market conditions, as per EU state aid guidelines. The competitive procedure for project selection provides an additional impetus for investors to apply with cost-effective and competitive projects.

A megawatt-hour of electricity generated in production facilities selected in open calls requires, on average, significantly less support than the electricity generated in production facilities that were included in the support scheme before the changes to the support scheme came into effect. The average amount of support paid out[3] per MWh of electricity produced in production facilities selected in open calls in 2021 was thus €32.05/MWh, whereas the average value of support provided for the electricity produced in production facilities predating the support scheme amendments was €138.09/MWh.

3 The support corresponds to the difference between reference costs, or the offered price of electricity in the open call, and the reference market price of electricity.

FIGURE 25: A COMPARISON OF THE LOWEST OFFERED PRICES OF ELECTRICITY AMONG THE SELECTED PROJECTS OF CERTAIN TECHNOLOGIES IN OPEN CALLS AND THE REFERENCE COSTS OF ELECTRICITY PRODUCTION USING THESE SAME TECHNOLOGIES BEFORE AND AFTER THE AMENDMENTS TO THE RES AND CHP SUPPORT SCHEME



SOURCE: ENERGY AGENCY

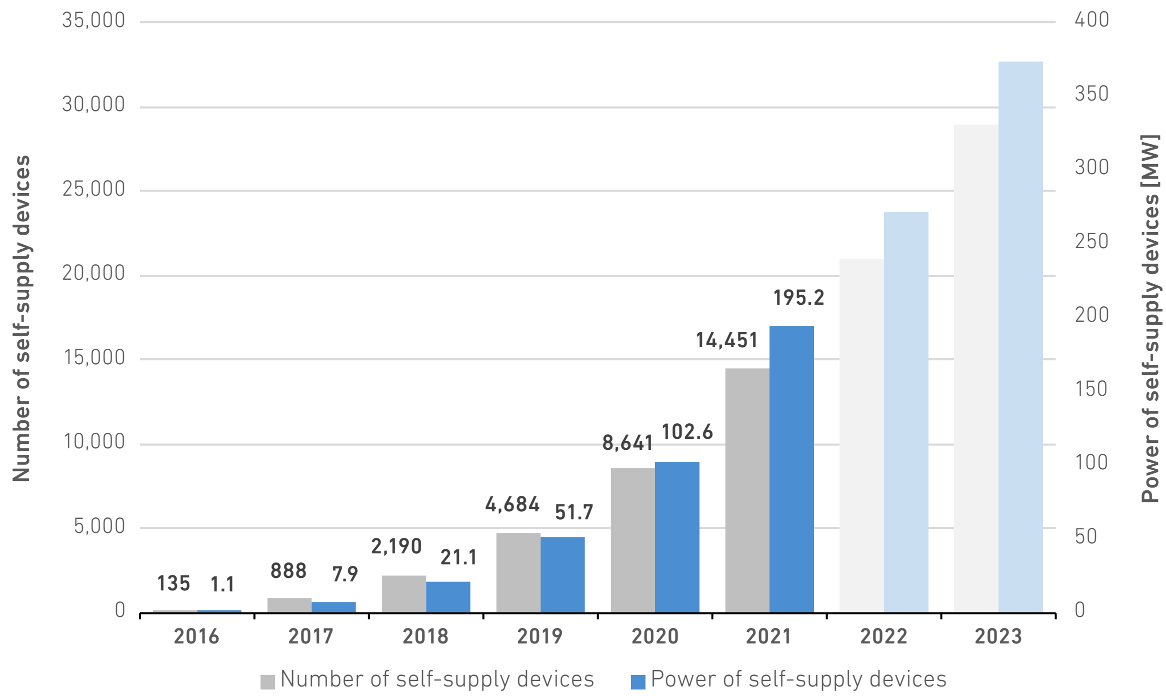
Renewable Electricity Self-Supply

Self-supply is the generation of electricity from renewable sources using a production facility connected to the internal low-voltage installation of a building. Its purpose is for final consumers, i.e., households or small business consumers, to cover their own electricity consumption. The final consumers feed their surplus electricity into the distribution network and draw from the network at times when the output of the self-supply device is insufficient. In this case, the distribution network acts as a virtual storage or battery due to the mismatch between the output of the consumer's self-supply device and the final consumer's consumption.

While only 135 self-supply devices with a total capacity of 1.1 MW had been connected in 2016, which was the first year in which self-supply devices were connected, a total of 5,810 installations with a total installed capacity of almost 93 MW were newly connected in 2021. In 2021, a total of 14,451 self-supply devices with a total installed capacity of 195 MW and an average installed capacity of 13.5 kW were thus in operation. As the number of self-supplying consumers grows, so does the average power of self-supply devices. In 2016, the average power of a newly connected self-supply device was 8.1 kW, and in 2021 it grew to 15.9 kW. The increase in the power of self-supply devices can be attributed to the increasing use of electricity to heat buildings using heat pumps and the emerging interest in using self-supply measures to charge electric vehicles at home.

Based on data from the last six years, the Energy Agency created an estimate of the increase in the number (using a second-degree polynomial) and total power of self-supply devices until 2023 (based on the average power of devices connected in 2021). Under such dynamics, almost 29,000 customers are expected to be self-sufficient in electricity, with the total power of self-supply devices amounting to almost 375 MW by the end of 2023.

FIGURE 26: NUMBER AND INSTALLED CAPACITY OF SELF-SUPPLY DEVICES IN THE 2016–2021 PERIOD AND FORECAST UNTIL 2023



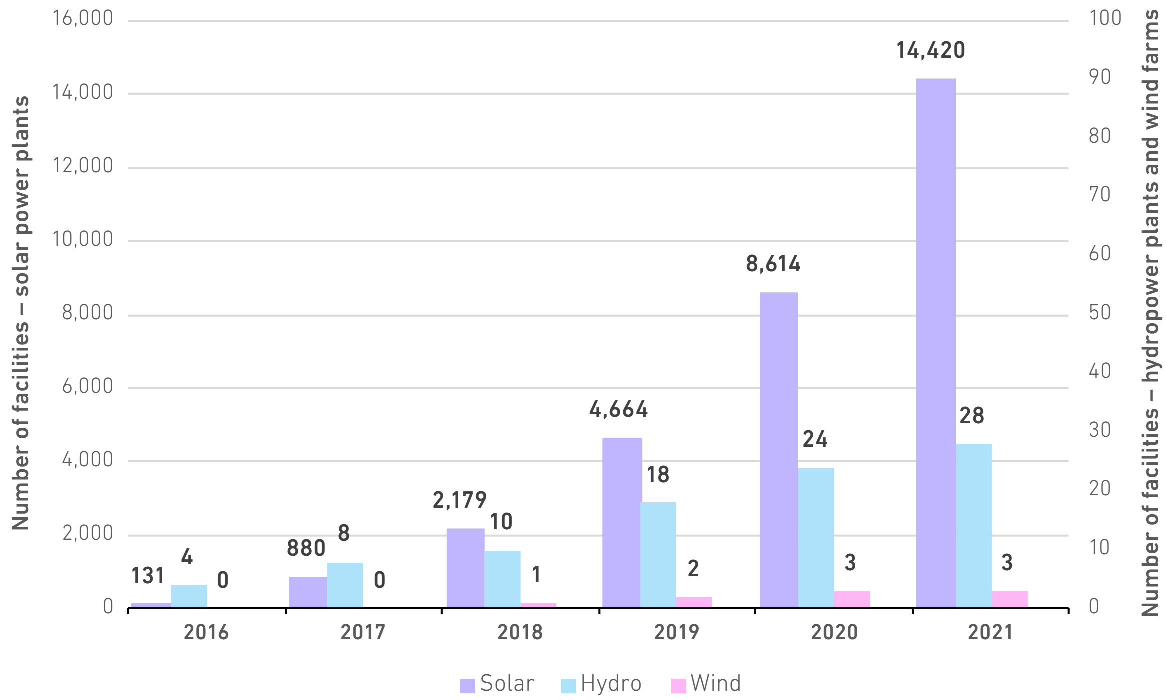
SOURCES: ENERGY AGENCY, SODO, ELECTRICITY DISTRIBUTION COMPANIES, BORZEN

According to the legislation, a self-supply device may produce electricity by using solar, wind, hydro or geothermal energy, or it may be a CHP unit that uses RES as the primary source. In practice, solar power plants are overwhelmingly predominant (14,420 devices), while there are only 28 devices using hydro power and only three installations using wind power.

Among the existing self-supply devices, there are no devices using geothermal energy as of yet, nor any CHP units using RES as the primary source.

In the coming years, we expect an increase in the number of production facilities for community self-supply coming online. The first facility for community self-supply, with a rated power of 14 kW, was connected in 2019. In 2020, four more such facilities were connected, totalling 86 kW of installed capacity; this increased to 25 facilities in 2021, totalling 1100 kW of installed capacity. By the end of 2021, there were already 30 community self-supply facilities in operation, totalling 1200 kW of installed capacity and serving 154 consumers.

FIGURE 27: NUMBER OF SELF-SUPPLY DEVICES BY PRODUCTION SOURCE

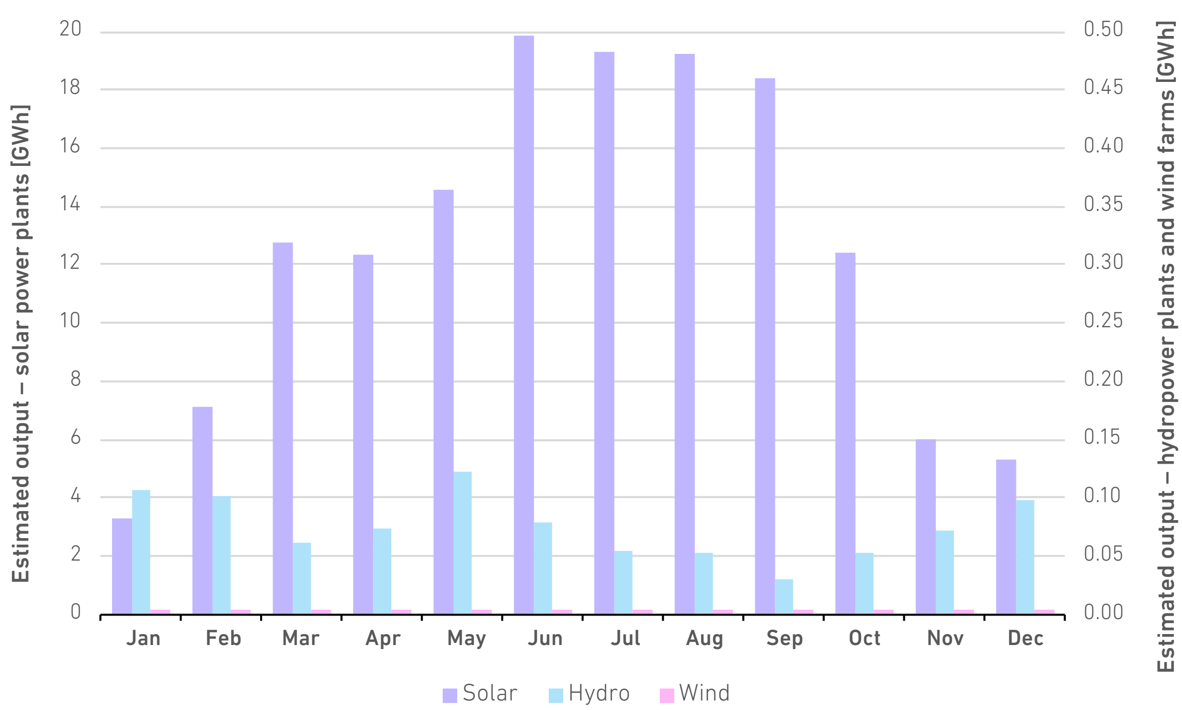


SOURCES: ENERGY AGENCY, SODO, ELECTRICITY DISTRIBUTION COMPANIES, BORZEN

Due to the measuring method and the annual netting of electricity produced and consumed, the annual production of electricity in self-supply devices connected behind the final consumer delivery point can only be estimated. This estimate depends on the type of production facility, the installed capacity and the reference monthly operating hours.

As many as 99.8% of all self-supply devices are solar power plants, which means that the estimated electricity production depends heavily on the time of year and geographical and weather factors. In 2016, the estimated amount of electricity produced by self-supply devices was only 0.6 GWh, while in 2021 it was already at 151.6 GWh.

FIGURE 28: ESTIMATED OUTPUT OF SELF-SUPPLY DEVICES IN 2021 BY MONTH AND TECHNOLOGY



SOURCE: BORZEN

Regulation of Network Activities

The Unbundling of Activities

Electricity transmission and distribution companies are required to keep separate accounts for each of their transmission and distribution activities, as they would be required to do if the distribution and transmission activities were carried out by separate undertakings.

The service of general economic interest provided by the transmission system operator (hereinafter: the TSO) is performed by a legal entity that, in addition to the transmission activity, also performs other non-electricity-related activities. In its annual report, ELES discloses separate financial statements for those activities, as well as the criteria for the allocation of assets and liabilities, costs, expenses and revenues used in the preparation of separate accounting records and separate financial statements.

The service of general economic interest provided by the distribution system operator (hereinafter: the DSO) is performed as a separate legal entity and is the only activity performed by SODO, which does not prepare separate financial statements for regulatory purposes.

Based on the approval of the Government of the Republic of Slovenia, SODO delegated the services of general economic interest provided by the DSO to distribution companies. Distribution companies engage in other non-electricity-related activities in addition to the activity contractually delegated to them by SODO. Therefore, the distribution companies maintain separate accounting records in their books and draw up separate financial statements for the activity contractually delegated to them by SODO and for their non-electricity-related activities. In their annual reports, distribution companies disclose separate financial statements for those activities, as well as the criteria for the allocation of assets and liabilities, costs, expenses and revenues used in the preparation of separate accounting records and separate financial statements.

Technical Services

Ancillary Services

Ancillary services, which need to be provided by the transmission system operator (TSO), are the services required to maintain the normal operation of the entire electricity system. The Slovenian electricity system features the following ancillary services:

- frequency containment process (FCP);
- automatic frequency restoration process (aFRP);
- manual frequency restoration process (mFRP);
- voltage and reactive power control; and
- black start services.

The TSO sources all ancillary services from providers in the market; the costs of their provision are covered by the network charge for the transmission system.

Ancillary services are categorized into frequency services, which encompass FCP, aFRP and mFRP, and non-frequency services, which include voltage regulation and the provision of a black start. Frequency ancillary services belong to the balancing services in the electricity system. The required scope of frequency services can be evaluated using the volume of reserves in MW, while for non-frequency ancillary services, an appropriate geographical distribution of providers throughout the transmission system is required. The FCP reserve is denoted by FCR, aFRP reserve by aFRR and mFRP by mFRR. For 2021, ELES planned the following reserve capacities for frequency ancillary services:

- RVF: ±15 MW,
- aRPF: +60 MW, –60 MW,
- mFRR: +250 MW, –71 MW.

The projected total volume of frequency ancillary services was the same in 2021 as in the previous year. This is due to the fact that the TSO complied with the provisions of the reserve sharing agreement in the SCB (Slovenia, Croatia, Bosnia and Herzegovina) control block. At the block level, ELES must provide mFCR at the level of the potential outage of the largest production and consumption unit. In the SCB block, these would be outages of the Krško NPP and the Avče PSHPP in the pumping regime. The participating TSOs of the three countries each contribute their share of the reserve, which is calculated in accordance with the provisions of the control block operating agreement.

In 2021, as in the previous year, there was full implementation in the area of frequency ancillary services of the provisions of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereinafter: Regulation (EU) 2017/2195). These provisions mandate the leasing of services on the basis of market principles for the shortest possible leasing period, with aFRR and mFRR leases to be performed separately for the positive and negative balancing directions, and the leasing of balancing power to be separated from the purchase of balancing energy.

In the area of system balancing, there was also a change in 2021 to the way system energy imbalances are accounted for between system operators in the event of a system imbalance. Until June 2021, the transmission system operator corrected imbalances in the transmission system by accepting energy from other operators, offsetting these transfers later in the form of non-monetary compensation. Beginning with June 2021, however, common billing rules for all unintended energy exchanges – commonly referred to as FSkar settlement – came into effect. The costs incurred by the transmission system operator through FSkar settlement are covered using the imbalance settlement.

The major development in the area of ancillary services in 2021 was the entry of ELES into the FCR Cooperation, the European platform for the exchange of frequency containment reserves, in which the transmission system operators of Austria, Belgium, Denmark, France, Germany, the Netherlands and Switzerland also participate. The first auction to include ELES was held for the delivery day of 19 January 2021. For this reason, the FCR provision contracts for 2020 were extended to cover the first 18 days of the next year.

Further details on Slovenia's participation in the FCR Cooperation can be found in the associated case study.

In 2021, ELES managed the aFRP service providers for power (aFRR) and balancing energy separately. All providers with a valid certificate of technical competence for the provision of aFRP services were eligible for participation in the aFRR auctions. Each day, the selected aFRR providers had to provide an amount of energy corresponding to the balancing capacity assigned at the auction, while all providers with a valid certificate of technical competence for the provision of aFRP services could offer balancing energy up to the amount corresponding to the total recognised aFRR regulation capacity.

ELES selected the 2021 aFRR providers by conducting separate annual auctions for 40 MW of balancing capacity in the positive and negative directions; the remaining 20 MW were selected in monthly auctions conducted separately for each transmission direction and for peak and off-peak products. Peak product was defined as production in the period from Monday to Friday between 08:00 and 20:00. The auction results are shown in Table 13. Only two bidders participated in all the auctions, one providing services with conventional production sources and the other with battery storage.

Since 19 January, Slovenia has been part of the common market for intergovernmental frequency containment reserve exchange.

TABLE 13: ANNUAL AND MONTHLY AUCTION RESULTS FOR aFRR

Positive balancing direction (aFRR+)		
Annual auction		
	Allocated quantity (MW)	Price achieved (€/MWh)
provider 1	20	7.79
provider 2	20	8.09
Summary of monthly auctions – average quantities and prices		
provider 1	8.92	7.98
provider 2	10.88	8.09

Negative balancing direction (aFRR-)		
Annual auction		
	Allocated quantity (MW)	Price achieved (€/MWh)
provider 1	19	7.45
provider 2	21	7.69
Summary of monthly auctions – average quantities and prices		
provider 1	8.63	7.63
provider 2	11.13	7.75

SOURCE: ELES

Some of the monthly aFRR auctions in 2021 were unsuccessful due to an insufficient quantity of bids. Table 14 shows a list of partially unsuccessful auctions. This can be partly attributed to speculative behaviour on the part of the service providers, but in one case, which led to the largest shortfall in the required amount, there was very likely an error in the bidding process.

TABLE 14: PARTIALLY UNSUCCESSFUL MONTHLY aFRR AUCTIONS IN 2021

Auction	Quantity tendered (MW)	Allocated quantity (MW)
February, aFRR+, peak product	20	18
July, aFRR+, peak product	20	19
September, aFRR+, peak product	20	19
September, aFRR+, off-peak product	20	19
November, aFRR-, peak product	20	14

SOURCE: ELES

In 2021, ELES managed the mFRP service providers for power (mFRR) and balancing energy separately. All providers with a valid certificate of technical competence for the provision of mFRP services were eligible for participation in the mFRR auctions. Each day, the selected mFRR providers had to provide an amount of energy corresponding to the balancing capacity assigned at the auction, while all providers with a valid certificate of technical competence for the provision of aFRP services could offer balancing energy up to the amount corresponding to the total recognised aFRR regulation capacity. ELES also has a five-year contract with one of the mFRR providers for the provision of 178 MW of this service until the end of 2023. This required ELES to lease, on an annual and monthly basis, a total of 72 MW of reserves in the positive direction for 2021, while for the negative direction, ELES had to lease the entirety of the required 71 MW of reserves in this way. For each balancing direction, it selected bidders for the provision of a total of 50 MW in the annual auction, while 22 MW of mFRR+ and 21 MW of mFRR- reserve were selected in monthly auctions, where bidders offered base-load products for all 24 hours in all the days of the month. All the auctions for this service were successful. Participating in the auctions were providers with conventional production sources, demand response capabilities, distributed generation and battery storage. The auction results are shown in Table 15.

TABLE 15: ANNUAL AND MONTHLY AUCTION RESULTS FOR mFRR

Positive balancing direction (mFRR+)		
Five-year product		
	Already allocated quantity (MW)	Price achieved (€/MWh)
provider 1	178	6.11
Annual auction		
	Allocated quantity (MW)	Price achieved (€/MWh)
provider 1	6	3.04
provider 2	31	2.84
provider 3	8	2.99
provider 4	5	2.78
Summary of monthly auctions – average quantities and prices		
provider 1	21	3.03
provider 2	0.25	2.93
provider 3	0.75	2.99

Negative balancing direction (mFRR-)		
Annual auction		
	Allocated quantity (MW)	Price achieved (€/MWh)
provider 2	28	4.00
provider 5	22	4.31
Summary of monthly auctions – average quantities and prices		
provider 2	0.58	4.29
provider 5	20.42	4.30

SOURCE: ELES

ELES selected non-frequency ancillary service providers for 2021 at the end of 2020. In a negotiation process, ELES selected the providers of frequency containment, voltage and reactive power control and black start services.

Table 16 shows the total costs of individual ancillary services for 2021. Note that only the costs funded from the network charge for the transmission system are shown. These are the costs of all non-frequency ancillary services and the costs of leasing reserves for frequency ancillary services. Energy activation costs for frequency ancillary services are funded from imbalance settlement, the costs of which are covered by the balance responsible parties.

The total costs of ancillary services in 2021 were nearly €6 million lower than in 2020. They were lower for all items, except for the frequency containment reserve, which was the most affected by the general price increase on European markets due to membership in the FCR Cooperation. The cost of aFRP and mFRP decreased by around 19.6% compared to the previous year, while the cost of non-frequency services decreased by around 17.3%.

17% decrease in the costs of ancillary services funded by the network charge

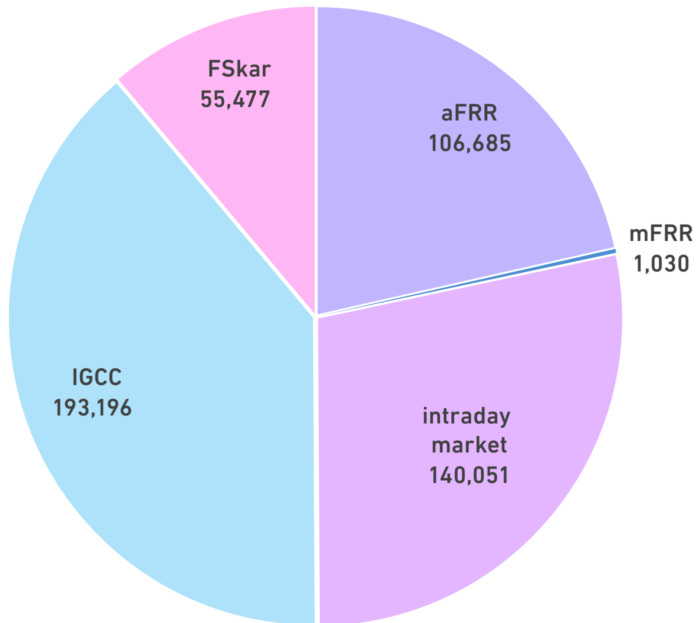
TABLE 16: COSTS OF ANCILLARY SERVICES IN 2021 FUNDED BY THE NETWORK CHARGE

Ancillary service	Annual cost not including VAT (EUR)
FCR	1,814,492
Positive aFRP	4,198,968
Negative aFRP	3,991,691
Positive mFRP	11,356,883
Negative mFRP	2,589,782
Voltage and reactive power control	4,232,000
Provision of a black start	1,212,095
Total	**29,395,911**

SOURCE: ELES

In the provisioning of aFRP in 2021, ELES activated 56.1 GWh of positive and 50.6 GWh of negative energy – substantially more positive energy than the year before, when 41.8 GWh of positive energy was activated, and considerably less negative energy, with 60.5 GWh negative energy being activated in 2020. The difference is mainly due to the fact that ELES often faced transmission capacity constraints in imbalance netting in the direction of Slovenia in 2021. In the context of imbalance netting in 2021, ELES exported 109.6 GWh to offset positive imbalances, reducing the need for negative aFRP energy activation, and imported 83.6 GWh to offset negative imbalances, with the corresponding decrease in the activation of positive aFRP energy. In both directions, these quantities were greater than in 2020, when they amounted to 101.9 GWh in the positive and 70.8 GWh in the negative direction. In the area of imbalance netting, Slovenia has been participating in the IGCC (International Grid Control Cooperation) project since 2019; as can be seen, the amount of energy exchanged in this process is increasing from year to year. In terms of unintended energy exchanges (FSkar settlement), there was 27.3 GWh of positive and 28.2 GWh of negative energy exchanged in 2021. In the intraday market, which includes the balancing market of the market operator and the continuous intraday market, ELES activated 73.4 GWh and 66.6 GWh of negative energy. Figure 29 shows the absolute values of activated energy quantities in ancillary services.

FIGURE 29: THE ABSOLUTE VALUES OF ACTIVATED QUANTITIES, IN MWH, IN THE AREA OF FREQUENCY ANCILLARY SERVICES



SOURCE: ELES

In performing mFRP, ELES activated 967 MWh of positive energy, which is considerably less than in the previous year, when it activated no less than 3349 MWh of positive energy. 54% of the activated energy came from domestic and 46% from foreign providers. ELES activated 50 MWh of negative mFRR in 2021 – a decrease of 23 GWh compared to the previous year. In 2021, negative mFRR was only activated once, while the positive reserve was activated ten times. This amounts to 11 activations in total, marking a substantial drop from 2020, which saw 18 activations of manual frequency restoration reserve.

CASE STUDY PROPOSAL: SLOVENIA'S ENTRY INTO THE FCR COOPERATION

The effect of Slovenia's entry into the FCR Cooperation was initially highly favourable due to the decrease in prices, which had previously been set at €9.1/MWh in contracts agreed with domestic providers for 2020 up to 18 January 2021. Table 17 shows the FCR prices achieved by month, with only the period 19–31 January 2021 considered for January. The table indicates that the FCR prices started to rise in April, as a result of the general price increases in the European wholesale electricity markets. The table also shows the share, for each individual month, of the total demand covered by domestic providers. We note that these were seldom selected at auctions during the period of lower prices; as the prices rose, however, the share of domestic bids selected increased. The only exceptions to this trend were the drops in May and June – a consequence of the fact that a major portion of the Slovenian FCR providers employ hydropower plants situated on rivers that reach their highest flows in May and June, leading to the providers' wanting to offer as much of the energy from these production facilities as possible on the energy market in these two months. Opportunity losses in short-term markets, where both average prices and price volatility increased sharply, particularly in the second half of the year, have a strong impact on FCR pricing. Even so, by the end of the year, FCR lease prices settled down considerably compared to the record increase in October, when marginal prices averaged as much as €42.19/MWh. In the first three months of 2022, the average marginal prices likewise remained in the range of €18–26/MWh.

As we entered into the European FCR Cooperation, we saw lower prices than in the previous years; there were indications that by participating in the continuous, common market, Slovenia would see a significant reduction in the costs of leasing FCR. As the conditions on the wholesale market tightened, however, the short-term nature of FCR leases was immediately reflected in the lease prices, so that, on an annual basis, the final FCR lease costs still ended up exceeding the 2019 level by just over 50%.

TABLE 17: FCR PRICES AFTER JOINING THE FCR COOPERATION

	Average price (€/MWh)	Lease cost (EUR)	Share of FCR leased in Slovenia (%)
January	5.84	27,316.35	3.7%
February	6.15	61,995.15	4.5%
March	6.74	75,171.00	4.7%
April	12.69	137,052.15	17.1%
May	18.95	211,432.95	8.0%
June	14.14	152,691.45	6.0%
July	17.38	194,006.25	27.0%
August	14.79	165,006.15	20.9%
September	17.59	190,006.20	26.0%
October	42.19	471,514.95	54.2%
November	25.24	272,581.95	40.9%
December	26.61	296,958.45	32.1%

SOURCES: ELES, HTTPS://WWW.REGELLEISTUNG.NET

Balancing and Imbalance Settlement

The entity responsible for balancing the imbalances of the electricity system from the forecasts in Slovenia is the transmission system operator, ELES. Minor system imbalances are balanced by tapping into the automatic frequency restoration reserve (aFRR), while larger imbalances require either the activation of the manual frequency restoration reserve (mFRR) or buying/selling energy on the balancing market. The costs associated with balancing are covered by the balance responsible parties through imbalance settlement.

There was an important change in the area of imbalance settlement in 2021, with the settlement period being decreased from one hour to 15 minutes.

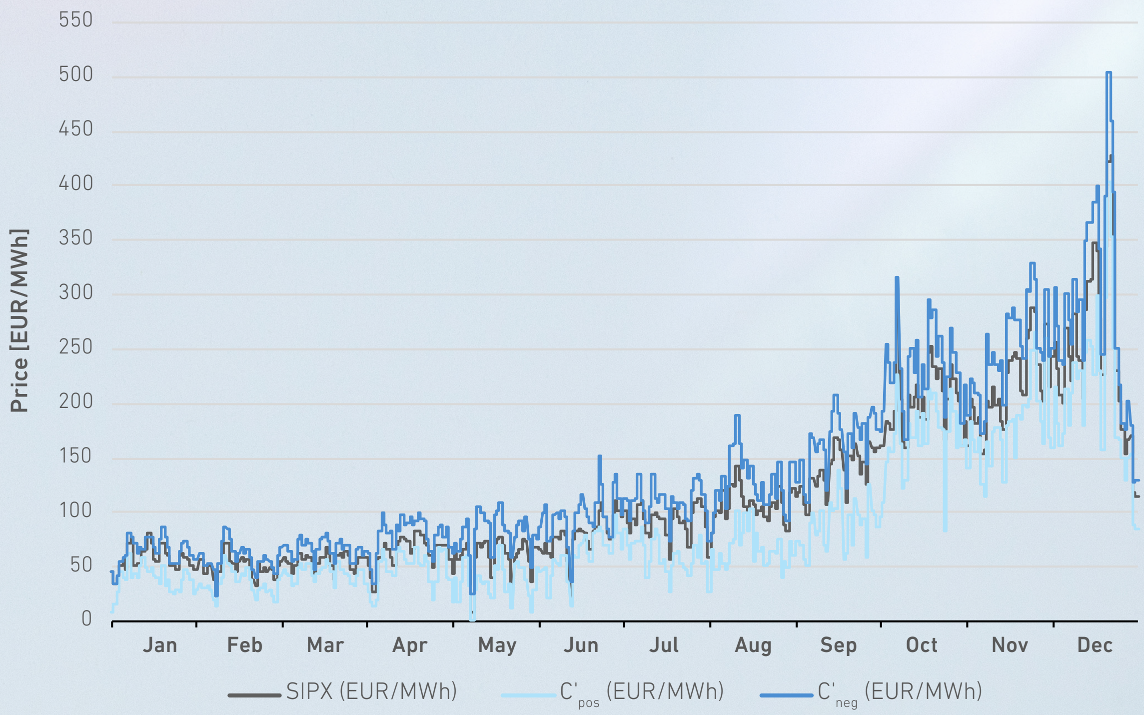
In the area of balancing, 2021 was marked by the transition to a 15-minute settlement period and a large increase in the imbalance prices due to the situation in the European market.

The Slovenian power exchange index (SIPX) is used to calculate the basic prices of C_{pos} and C_{neg} imbalances, and therefore also to calculate the derived prices of C'_{pos} and C'_{neg} imbalances. In 2021, the average value of SIPX amounted to EUR €115.04/MWh, which is EUR €77.50/MWh or 206.45% more than in the previous year. The SIPX was highest (€533.19/MWh) on 22 December in the 9th block hour, and lowest (€-66.18/MWh) on 9 May in the 15th block hour.

In 2021, the average derived price for negative imbalances C'_{neg} (short position of the balance responsible party) was €135.49/MWh, while the price for positive imbalances C'_{pos} (long position of the balance responsible party) was €86.47/MWh. In this period, the highest price of C'_{neg} was €724.86/MWh, and the highest price of C'_{pos} was €533.19/MWh. In the same period, the lowest price of C'_{neg} was €-41.72/MWh, and the lowest price of C'_{pos} was €-70.94/MWh.

Figure 30 shows the trends in the derived imbalance prices of C'_{pos} and C'_{neg} and the Slovenian power exchange price index (SIPX) in 2021. Due to the copious amounts of 15-minute data, the graph uses the daily averages of SIPX, C'_{pos} and C'_{neg}, so that the extremes of the individual prices are not visible on the graph.

FIGURE 30: AVERAGE DAILY VALUES OF BASIC IMBALANCE PRICES C'_{POS} AND C'_{NEG} AND SIPX INDEX

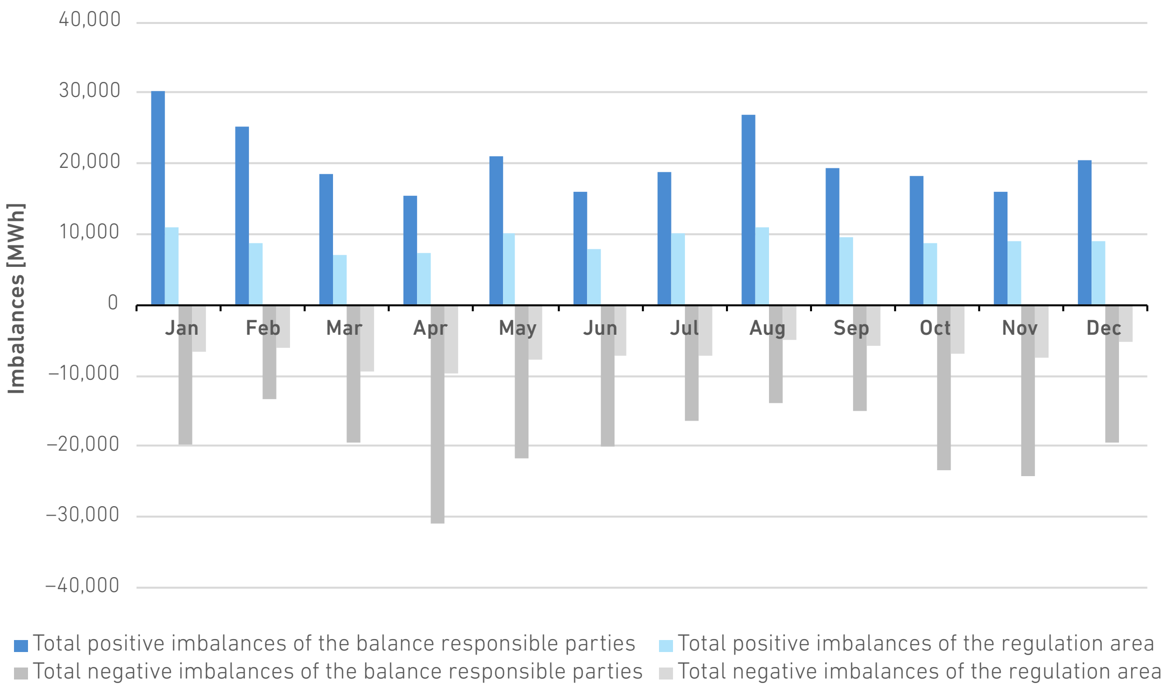


SOURCE: BORZEN

The chart in Figure 30 shows a big jump in prices in the second half of the year due to the onset of the energy crisis in Europe and thus in Slovenia. As a result, the average prices of negative imbalances C'_{neg} in this year ranged from €58.25/MWh in February to €288.42/MWh in December. Prices of positive imbalances C'_{pos} in this year ranged from €34.62/MWh in February to €207.75/MWh in December. As expected, the highest difference between C'_{neg} and C'_{pos} was recorded in December (€80.67/MWh) and the lowest in March (€22.34/MWh).

Figure 31 shows the total positive and negative imbalances of all the balance responsible parties in Slovenia in 2021, as well as the total imbalances of the Slovenian regulation area.

FIGURE 31: TOTAL IMBALANCES IN THE SLOVENIAN ELECTRICITY SYSTEM IN 2021



SOURCES: BORZEN, ELES

The highest positive imbalances of the balance responsible parties were recorded in January and the highest negative in April. The total positive annual imbalances of the regulation area amounted to 109,557 MWh, and negative to 83,639 MWh. At the same time, the total positive annual imbalances of all balance responsible parties amounted to 245,997 MWh, and negative to 236,796 MWh. In 2021, all the imbalances increased compared to the previous year. The trends in imbalances over the last five years are shown in Table 18; it should be noted that all imbalances are treated in accordance with the new Rules on the Operation of the Electricity Market. This means that the imbalances that were positive in the reports up to and including 2018 are shown as negative in the table, and vice versa.

TABLE 18: TRENDS IN TOTAL IMBALANCES OF BALANCE RESPONSIBLE PARTIES AND THE REGULATION AREA IN SLOVENIA IN THE 2017–2021 PERIOD

	2017	2018	2019	2020	2021
Total positive imbalances of the balance responsible parties (MWh)	326,166	251,711	278,713	245,421	245,997
Total positive imbalances of the regulation area (MWh)	344,064	87,206	98,471	90,606	109,557
Total negative imbalances of the balance responsible parties (MWh)	263,038	168,692	152,982	177,414	236,796
Total negative imbalances of the regulation area (MWh)	280,935	83,750	57,541	53,215	83,639

SOURCES: BORZEN, ELES

As in all previous years, both the system and the balance responsible parties deviated more in the positive than in the negative direction. The main reason for this is likely the imbalance settlement methodology used in Slovenia, which is based on two prices, between which there is normally a significant difference. This fact encourages traders to secure energy surpluses rather than deficits, as this reduces their risks in the market. The large share of positive imbalances can also partially be contributed to an increasing share of unpredictable generation from RES.

The shorter settlement period in 2021, reduced from one hour to 15 minutes, likewise had a certain effect on the imbalance totals reported by the balance responsible parties. This is due to the fact that during longer intervals, some of the imbalances cancel out, whereas over the 15-minute period, which more closely tracks the actual operation of the electricity system, the quantitative differences between the forecasts and the realisation are expected to increase. This also represents a strong signal for the market participants, as well as provides an additional incentive for them to continue striving for more accurate operational forecasting.

Quality of Supply

At the system level, the regulation of the quality of the supply aims to improve or maintain the existing level with optimised costs. Various activities are carried out to address the quality of the supply, such as monitoring, reporting and analysing data on the following observed dimensions: continuity of supply, commercial quality, and voltage quality. In addition, the Energy Agency regulates the quality of the supply by publishing data and analyses in its report on the quality of the supply[4].

In 2021, the Energy Agency carried out an audit of the data on the continuity of the supply reported by two distribution companies for the 2020 financial year and identified marked progress on the part of both companies in the area of reporting as stipulated in the Legal Act on the Rules for Monitoring the Quality of the Electricity Supply. As part of the audit process, the Energy Agency also assessed the effectiveness of the process of monitoring the continuity of supply; notwithstanding certain shortcomings, both companies' processes were assessed to be sufficient for the purpose of monitoring the continuity of supply.

Continuity of Supply

The data on the continuity of supply is collected, reported, and analysed using a uniform methodology. This ensures the mutual comparability of the data on the quality of supply among distribution companies and also the international comparability of the achieved parameters of the continuity of supply at the EU level.

Interruptions caused by electricity system operators or distribution companies are classified as internal events, while interruptions caused by third parties are classified as external events. Unexpected or unforeseen events that are not attributable to the electricity system operators or distribution companies, or third parties, can be classified as force majeure.

Electricity supply was interrupted two times per year on average

Based on the data on the SAIDI and SAIFI indicators, calculated at the level of individual distribution companies, the Energy Agency calculated the aggregate value of these indicators considering the number of all the consumers in Slovenia. The monitoring of the SAIDI and SAIFI parameters over the observation period has identified a gradual improvement in the level of quality of the supply. In 2021, the electricity supply to each customer was interrupted 2.04 times on average for an average duration of 157.3 minutes.

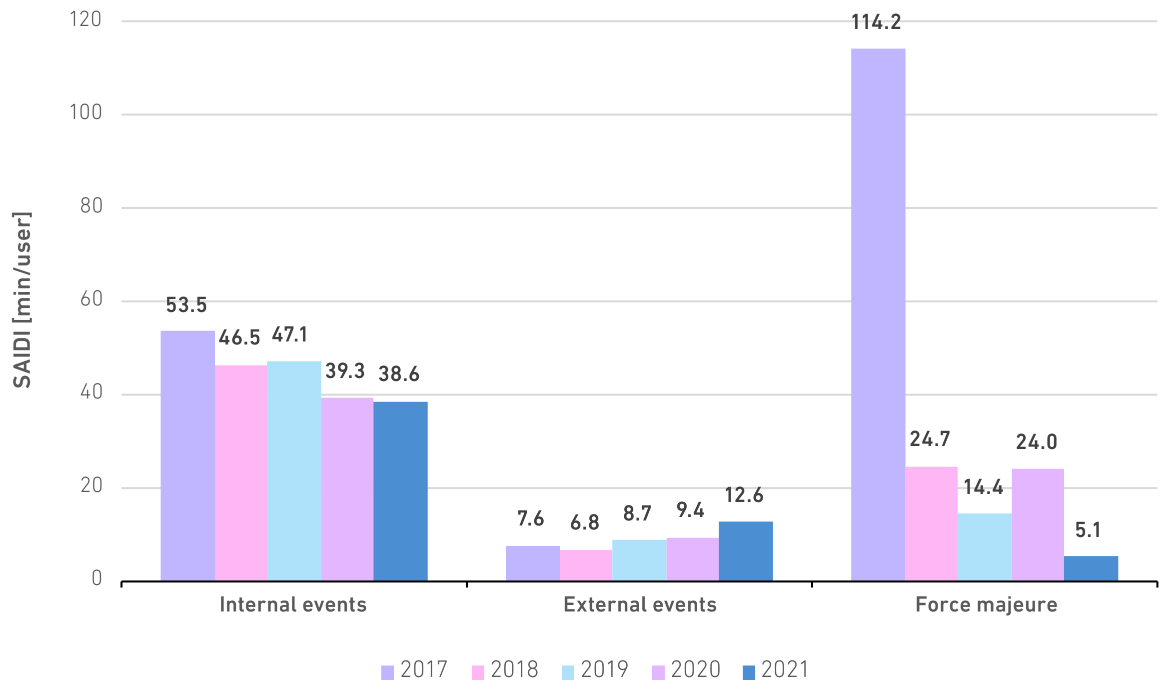
157 minutes was the duration of the average electricity supply interruption, the lowest value since the Energy Agency started monitoring the continuity of supply data.

The Energy Agency also monitors the MAIFI parameter, which is calculated similarly to the SAIFI parameter and indicates short-term interruptions of under three minutes, which are not classified by causes. After a slight deterioration in 2020, the MAIFI parameter once again improved in 2021, reaching an average of 4.52 short-term interruptions per consumer. This indicates a continuation of the positive trend in the area of short-term interruptions per user.

4 The annual reports on the quality of supply are available on the Energy Agency's website.

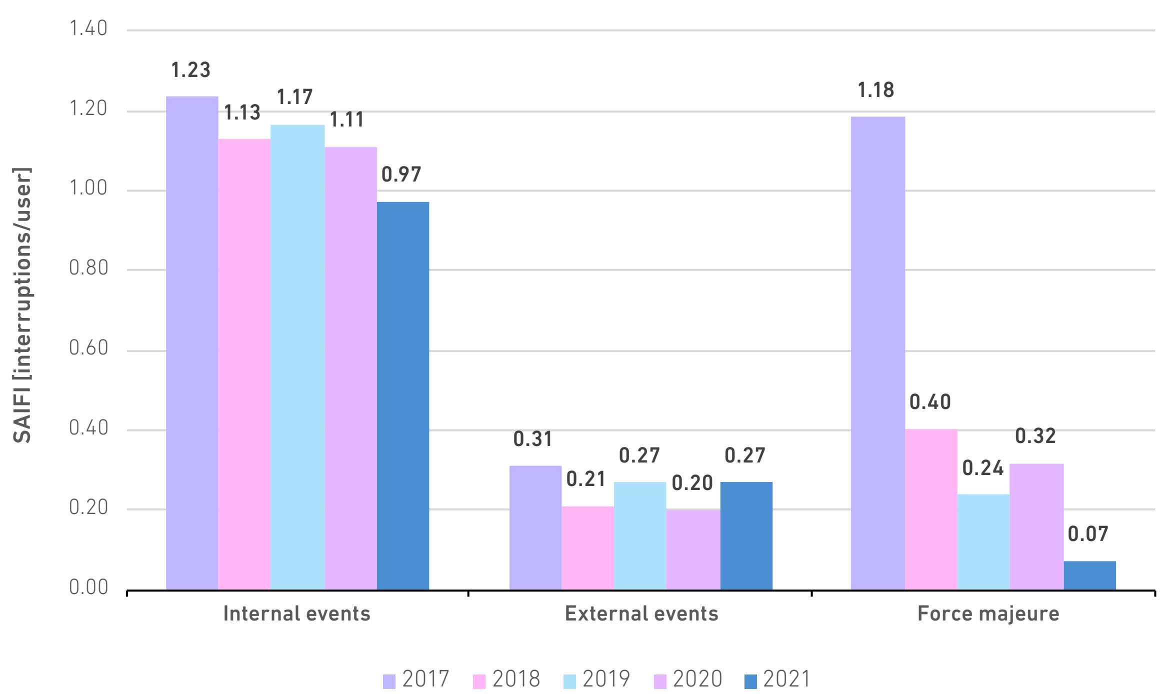
Figures 32 and 33 show the SAIDI in SAIFI indicators for unplanned long-term interruptions, classified by causes of interruption (internal and external events, and force majeure), for the 2017–2021 period, while Figure 34 shows the MAIFI indicator for the same observed period. All the indicators are calculated at the national level.

FIGURE 32: SAIDI FOR UNPLANNED LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2017–2021 PERIOD



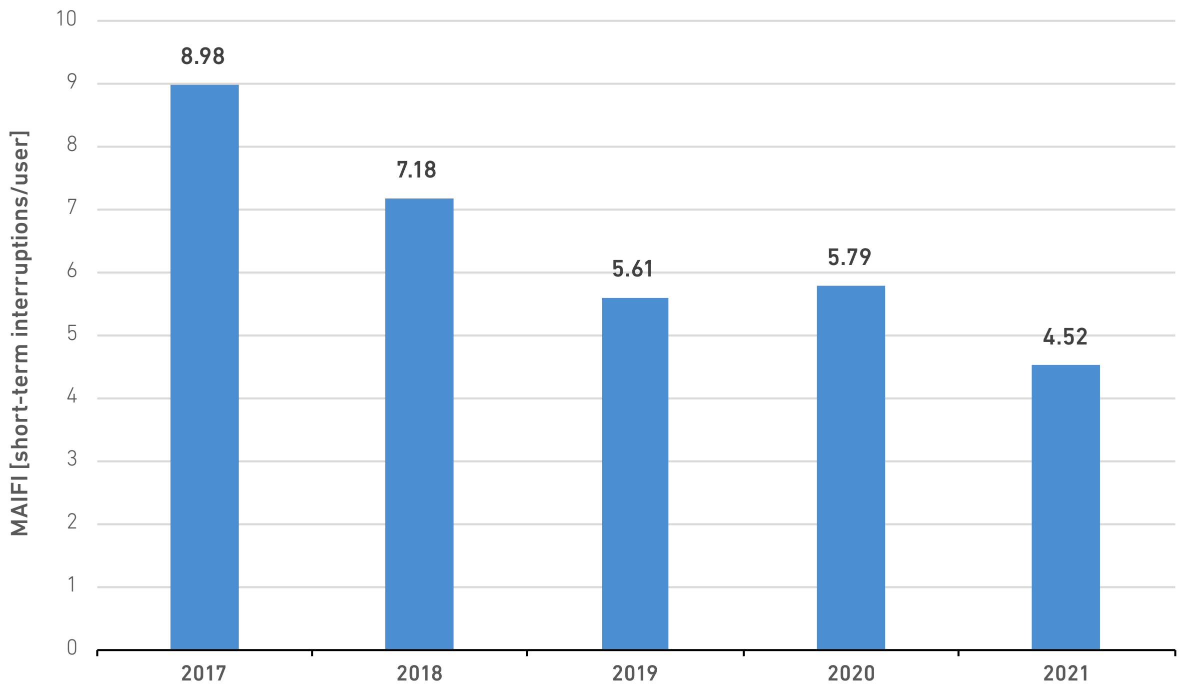
SOURCE: ENERGY AGENCY

FIGURE 33: SAIFI FOR UNPLANNED LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

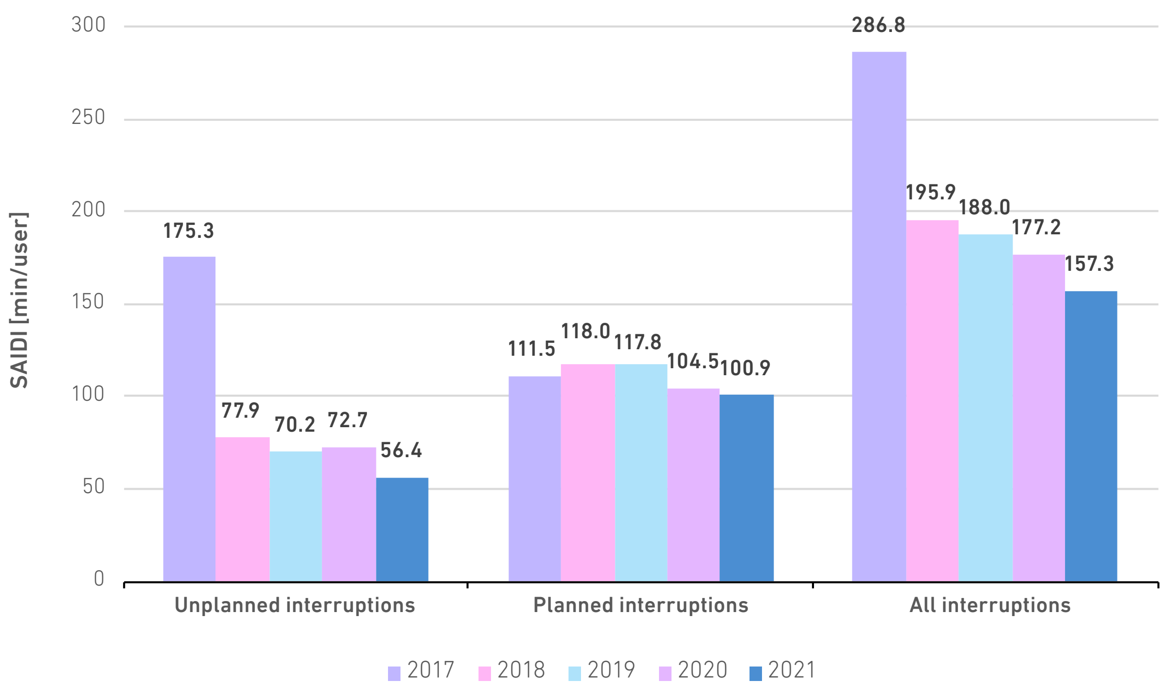
FIGURE 34: MAIFI IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

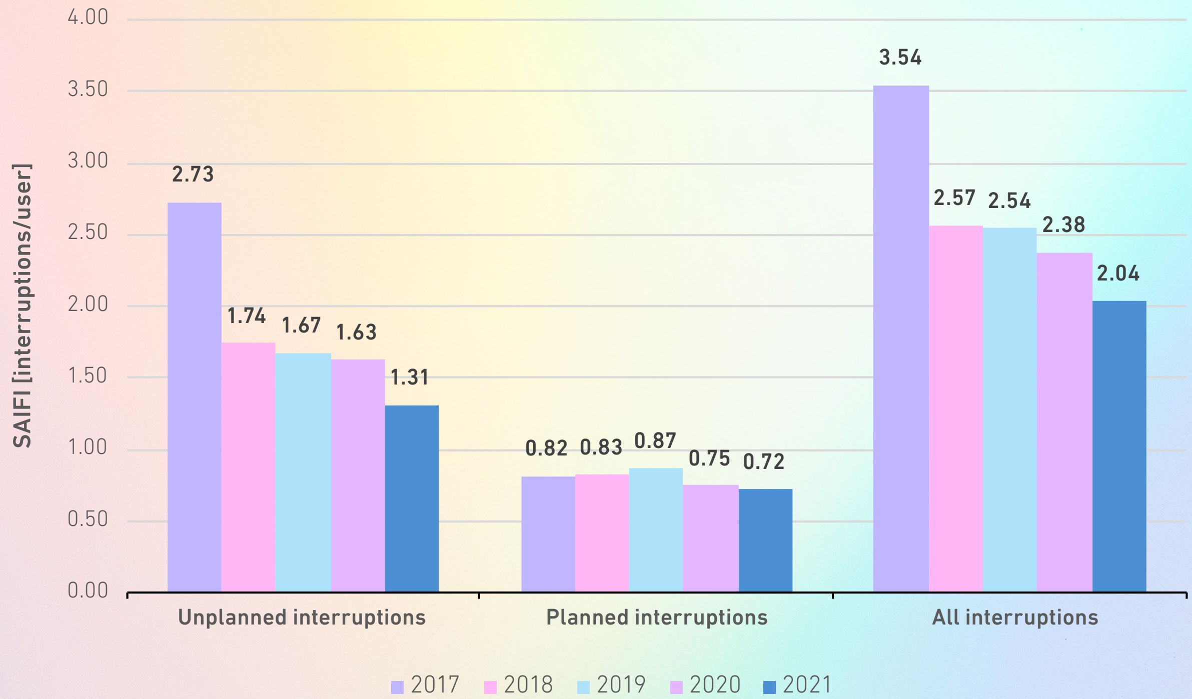
Figures 35 and 36 show the aggregate value for the SAIDI and SAIFI indicators for unplanned, planned, and all interruptions in Slovenia in the 2017–2021 period.

FIGURE 35: SAIDI FOR ALL LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

FIGURE 36: SAIFI FOR ALL LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

In 2021, the Energy Agency also continued to monitor the data on supply continuity in CDSs. This year, CDSs did not receive any complaints from consumers with regard to the continuity of supply; however, they did record electricity supply interruptions, as shown in Table 19.

TABLE 19: OVERVIEW OF THE NUMBER OF INTERRUPTIONS IN CDSs, CLASSIFIED BY CAUSES

Number of electricity supply interruptions in 2021	CDS Petrol Ravne	CDS Petrol Štore	CDS Jesenice	CDS Sij Acroni	CDS Talum
Unplanned interruptions	**30**	**0**	**0**	**4**	**0**
• internal events	7	0	0	4	0
• external events	23	0	0	0	0
• force majeure	0	0	0	0	0
Planned interruptions	**31**	**2**	**0**	**4**	**0**
Short-term interruptions	**0**	**0**	**0**	**0**	**0**

SOURCE: CDSS

Commercial Quality

The required level of commercial quality is determined by the system standards and guaranteed standards for commercial quality. A breach of the guaranteed commercial quality standards defined by the Energy Agency may bring financial consequences for the service provider, i.e., the payment of compensation to the consumer concerned. On the basis of the system standards, a consumer can expect a certain quality level, as these standards

The level of commercial quality of services markedly deteriorated in the area of connection-related services due to the increase in the time taken to issue connection approvals for self-supply devices.

indicate the average level of service quality or the share of all customers provided with the required service quality.

In 2021, no compensations for a breach of guaranteed standards were paid. Based on the three-year trend of commercial quality parameters, we conclude that the level of commercial quality has generally remained steady; in contrast, there has been a decrease in quality in the area of connection-related services. In certain areas of the distribution system in particular, the time taken to issue a connection approval has increased significantly, largely due to difficulties in connecting self-supply devices.

Table 20 shows the ranges (minimum and maximum values) of the commercial quality parameters in the 2019–2021 period.

TABLE 20: THE RANGE OF THE COMMERCIAL QUALITY INDICATORS IN THE 2019–2021 PERIOD

Commercial quality parameters	2019		2020		2021	
	Min.	Max.	Min.	Max.	Min.	Max.
Connection-related services						
Average time to issue a connection approval [days]	13.5	23.5	8.3	24.6	10.4	47.9
Average time to issue a cost estimate or proforma invoice for simple works [days]	2.6	6.0	3.1	5.2	2.8	7.9
Average time to issue a contract for connection to the LV system [days]	1.0	8.5	2.7	10.8	2.0	14.2
Average time to activate a connection to the system [days]	1.8	8.1	0.6	7.8	1.6	5.9
Customer service						
Average response time to consumers' written questions, complaints or enquiries [days]	1.1	5.7	2.0	4.3	1.3	3.3
Average hold time in the call centre [s]	15.0	109.7	12.0	92.1	13.0	93.7
Call centre performance indicator [%]	84.0	93.7	89.0	93.8	88.0	94.0
Technical services						
Average time to restore supply following a failure of a current limiting device (06:00–22:00)	0.9	2.1	0.9	1.7	0.8	2.2
Average time to restore supply following a failure of a current limiting device (22:00–06:00)	1.0	2.2	0.8	2.4	1.2	6.1
Average response time to voltage quality complaints [days]	12.8	29.6	13.7	18.8	14.4	31.9
Average time to resolve voltage quality inconsistencies [months]	2.9	31.0	1.1	35.6	0.3	41.8
Metering and billing						
Average time to remedy meter failures [days]	2.7	8.0	3.3	9.6	3.3	9.6
Average time to restore supply following disconnection due to non-payment [h]	0.1	8.7	0.1	9.1	0.1	9.2

SOURCE: ENERGY AGENCY

In relation to commercial quality, data on consumer complaints is also collected through a standardised procedure. 2021 saw a noticeable increase in the number of complaints due to exceeding the maximum time to resolve voltage quality deviations and delays in issuing a connection approval; both of these already represented the most frequent grounds for complaints in the past. There has also been a considerable increase in complaints, in most cases justified, about failures to notify consumers of a planned disconnection in time.

The increase in the number of complaints in the area of commercial quality has been accompanied by a decreasing share of those of them that are justified

The data on the share of justified complaints might be taken as an indication that consumers are aware of the rights that must be guaranteed by the DSO in the provision of its services.

The data on commercial quality complaints for the 2019–2021 period is summarised in Table 21.

TABLE 21: NUMBER AND SHARES OF JUSTIFIED COMMERCIAL QUALITY COMPLAINTS IN THE 2019–2021 PERIOD

Reason for complaint	Total number of complaints			Number of justified complaints			Share of justified complaints		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Connection activations									
Exceeding the time to activate a connection to the system	0	0	1	0	0	0	-	-	0%
Inadvertent disconnection due to an error by the maintenance crew	0	1	4	0	1	4	-	100%	100%
Quality of supply									
Exceeding the maximum time to resolve voltage quality deviations	6	4	15	6	3	3	100%	75%	20%
Exceeding the time limit to respond to a voltage quality complaint	0	7	0	0	6	0	-	86%	-
Exceeding the maximum permitted duration and number of unplanned long-term interruptions (applies only to end consumers on the MV system)	0	2	0	0	0	0	-	0%	-
Metering									
Delay in repairing a meter malfunction	2	1	1	2	0	1	100%	0%	100%
Billing, invoicing and debt collection									
Delay in responding to consumers' written questions, complaints or enquiries	3	1	2	3	1	2	100%	100%	100%
Connection-related services									
Delay in issuing a connection approval	7	0	14	0	0	8	0%	-	57%
Consumer services									
Failure to notify consumers about a planned interruption in time	0	2	7	0	0	6	-	0%	86%
TOTAL	18	18	44	11	11	24	61%	61%	55%

SOURCE: ENERGY AGENCY

In 2021, CDSs continued to monitor the commercial quality. Due to the greater system rigidity and a relatively low number of consumers, CDSs did not receive any consumer complaints relating to commercial quality.

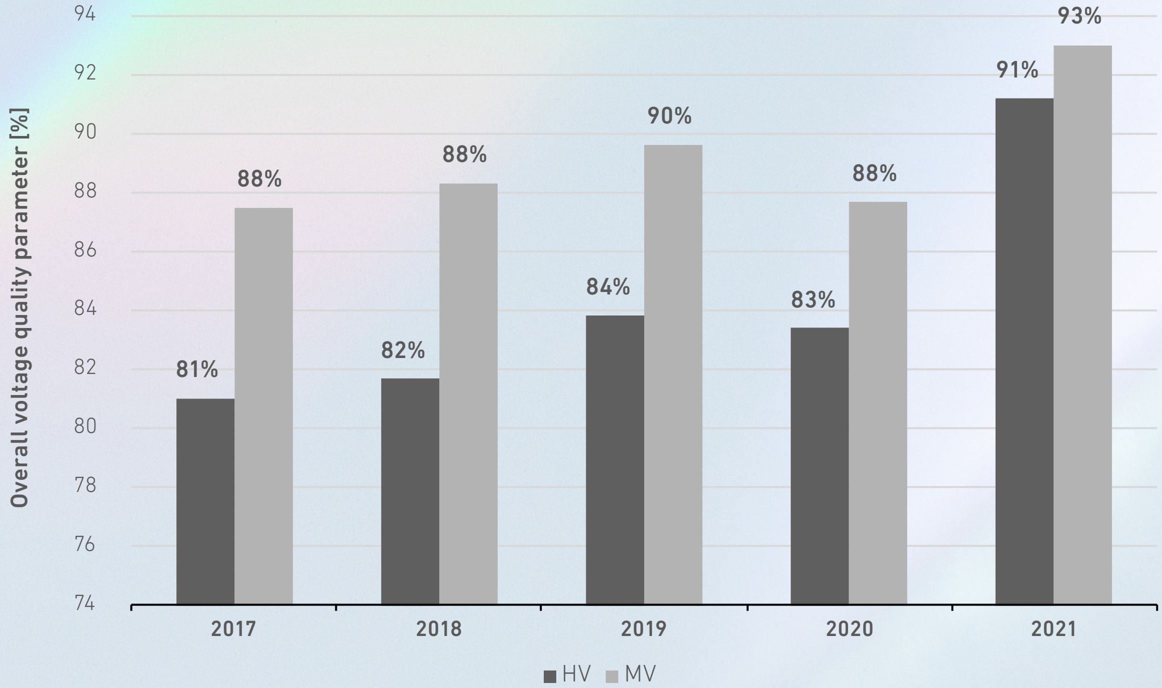
Voltage Quality

The two electricity system operators and the distribution companies are required to perform continuous monitoring at the border of the transmission and distribution networks, and at delivery points for larger consumers. In addition, occasional monitoring is carried out according to a predefined plan. When addressing a consumer's complaint, voltage quality is monitored for at least one week. Voltage quality is also monitored as part of the procedure for issuing connection approvals before a new consumer is connected.

A sharp increase in the number of complaints regarding voltage quality

On the basis of continuous voltage quality monitoring, an overall voltage quality parameter is calculated, reflecting the proportion of weeks in a calendar year during which the voltage quality parameters were in compliance with the requirements of the technical standard. Figure 37 shows the overall voltage quality parameters as derived from supply voltage deviations, harmonics and flicker for the HV and MV levels of the distribution system over the 2017–2021 period.

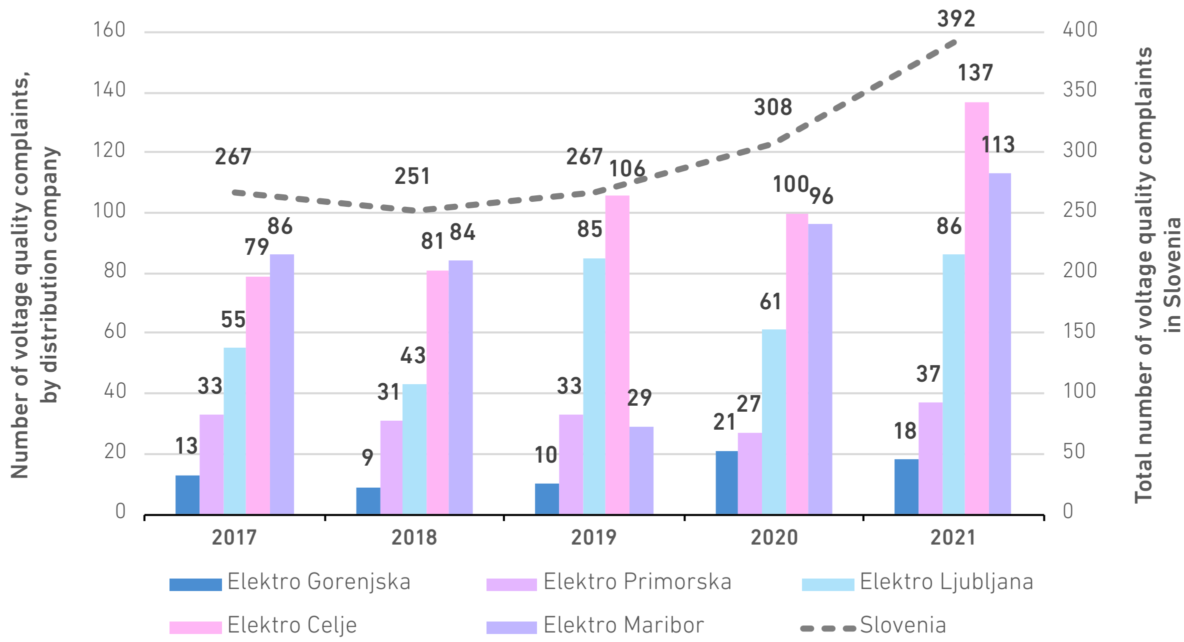
FIGURE 37: THE OVERALL VOLTAGE QUALITY PARAMETER BY INDIVIDUAL VOLTAGE LEVEL IN THE DISTRIBUTION SYSTEM IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

Figure 38 shows the trend in voltage quality complaints for individual distribution companies and for the entire territory of Slovenia. In recent years, the total number of complaints has been rising increasingly steeply, which could be a confirmation of the increasing difficulties in operating the distribution network under conditions of the accelerated connection of new consumers with devices such as self-supply facilities and heat pumps.

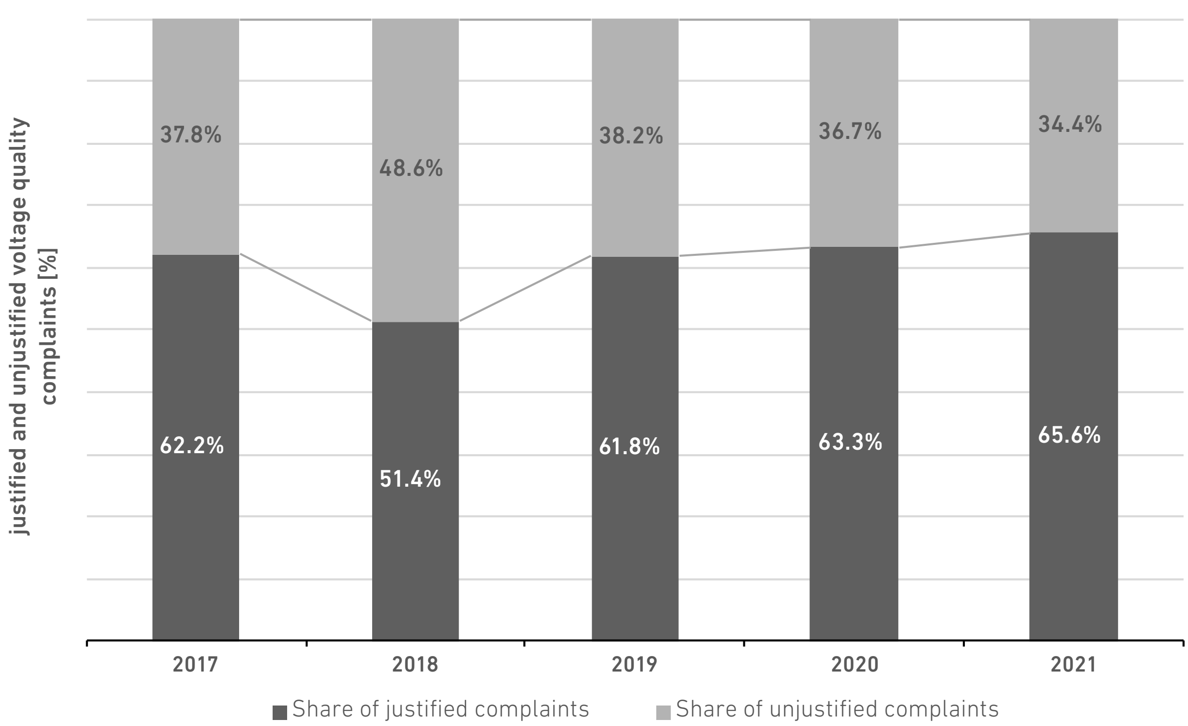
FIGURE 38: NUMBER OF VOLTAGE QUALITY COMPLAINTS BY DISTRIBUTION COMPANY AND IN SLOVENIA IN GENERAL IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

The increase in the total number of complaints has been accompanied by an increase in the proportion of justified complaints, as shown in Figure 39.

FIGURE 39: SHARE OF JUSTIFIED AND UNJUSTIFIED VOLTAGE QUALITY COMPLAINTS IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

ELES carried out the continuous monitoring of voltage quality in the high-voltage network at 202 connection points between the distribution system, producers and direct consumers. Similar to previous years, the most breaches of the standards were due to the occurrence of flicker. Deviations from the standard were recorded at 118 connection points. In addition to that, breaches of the standards relating to supply voltage were recorded in 2021 at two connection points.

In 2021, voltage quality monitoring according to the standard was also conducted by CDSs. In 2021, the Sij Acroni CDS and Jesenice CDS recorded a similar voltage quality as in previous years. The limits of the standard were exceeded due to flicker, which is beyond the control of the CDS operators. Non-compliance with the standard due to flicker was also detected at the Ravne CDS and the Štore CDS. Other than that, the CDSs did not receive any complaints relating to voltage quality monitoring.

The Multi-Year Development of the Electricity Network

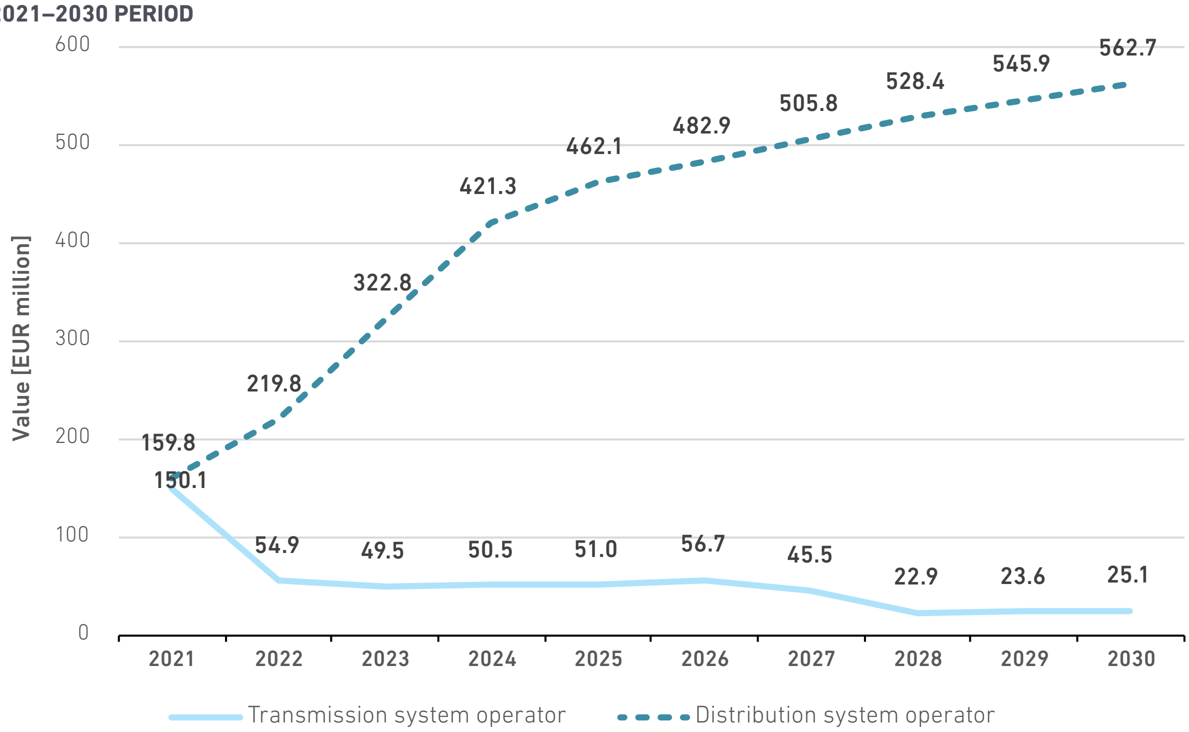
Every other year, the electricity system operators are required to formulate ten-year development plans for the electricity transmission and distribution system and have them approved by the ministry responsible for energy. The plans must take into account the country's strategic energy goals, be developmentally coherent and formulated according to the prescribed methodology, which takes into account long-term consumption forecasts, analyses of expected operating conditions, the degree of reliability of the supply to consumers, economic analyses, as well as the potential locations of new production sources.

In its planning, the transmission system operator draws on the analysis of the current situation, as well as forecasts of electricity demand. In the process of developing various scenarios, it also needs to adhere to the methodology of the European association for the cooperation of transmission system operators, ENTSO-E. The development plan must include an analysis of consumption coverage with existing production sources and the sufficiency of the said sources, as well as an assessment of the necessary transmission capacity to determine the time dynamics of planned investments and evaluate them financially.

The DSO's development plan must include an analysis of the period covered by the previous development plan, an analysis of the electricity and electric power consumption forecast, and a country-wide distribution infrastructure investment plan, which must also be financially evaluated.

In their development plans for the 2021–2030 period, the electricity system operators take into account, inter alia, the various scenarios for the transition to a low-carbon society as set out in the NECP and the related investments in the electricity infrastructure, valued at €590 million by the transmission system operator and at over €4.2 billion over the ten-year development plan period by the distribution system operator.

FIGURE 40: ASSESSMENT OF INVESTMENT RISKS FROM THE DEVELOPMENT PLANS PREPARED BY ELECTRICITY SYSTEM OPERATORS FOR THE 2021–2030 PERIOD



SOURCES: ELES, SODO

The transmission system operator's development plan by 2030 has been prepared in accordance with the long-term projections of growth in electricity demand on the transmission network, the planned construction of new production units, the expansion of the distribution network and the planned changes in the European transmission network. In designing future development scenarios, the development plan follows the guidelines and targets of the NECP, the methodology of the European Association of Transmission System Operators – ENTSO-E – and the European energy policy orientations. The general guidelines followed in the development of the set of new and reconstruction investments include: interconnection with neighbouring electricity systems, control of power flows and ensuring adequate voltage conditions in the entire Slovenian power system, ensuring reliable and safe operation in accordance with ENTSO-E recommendations and criteria, and the introduction of smart grids to improve the utilisation of the existing infrastructure and to achieve adequate stability and efficiency in order to meet European energy requirements. After the construction of the 400-kV Cirkovce–Pince transmission line, which will significantly increase the import capacity of Slovenia's transmission system and enable the import of cheaper electricity from Eastern Europe, as well as improve the reliability of the power supply in Slovenia, no further major increases of transmission network capacity are foreseen before 2030. The projects for the transition of the 220-kV transmission network to the 400-kV voltage level and the new direct current link between Slovenia and Italy are still in the study phase and their realisation will depend mainly on future market conditions.

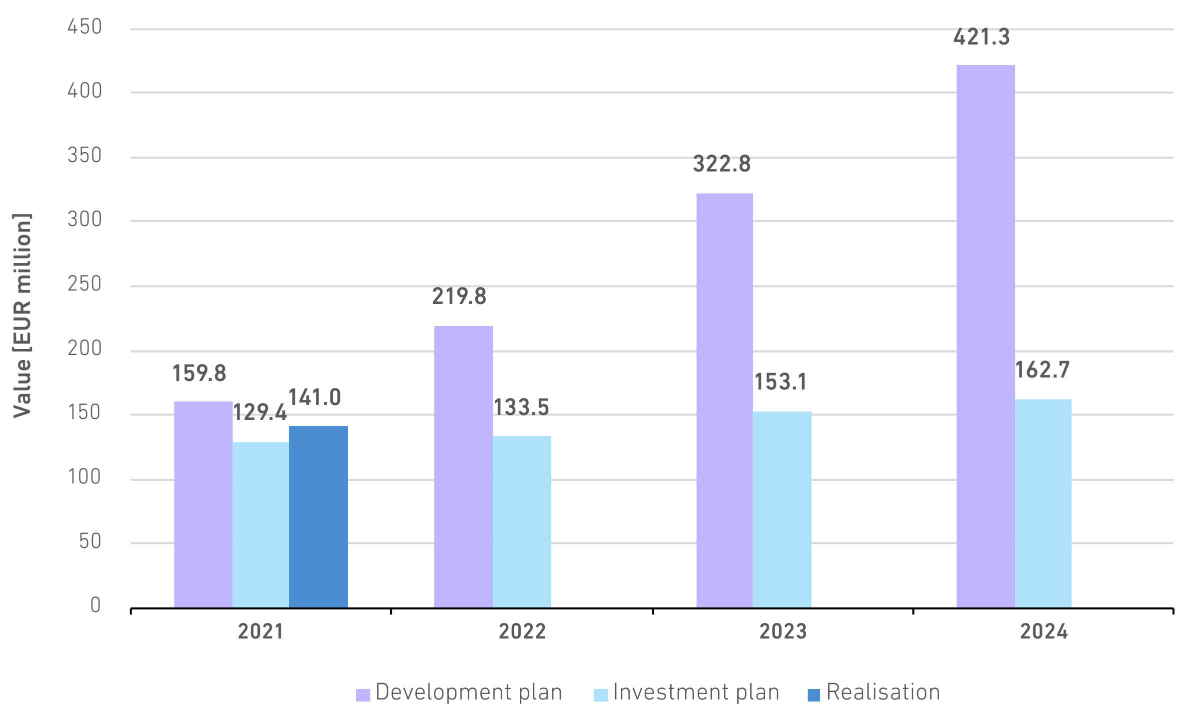
No further major increases of transmission network capacity are foreseen before 2030.

The DSO's distribution network development plan up to 2030 takes into account the objectives relating to the guidelines and targets of the national and European energy and environmental policy with the NECP as the starting point, while also taking into account both the past increases in peak loads and electricity consumption and the prognosis for the next ten-year period. The planned volume of investments, which is approximately two and a half times higher than the current distribution system development plans, is based on an assessment of the necessary network expansions and capacity increases due to the planned integration of distributed RES for electricity generation and the increased use of electricity for heating and for charging electric vehicles, with the aim of decarbonising the energy sector and transport. Compared to previous development plans, we see a marked shift towards addressing problems in the low voltage network; this is of key importance in addressing the objectives of the NECP, which, in addition to the above, include increasing the robustness of the network to ensure the long-term stability, reliability and availability of the distribution network while improving or maintaining the quality of the electricity supply.

The distribution system development plan for the 2021–2030 period is focused on fulfilling the objectives of the energy.

Funding for the distribution system development plan for the ten-year period from 2021 to 2030 is estimated at €4.2 billion, with the necessary investment amounts rising year by year from €159.8 million in 2021 to €562.7 in 2030. That said, questions are already arising as to whether the distribution system operator and the owners of the distribution network will be able to realise these planned investments. In the investment plans submitted for the 2021–2024 period, the planned investment funds are significantly lower than those proposed in the development plan. In fact, the discrepancy between the resources needed to realise the development and investment plan and the available resources has been increasing over the years. While investment realisation in 2021 at least somewhat exceeded the investment plan, the situation in 2022 and in the years to come remains in question, considering the government intervention in the payment of the network charge at the beginning of 2022.

FIGURE 41: COMPARISON OF THE AMOUNTS IN THE DEVELOPMENT AND INVESTMENT PLANS FOR THE ELECTRICITY DISTRIBUTION SYSTEM ALONG WITH THE REALISATION

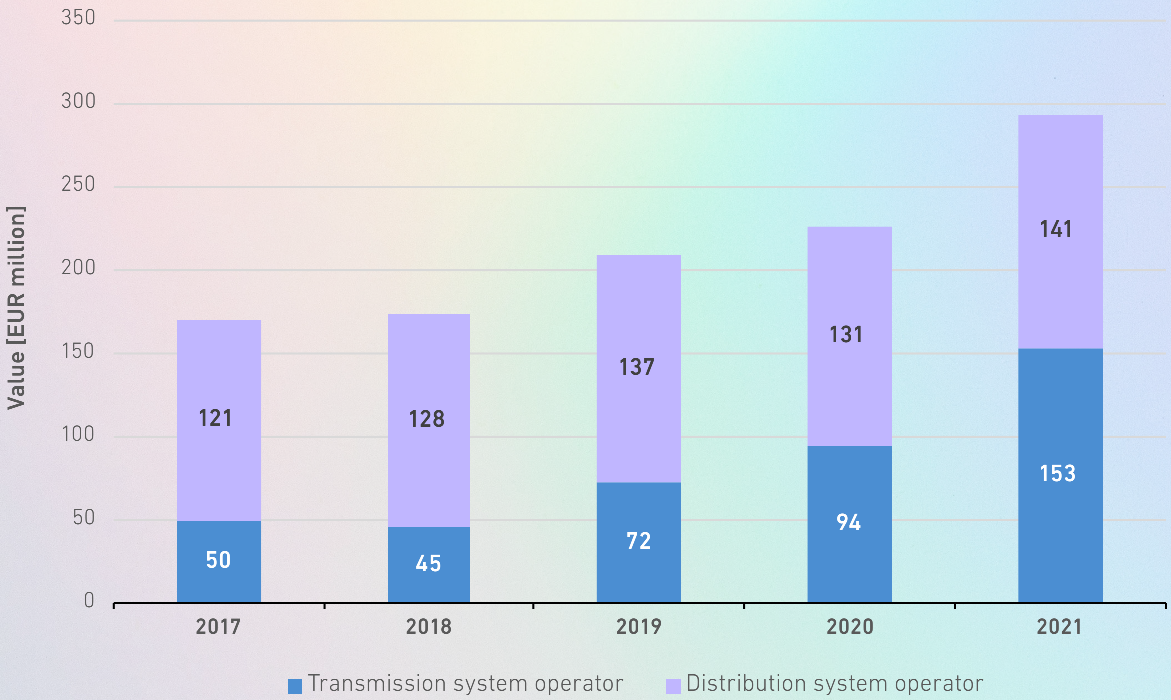


SOURCE: SODO

Supervision over Implementation of Electricity System Operators' Development Plans

In 2021, the TSO allocated €153.1 million to investments, which, despite being only 2% more than the investment funds provided for in the development plan, represents 286% of the funds provided for in the regulatory framework. Out of that amount, €128.1 million was allocated to new investments, €9.2 million to reconstructions and €15.8 million to other business investments. The largest share, 61.8%, was allocated to network investments, followed by smart grid investments (24.4%) and other business investments (10.3%). A smaller share comprises investments into secondary equipment and telecommunications and operational investments. Standing out in terms of value, at €61.6 million, is the investment into the Cirkovce-Pince 400 kV cross-border transmission line, which is also the main reason for the overrun of the funds projected in the regulatory framework, due to the postponement of its implementation to 2021. This is followed by investments in the area of smart grids, namely the installation of storage facilities at €21 million and the integration of compensation devices into the Slovenian electricity system at €8.6 million.

FIGURE 42: TRANSMISSION SYSTEM OPERATOR AND DISTRIBUTION SYSTEM OPERATOR INVESTMENTS FOR 2017–2021



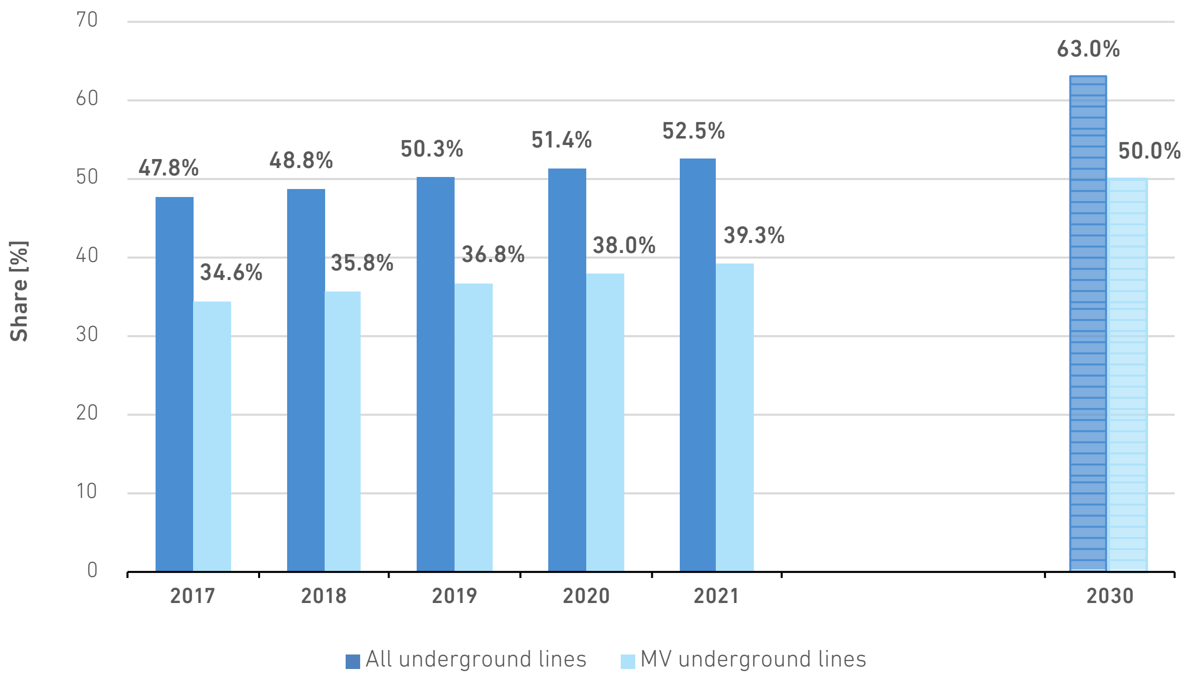
SOURCES: ELES, SODO

In 2021, the DSO and the owners of the distribution network earmarked EUR 140.5 million for investments into the distribution network, which is 108.7% of the funds planned in the regulatory framework, but only 87.9% of the funds planned in the development plan. Out of that amount, €72.6 million was allocated to new investments, €51.8 million to reconstructions, and €16.1 million to other business investments. In terms of voltage level, the majority of the investments, 37.4%, were made in the medium-voltage network, followed by 20.9% in the low-voltage network and 18.2% in the high-voltage network. The remaining amount comprises investments in secondary equipment (12.1%) and other business investments. By type, investments in medium-voltage underground lines dominated in terms of new constructions, followed by investments in low-voltage underground lines and HV/LV substations, with the development of advanced metering also accounting for a significant share. Regarding reconstructions, most of the funds were allocated to low-voltage underground lines and HV/LV substations.

Deviation of realised investments in the distribution network from the development plan

The share of underground lines in the distribution network has been increasing by just over one percent a year on average, representing 52.5% with respect to all the distribution lines at the end of 2021, or 39.3% when looking only at the MV distribution lines. Assuming continued growth at this rate, the NECP target of at least 50% of underground MV lines by 2030, to increase the resilience of the electricity distribution network, will be met.

FIGURE 43: GROWTH IN THE SHARE OF UNDERGROUND DISTRIBUTION LINES IN THE 2017–2021 PERIOD AND PROJECTION FOR 2030



SOURCES: ENERGY AGENCY, SODO, ELECTRICITY DISTRIBUTION COMPANIES

TABLE 22: TRANSMISSION AND DISTRIBUTION ELECTRICITY INFRASTRUCTURE IN SLOVENIA AT THE END OF 2021

Transmission system	
400-kV lines	670 km
220-kV lines	328 km
110-kV lines	1,927 km
HV/HV DTS	8
110-kV DS	1
Distribution system	
110-kV lines	919 km
35-kV, 20-kV, 10-kV lines	18,201 km
0.4-kV lines	45,141 km
110-kV/MV DTS	95
MV/MV DTS	7
MV DS	80
MV/LV TS	18,451

SOURCE: ELES, SODO, EDCs

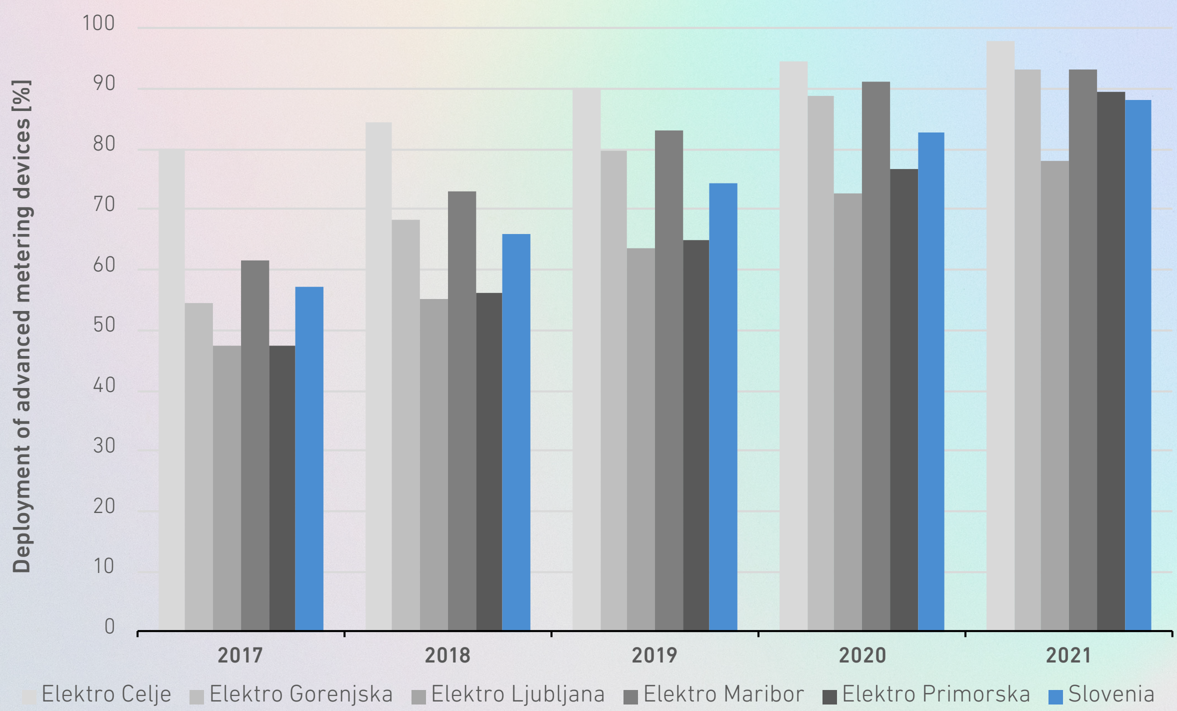
Development of the Advanced Metering System in Slovenia

Slovenia is one of the leading European countries in terms of the installation of advanced metering devices. At the end of 2021, no fewer than 88.1% of consumers connected to the distribution system were equipped with advanced metering devices, and 84.3% were included in remote meter reading.

The distribution companies have yet to ensure adequate usefulness of the detailed data collected by the advanced meters that have been installed for nearly 90% consumers.

Unfortunately, the installed metering devices are still lacking the minimum level of functionality required to provide the metering data necessary for the effective development of the electricity market, with the provision of 15-minute metering data being of particular concern. 25% of the consumers' metering devices lack the 15-minute acquisition interval capability entirely, and with the rest, the availability of this data is quite unstable and dependent on the network conditions. An additional problem is the difficulty of processing such a large amount of data, as the tools that have been used thus far have proved to be unsuitable.

FIGURE 44: TREND OF THE DEPLOYMENT OF ADVANCED METERING DEVICES IN THE 2017–2021 PERIOD



SOURCE: EDCs

Development of Smart Grids and Deployment of New Technologies

Smart grid development in Slovenia is guided by the study Update of the National Smart Grid Roadmap[5]. The study lists the key projects that, through the use of the technologies identified in the study, contribute to achieving the national targets in an optimal way. For distribution companies, the emphasis is on new, smart grid-supported planning and operational approaches, while on the transmission network, the focus is on intersectoral integration.

5 Update of the national smart grid roadmap, study No: 2444, EIMV, FE, FERI, Ljubljana, November 2020

In the 2019–2021 regulatory period, the Energy Agency promoted smart grid investments, as well as research and innovation by the electricity system operators, through dedicated incentive schemes. Both schemes were presented in detail in the Report on the State of the Energy Sector in Slovenia in 2020.

On its website, the Energy Agency publishes research and innovation project applications and basic information about the investment projects, as well as reports on all the projects it has qualified under its regulatory methodology. In addition to that, it supervises the qualified projects.

Smart Grid Investments

In 2021, the Energy Agency has not received any new project applications for smart grid investments. The implementation of two major projects, NEDO and SINCRO.GRID continued. These two projects are described in more detail in the Report on the Energy Situation in Slovenia in 2018.

The Green Switch project,[6] coordinated by ELES and developed by a consortium of nine companies, has also been added to the list of projects of common interest[7]. The project aims to optimise the level of utilisation of the existing electricity infrastructure and to enable the integration of new technologies and advanced functionalities into the transmission and distribution networks in Austria, Croatia and Slovenia in order to increase the penetration of renewables, effectively integrate new loads and improve the quality and security of the electricity supply. Investments in primary infrastructure and the deployment of various technologies, platforms and functionalities are foreseen in order to further the development of smart grids and active consumption, and to optimise the operation of the transmission and distribution networks in a coordinated manner.

Figures 45 and 46 show the structure of investment realisation by the electricity system operators and electricity distribution companies (EDCs) by smart grid function for 2020[8].

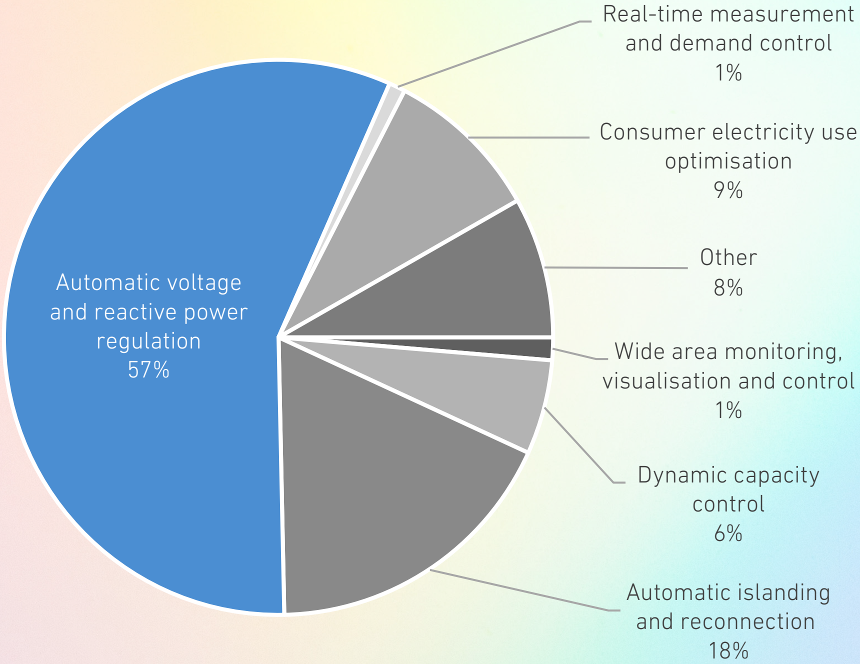
A total of €17.7 million in smart grid investments in 2020

The total value of ELES' investments in smart grids in 2020 amounted to approximately EUR 17.17 million, making up 18.2% of the company's total investments in that year. Investments in compensation devices and storage facilities represent the bulk of this amount.

The total value of EDC's investments in smart grids [9] in 2020 amounted to approximately EUR 0.56 million, making up 0.38% of the total investments by distribution companies.

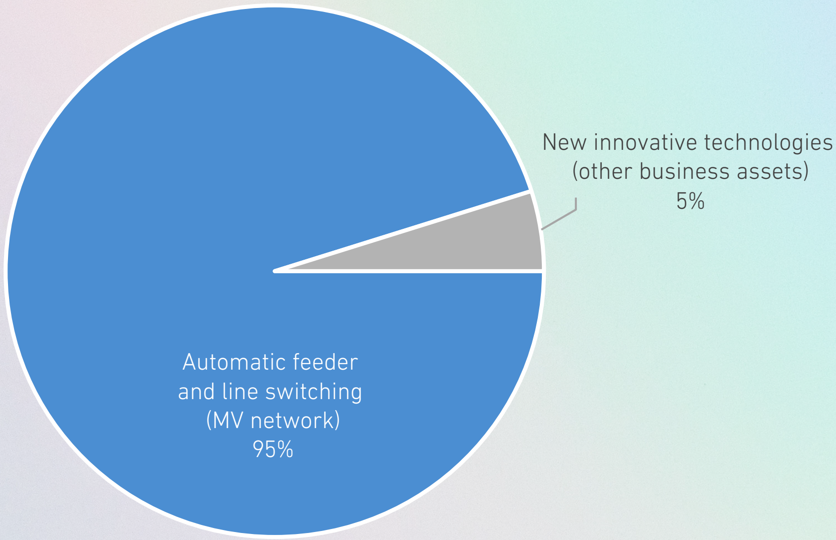
6 https://ec.europa.eu/energy/sites/default/files/fifth_pci_list_19_november_2021_annex.pdf
7 From Slovenia (ELES, Elektro Celje, Elektro Gorenjska, Elektro Ljubljana, GEN-I), Austria (KNG-Kärnten Netz GmbH) and Croatia (Hrvatski operator prijenosnog sustava, HEP Operator distribucijskog sustava, Hrvatska elektroprivreda).
8 Data for 2021 is not available due to the mechanism for accounting for deviations from the regulatory framework.
9 In 2020, Elektro Ljubljana was the only distribution company to invest in smart grids.

FIGURE 45: STRUCTURE OF ELES' INVESTMENTS IN 2020 BY SMART GRID FUNCTION



SOURCE: ENERGY AGENCY

FIGURE 46: STRUCTURE OF DISTRIBUTION INVESTMENTS IN 2020 BY SMART GRID FUNCTION



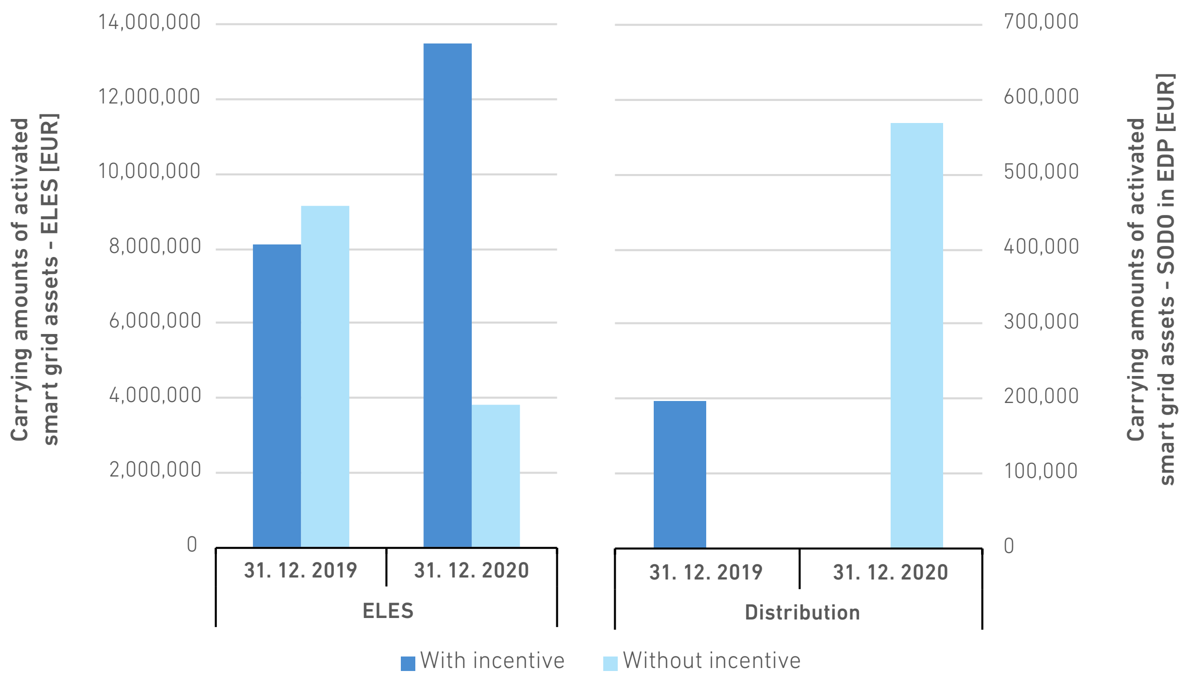
SOURCE: ENERGY AGENCY

Smart grid investment incentive scheme projects are qualified for implementation on the basis of a project application submitted to the Energy Agency. Incentives are granted on the basis of the qualification of the project and an assessment of the associated activated assets, which must meet the definition of smart grids and smart energy infrastructure as set out in the general act governing the methodology for determining the regulatory

Marked regional variation in the realisation of smart grid investments by EDCs

framework. The Energy Agency grants incentives on the basis of an assessment of the assets actually activated under the qualified smart grid project as reported by those with a reporting obligation in the annual process of accounting for deviations from the regulatory framework. Figure 47 shows a comparison of the carrying amounts of assets activated under smart grid projects that were granted an incentive and the carrying amounts of smart grid assets for which companies do not receive incentives. At the distribution level, SODO received an investment incentive in 2019, whereas Elektro Ljubljana did not apply for an incentive for investments in 2020. The rest of the EDCs did not invest in smart grids.

FIGURE 47: OVERVIEW OF THE CARRYING AMOUNT OF ACTIVATED SMART GRID ASSETS BY COMPANY



SOURCE: ENERGY AGENCY

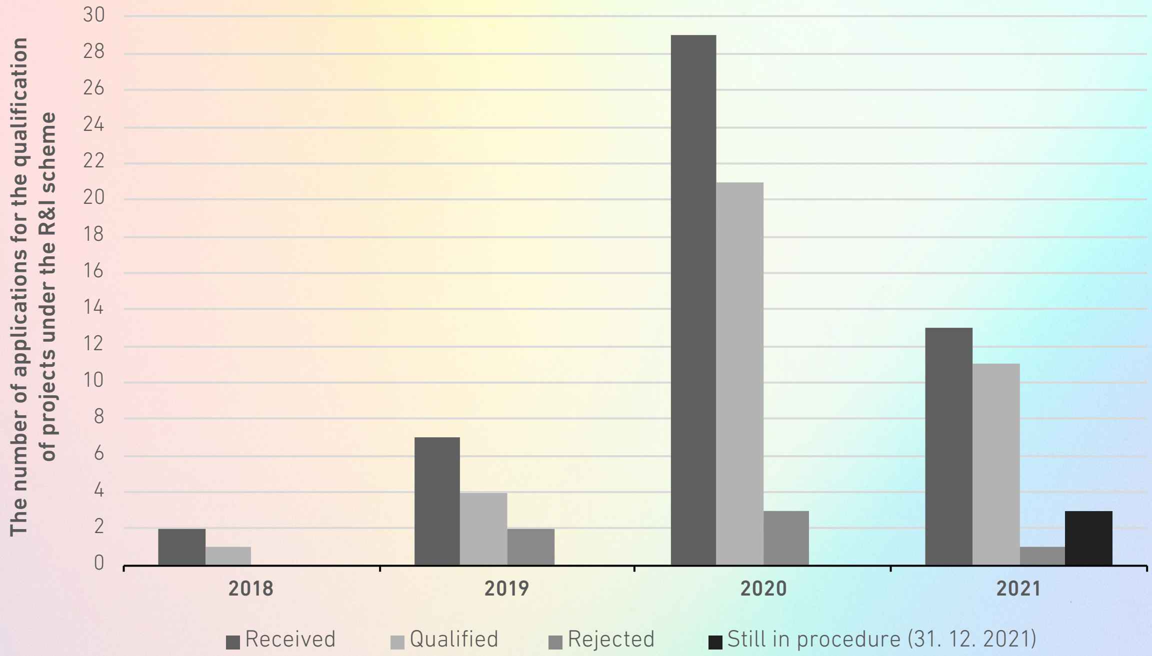
These results show that the distribution companies are somewhat passive in terms of investments in smart grids, with only SODO and Elektro Ljubljana reporting such investments. Investments by SODO are linked to the implementation of the ELES-led SINCRO.GRID project. Similarly, four[10] of the EDCs are involved, as infrastructure owners, in the implementation of the NEDO project, likewise led by ELES. At the end of the project, part of the NEDO project assets is expected to be transferred from ELES to the EDCs, since some of the assets currently held by ELES are essentially intended for use in distribution. Despite the overhauled smart grid[11] development strategy, no other activities in the area of smart grid investments have been identified.

Projects Included in the Research and Innovations Scheme

In 2021, the Energy Agency received 10 applications for the qualification of projects for the research and innovation scheme (R&I scheme). 11 projects qualified,[12] five of which would be finished. By the end of 2021, three of the projects were still in the qualification procedure. Figure 48 shows the number of applications for the qualification of projects under the R&I scheme by the individual year. The applications processed in 2021 included no projects featuring performance incentives by the Energy Agency aimed at eliminating regulatory barriers to the implementation of innovative measures that are not possible under the existing regulatory framework and involve the active participation of consumers.

10 Elektro Celje, Elektro Ljubljana, Elektro Maribor, Elektro Primorska
11 EIMV, UM-FERI, UL-FE, Update of the national smart grid roadmap, study No: 2444, 2020
12 Some of the applications were submitted in 2020.

FIGURE 48: OVERVIEW OF THE NUMBER OF APPLICATIONS FOR THE QUALIFICATION OF PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME IN THE 2018–2021 PERIOD

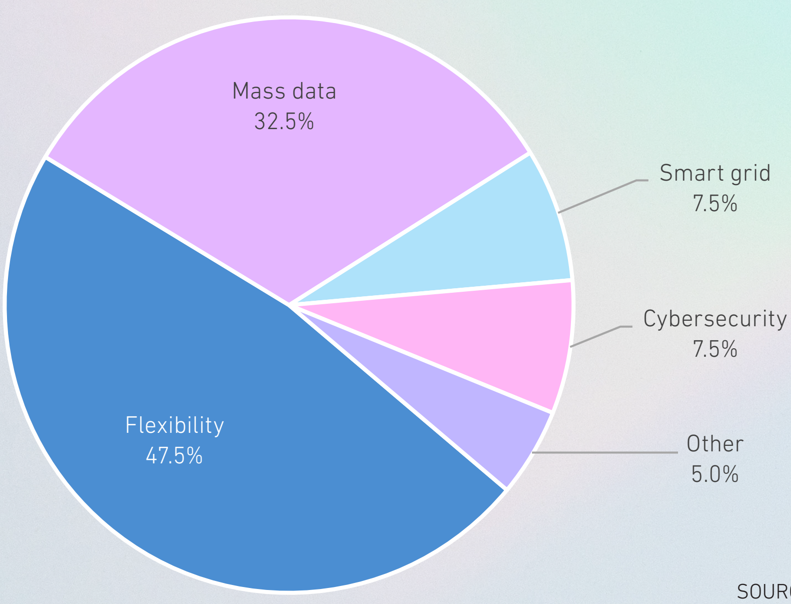


SOURCE: ENERGY AGENCY

Figure 49 features an overview of the central subjects of all the projects qualified by the end of 2021. Roughly half of the projects are related to the utilisation of flexibility for the benefit of the electricity system. In 2021, there was marked growth in the share of projects addressing the use of mass data for the benefit of the electricity system. Interest in cybersecurity projects is also increasing.

A 20% increase in the number of projects focusing on mass data

FIGURE 49: STRUCTURE OF THE MAIN TOPICS OF QUALIFIED PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME IN 2021

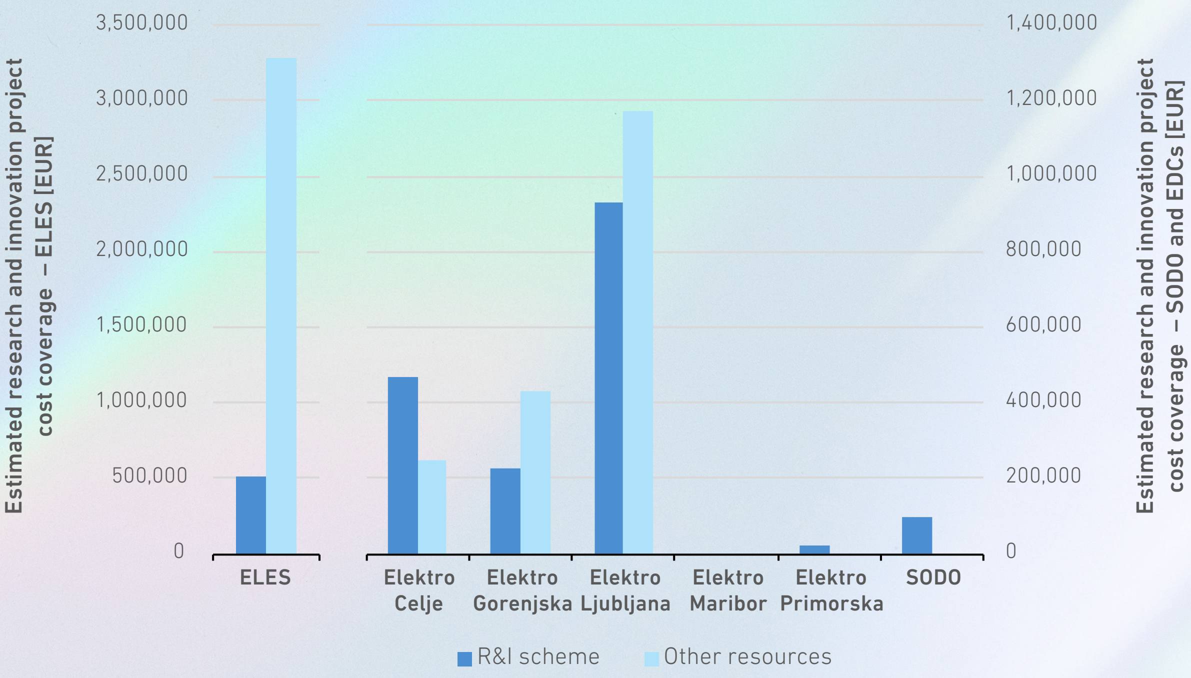


SOURCE: ENERGY AGENCY

In the 2019–2021 regulatory period, the electricity system operators and EDCs jointly developed projects with approximately €2.3 million covered by the R&I scheme and €5.1 million from other sources (the Horizon programme, etc.). Figure 50 shows the estimated[13] costs of the projects covered by the R&I scheme and other sources by company for the 2019–2021 period.

EUR 2.3 million for qualified projects under the R&I scheme

FIGURE 50: COST COVERAGE FOR QUALIFIED PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME BY COMPANY (ESTIMATE FOR THE 2019–2021 PERIOD)



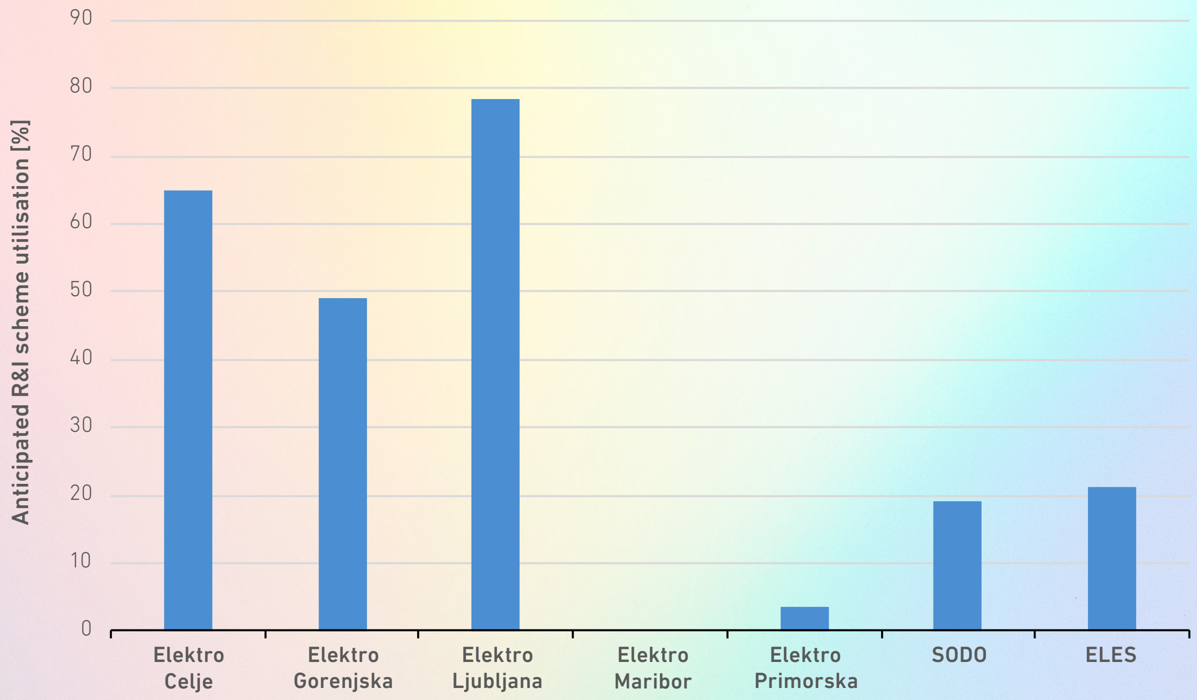
SOURCE: ENERGY AGENCY

The costs earmarked for research and innovation for a given company are capped at 0.5% of the recognised sources for covering the company's eligible costs. This also makes it possible to assess the uptake[14] of the R&I scheme with qualified projects on a company-by-company basis against the planned values under the regulatory framework, as shown in Figure 51.

13 When the duration of a project exceeds the 2019–2021 regulatory period, the costs of the project were distributed between the 2019–2021 regulatory period and the remaining duration of the project assuming an even distribution of costs over time for the duration of the project.

14 The mechanism for accounting for deviations from the regulatory framework prevents an assessment of the actual realisation.

FIGURE 51: TAKE-UP OF THE RESEARCH AND INNOVATION INCENTIVE SCHEME BY COMPANY AS A PERCENTAGE OF THE PLANNED VALUES UNDER THE REGULATORY FRAMEWORK



SOURCE: ENERGY AGENCY

The results show that four[15] regulated companies are intensely involved in the R&I scheme. In 2021, SODO had two projects in progress. Elektro Primorska participated in one of the projects managed by SODO, but did not submit an independent project application. Elektro Maribor had no project activities under the R&I scheme.

There is marked variation in the amount of research and innovation activities in the field of electricity distribution.

Cybersecurity of the Power System

In 2021, activities covering the legislative aspects of cybersecurity in the energy sector and specific regulatory aspects within the scope of national regulators continued. Part of the Energy Agency's responsibilities is to monitor investments in cybersecurity, including activities performed by public service companies in the area of information security and data protection, and the associated development activities. The Energy Agency continued to raise awareness among stakeholders and monitor their activities in the area of cybersecurity. In addition, the Energy Agency provided stakeholders with up-to-date information via the Slovenian Energy Security Forum (SEVF).

EU Legislation

While digital transformation brings new opportunities, it also brings risks to the European economy and society. Despite the progress in EU rules, the cybersecurity capabilities in the EU remain uneven and protection against cyber threats is insufficient. This prompted a review of the EU rules on network and information system security, which included:

- an assessment of progress in the area of cybersecurity in the EU,
- the identification of existing and new problems,
- a delineation and quantification of regulatory costs and benefits.

In parallel, activities were underway to issue new network rules for cybersecurity, which expand the existing network rules for the energy sector to include rules for cybersecurity. Activities were also carried out to update Directive (EU) 2016/1148 concerning measures for a high common level of security of network and information systems across the Union (hereinafter: Directive NIS2), adopt the Directive on the Resilience of Critical Entities and establish the European cybersecurity certification scheme.

15 ELES, Elektro Celje, Elektro Gorenjska, Elektro Ljubljana

Recast of Directive 2016/1148

The first cybersecurity directive, i.e., the Network and Information Systems (NIS) Directive, came into force in 2016 and addressed a higher and more uniform level of security for networks and information systems across the EU. Recent years have witnessed a remarkable rate of digitisation, which has resulted in circumstances requiring an update of the directive. The COVID-19 epidemic has taken digitisation to the next level, transferring many activities from the physical to the cyber environment. Even though NIS increased the member states' cybersecurity capabilities, its implementation has proved challenging; this led to fragmentation at different levels of the internal market. In response to the mounting threats represented by digitalisation and the increased prevalence of cyber-attacks, the EC put forward a proposal to replace the NIS directive in order to strengthen the security requirements, address supply chain security, simplify the reporting obligations and introduce stricter control measures and more stringent enforcement requirements, including harmonised sanctions across the EU. The proposed increase in the scope of the NIS2, which effectively obliges more entities and sectors to adopt measures, will contribute to an improvement of European cybersecurity in the long term. In the European parliament, the brief was assigned to the Committee on Industry, Research and Energy. The Committee adopted its report in the final quarter of 2021, receiving a mandate to begin interinstitutional negotiations.

The adoption of the revised directive on the measures for a high common level of security of network and information systems in the EU is scheduled for the third quarter of 2022.

Directive on the Resilience of Critical Entities

The goal of the proposed directive on the resilience of critical entities is to secure the provision, on the internal market, of the services that are crucial for the preservation of key social functions or economic activities by increasing the resilience of critical entities providing such services. The proposal for the Directive reflects recent calls to action by the Council and the European Parliament, both of which have encouraged the EC to revise its current approach to better reflect the increased challenges faced by critical entities and to ensure closer alignment with the NIS Directive. This proposal is consistent with and establishes close synergies with the proposed amendment of the directive on measures for a high common level of cybersecurity throughout the EU (hereinafter: NIS2 Directive), which is slated to supplant the NIS Directive, in order to address the increased interconnectedness of the physical and digital worlds through a legislative framework that brings robust resilience measures for both cyber and physical aspects, as set out in the Security Union Strategy.

The Directive on the Resilience of Critical Entities is scheduled to be adopted in the final quarter of 2022.

Network Rules for Cybersecurity

Following the final reports of the group for the preparation of baselines, the mandate to develop a framework for the network rules for cybersecurity was given to ACER, which finished the conceptual design in the first quarter of 2021. On the basis of this framework, the EU DSO and CEER have started working on the design of the rules. In this regard, cooperation with national energy regulators and cybersecurity authorities will be essential. This initiative will help improve the resilience of the European electricity system and the reliability of supply. It builds on the authority that the European Parliament and the Council delegated to the EC with the electricity directive to develop sectoral rules (network code) on the cybersecurity aspects of cross-border electricity flows, including rules on common minimum requirements, planning, monitoring, reporting and crisis management.

The network rules for cybersecurity are planned to be adopted in the third quarter of 2022.

European Cybersecurity Certification Scheme

The EUCC will establish a European cybersecurity certification scheme based on common criteria. This voluntary scheme will introduce a set of security requirements for ICT products dedicated to security (e.g. firewalls, encryption devices, electronic signature devices) and ICT products embedding a security functionality (i.e. routers, smartphones, banking cards). The products certified under this scheme will provide consumers with improved security.

Regulatory Aspects – Important Activities

The Energy Agency, as part of the CEER Cybersecurity Work Stream (CEER CS WS), participated in the review of the draft network rules on cybersecurity in the energy sector and in the preparation of the annual report on cybersecurity activities in the energy sector. Within the ACER RISIG group, the Energy Agency participated in the substantive coordination of the draft document on REMIT data exchange between national regulators and external authorised stakeholders.

Operational Aspects – Important Activities

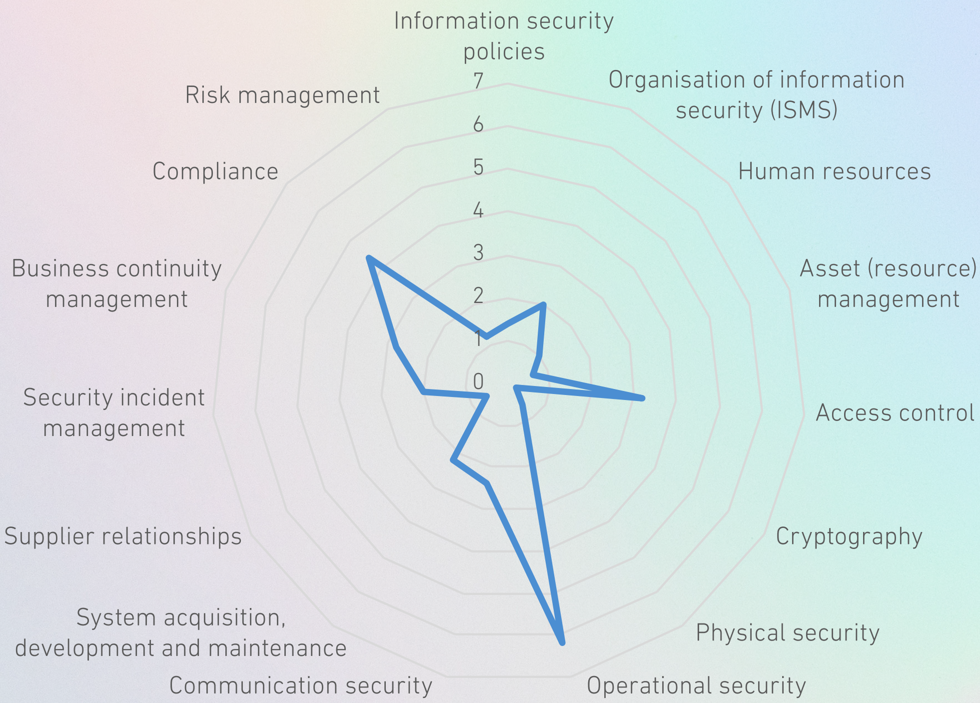
Public Service Companies

The SEVF continued its expert dialogue in the area of information/cyber security and data protection with public service companies in the energy sector, state authorities, and European and other institutions (SI-CERT, URSIV, ACER, CEER). The Energy Agency informed SEVF participants about the current activities of the EC in the field of cybersecurity in the EU energy sector and the activities of the CEER CS WS. Relevant security threat alerts published by the national and European cyber security response centres SI-CERT, US-CERT and CERT-EU, as well as by the other sectoral response centres for information technology, ICS-CERT and MS-ISAC, are promptly forwarded by the Energy Agency to stakeholders. The Energy Agency also occasionally informs stakeholders about notifications from the cybersecurity group of the Hungarian regulator, E-ISAC.

Public service companies primarily implemented actions in the areas of information (IT) and operational (OT) technology. A summary of the most important measures/activities by stakeholder, broken down by domains and areas per ISO/IEC 27002, is provided in Table 23, while the polar chart in Figure 52 shows the normalised distribution of activities by domain.

Activity monitoring by area according to ISO 27002

FIGURE 52: NORMALISED DISTRIBUTION OF ACTIVITIES BY PUBLIC SERVICE COMPANIES BY DOMAIN



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS, EDCs, PLINOVODI

TABLE 23: ACTIVITIES OF PUBLIC SERVICE COMPANIES IN THE FIELD OF INFORMATION/CYBER SECURITY

Domain	Area	ELES	SODO	EL-MB	EL-CE	EL-LJ	EL-GO	EL-PR	Plinovodi
IT	Information security policies	✓	✓	✓	–	–	✓	–	✓
OT		✓	–	–	–	–	–	–	✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	✓	✓	–	–	✓
IT	Organisation of information security	✓✓✓	✓	–	–	–	–	–	✓✓
OT		–	–	–	–	–	✓	–	✓✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	–	✓✓✓	✓✓	–	✓
IT	Human resources	✓	–	–	✓	✓	✓	–	✓
OT		–	–	–	–	–	✓	–	✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	–	–	–	–	✓✓
IT	Asset management	–	✓	–	–	–	✓	✓	✓✓✓
OT		–	–	–	–	–	–	–	✓✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	–	–	–	–	–
IT	Access control	✓	✓	✓✓	✓	✓✓	✓	✓	✓✓✓
OT		✓	–	–	–	✓	–	–	✓✓
Measurements		–	–	✓✓	✓	✓	–	–	–
Other		–	–	–	–	–	–	–	✓
IT	Cryptography	–	–	–	–	–	–	–	✓
OT		–	–	–	–	–	–	–	–
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	–	✓	–	–	–
IT	Physical security	✓	✓	–	–	✓	✓	–	✓
OT		–	–	–	–	–	–	–	✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	–	–	–	–	✓
IT	Operations security	✓	✓	✓✓✓	✓	✓✓✓	✓	✓	✓✓✓
OT		✓	–	✓	✓	✓	✓✓	✓	✓✓✓
Measurements		–	–	✓	–	✓	–	–	–
Other		–	–	–	✓	–	–	–	✓
IT	Communications security	–	✓	✓	–	✓	✓	–	✓✓✓
OT		–	–	✓	✓	✓	✓	–	✓✓✓
Measurements		–	–	–	✓	–	–	–	–
Other		–	–	–	–	–	–	–	–
IT	System acquisition, development and maintenance	–	✓	–	✓	✓	–	✓	✓
OT		–	–	–	✓	✓	✓	✓	✓
Measurements		–	–	–	✓	✓	–	–	–
Other		–	–	–	–	–	–	–	–
IT	Supplier relationships	–	✓	–	–	✓	–	–	✓
OT		–	–	–	–	–	–	–	✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	✓	–	✓	–	✓
IT	Security incident management	✓	✓	✓	–	✓	✓	✓	✓✓
OT		–	–	–	–	✓	✓	–	✓✓
Measurements		–	–	–	✓	✓	–	–	–
Other		–	–	–	✓	–	✓	–	✓
IT	Business continuity management	✓	✓	✓	–	✓	✓✓	✓	✓
OT		✓	–	–	–	✓	✓	–	✓
Measurements		–	–	–	–	✓	–	–	–
Other		–	–	–	✓	–	–	✓	–
IT	Compliance	–	✓	✓✓	–	✓✓	–	✓	✓✓
OT		✓	–	–	–	–	–	–	✓✓
Measurements		–	–	–	✓	–	–	–	–
Other		–	–	✓✓	✓	✓✓	✓✓	✓✓	–
IT	Risk management	✓	✓	✓	–	✓	–	–	✓
OT		–	–	–	–	–	–	–	✓
Measurements		–	–	–	–	–	–	–	–
Other		–	–	–	–	✓	✓	–	–

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS, PLINOVODI, EDCs

Key:	By domain	The scope of activity
✓	One or two activities	
✓✓	More than three activities	
✓✓✓	More than six activities	
–	No important activities	

ELES

In 2021, the transmission system operator carried out 25 important activities, of which 70% were in the area of business data processing and 30% in the area of operational technology. The major sub-areas in the improvement of the maturity of controls in information security in areas according to ISO 27002 were those concerning internal organisation (contact with authorities), reporting information security events, information security continuity (monitoring remote working functionality and security), information security policy (review of information security policies), information security review and access control within the scope of the SUVI, and implementing information security continuity.

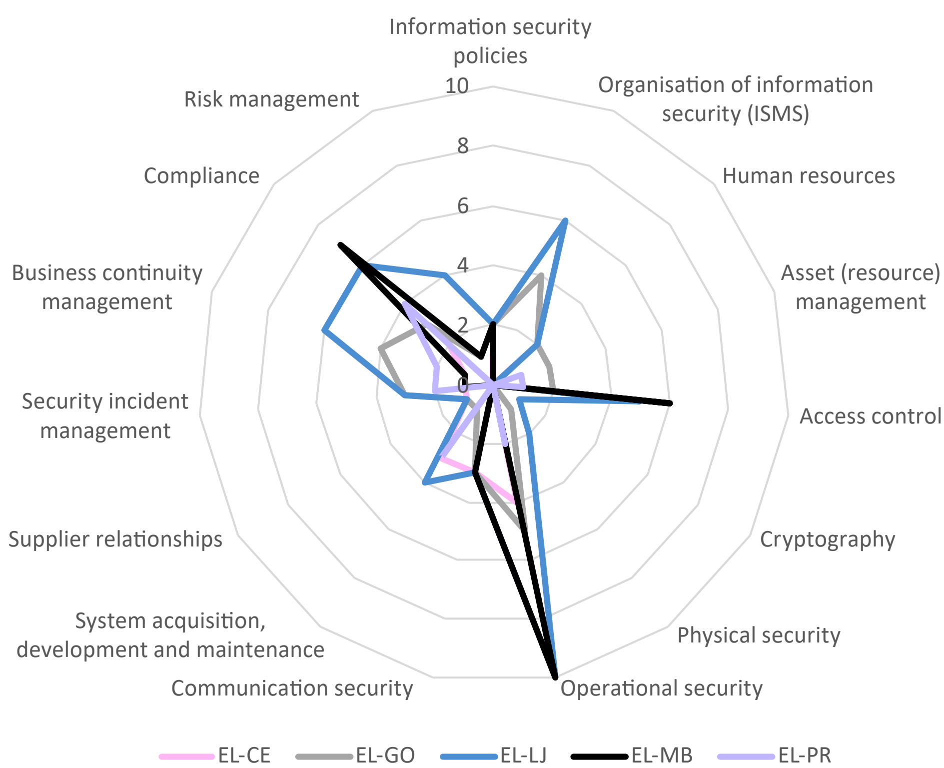
SODO

In 2021, the distribution system operator carried out a single activity in each of the areas in the business data processing domain; there were no major activities in the areas of human resources and cryptography.

Distribution Companies

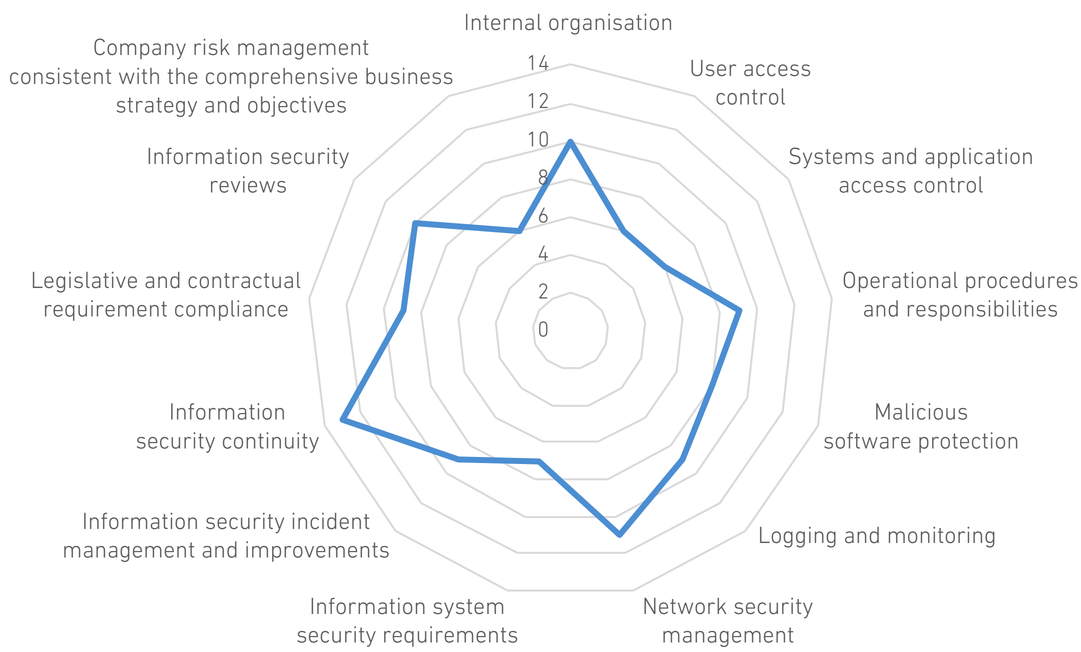
In 2021, EDCs carried out a total of 154 important activities in the area of information security. Of those activities, 45% were in the area of business data processing, 20% in the area of operational technology, 10% in the area of measurements and 25% were miscellaneous activities. The major areas in the improvement of the maturity of controls in information security in areas according to ISO 27002 are highlighted in the polar chart in Figure 53, while the most important sub-areas of the activities of distribution companies are shown in the polar chart in Figure 54.

FIGURE 53: DISTRIBUTION OF EDCs' ACTIVITIES BY AREA



SOURCES: ENERGY AGENCY, EDCs

FIGURE 54: THE MOST IMPORTANT SUB-AREAS OF ACTIVITIES BY EDCs



SOURCES: ENERGY AGENCY, EDCs

Plinovodi

The volume of activities carried out by the natural gas transmission system operator in 2021 represents less than half of the total activities compared to the EDCs. 117 major activities were carried out – 50% in the area of business data processing, 40% in the area of operational technology; 10% were miscellaneous activities (e.g. personal data protection, etc.). The focus in the improvement of the maturity of controls in information security in areas according to ISO 27002 was on the following sub-areas: network security management, systems and application access control, information classification, logging and monitoring, and backup.

Electricity System Cybersecurity Exercises

In 2021, NATO's largest regional cyber defence exercise, Cyber Coalition 2021 (hereafter: CC21 exercise), was conducted. It was planned and conducted by Allied Command Transformation in cooperation with representatives of Alliance members under the auspices of the EU Military Committee. With the CC21 exercise, which took place from 29. 11. 2021 to 3. 12. 2021, Slovenia realised the exercise planned (in accordance with government decisions and the exercise plan) in the 2021 exercise plan of the defence system and the disaster response system. The basic scenario of the CC21 exercise was based on an international NATO mission in a fictitious territory that had recently been divided into two entities with ongoing hostilities between them due to disputes. The NATO mission, which included all CC21 participant countries with their respective military commands taking part in the CC21 exercise, faced various cyber operations by one of the aforementioned entities in the role of an adversary. The events in the CC21 exercises were triggered according to the CC21 exercise scenario and the development of five stories linked to legal questions answered by national legal experts. The scenario exhaustively described the historical context that the entire CC21 exercise was set in. This was further enhanced by the "simulated" media coverage before and during the CC21 exercise. The objective of the CC21 NATO Exercise was to exercise and test the capabilities, procedures and tools used by NATO and allies in their regular work for responding to cyber incidents. The basic purpose of the CC21 exercise was solving technical problems and practicing cooperation procedures and collaborative problem-solving. In accordance with the Decision on Slovenia's participation in the Cyber Defence Exercise Cyber Coalition 2021 – CC21, Slovenia supplemented the NATO objectives of the CC21 exercise with national objectives in order to test the response of Slovenia's national security system in the event of complex cyber threats and incidents. Slovenia supplemented the NATO CC21 exercise scenario with a national scenario, thus expanding the NATO CC21 exercise in Slovenia into a national cyber exercise. According to the national scenario, the NATO exercise CC21 and the national exercise in Slovenia not only involved state authorities but also various companies, as well as AKOS, ELES, Elektro Ljubljana and the Energy Agency (as an observer).

Network Charge for the Electricity Transmission and Distribution System

Network Charge Determination

The Energy Agency accomplishes the economic regulation of the electricity system operators' activities using the method of a regulated network charge. By setting the network charge and other revenues while taking into account the network charge surplus from previous years, the Energy Agency allows the electricity system operator to cover all eligible costs within the regulatory period, as well as any network charge deficit from previous years.

Through regulation, the Energy Agency incentivises the operators' cost-effectiveness, ensures their continuous and stable operation and maintains a stable environment for investors and owners, as well as stable and predictable conditions for the consumers in the system.

Before the start of the regulatory period, the Energy Agency uses certain criteria to determine the planned eligible costs and the planned resources to cover them. Within these parameters the network charge and, consequently, the tariff rates for the network charge are set, taking into account the regulated network charge method.

Eligible costs are the costs necessary to perform an activity and are determined on the basis of criteria set out in the general act governing the methodology for determining the regulatory framework. Eligible costs include operation and maintenance costs (SDV), costs of electricity losses in the system (SEEI), ancillary services costs (SS), depreciation costs (AM), research and innovation costs (RI), the regulated return on assets (RROA) and incentives (S).

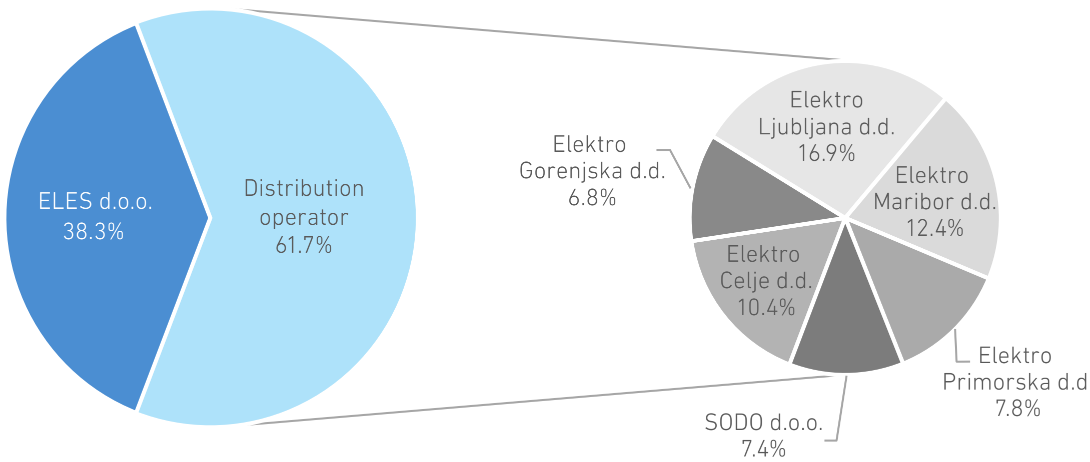
After the end of each year of the regulatory period, deviations from the regulatory framework, defined as the difference between the recognised eligible costs of the electricity system operator and the recognised resources available to cover the eligible costs, are determined. Deviations from the regulatory framework are reflected in a deficit or surplus of the network charge, which is taken into account when the next regulatory framework is set.

1 January 2019 marked the beginning of a three-year regulatory period that ran until 31 December 2021. In 2018, the Energy Agency issued the Legal Act on the methodology for determining the regulatory framework and network charges for the electricity distribution system. In 2018, on the basis of this Act, it set the regulatory framework for the transmission and distribution system operators for the 2019–2021 period through two decisions in which it also set the network charge tariffs.

For the three-year period in question, the Energy Agency set the planned eligible costs for the activity of the transmission system operator (ELES) at €518.9 million, an increase of 5.7% compared to the previous regulatory period, and those for the activity of the distribution system operator (DSO) at €846.1 million, an increase of 0.7% compared to the previous regulatory period. The structure of the planned eligible costs for each year of the 2019–2021 regulatory period does not vary significantly within a particular activity. In both activities, the operational and maintenance costs represent the bulk of the total costs.

For 2021, the Energy Agency set the planned eligible costs for the activity of the transmission system operator (ELES) at €176.5 million and those for the activity of the distribution system operator (DSO) at €284.0 million. Figure 55 shows the structure of the planned eligible costs in 2021 for each of the companies.

FIGURE 55: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION AND DISTRIBUTION OPERATOR FOR 2021



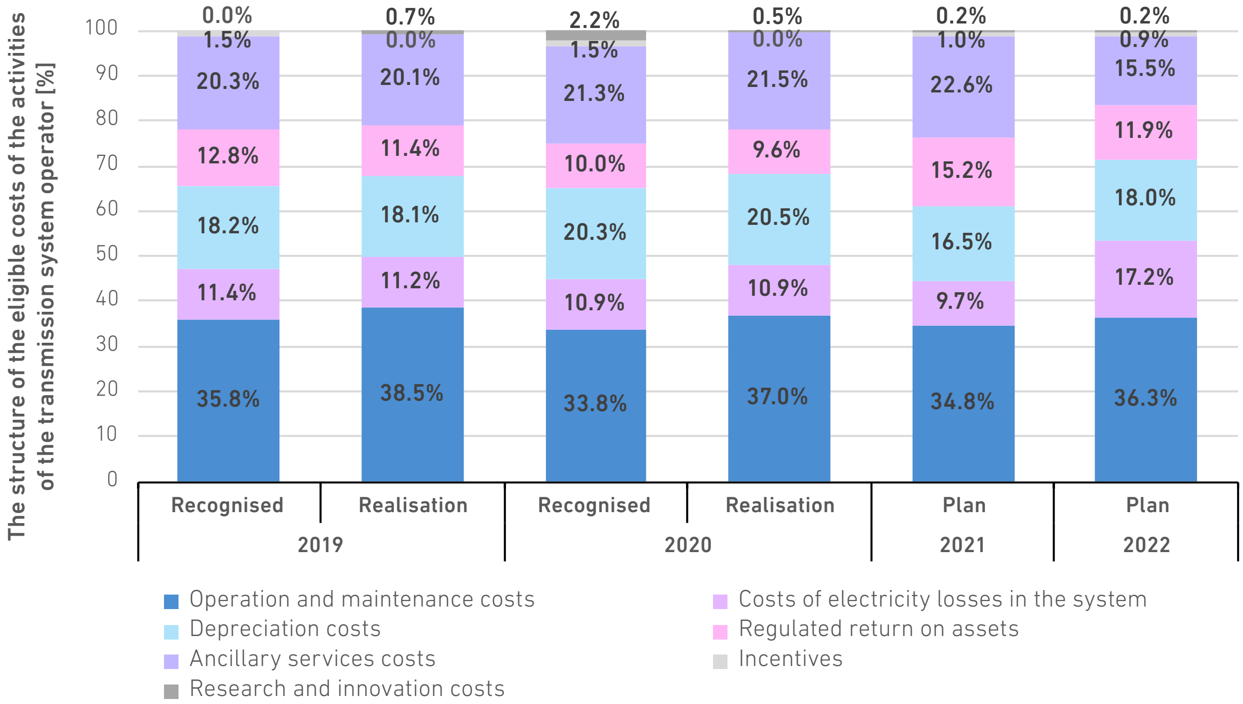
SOURCE: ENERGY AGENCY

On the basis of the criteria set out in the Act, the electricity system operators converted the planned eligible costs from 2019 and 2020 into costs recognised by the regulation. The Energy Agency verified the conversion process and issued special decisions. The Energy Agency also calculated the realised eligible costs using the accounting records of the electricity system operators and electricity distribution companies.

Comparing the structure of the transmission system operator's recognised eligible costs in 2019 and 2020 shows that in 2020, compared to 2019, the share of operation and maintenance costs, costs of electricity losses in the system and the regulated return on assets decreased, while the share of ancillary service costs and amortisation costs increased. In 2020, for the first time, the TSO's research and innovation costs of €3.7 million were recognised, representing 2.2% of the total recognised eligible costs.

Comparing the structure of the recognised and realised eligible costs (Figure 56) of the transmission system operator shows that in 2019 and 2020, there were once again significant differences in the operation and maintenance costs and regulated return on assets, and no significant differences in the rest of the eligible cost items. In 2020, as in 2019, the operation and maintenance costs represented a higher percentage of the total realised eligible costs than of the recognised eligible costs. This means that in 2019 and 2020, the TSO operated in a cost-inefficient way and consequently realised a regulated return that was lower than that recognised by the regulation.

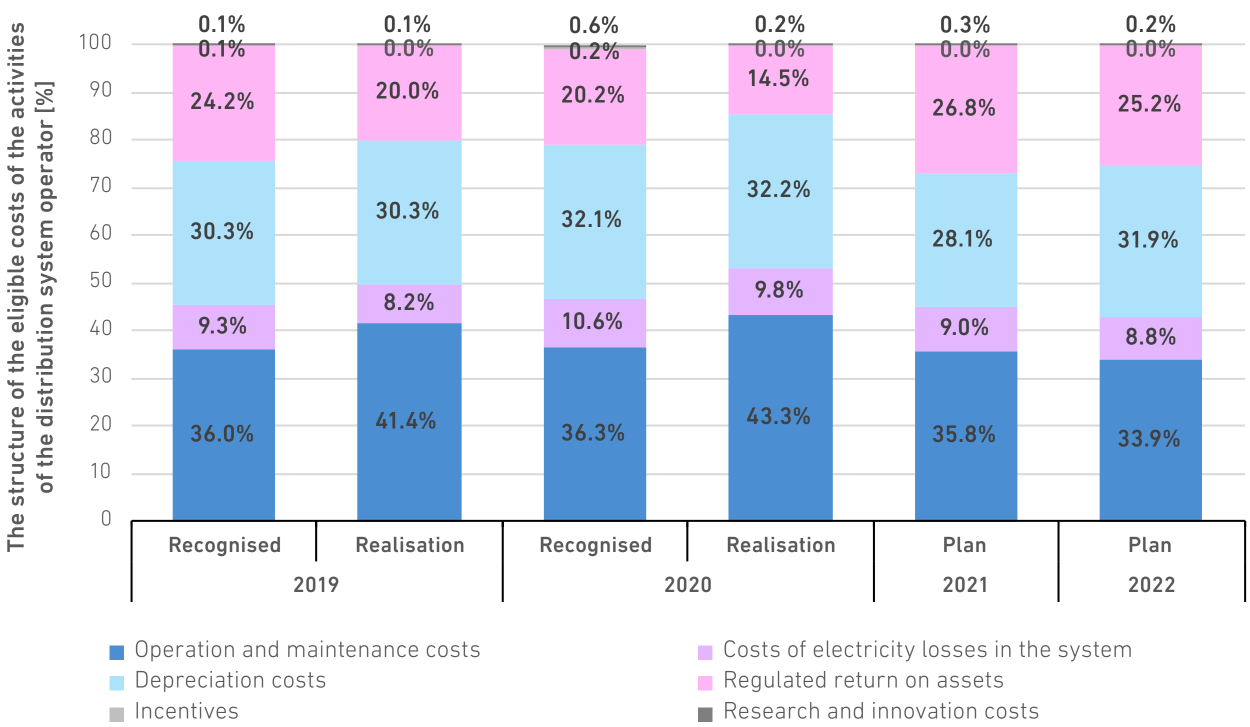
FIGURE 56: THE STRUCTURE OF THE ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION SYSTEM OPERATOR IN THE 2019–2022 PERIOD



SOURCE: ENERGY AGENCY

Figure 57 shows the structure of eligible costs for the DSO's activity, with the costs calculated as the sum of eligible costs of EDCs and the distribution system operator. Comparing the structure of the recognised and realised eligible costs shows that the distribution operator's activity in the area of operation and maintenance costs was likewise cost-inefficient, a fact reflected in a realised regulated return lower than that recognised by the regulation. Comparing the structure of the recognised and realised eligible costs in 2019 and 2020 shows that cost-efficiency in 2020 was somewhat worse than in 2019.

FIGURE 57: THE STRUCTURE OF THE ELIGIBLE COSTS OF THE ACTIVITIES OF THE DISTRIBUTION SYSTEM OPERATOR IN THE 2019–2022 PERIOD



SOURCE: ENERGY AGENCY

The actual regulated return on assets is affected by incentives, changes in resources for covering eligible costs, and the recording of network charge surpluses and deficits in the account books. This holds for both electricity system operators.

The eligible costs of the activities of both electricity system operators are covered by the network charge, other revenues and the network charge surplus from previous years.

For 2021, €98.2 million of the transmission system operator's eligible costs were planned to be covered by the network charge, €66.7 million by other revenues and €13.7 million by the network charge surplus from previous years. Due to tariff smoothing to prevent tariffs changing sharply between the years in the regulatory period, €2.1 million more in network charges was billed in 2021 than the planned eligible costs for that year. This network charge is intended to cover the planned network charge deficit due to tariff smoothing in 2019 and 2020. In 2021, €96.3 million in network charges was billed to cover the eligible costs of the transmission system operator.

For 2021, €256.5 million of the distribution system operator's eligible costs were planned to be covered by the network charge, €14.1 million by other revenues and €1.5 million by the network charge surplus from previous years. Due to tariff adjustment, a network charge deficit of €11.9 million was planned for 2021, to be covered by the planned network charge surplus due to network charge tariff adjustment in 2019 and 2020. In 2021, €258.4 million in network charges was billed to cover the eligible costs of the distribution system operator.

Since 2021 is the final year of the 2019–2021 regulatory period, the Energy Agency issued an amendment to the Legal Act on the methodology for determining the regulatory framework and network charges for the electricity distribution system in 2021 for the next regulatory period. In 2021, on the basis of this Act, the Energy Agency set the regulatory framework for both electricity system operators for the period from 1 January 2022 to 31 December 2022 through two decisions in which it also set the network charge tariffs. For the period in question, the Energy Agency set the planned eligible costs for the transmission system operator at €198 million, an increase of 12.2% 2021, and those for the distribution system operator at €299.7 million, an increase of 5.5% compared to 2021.

The planned eligible costs of the activities of the transmission and distribution system operators for the 2022 regulatory period amount to €497.70 million.

The structure of the planned eligible costs for the 2022 regulatory period is shown in Figure 56 and Figure 57. Comparing the 2022 cost structures to the 2021 plan for the transmission system operator shows a significant change in the structure of the planned electricity costs of covering electricity losses in the system, a result of the way the electricity for covering the losses is leased. By contrast, the structure of the planned eligible costs for 2022 compared to the 2021 plan for the distribution system operator remained largely the same.

Calculating the Network Charge

To calculate the network charge, the Energy Agency uses a non-transaction postage-stamp method, which means that the tariffs for calculating the network charge are unified for the whole territory of Slovenia within each consumer group. The electricity system operator classifies the final consumer into a consumer group according to the voltage level (HV, MV, LV), type of connection (busbar, feeder), operating mode (operating hours) and type of consumption. The calculating method has not been changed in the regulatory periods so far, as this maintains predictability for consumers.

To cover the eligible costs of the electricity system operator that are funded from the network charge, the Energy Agency determines network charge tariffs for individual consumer groups. The tariffs are divided into:

- the network charge for the transmission system,
- the network charge for the distribution system,
- the network charge for the excessive reactive power, and
- the network charge for connected load.

Depending on the time of day, the network charge tariffs for the transmission and distribution systems are divided into:

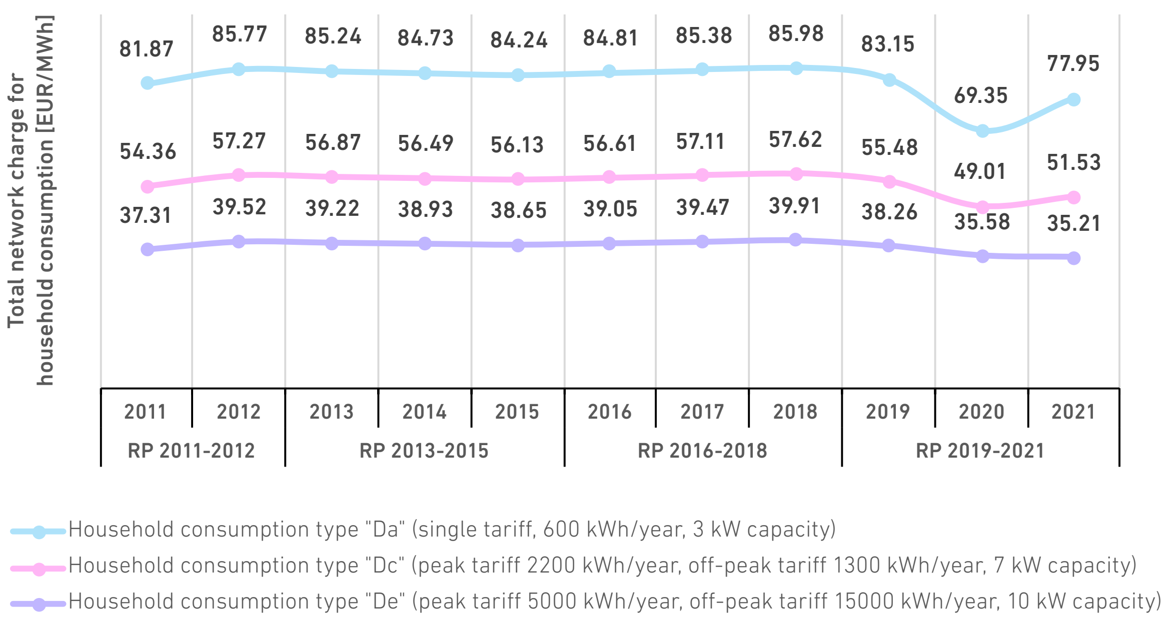
- High daily tariffs during the high tariff time, charged from Monday through Friday from 06:00 to 22:00, and
- low daily tariffs during off-peak time, charged in the remaining week hours and Saturdays, Sundays and public holidays (all day), or
- single daily tariffs, charged every day all day.

In both final consumers on the LV level without power metering and in household consumers, the billed capacity is determined based on the nominal capacity of the device preventing the contracted load being exceeded (billing fuse) and the connection type (single-phase or three-phase connection), while for customers with a connection capacity greater than 43 kW, the billed capacity is determined on a monthly basis from the average of the three highest capacity peaks achieved during the high tariff period.

Figures 58 and 59 show the fluctuation of the total network charge for the transmission and distribution systems per year of regulatory periods for some typical household and business consumers, defined by standard consumer groups.

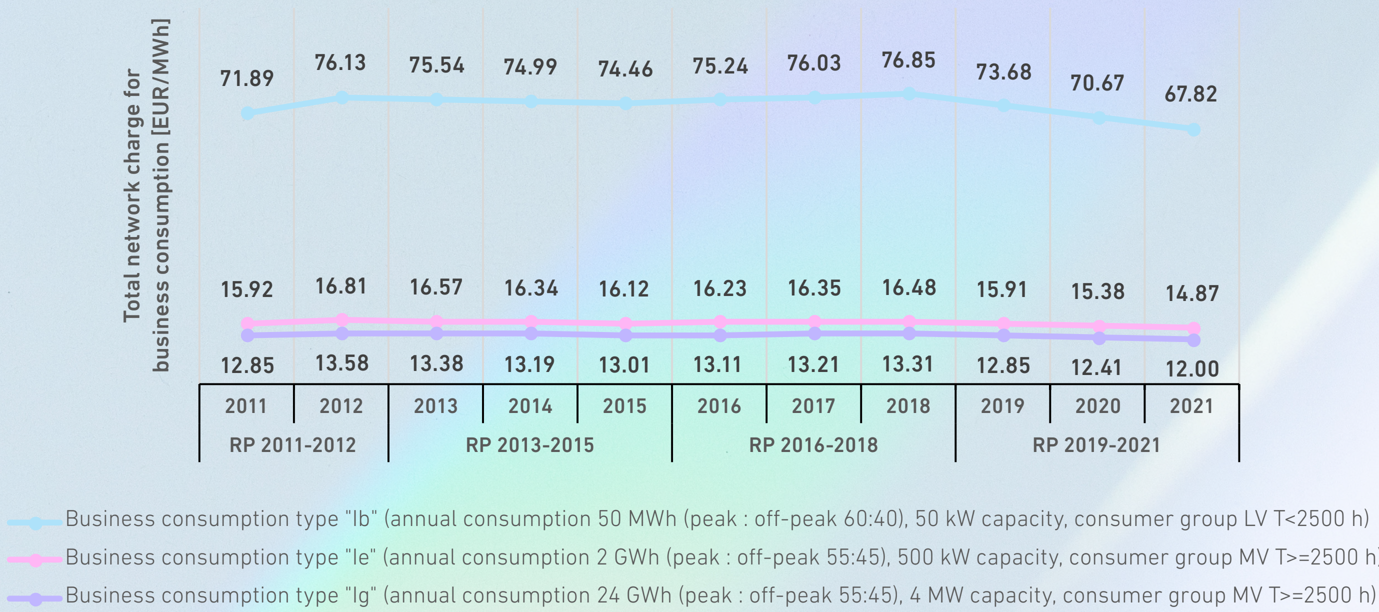
There was a noticeable fluctuation in the network charge for household consumption in the period from 1 March to 31 May 2020, when household and small business consumers were exempt from paying the billed capacity tariff due to the Energy Agency passing the emergency measure for the mitigation of social and economic consequences of the COVID-19 epidemic, as can be seen in Figure 58. During the preparation of this report (in 2022), a similar measure was implemented by the Government of the Republic of Slovenia. With this measure, all the tariffs for the billed capacity and the effective energy received by all consumer groups were reduced to zero for both electricity system operators from 1 February to 30 April 2022. The Energy Agency will address the effect of this measure in more detail in the next report.

FIGURE 58: FLUCTUATION OF THE TOTAL NETWORK CHARGE FOR THE TRANSMISSION AND DISTRIBUTION SYSTEMS FOR SOME TYPICAL HOUSEHOLD CONSUMERS PER REGULATORY PERIOD



SOURCE: ENERGY AGENCY

FIGURE 59: FLUCTUATION OF THE TOTAL NETWORK CHARGE FOR THE TRANSMISSION AND DISTRIBUTION SYSTEMS FOR SOME TYPICAL BUSINESS CONSUMERS PER REGULATORY PERIOD



SOURCE: ENERGY AGENCY

Allocation and Use of Cross-Zonal Transmission Capacities

Day-ahead and intraday allocation of CZCs in the context of pan-European market coupling on all Slovenian borders from September 2021 onwards

The allocation and use of cross-zonal transmission capacities (hereinafter: CZCs) in the EU are governed by EU Regulation 2019/943. The regulation stipulates, among other things, the mandatory use, in all time periods, of market-based methods for allocating the CZCs available. In 2021, this area was additionally governed by EU Regulation 2015/1222 establishing a guideline on capacity allocation and congestion management (hereinafter: EU Regulation 2015/1222), which governs the day-ahead and intraday calculation and allocation of CZC, and Commission Regulation (EU) 2016/1719 on establishing a guideline on forward capacity allocation (hereinafter: EU Regulation 2016/1719), which lays down the rules on calculating and allocating CZCs for time-frames longer than day-ahead.

Slovenia has been participating in the pan-European day-ahead market coupling at the border with Italy since February 2014 and at the border with Austria since July 2016. In June 2018, the Slovenian-Croatian border was added to this market coupling. This means that in 2021, day-ahead CZC allocation at all the borders where Slovenia has cross-zonal transmission capacities, that is, the Slovenian–Austrian, Slovenian–Italian and Slovenian–Croatian borders, took place in the context of the pan-European single day-ahead market coupling, in line with the provisions of EU Regulation 2015/1222.

Throughout 2021, the intraday CZC allocation at the Slovenian–Austrian and Slovenian–Croatian borders took place within the context of European intraday market coupling. The most significant change in CZC allocation took place on 21 September 2021, when the Slovenian-Italian border was added to the continuous intraday market coupling. Even after this integration, three regional complementary implicit auctions were still held at this border, two of which took place the day before the time of delivery, allocating capacities for all hours of the day, while the third took place on the day of delivery and allocated capacity only for the second 12-hour block of the day. This solution is also in keeping with EU Regulation 2015/1222, which foresees the option of using so-called complementary regional auctions.

In addition to the TSO, BSP – the nominated electricity market operator (IOTEE) for the Slovenian bidding zone until the end of 2023 – also took part in the allocation of capacity in the context of day-ahead and intraday market coupling on the Slovenian side.

In the context of the forward allocation of CZCs, governed by EU Regulation 2016/1719, capacity was allocated on an annual and monthly basis at all Slovenian borders. This allocation took place in the form of explicit auctions where capacities in the form of physical usage rights were being allocated according to the use-it-or-sell-it principle. In the role of the common European auction platform at all Slovenian borders was the Joint Allocation Office (JAO) headquartered in Luxembourg. All annual and monthly auctions at the Slovenian borders were conducted in accordance with the harmonised auction rules, which also apply at all other borders in the common European electricity market.

Table 24 shows the allocated CPC quantities and the realised revenue in 2021 at each border for both transmission directions. Compared to the year before, there was approximately 5.25 TWh less capacity allocated, whereas the realised revenue in 2021 was nearly €650,000 higher. The higher revenue can largely be attributed to the increase in electricity prices in the second half of the year, especially in light of the event described below. Otherwise, the situation that has been observed since the liberalisation of the electricity market continued in 2021, i.e. traders using the vast majority of the available capacity at the Slovenian borders for the transmission of electricity in the direction from the German to the Italian market, conditioned, of course, by the price differences between these two markets.

TABLE 24: ALLOCATED CPC AND REALISED REVENUE IN 2021 AT EACH BORDER

Border	Allocated (MWh)	Realised revenue (EUR)
SI-IT	3,825,557	16,484,750
IT-SI	512,951	1,070,856
SI-AT	690,169	374,044
AT-SI	3,974,843	21,724,385
SI-CRO	3,870,838	2,383,788
CRO-SI	3,723,184	–1,139,057
Total	16,597,542	40,898,766

SOURCE: ELES

In Table 24, the negative revenue at the Croatian border in the direction of transmission from Croatia to Slovenia certainly stands out. The “Realised revenue” category contains the net revenue, that is, the revenue from individual auctions minus the reimbursements due to unused capacity in accordance with the use-it-or-sell-it principle and the compensations in case of the curtailment of the capacities already allocated. The negative revenue is due to a single event that occurred in day-ahead trading for the delivery day of 14 January 2021. On that occasion, an error in the Italian exchange led to a decoupling of the Slovenian and Italian markets, which also had an impact on the Slovenian-Austrian and Slovenian-Croatian borders. As the reimbursement mechanism has to take into account the price difference between the markets, and since the decoupling left the low-liquidity Croatian market completely isolated, the price difference between the Slovenian and Croatian markets built up to extremely high levels, reaching as much as €335.31/MWh in one of the hours in the day. And so, on the Croatian border in the direction of transmission from Croatia to Slovenia, almost €3 million in costs were incurred due to reimbursements, which were equally shared by the two neighbouring TSOs. As a consequence, ELES incurred €1.49 million in costs in a single day at that border. Just for comparison, in the entire year 2020, ELES had a revenue of €3.86 million at this border and for this transmission direction.

In practice, access to CZCs consists of two phases. The first phase is the allocation of the right to their use, while the second is the confirmation of the actual use through nomination. In the case of explicit auctions, these are two separate procedures, while in implicit auctions (market coupling), obtaining capacity automatically implies its nomination, which is done by two market interfaces to their relative TSO. In the Slovenian bidding zone, the NEMO acts as the interface. In 2021, the largest share of the CZC utilisation rate was achieved at the borders from Slovenia to Italy and from Austria to Slovenia.

A high utilisation rate was reached at the Croatian border in both transmission directions but the revenues from CZCs were relatively low due to the large quantity of CZCs available. The relatively high utilisation rate of the direction from Slovenia to Croatia is also due to the fact that half of the production in the Krško NPP belongs to Croatia, with the consequent regular use of the Slovenia–Croatia transmission capacity. The utilisation of CZCs for all borders in the 2017-2021 period is shown in Table 25.

TABLE 25: UTILISATION RATE OF CZCs IN THE YEARS 2017–2021

	Utilisation rate of CZCs (%)				
Border/Year	**2017**	**2018**	**2019**	**2020**	**2021**
SI-IT	58	81	66	40	78
IT-SI	20	6	16	31	10
SI-AT	8	16	7	8	13
AT-SI	93	63	80	74	62
SI-CRO	58	37	51	60	34
CRO-SI	28	41	18	10	33

SOURCE: ELES

Promoting Competition

As part of its continuous monitoring process, the Energy Agency monitors developments in pricing (weighting factors, price trends, the impact of liquidity on prices, etc.), market transparency and integrity (access to information about prices, implementation of the Regulation on wholesale energy market integrity and transparency – REMIT), and market efficiency (openness and competitiveness). Highlighted below are the key indicators we use to evaluate the competitiveness, transparency and integrity of relevant markets.

Wholesale Market

Producers, traders and suppliers of electricity exchange electricity in the wholesale market. That exchange can take place in organised trading venues (exchanges) or bilaterally (OTC – Over The Counter). The connections of the Slovenian energy network with foreign networks enable the participants of the Slovenian bidding zone to exchange energy with foreign bidding zones. If participants transmit energy from the Slovenian bidding zone, we talk about export, if they feed it, about import.

The free flow of energy within the available transmission capacities means that the market conditions of one bidding zone transfer to other bidding zones. So, it does not make sense to monitor only the national wholesale market. Monitoring should be conceived in a broader sense and follow the price trends not only in the Slovenian bidding zone but also in the region.

Electricity Prices

The Energy Agency monitors the level of wholesale prices in Slovenia and on related and reference markets that directly or indirectly affect prices in Slovenia. The information on prices is gathered from the BSP website, as well as from commercial providers of analytical services and market information.

An enormous price increase in day-ahead markets in the second half of 2021

Prices in Day-Ahead Power Exchanges in Slovenia and on Foreign Markets

The Slovenian electricity market is situated at the juncture of four large European markets: the German, Austrian and Italian markets and that of South-Eastern Europe. The Slovenian market is part of the interregional day-ahead market coupling at the borders with Austria, Italy and Croatia. As regards intraday coupling, the Slovenian electricity exchange joined the European single intraday market on its borders with Croatia, Austria and Italy. Italy joined the common European market in September 2021. For the time being, the border with Italy includes complementary regional intraday auctions.

Figure 60 shows trends in the average base prices on power exchanges in Slovenia and its neighbouring countries in the last five years. Despite the fact that Slovenia and Hungary have not established interregional coupling, the price on the Slovenian exchange is still very similar to the price in Hungary.

In 2021, the average base price for the power exchange in Slovenia increased by 206% compared to 2020, thus amounting to €115.03/MWh, which is historically the highest average annual amount. This is at also more than twice the ten-year average of the Slovenian power exchange base load price index. As seen from figure 60, growth in electricity prices was recorded on all observed markets. The biggest price growth was recorded on the Italian market GME (NORD), where the prices increased by 231.3%. In addition, the Italian market saw the highest average price (€125.19/MWh) in the day-ahead market in 2021.

Once again, the lowest base price (€100.98/MWh) was recorded on the German power exchange, where the average prices also rose by 231.4% compared to 2020. The prices in Austria are slightly higher. Due to electricity liquidity, the prices on German power exchanges affect other EU markets. Higher prices on German exchange are also a consequence of the lower production of electricity from RES compared to the year before. In 2021, electricity from RES accounted for 46.5% of the total production of electricity in Germany, which, compared to the year before, dropped by 4.8 percentage points.

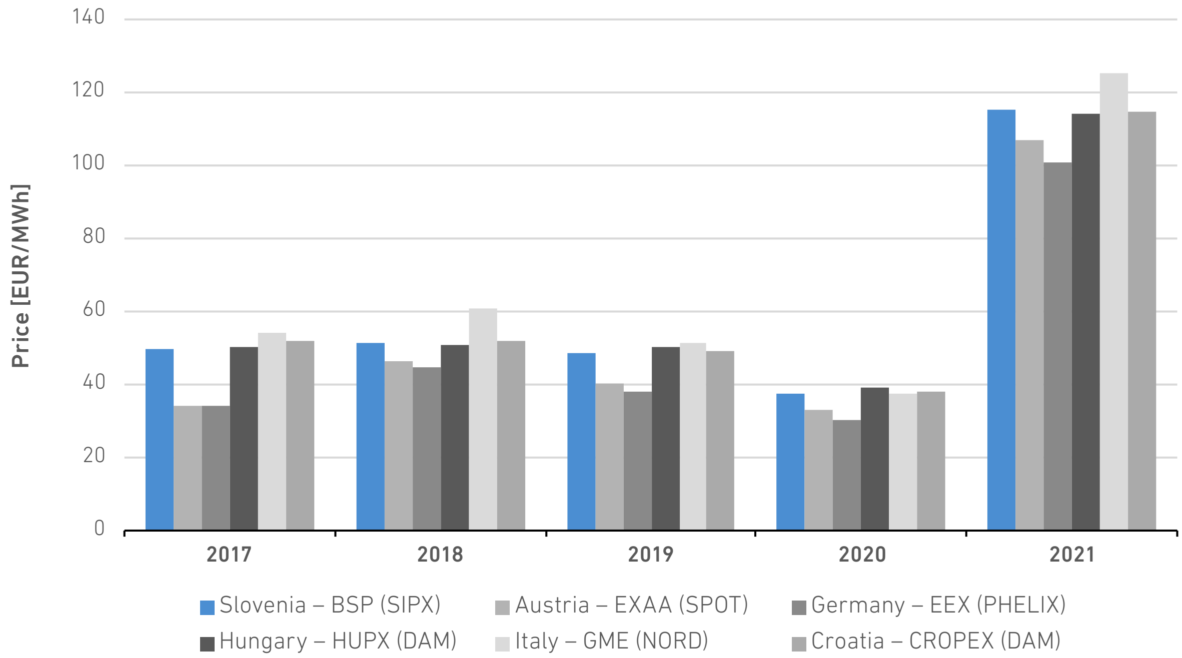
The increased consumption of electricity due to the EU's economic recovery caused an increase in the production of electricity in coal power plants. Compared to the year before, the share of electricity produced in coal power plants rose by 5.4 percentage points. Due to the higher prices of coal, natural gas and allowances, the production costs of electrical energy in 2021 increased dramatically resulting in higher electricity prices. Wholesale natural gas prices began to grow in the first half of 2021 and continued to do so in the second half, which also significantly affected electricity prices, since production units that use natural gas as an input energy source in relation to the market model often greatly affect the determination of electricity prices[16]. On the observed markets, the rise of electricity prices started in January which is, as said, a consequence of the economic recovery in the EU. However, the rise of prices gained extra momentum due to the decreased production of electricity in French nuclear plants, which was 2% lower in the first quarter of 2021 compared to the same period the year before. An increase in demand due to temperatures further affected the prices, as Germany recorded one of the coldest Aprils in the last forty years. Temperature-based demand continued during the summer due to air-conditioning and then increased significantly in November with lower than average temperatures and increased needs for heating.

In Slovenia, the total electricity consumption by final consumers in 2021 increased by 3.1% as a consequence of increased consumption by both businesses and households. In 2021, the prices were the lowest in the first quarter, when the average base price in Slovenia was €54.75/MWh and in Germany €49.57/MWh. For the remaining part of the year, the prices continued to grow. The highest prices were recorded in the final quarter, when the average base price in Slovenia was €223.72/MWh and in Germany €195.35/MWh.

Despite the greater absolute difference in average prices recorded on the observed markets, relatively speaking, the convergence of prices continued, with the exception of the Italian market.

16 More information on the prices of natural gas is available in the chapter 1.3.1.2 Market Efficiency

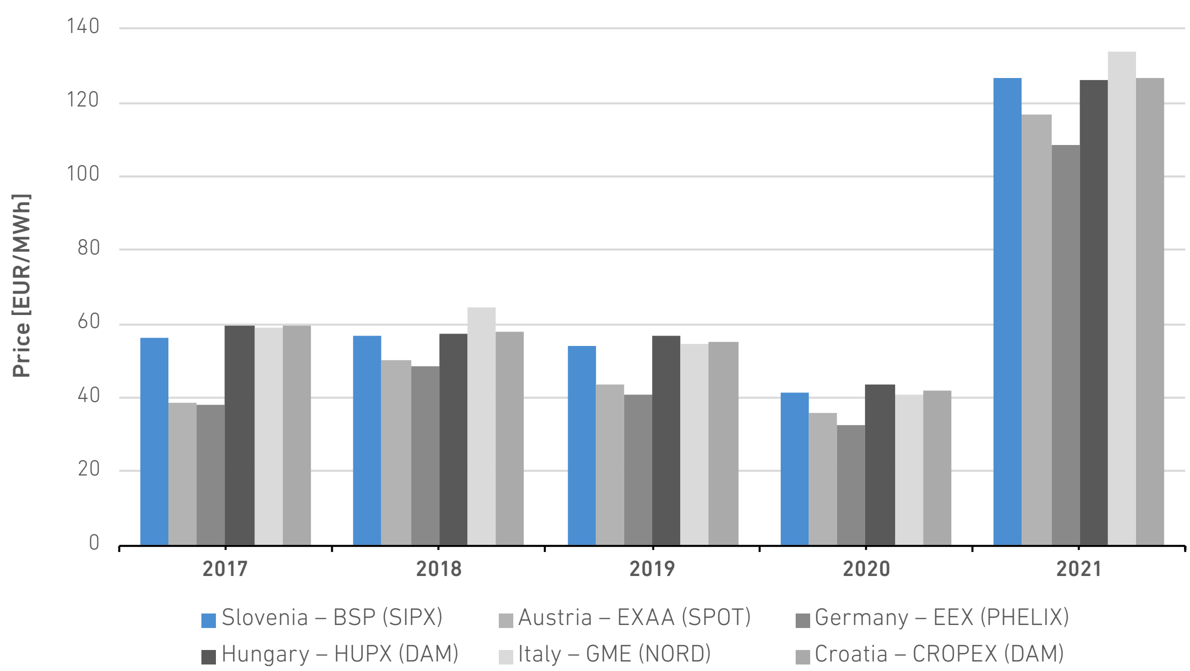
FIGURE 60: TRENDS IN THE AVERAGE BASE PRICE IN THE DAY-AHEAD MARKET IN SLOVENIA AND IN FOREIGN EXCHANGES IN THE 2017–2021 PERIOD



SOURCE: MONTEL

The trends in average peak price in individual day-ahead markets are shown in Figure 61. In 2021, the average peak price on the power exchange in Slovenia increased by 205.8% compared to the average price in 2020, thus amounting to €126.74/MWh. Similarly to the base prices, peak prices increased compared to 2020 in all the markets under observation, with the biggest rise in prices recorded on the German market (232.1%). The lowest price increase was recorded on the Hungarian market (189.5%). Out of all the observed markets, the Italian GME (NORD) reached the highest average peak price in 2021, which was €133.76/MWh.

FIGURE 61: TRENDS IN THE AVERAGE PEAK PRICE IN THE DAY-AHEAD MARKET IN SLOVENIA AND ON FOREIGN EXCHANGES IN THE 2017–2021 PERIOD

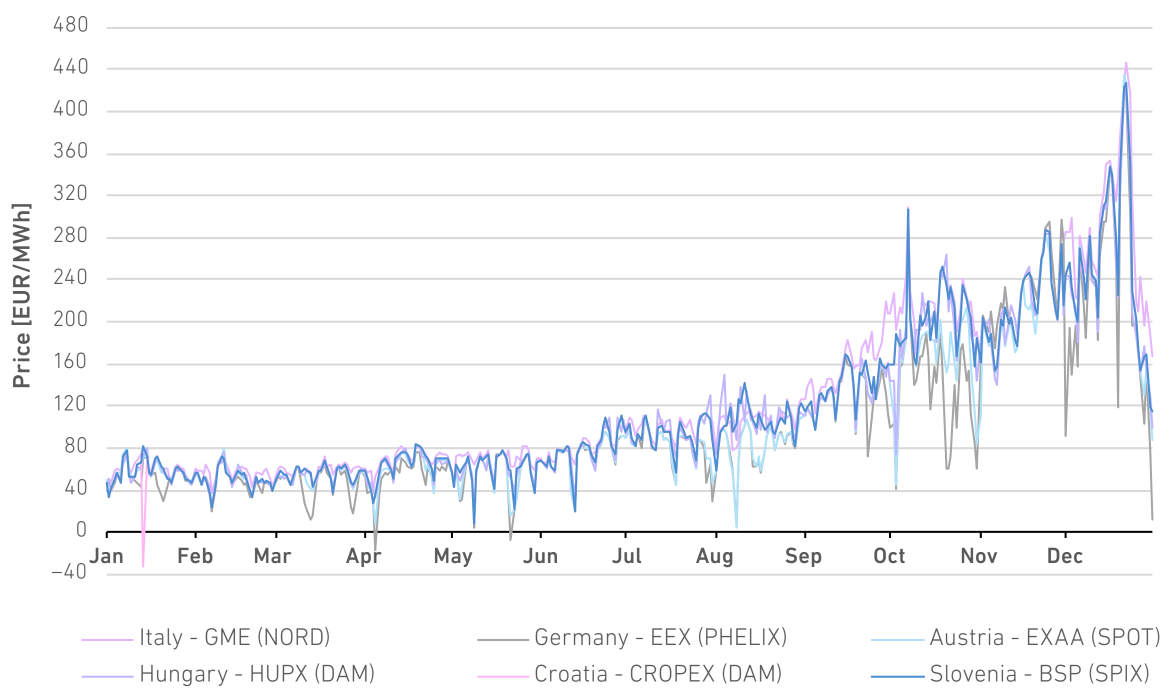


SOURCE: MONTEL

In 2021, the highest base prices on day-ahead power exchanges were recorded in November and December. The highest daily base price on the Slovenian exchange was recorded on 20 December 2021 – €492.45/MWh. On this day, the highest hourly prices were also recorded, namely between €428.56/MWh and €517.5/MWh. These prices reflected the broader developments on the energy markets, including the news that Gazprom had failed to purchase additional transmission capacity to supply natural gas to the EU in January 2022. Combined with the information about record-low natural gas reserves in underground storages in Europe, the prices of natural gas and electricity soared. Defining (arbitrarily) price peaks as exceeding three times the amount of the average hourly rates, Slovenia saw the exceeding of the price peaks in 147 cases, which is seven times more compared to 2020. All the price peaks took place in the last quarter.

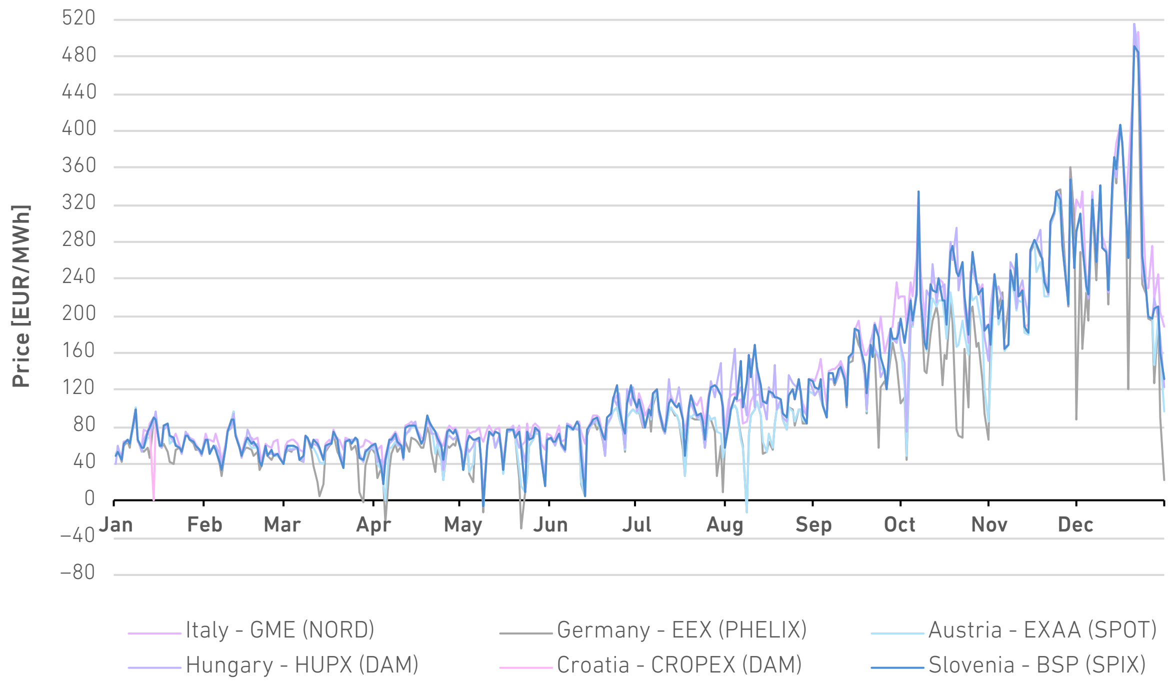
Negative hourly prices were recorded in Slovenia in 23 cases, which is the same as in 2020. Reduced incidences of negative prices were recorded on the German market, where prices were negative in 139 hours. The reasons behind this are the increased demand and reduced share of electricity produced with solar and wind farms.

FIGURE 62: TRENDS IN THE BASE PRICE ON THE DAY-AHEAD MARKET IN SLOVENIA AND ON THE NEIGHBOURING EXCHANGES



SOURCE: MONTEL

FIGURE 63: TRENDS IN THE PEAK PRICE ON THE DAY-AHEAD MARKET IN SLOVENIA AND ON THE NEIGHBOURING EXCHANGES



SOURCE: MONTEL

Table 26 shows the results of a comparative analysis of the prices that were reached in the day-ahead market in the BSP (Slovenia), GME (Italy), EXAA (Austria) and CROPEX (Croatia) exchanges in 2020 and 2021. The difference between the electricity prices is gradually decreasing as markets couple; in addition, greater comparability between the BSP and EXAA markets can be observed. The share of hours when prices in the EXAA were the same as in the BSP increased, amounting to over 21%. The difference between electricity prices in the BSP and GME, as well as the BSP and CROPEX, has slightly increased.

TABLE 26: COMPARISON OF PRICES (ACCORDING TO THE SHARE OF HOURS) BETWEEN THE POWER EXCHANGES ON THE DAY-AHEAD MARKET

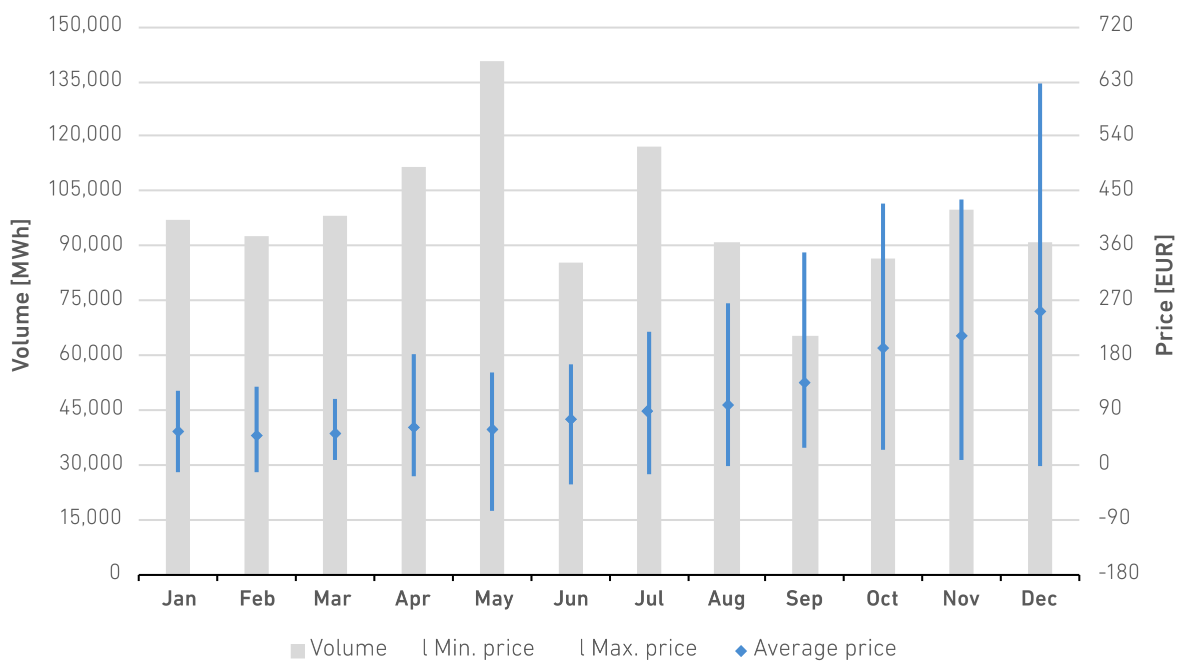
	Share of hours in 2020	Share of hours in 2021
Lower price in BSP than GME	21.69%	51.53%
Lower price in GME than BSP	13.43%	3.54%
Same price in BSP and GME	64.88%	44.93%
Lower price in BSP than EXAA	27.39%	24.34%
Lower price in EXAA than BSP	72.50%	54.65%
Same price in BSP and EXAA	0.11%	21.03%
Lower price in BSP than CROPEX	3.69%	5.24%
Lower price in CROPEX than BSP	23.81%	29.12%
Same price in BSP and CROPEX	72.50%	65.64%

SOURCE: MONTEL

Prices on the Intraday Continuous Market

Figure 64 shows the trends in the trading quantities and price ranges of hourly products on the intraday continuous market[17]. The highly above-average hydrology conditions in May were reflected in a higher volume of continuous trading and lower prices. The prices started to rise in the second half of the year, which coincides with the trends in prices on the day-ahead market. In addition, price volatility and range increased significantly in this period.

FIGURE 64: VOLUME OF TRADING AND PRICE RANGES IN THE INTRADAY MARKET



SOURCE: BSP

In 2021, the average price of hourly products on the intraday market amounted to €111.48/MWh, which is almost three times the price in 2020, when the average prices amounted to €38.05/MWh.

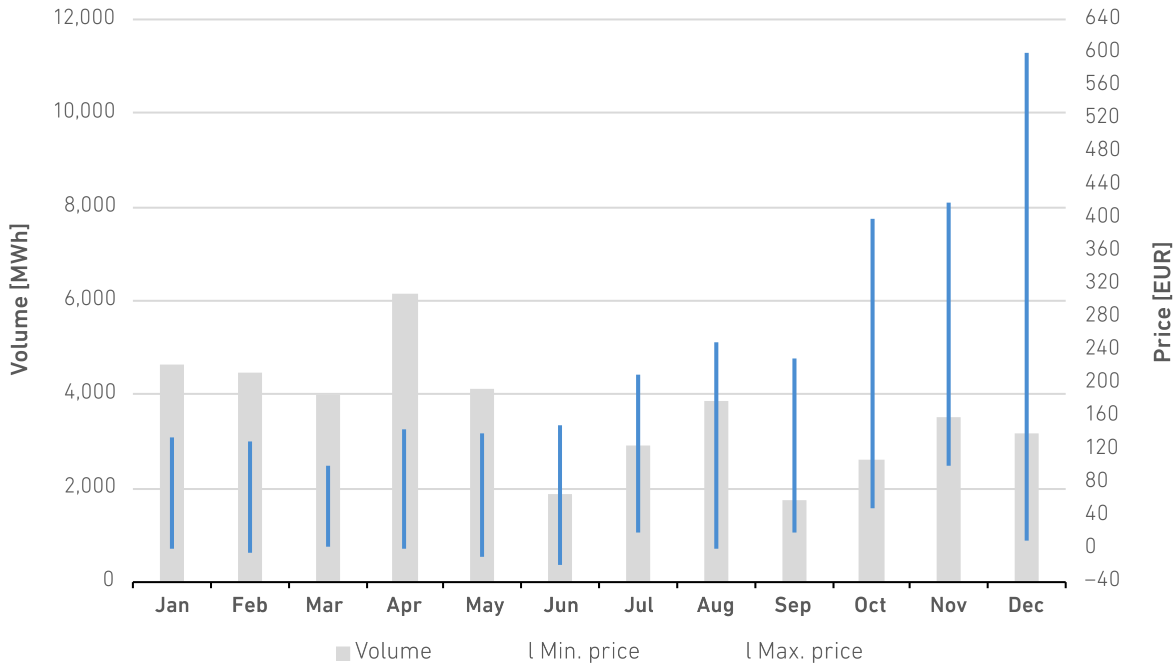
Energy Prices on Systemic Balancing Markets

The Energy Agency continues to monitor all the organized markets trading with energy for systemic balancing, i.e. the ancillary services market organised by the transmission system operator and the market operator balancing market. The purchase prices of balancing capacity with the object of guaranteeing the availability of units included in the ancillary services market, the unintentional imbalances (Fskar) and imbalance netting (IGCC) are addressed in the Ancillary Services chapter. The following analysis addresses exclusively the prices of balancing energy.

In 2021, the highest price of electricity on the market operator balancing market was €600/MWh and the lowest was €-20/MWh. The highest prices occur when balancing energy is purchased, while the lowest occur when the transmission system operator sells energy surpluses. The highest price occurred on the evening of 21 December 2021 when the intraday continuous market also experienced a price peak. In the first half of the year, the TSO mostly sold electricity on the balancing market, while in the second half of the year the TSO mostly purchased energy.

17 Continuous markets are markets enabling immediate supply (e.g. day-ahead supply or intraday supply).

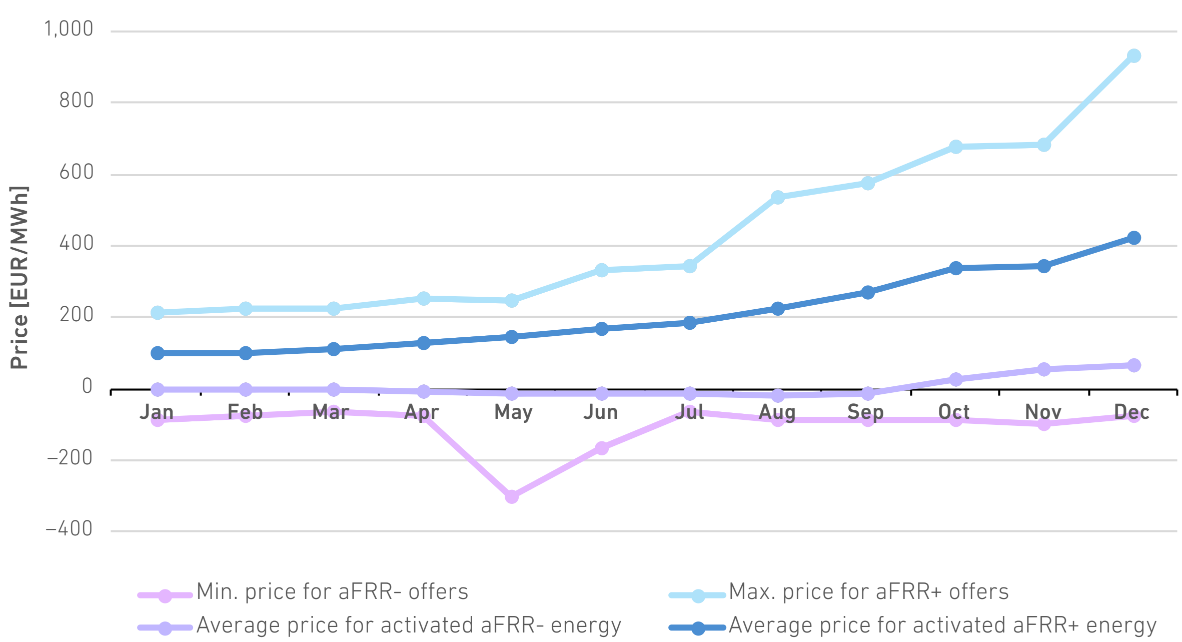
FIGURE 65: VOLUME OF TRADING AND PRICE RANGES IN THE MARKET OPERATOR BALANCING MARKET



SOURCE: BORZEN

In the frequency services market, the prices of balancing energy regarding the reserve capacity for frequency restoration (FRR) are established depending on the submitted offers from qualified providers of balancing services, which submit separate offers for positive (FRR+) and negative (FRR–) balancing, and separate offers for automated (aFRR) and manual frequency restoration reserves (mFRR). The transmission system operator uses a trading platform to collect offers and activate aFRR and mFRR energy. Every hour, the trading platform collects offers while the system selects the most favourable offer based on the list of offers and current balancing needs. This is then the basis for the activation of balancing energy in the final concluded transaction according to the pay-as-bid principle.

FIGURE 66: PRICE TRENDS OF OFFERS AND ACTIVATED aFRR ENERGY

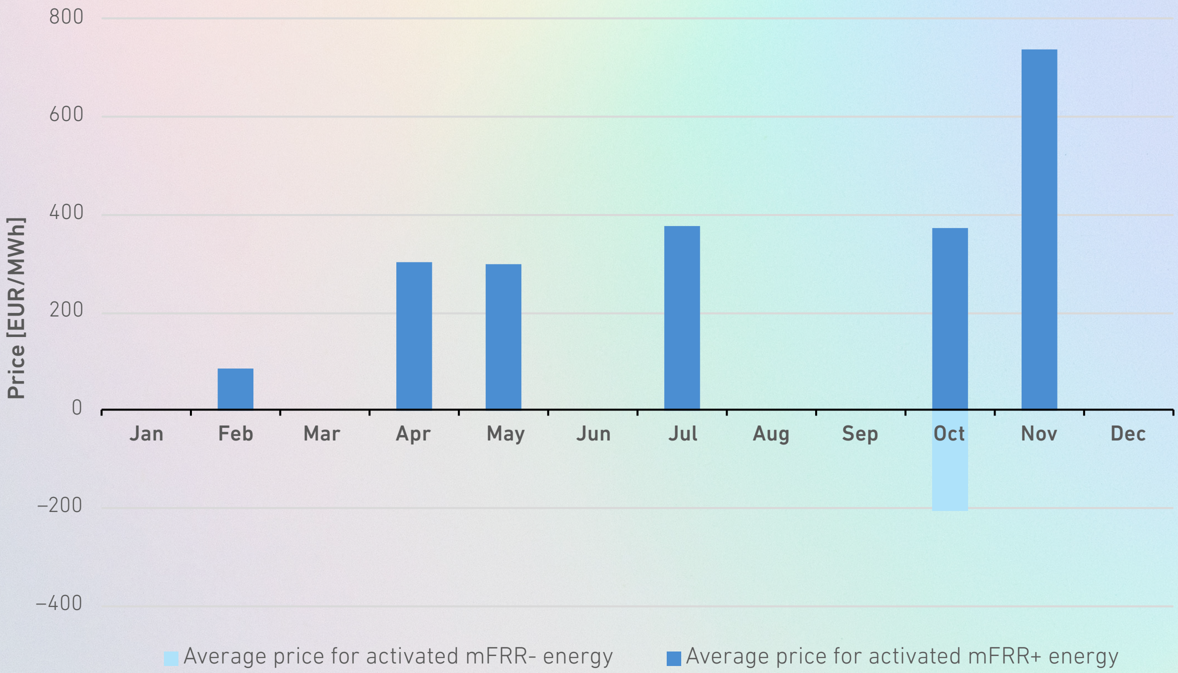


SOURCE: ELES

Figure 66 shows the price trends of offers and activated energy of aFRR– and aFRR+. Due to activations according to the list of offers, the actual prices are more favourable compared to the range of prices shown. In May and June, an increase of the lowest negative offers for the aFRR– energy can be observed. This is due to some extremely unfavourable offers in the afternoon of 9 May 2021 and 13 June 2021, which coincides with high production from RES and consequently the negative price peaks on continuous markets. The highest prices for the aFRR+ positive balancing were reached in December, when the average price of activated energy amounted to €421.58/MWh. The lowest and therefore least favourable prices for the aFRR– negative balancing were reached in August, when the average price of activated energy amounted to €-18.98/MWh. The biggest difference between the positive and negative balancing prices was observed in December with the average amount of €354.63/MWh, which is 1.4-times the wholesale price on the day-ahead market in this period.

With regard to the mFRR+ positive balancing, the average prices of activated energy in 2021 reached €363.39/MWh, while for the mFRR– negative balancing, they amounted to €-206.28/MWh. Figure 67 shows the average prices of activated mFRR– and mFRR+ energy for the months in which the energy was activated. The mFRR– negative balancing was only activated in October.

FIGURE 67: PRICE TRENDS OF ACTIVATED mFRR ENERGY



SOURCE: ELES

Estimated Market Price of Electricity for Which Producers are Eligible for Support

The Energy Agency establishes the estimated market price of electricity produced in power plants that are included in the support scheme. This is done as part of monitoring the effect that this electricity has on the development of prices of other electricity on the market that does not benefit from financial support for production. That monitoring aspect is particularly important if the share of electricity for which producers are eligible for support is large. That is because it can begin to

A record difference between the estimated market price of electricity and the hourly price reached in the BSP

distort market prices while placing producers without support in a non-competitive position. The share of generated electricity for which producers can receive support remained below 10% of all the electricity generated in Slovenia. Although no influence of the support on pricing was detected, the Energy Agency keeps monitoring the market and determining the estimated market price of electricity for which producers are eligible for support.

The model for calculating the market price of electricity for which producers are eligible for support has not changed since its introduction. It is described in more detail in previous reports on the energy situation in Slovenia. It is based on the weighted price of electricity generated and sold in the market by producers that are eligible for operational support and the weighted price of electricity acquired by Borzen in the so-called Eco Group. That price is formed at an annual auction carried out by Borzen, while the energy is acquired from the producers that receive support in the form of guaranteed purchase.

As has been the case for several consecutive years now, most of the electricity included in the support scheme in 2021 was sold freely on the market, so within the framework of operational support. The estimated market price was thus mainly influenced by the weighted price of electricity achieved by the producers by selling the generated electricity to the suppliers on the market. Table 27 shows the estimated market price of electricity together with the average base price in BSP for the 2017–2021 period. In 2021, the latter was no less than 61.1% lower compared to the average base price. When electricity purchase prices were determined for 2021, no one could have foreseen the upcoming record-level increases in prices. Due to that, purchase prices were set at considerably lower values compared to those that were later established in the BSP in 2021.

TABLE 27: COMPARISON OF THE ESTIMATED MARKET PRICE OF ELECTRICITY FOR WHICH PRODUCERS ARE ELIGIBLE FOR SUPPORT AND THE AVERAGE ANNUAL BASE PRICE IN BSP IN THE 2017–2021 PERIOD

Year	Estimated market price (€/MWh)	Average hourly price in BSP (€/MWh)
2017	36.69	49.52
2018	44.54	51.16
2019	55.86	48.74
2020	53.10	37.55
2021	44.71	115.03

SOURCES: ENERGY AGENCY, BORZEN, BSP

Emission Allowance Trading

Allowance is a general term for a certificate or authorisation to emit one tonne of carbon dioxide equivalent into the atmosphere.

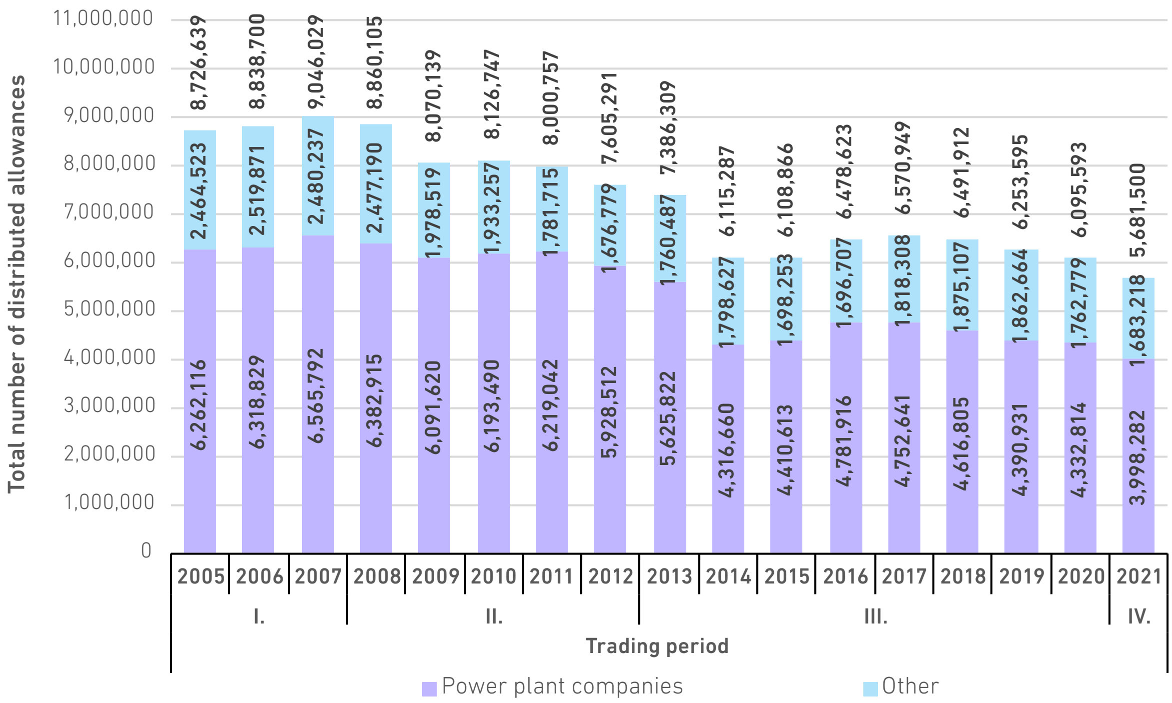
6.8% fewer allowances allocated

In 2021, there were 1,459,913 emission allowances issued with a total of 5,681,500 allowances distributed. Facilities' operators had to purchase the difference at the auction or on the market. The number of distributed allowances has decreased for the fourth consecutive year. Compared to 2020, it fell by 6.8%.

Thermal power plant companies issued 3,998,282 allowances, which is 7.7% fewer than in 2020. The largest allowance user in Slovenia is Šoštanj TPP, which allocated 3,375,040 allowances, which is 10.2% less compared to the year before that. The rest of the industry allocated 1,683,218 allowances, which is 4.5% fewer than in 2020.

In 2021, the fourth trading period kicked-off, which will last until 2030. This trading period is characterized by an even faster rate of reducing the commonly awarded emission allowances, which would contribute towards a 43% decrease in emissions in this period compared to 2005. In addition, the share of emission allowances granted free of charge is dropping every year.

FIGURE 68: NUMBER OF DISTRIBUTED ALLOWANCES FOR ALL FOUR TRADING PERIODS IN THE 2005–2021 PERIOD



SOURCE: ARSO

Figure 69 shows the price trends for allowances for forward[18] contracts with a maturity in December 2021 (product of EUA on EEX). The average price in the observed period was around 52.8 EUR per tonne of CO_2, which is 111.2% higher compared to the average price of allowances from 2020 for forward contracts matured in December 2020. The lowest price for allowances was reached on 18 January 2021 (31.62 EUR per tonne of CO_2). During the year, a trend of increasing prices was observed on the allowance market, which reached the highest amount on 8 December 2021 with the clearing price of 88.88 EUR per tonne of CO_2 at the end of the trading day. This was the period before the maturity of forward contracts when the market recorded high trading activity while, at the same time, the rise in prices on the natural gas wholesale market was observed due to the relatively empty underground gas storage. The reason behind the increase in prices was primarily the economic recovery of the EU and the pertaining economic growth, which was a consequence of the industrial activity and increased consumption of electricity. Given the quantity of emissions produced, the industry is bound by the obligation to purchase allowances and increased industrial activity is therefore directly reflected in an increased demand for allowances. The increased electricity consumption caused an increase of electricity generation, which was primarily covered by coal power plants that are one of the largest users of allowances due to their emissions. An additional pressure on the prices of allowances was that the beginning of 2021 marked the beginning of the fourth trading period in which the number of allowances decreased, while the prices also increased due to the EU's ambitions plans with regard to climate policy.

18 Forward contracts are either long- or short-term. Long-term forward contracts mature in a period that is longer than one year (an example of such a contract is the forward supply contract for 2024), while short-term contracts mature in a period that is shorter than one year (for example, the forward supply contract for December 2021).

FIGURE 69: PRICE TRENDS OF ALLOWANCES (EUA) IN THE EEX EXCHANGE (BOUGHT IN 2021 FOR 2022)

SOURCE: MONTEL

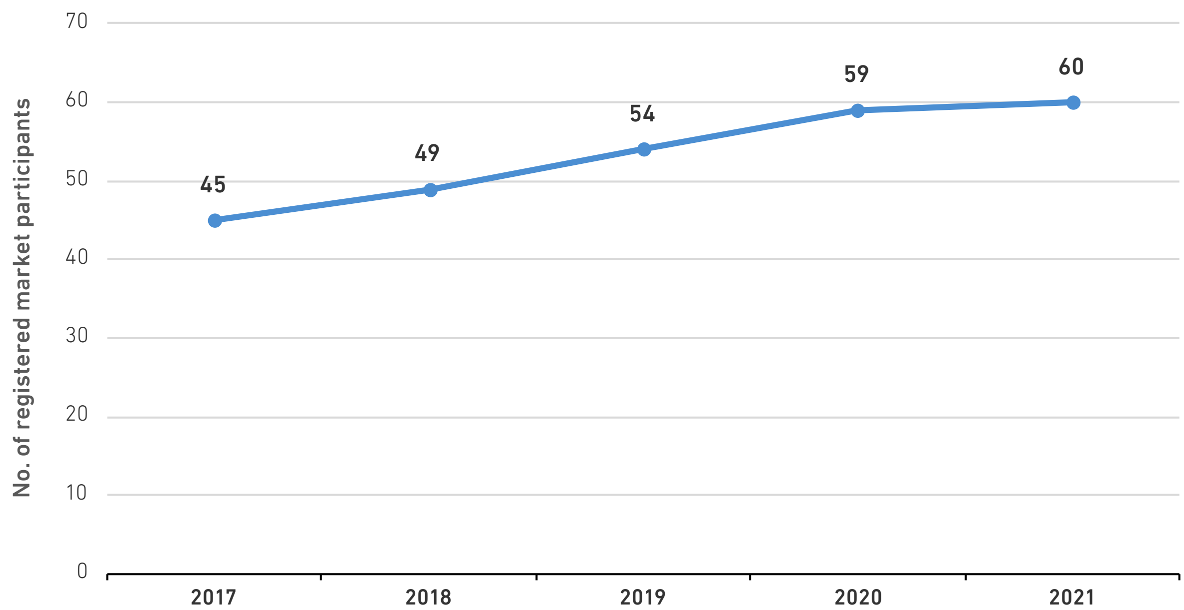
Market Transparency

REMIT (EU Regulation No 1227/2011 on wholesale energy market integrity and transparency) is the key foundation for ensuring integrity and transparency in the energy market. It is a comprehensive regulatory framework for monitoring and supervising the European electricity and natural gas wholesale markets. The Regulation consists of three major parts: prohibition of market manipulation and insider trading, a requirement for the effective and timely publication of inside information, and the appropriate legislative framework for comprehensive market monitoring.

Monitoring the market based on the REMIT Regulation includes monitoring all wholesale energy products, including orders to trade regardless of the place of trading. It also includes basic information on the availability of the energy infrastructure. The type and method of reporting information are specified in Implementing Regulation EU 1348/2014. All data is gathered by the Energy Agency for the Co-operation of Energy Regulators (ACER). Pursuant to an agreement, ACER provides the data the Energy Agency needs to monitor the national energy market. It submits daily data, which refers to the Slovenian bidding zone and data related to the activity of market participants that are registered with the Energy Agency.

In accordance with REMIT, market participants must register with the national regulatory authority in the Member State in which they are established or resident or, if they are not established or resident in the EU, in a Member State in which they are active. 60 participants had registered with the Energy Agency by the end of 2021 (Figure 70).

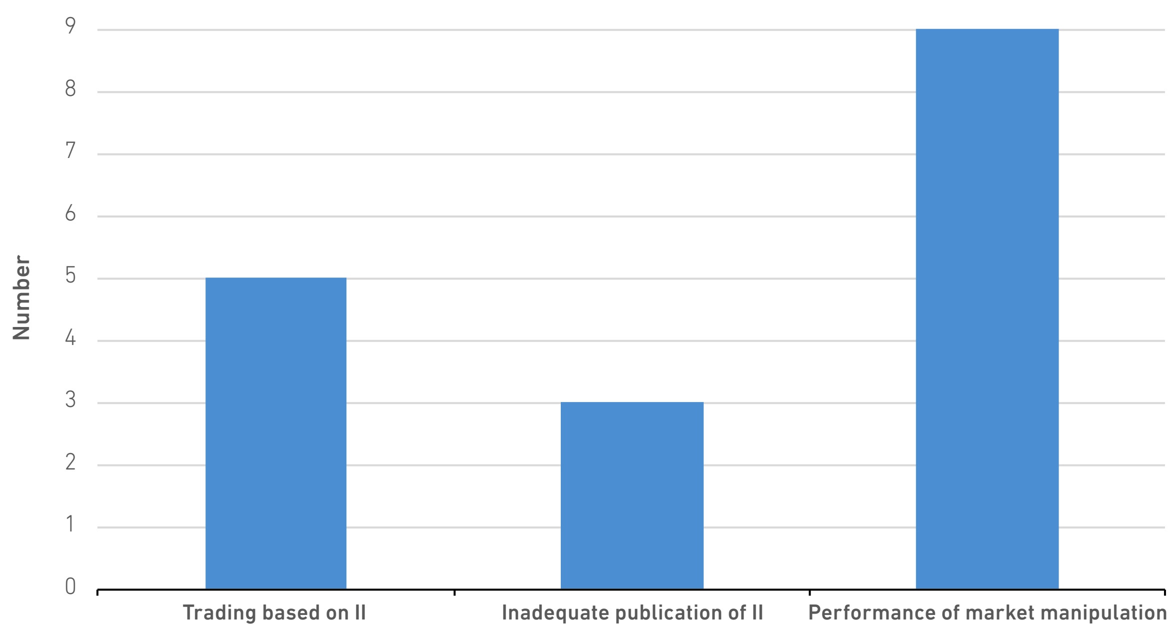
FIGURE 70: REGISTRATION OF MARKET PARTICIPANTS IN SLOVENIA IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

In 2021, as part of monitoring the wholesale energy markets according to the REMIT Regulation, the Energy Agency conducted five cases and was at the same time included in seven foreign cases as part of the mutual assistance between national regulative bodies. The violations that are under investigation by the Energy Agency or that the Energy Agency investigates in collaboration with foreign national regulative bodies are shown in figure 71[19]. In some cases a multitude of violations may be under investigation, therefore the total number of violations under investigation is always higher or equivalent to the number of cases under investigation.

FIGURE 71: TYPES OF VIOLATIONS ALLEGED AGAINST MARKET PARTICIPANTS IN PROCEEDINGS INVOLVING THE ENERGY AGENCY



SOURCE: ENERGY AGENCY

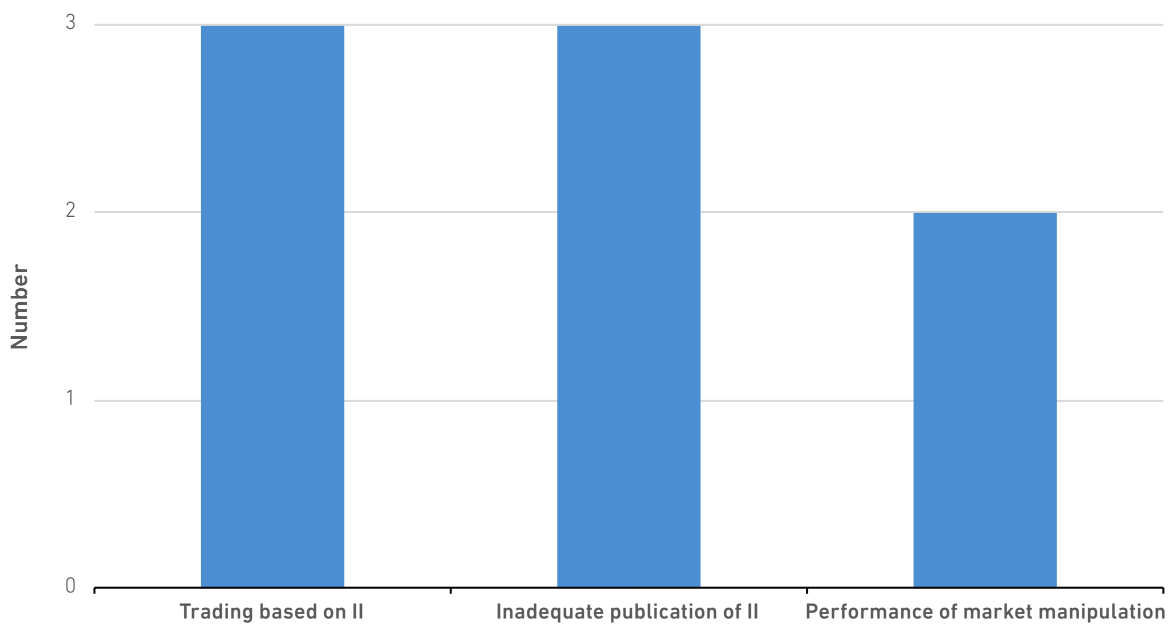
19 "II" in the figure means "Internal Information".

All five cases under investigation were received by ACER based on agreements signed with them. Procedures were initiated on the basis of reported suspicious transactions or alarms triggered by the control system on detecting manipulation and abuse within the ACER continuous market monitoring system. The number of cases conducted by the Energy Agency may vary year to year, if a case is taken over by another national regulative body due to changes in competence that usually occur in the early phase of investigation and based on newly acquired facts.

All cases, conducted by the Energy Agency are connected to prohibited practices on the electricity market. One case is in the examination phase of the alleged breaches, one is in the offence proceedings, and three are in monitoring procedures, which entails collecting evidence on alleged breaches by the market participants. As part of the procedures conducted by the Energy Agency, two notifications on detected infringements were sent to concerned market participants. One notification was sent as part of the monitoring procedure while the other was part of the offence proceedings. The types of breaches investigated by the Energy Agency as part of the proceedings against market participants are shown in Figure 72.

The Energy Agency has been dealing with all the cases in close cooperation with foreign regulatory authorities in the region and with ACER, which ensures a coordinated approach to solving the cases.

FIGURE 72: TYPES OF BREACHED INVESTIGATED BY THE ENERGY AGENCY



SOURCE: ENERGY AGENCY

Market Effectiveness

The Energy Agency monitors the effectiveness of the wholesale market in Slovenia in terms of their level of competitiveness and liquidity. Monitoring the registration of closed contracts and operational forecasts, which is essential for ensuring an effective market, provides a bigger picture of trading because it includes bilateral trading.

Registration of Closed Contracts and Operational Forecasts

The registration of closed contracts and operational forecasts is carried out by the market operator Borzen. These contracts are the basis for drawing up the trading plans of the members of the balance scheme and for calculating the imbalances of balance responsible parties after the supply has taken place.

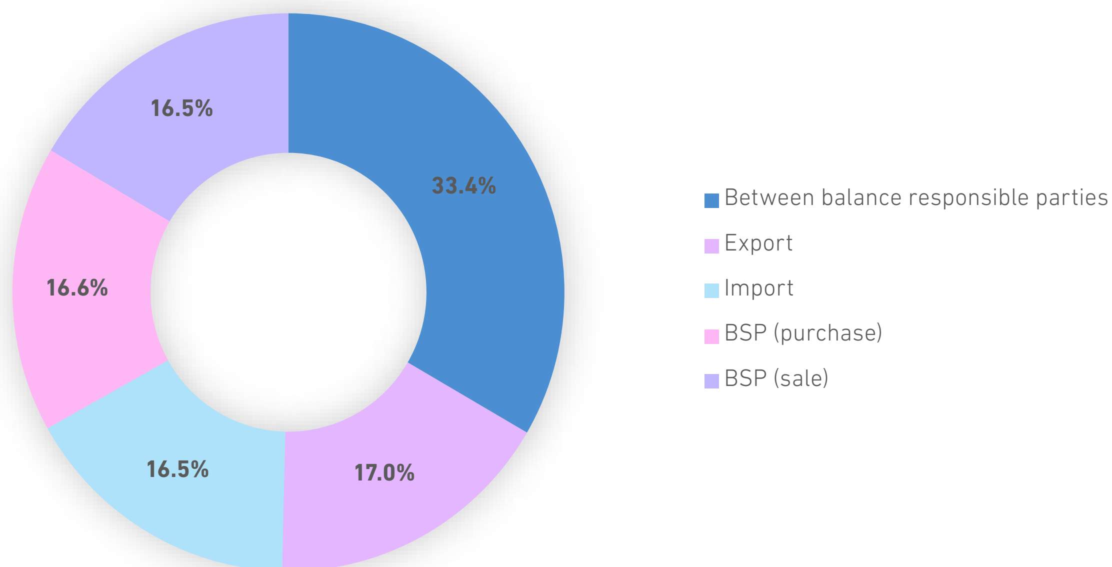
Borzen registers all closed contracts that affect the energy balance of a member of the Slovenian balance scheme. It registers all the contracts concluded between members of the balance scheme, contracts concluded on the energy exchange and closed import-export contracts. Contracts concluded on bilateral markets are part of registered import-export closed contracts and closed contracts concluded between members of the balance scheme. Bilateral trading is carried out between two contracting parties outside an organised power exchange.

In addition to closed contracts, Borzen also registers operational forecasts, which represent forecasts of the delivery and consumption of electricity by the members of the balance scheme for those delivery points for which open contracts are concluded. In 2021, the market operator registered a total of 97,244 closed contracts and operational forecasts for a total amount of 82,797,100 MWh. Compared to the previous year, the total number of registered closed contracts and operational forecasts dropped by 3.5% in 2021, while the trading volume rose by 0.7%.

The amount of electricity that was sold or purchased through closed contracts in 2021 was 55,388,063 MWh. Compared to 2020, when the total amount of closed contracts was 53,839,876 MWh, that amount increased by 2.9%.

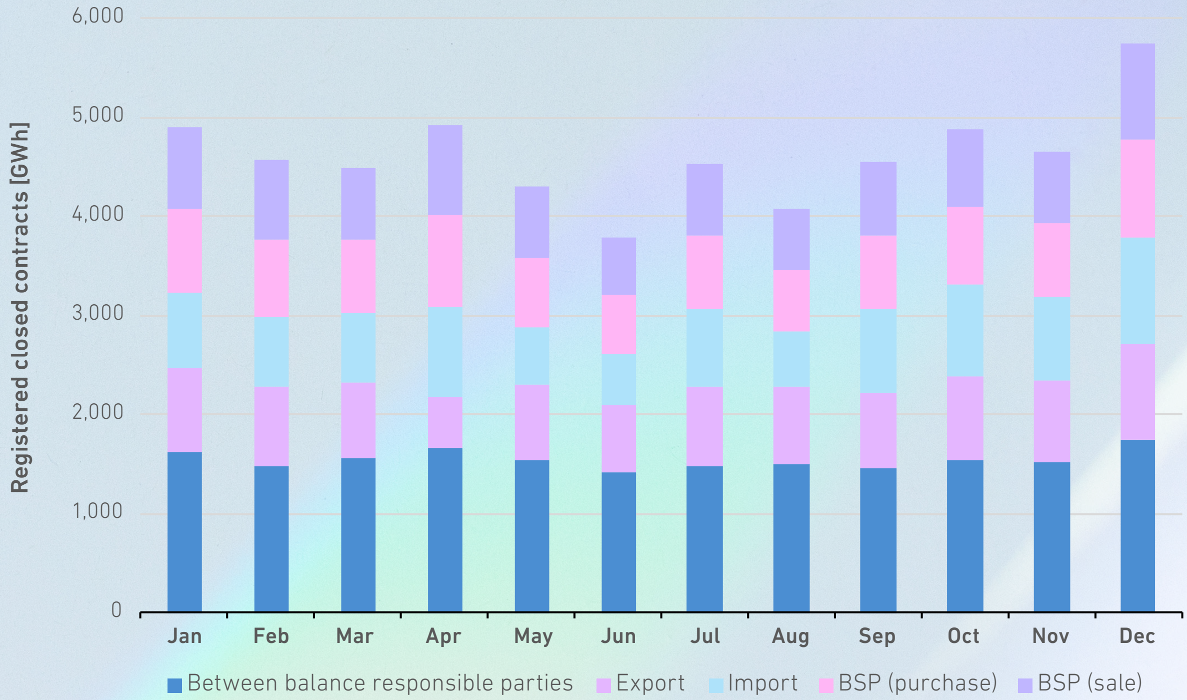
The structure of the volume of registered closed contracts and their corresponding quantities are shown in Figures 73 and 74.

FIGURE 73: STRUCTURE OF THE VOLUME OF REGISTERED CLOSED CONTRACTS



SOURCE: BORZEN

FIGURE 74: AMOUNT OF ELECTRICITY SOLD OR PURCHASED THROUGH CLOSED CONTRACTS PER MONTH



SOURCE: BORZEN

Day-Ahead Market

Day-ahead trading takes place on BSP in the form of auction trading. During the trading stage, market participants enter standardised hourly products into a trading application. The marginal price is calculated based on an algorithm of the trading application. Such trading is included in interregional market coupling, where any available CZCs are allocated. In 2021, market coupling included the borders of the Slovenian bidding zone with the bidding zones of Italy, Austria and Croatia. The volume of trading is influenced by numerous factors, most importantly by the quantities of available CZCs.

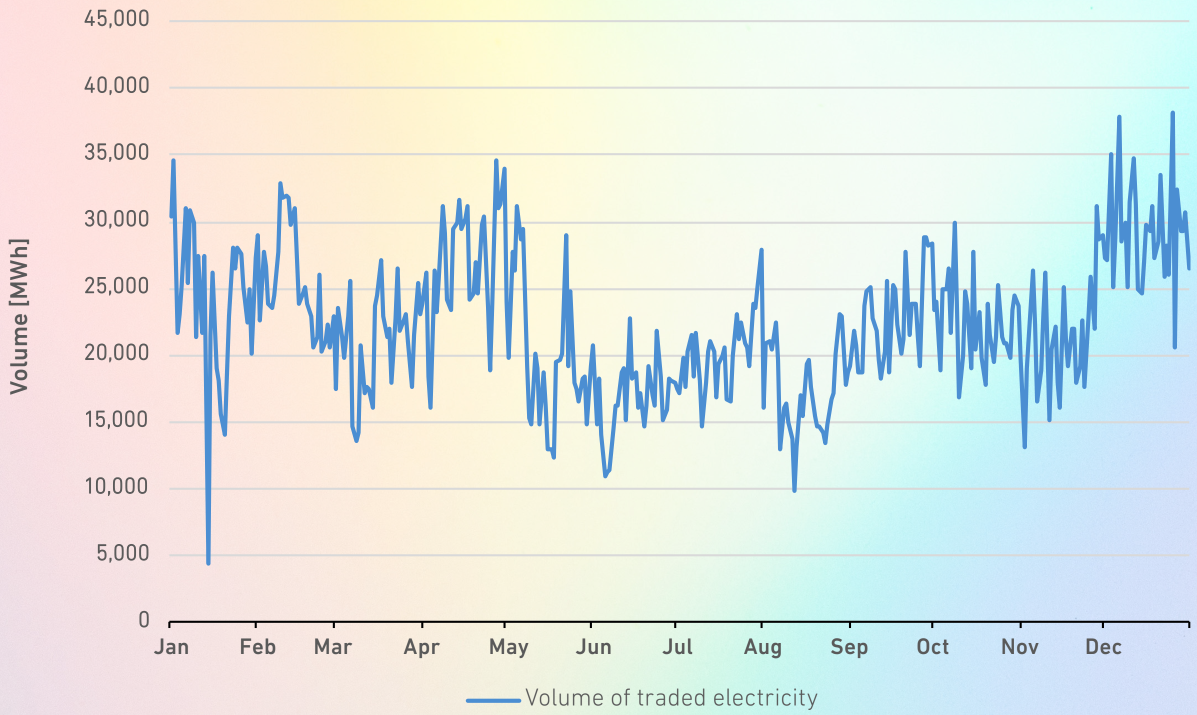
20 market participants were involved in day-ahead trading in 2021, which is one fewer than in 2020. The majority of the participants were from abroad.

The total volume of trading in the Slovenian dayhead market in 2021 amounted to 8,124,730 MWh or 6.7% more than in 2020. Bids in the total amount of 6612 GWh were recorded, of which 4573 GWh were purchase bids and 2039 GWh were sales bids. While the volume of bids in this exchange segment has been decreasing over the last three years, the volume of cross-border exchanges in electricity is increasing. The average daily trading volume was 22,260 MWh and the highest daily trading volume, which was reached on 24 December 2021 for the delivery day of 25 December 2021, was 38,121 MWh.

The highest monthly trading volume in 2021 was achieved in December and amounted to 905,365 MWh, which accounts for 11.1% of the total trading volume in that year. The highest monthly trading volume in 2021 was 4.4% higher than the highest monthly trading volume in 2020. The lowest monthly trading volume, amounting to 503,548 MWh, was reached in June. With the exception of January, June and August, the monthly trading volume exceeded all the trading volumes in the same periods in 2020.

A 6.7% larger volume of trading on the Slovenian day-ahead market

FIGURE 75: AMOUNT OF ELECTRICITY TRADED IN 2021



SOURCE: BSP

Intraday Market

Intraday trading on the Slovenian organised market is conducted on BSP. As regards intraday coupling, the Slovenian electricity exchange joined the European single intraday market on its borders with Croatia, Austria and Italy. The latter joined the common European intraday market in September as part of the SIDC project. On the continuous intraday market, trading is carried out 24 hours per day with hourly, 15-minute and block products.

Intraday trading allows market participants and balance responsible parties to post additional bids or purchases after the close of day-ahead trading and thus adjust their trading plans accordingly and harmonise them with the operational forecasts. Trading in the intraday market concludes one hour before physical delivery and converts into trading in the balancing market, where market participants are left to trade only with the TSO. Prices in the intraday market always provide a clearer reflection of the real-time value of energy, which can be put to use by the market participants. As providers of flexibility, they can adjust their generation and/or consumption within a short period of time.

Seven Slovenian and five foreign market participants participated in the intraday market on BSP at the end of 2021. Beside continuous trading, market participants can perform intraday auction trading through complementary regional auctions with Italy.

Further strengthening of the intraday market

In 2021, trading volumes increased in the segments of intraday continuous trading and auction intraday trading. In the same year, the total volume of continuous intraday trading amounted to 1135 GWh, which is 9.1% more compared to 2020. As part of the total volume of intraday trading, the trading volume on the balancing market amounted to 43 GWh. An explanation of why certain quantities in intraday trading are treated as quantities in the balancing market is given in the following chapter.

The volume of auction intraday trading amounted to 494 GWh in 2021 (implicit auctions MI1, MI2, MI3 and MI6 at the Slovenian-Italian border), which is a 12% upswing compared to the previous year. Bids in the total amount of 5990 GWh were recorded, of which 3382 GWh were purchase bids and 2608 GWh were sales bids. The volume of bids in this market segment is increasing and in 2021 it reached the highest point of the comparative period of the last three years.

The volume of trading on the intraday power exchange in 2021 already accounted for 16.7% of all trading on the Slovenian electricity exchange.

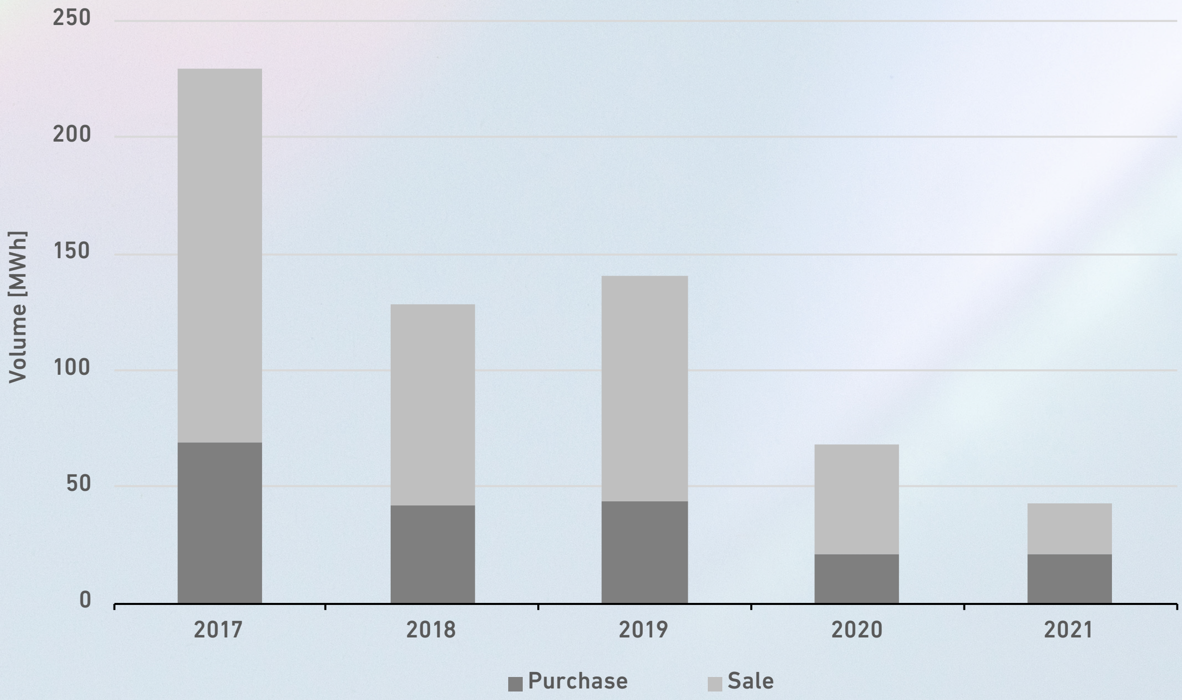
Trading on the Market Operator Balancing Market

The balancing market in Slovenia is run by the market operator Borzen. On the balancing market, the transmission system operator may purchase or sell balancing energy to keep the electricity system balanced. By doing this, the operator releases volumes of frequency restoration reserves. The rules for implementing the balancing market set that bids entered by members of the balancing market within intraday trading may be accepted by the TSO as bids placed in the balancing market, and that all transactions concluded with the TSO's bids for the purpose of balancing the electricity system are regarded as transactions in the balancing market. Transactions in the balancing market can be divided into transactions carried out in the intraday trading stage and transactions carried out in the balancing market stage. The latter is increasing and has reached a 99% share in 2021. This means that the transmission system operator mostly purchases or sells electricity on the market operator balancing market in the last hour before supply.

For practical reasons, trading in the Slovenian balancing market is carried out together with intraday trading. Under the authority of the market operator, both markets are carried out by BSP. The same rules apply to both markets, subject to the principle that intraday trading ends one hour before the time of delivery and converts into trading in the balancing market.

In 2021, 1955 transactions were concluded in the market operator balancing market for a total volume of 43.1 GWh. Out of these, 20.9 GWh represented the purchase of balancing energy and 22.2 GWh the sale of balancing energy by the TSO. Compared to the year before that, the quantity dropped by 37%. The drop in the volume is linked to an increase in the liquidity and more favourable prices on the single coupled continuous intraday market, which increases TSO's opportunities for system balancing. Most of the trading was performed for hourly products with a total volume of 38.9 GWh of electricity. With 1,497 transactions, hourly products were also the most traded product in the balancing market.

FIGURE 76: TRADING VOLUME ON THE MARKET OPERATOR BALANCING MARKET IN THE PERIOD BETWEEN 2017 AND 2021



SOURCE: BSP

In 2021, the market operator balancing market accounted for 8.6% of the entire system balancing, which is 6.8 percentage points less compared to 2020, when the share of the balancing market in the entire system balancing accounted for 15.4%.

Besides the TSO, another six out of a total of 32 members of the balancing market participated in trading, which is three more than in 2020.

A 37% drop in trading volume on the balancing market

Trading with Balancing Energy on the ELES Ancillary Services Market

Competition on the aFRR and mFRR ancillary services market is extremely low

The ELES ancillary services market is run by the TSO. In the beginning of 2020, ELES started using the Slovenian platform for balancing services, which is controlled and managed by the transmission system operator, to activate aFRR and mFRR balancing energy. The platform is monitored and managed by the TSO and it also enables the collection and activation of aFRR in mFRR offers. The activation of the aFRR energy offers is carried out automatically via the management system, while with mFRR offers, the activation in performed on demand via the mFRR auction and activation application.

Providers of balancing services must meet the market criteria and many technical and communication requirements in line with the Rules and conditions for providers of balancing services on the ELES balancing market. The offers for balancing energy may only be submitted by qualified providers of balancing services. The provider of balancing services submits separate offers for balancing power and balancing energy, which must also be separated according the balancing direction. The provider that was successful in the auction for balancing power, must submit mandatory offers for balancing energy with an hourly resolution in line with the quantity and period of collected offers for balancing power. The remaining providers can submit offers for balancing energy on a voluntary basis.

According to the order of activation of the balancing energy offers, the most favourable offers from the list, where the offers are classified according to the price, are activated first. Based on the selected offers the aFRR and mFRR balancing energy is accounted for according to the pay-as-bid principle.

In 2021, only two providers bid on the aFRR balancing energy, while the bids for the mFRR balancing energy were made by five qualified providers of balancing services. Consequently, there is a high concentration of the ancillary services market, while competitiveness and liquidity remain low.

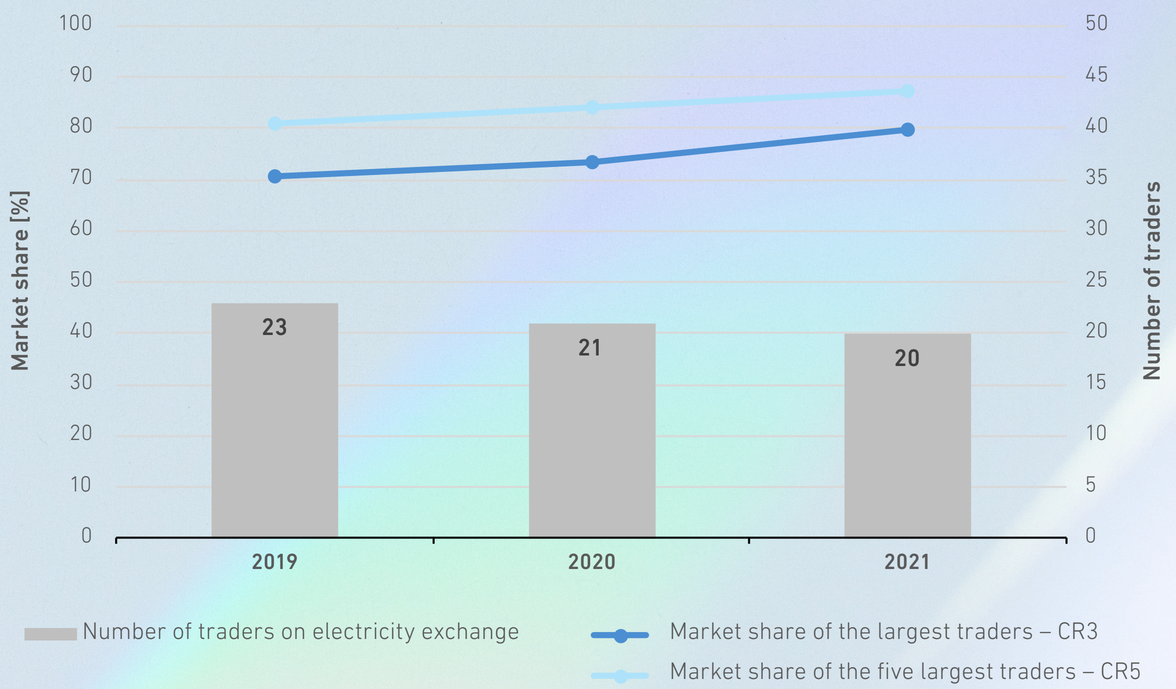
In 2021, the quantity of bids for each balancing direction on the aFRR balancing energy trading platform was 526 GWh. The bids for the mFRR+ balancing energy amounted to 2189 GWh, while the bids for the mFRR– balancing energy amounted to 622 GWh. Since the implementation of the organized collection of offers, the said quantities on hourly resolutions coincide with the minimum necessary ranges of ancillary services, which means that providers did not seize the opportunity to submit voluntary competitive offers. This confirms the poor competition of balancing service providers and low liquidity on this segment of the market.

Concentration in the Power Exchange

In 2021, 20 Slovenian and foreign companies traded on the BSP in the day-ahead market, which is one fewer than at the end of 2020. The number of traders operating on the BSP has been steadily falling in recent years. As an indicator of the level of concentration, the total market share of the three largest traders was 79.8% (CR3) in 2021, which indicates a new rise compared to 2020 when the share was 73.3%. The total market share of the five largest traders was 87.3%, which is also an increase compared to 2020 when it was 84%.

The HHI index was 3045, which indicates a high concentration in the wholesale market.

FIGURE 77: MARKET SHARE AND NUMBER OF TRADERS IN THE SLOVENIAN POWER EXCHANGE ACCORDING TO TRADED VOLUME



SOURCE: BSP

Wholesale Market Liquidity

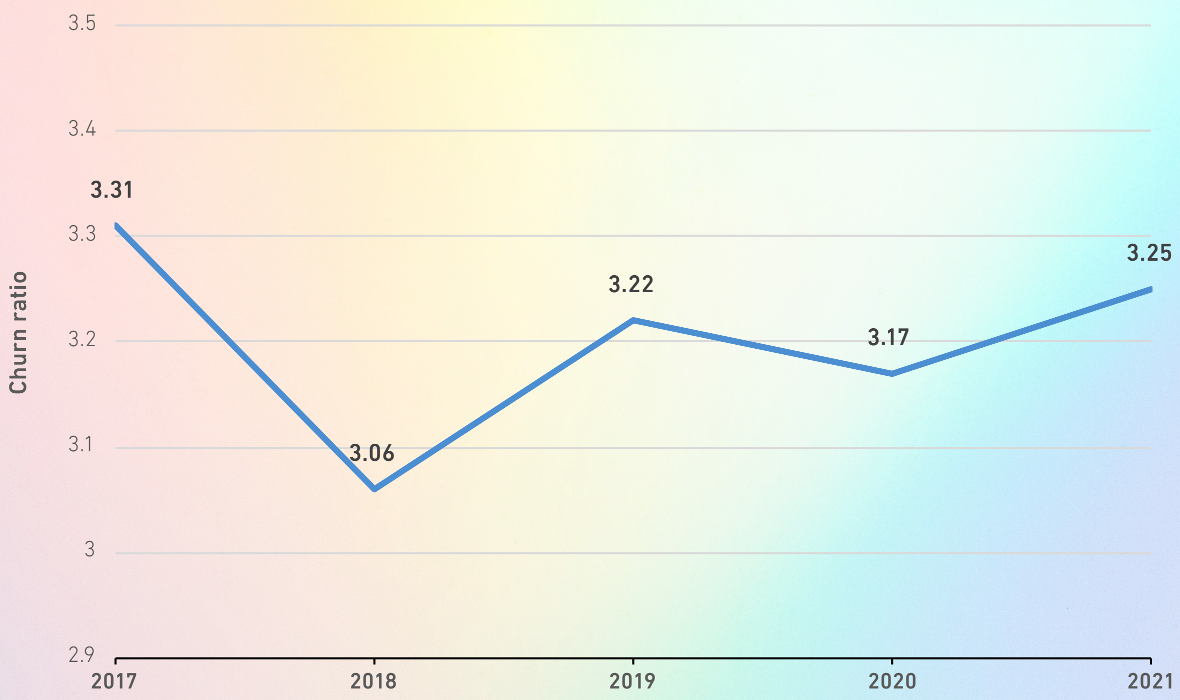
The Energy Agency monitors the liquidity of the Slovenian wholesale electricity market using an established index called the churn ratio. This index provides us with information on how many times a unit of electricity had been traded before it was delivered to the final consumer[20]. Figure 78 shows the trends of the index during the five-year period under review. Compared to the previous year, the value of the index slightly increased in 2021. The index value remains above 3, indicating that the Slovenian wholesale electricity market is well-developed and has a moderate level of liquidity.

Even though our wholesale market is smaller in comparison with other European markets, a relatively large number of active participants are present. They are Slovenian and foreign, large and small, which shows that the Slovenian market is open to the entry of new participants. The number of transactions concluded by the Slovenian market participants is comparable to that of the participants in foreign markets. Similarly to foreign markets, the market conditions that shape the prices elsewhere also reflect product prices in Slovenia.

The wholesale electricity market continues to be well-developed

20 The calculation is based on a methodology taking into account the quotient between the sum of the recorded volume from closed contracts minus the exported volume, and the consumption in Slovenia. The volume from closed contracts includes the volume traded on the BSP,, as well as that traded on the bilateral market.

FIGURE 78: TRENDS OF THE CHURN RATIO PER YEAR IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

Retail Market

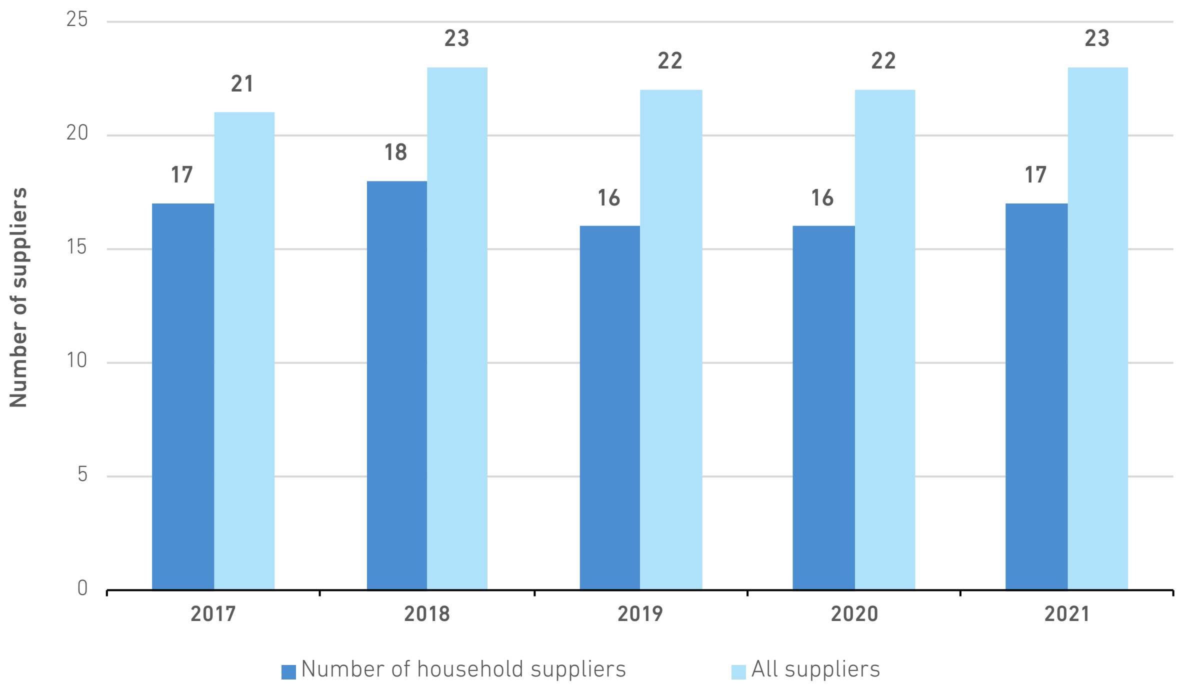
Suppliers and final consumers in the Slovenian retail market sign open contracts, in which the quantities of supplied electricity and the time profile of the supply are not set in advance. In 2021, the new supplier NGEN entered the market, which also supplied electricity to households. In December, the electricity market operator terminated the balancing agreement with the supplier Involta, which ended the supplier's membership in the balance scheme.[21]

A new supplier entered the retail electricity market

23 electricity suppliers were active in this market, of which 17 supplied electricity to household consumers.

21 Involta is included in the annual statistics of the number of suppliers in 2021.

FIGURE 79: TRENDS IN THE NUMBER OF SUPPLIERS IN THE SLOVENIAN RETAIL MARKET IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

The business models of suppliers are still different. Some only supply electricity to household consumers, others to businesses, but most of them to both. Due to the considerable price movements on the wholesale market, in 2021 suppliers faced great challenges in the field of price risk management. Due to that, in the beginning of 2022, the retail market also lost Telekom Slovenije as a supplier, in addition to Involta.

Prices

Retail electricity prices are not regulated and are set on the market. The Energy Agency regularly monitors the prices set for household and small business consumers based on data on prices and offers in the retail market for households and small business consumers, which is submitted by the suppliers on a monthly basis.

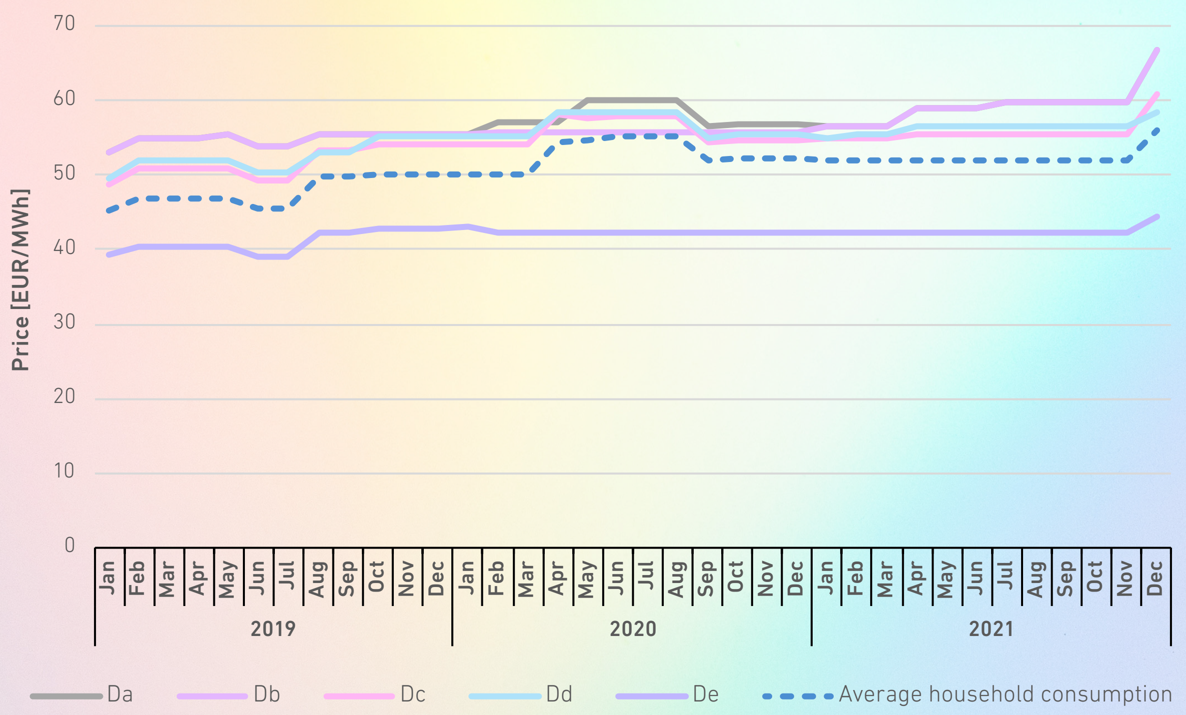
Retail Price Index for Typical Household Consumers

On the basis of monitoring the retail market for household consumers, the Energy Agency determines retail price indices (RPI). RPI is based on the lowest offer in the retail market, which is accessible to all household consumers and enables them to switch suppliers at any time without a contractual penalty. So, the RPI reflects the price potential of the relevant market.

Figure 80 shows the trends of the RPI for standard consumer groups Da, Db, Dc, Dd, De and an average Slovenian household consumer[22] in the 2019–2021 period. Most of the consumers in the retail market (except those who have contracts that include contractual penalties) have the option of switching their supplier or a product (offer) provided by their current supplier. In that way, they are sure to be supplied with electricity at a price reflected by the RPI.

22 Consumption profile of an average household consumer in Slovenia: billed capacity 8 kW, annual consumption 1996 kWh (peak tariff) and 2100 kWh (off-peak tariff)

FIGURE 80: RPI IN THE 2019–2021 PERIOD



SOURCE: ENERGY AGENCY

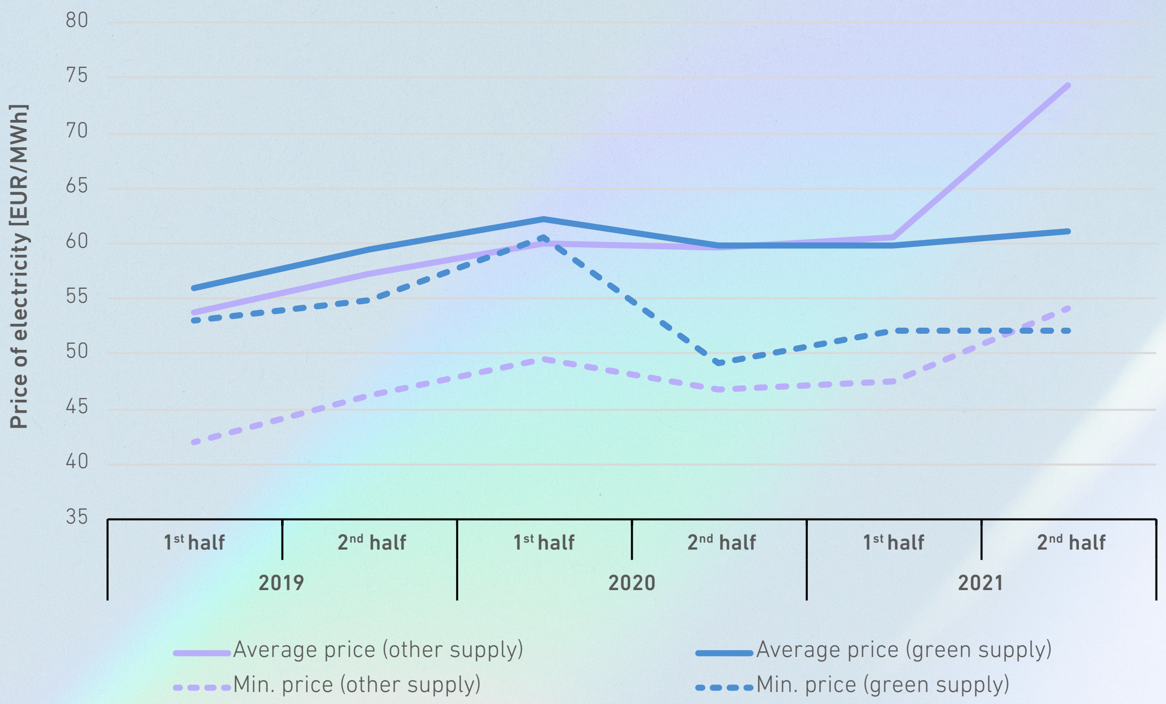
Figure 80 shows that the RPI in all consumer groups with the exception of the largest group De, began to rise in the first half of 2021. By the end of the year, a substantial rise in the RPI took place across all consumer groups. Compared to January, the RPI increased the most in consumer groups Da and Db, namely by 18%. In the same period, the lowest rise was recorded in the largest consumer group De. A rise in the RPI is a reflection of a delayed transfer of higher prices from the wholesale to the retail electricity market. The suppliers failed to replace the most favourable action offers with comparable offers in terms of price, or they did not replace such offers at all. Based on the movement of the RPI in 2021, it is possible to conclude that at the end of the year, most suppliers' portfolios lacked more low-cost forward contracts, purchased on the wholesale electricity market before 2021.

2021 saw the highest values of the RPI in the last ten years in all consumer groups

Analysis of Green Electricity Prices

As part of their electricity supply services, electricity suppliers offer consumers specific products that, among other things, differ in their structure of primary production sources. Consumers can choose between the supply of electricity produced exclusively from RES (green electricity) and other products that include other energy sources in their production sources (other supply offers).

FIGURE 81: PRICE TRENDS OF GREEN ELECTRICITY AND OTHER OFFERS IN SLOVENIA FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2019–2021 PERIOD



SOURCE: ENERGY AGENCY

Figure 81 shows the trends in the average price of green electricity and other offers and the trends in the lowest price of green electricity and other offers available in the market for a typical household consumer in the 2019–2021 period[23].

At the end of 2021, green electricity was the most favourable offer on the retail market

The rise of the average electricity prices that started in the second half of 2020 continued in 2021 regardless of the type of offer. In the second half of 2021, a significant increase in the price of other offers took place, while prices of green electricity rose, but to a lesser extent. In the second half of the year, the average price of other offers rose by 23% compared to the first half, while the lowest price of other offers in the same period rose by 14%. In the second half of 2021, the price of other offers exceeded the green electricity offer. The average price of green electricity grew at a slower pace compared to the price of other offers, mostly because GEN-I and Elektro Energija[24] had not yet decided to raise the price of current offers. In the second half of the year, the average price for green electricity rose by 2% compared to the first half of the year, while the lowest green electricity price remained the same. In the second half of 2021, the market share of green electricity was 27%, which means that the two above-mentioned suppliers significantly affected the movement of the average green electricity price with their price policy.

23 Consumption profile of a typical household consumer: billed capacity 7 kW, annual consumption 2200 kWh (peak tariff) and 1300 kWh (off-peak tariff)
24 The two suppliers offering half of all the available green electricity offers on the retail market at the end of 2021.

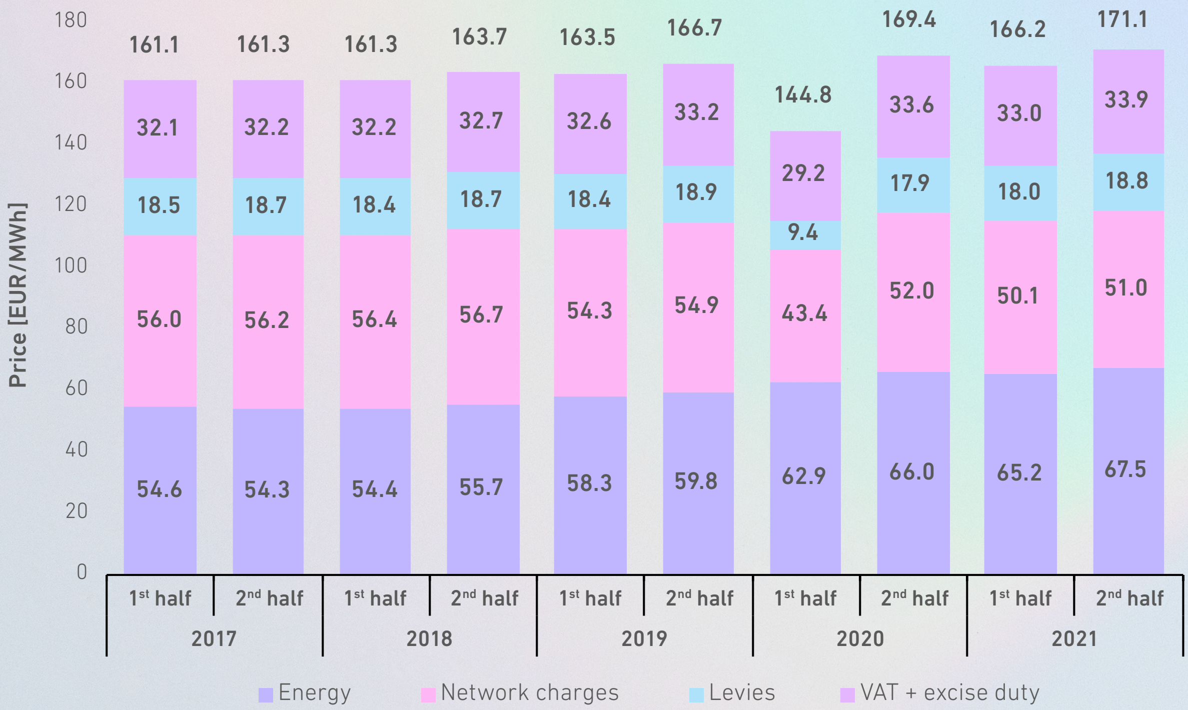
Final Electricity Prices for Household Consumers

An analysis of the structure of the final prices of electricity delivered to household consumers from the standard consumer group Dc is presented below[25]. The final electricity price for a consumer consists of:

- the electricity price set freely on the market;
- network charges:
  - network charges for the transmission and
  - network charges for the distribution network;
- levies:
  - levy for supporting electricity production with high-efficiency cogeneration and renewable electricity (RES);
  - the energy efficiency levy, and
  - levy for the operation of the market operator;
- excise duties and
- value-added tax (VAT).

7.4% higher final price of supplied electricity, which includes all electricity price components for the typical household consumer.

FIGURE 82: TRENDS OF THE FINAL ELECTRICITY PRICE IN SLOVENIA FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, SURS

25 The standard consumer group Dc includes household consumers with an annual consumption of between 2500 and 5000 kWh

The final price of electricity supply for household consumers from the standard consumer group Dc rose on the annual level by 7.4% compared to 2020. The increase in the final price is not a consequence of the increase of individual invoice items in 2021, but mostly a consequence of the emergency measures taken by the Government and the Energy Agency during the first COVID-19 wave in the period between 1 March and 31 May 2020[26]. To contribute to the rise of the final price was the increase in the price of electricity, which, on the annual level in 2021, amounted to 2.9% compared to 2020.

2.9% higher electricity price for the typical household consumer

A comparison with the last year before the epidemic, when there were no specific measures affecting the price of the network charges and levies, shows that the above-mentioned growth is principally a consequence of the increased prices of electricity, which on the annual level in 2021 grew by 12.4% compared to 2019. On the other hand, the data shows that the network charge on the annual level in 2021 dropped by 7.4% compared to 2019.

The share of the network charge in the final electricity price for a typical household consumer in 2021 was 30%, the share of energy was 39.3%, the share of the levies was 10.9% and the share of VAT and excise duty was 19.8%.

26 In the period of the first COVID-19 wave between 1 March and 31 May 2020, an emergency measure was adopted by the Energy Agency to mitigate the social and economic consequences of the epidemic for household and small-business consumers, which entailed the decision to omit billed capacity charges. Similarly to the Energy Agency, the Government adopted an emergency measure so that during the first epidemic wave, household and small-business consumers were not charged the RES contribution, which depends on the consumer's billed capacity. In 2021, there were no similar measures adopted, which was reflected in a 12.4% rise in the price of network charges and levies for the typical household consumer.

CASE STUDY: Calculation of the Weighted Price for the Typical Slovenian Household Consumer Based on the Data from Comparable Energy Agency Services.

With the objective of establishing the actual average retail price, the following is the weighted average electricity price for the typical Slovenian household[27] consumer in December 2021.

The calculation is performed based on supply offers for household consumers from all the suppliers the Energy Agency has access to. The calculation took into consideration the price of electricity and the number of consumers who were supplied with products based on observed offers in December 2021. The calculation excluded offers intended for the self-supply of household consumers.

Due to identified risks associated with the quality of data submitted by the suppliers regarding the number of consumers, we compared the reported numbers with the data on the number of metering points per each supplier reported to the Ministry of Infrastructure. The identified deviation (4%) does not significantly distort the result and is considered acceptable for the purpose of this case study.

The weighted average price of the typical Slovenian household consumption in December 2021 was €61.45/MWh. If we compare the weighted average price with the RPI, which for household consumers with the same electricity consumption amounted to €55.91/MWh in December 2021 (more on RPI in the chapter Retail price index for typical household consumers), we can establish that the weighted average price is €5.54/MWh or 10% higher.

The difference between the weighted average price of the typical Slovenian household consumer and the RPI in December 2021 shows that in this period, household consumers did not yet experience higher wholesale electricity prices. In addition, we can conclude that the typical Slovenian household consumer is on average supplied with electricity at relatively favourable prices.

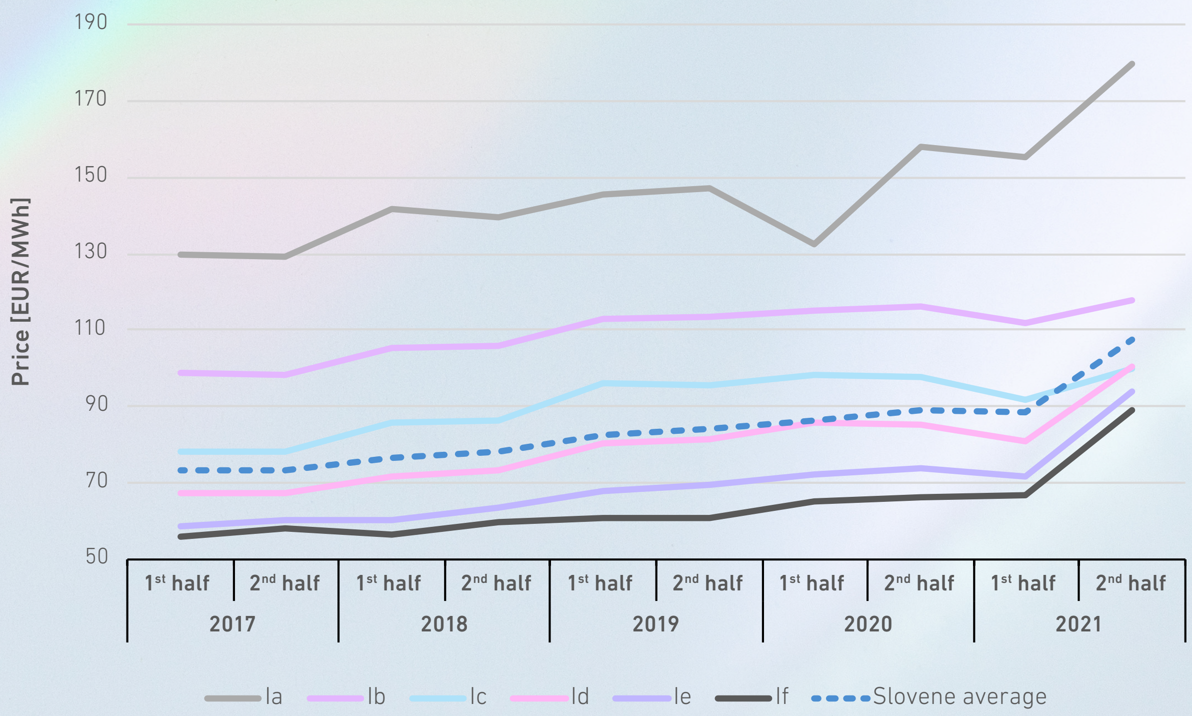
27 Consumption profile: billed capacity 8 kW, annual consumption 2100 kWh (off-peak tariff) and 1996 kWh (peak tariff)

Final Electricity Prices for Business Consumers

The average final electricity price for business consumers, which represents the average of the prices for the first and the second half of the year excluding VAT[28], was €97.9/MWh in 2021, which is an 11.3% rise compared to 2020. These prices had increased for all consumer groups, except Ib and Ic. The final price in the annual average for the group If had increased by 18.8% compared to 2020, which represented the biggest increase. Compared to 2020, the prices for the consumer group Ic had decreased by 2.1% in the 2021 annual average. The trends of the final electricity price in Slovenia for typical business consumers between 2017 and 2021 according to half-year periods are shown in Figure 83.

11.3% higher final electricity price for the average business consumer

FIGURE 83: TRENDS OF THE FINAL ELECTRICITY PRICE IN SLOVENIA FOR TYPICAL BUSINESS CONSUMERS IN THE 2017–2021 PERIOD



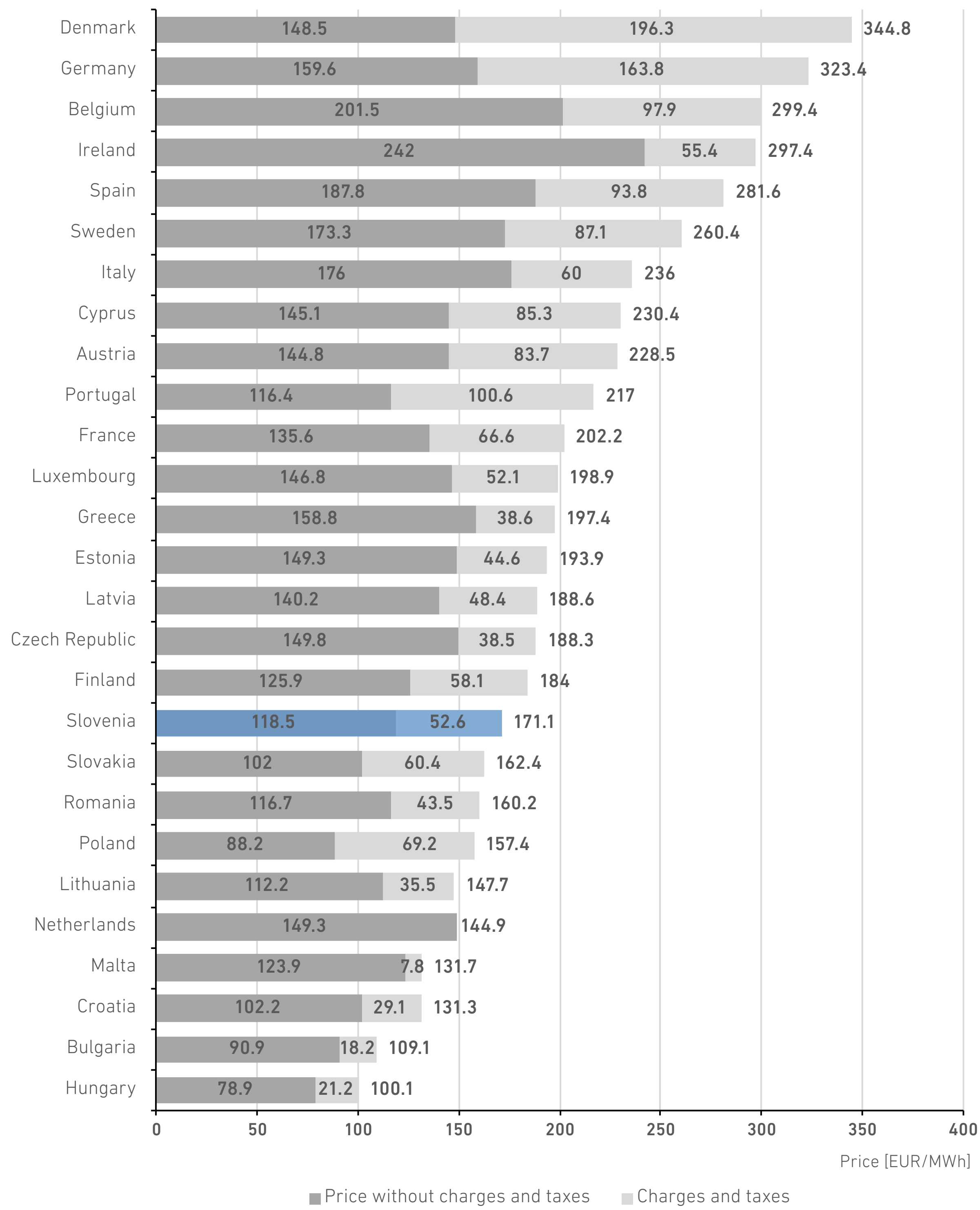
SOURCE: STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

28 VAT is not taken into account to ensure comparability with Eurostat's methodology.

Comparison of the Final Electricity Prices Between the EU Member States

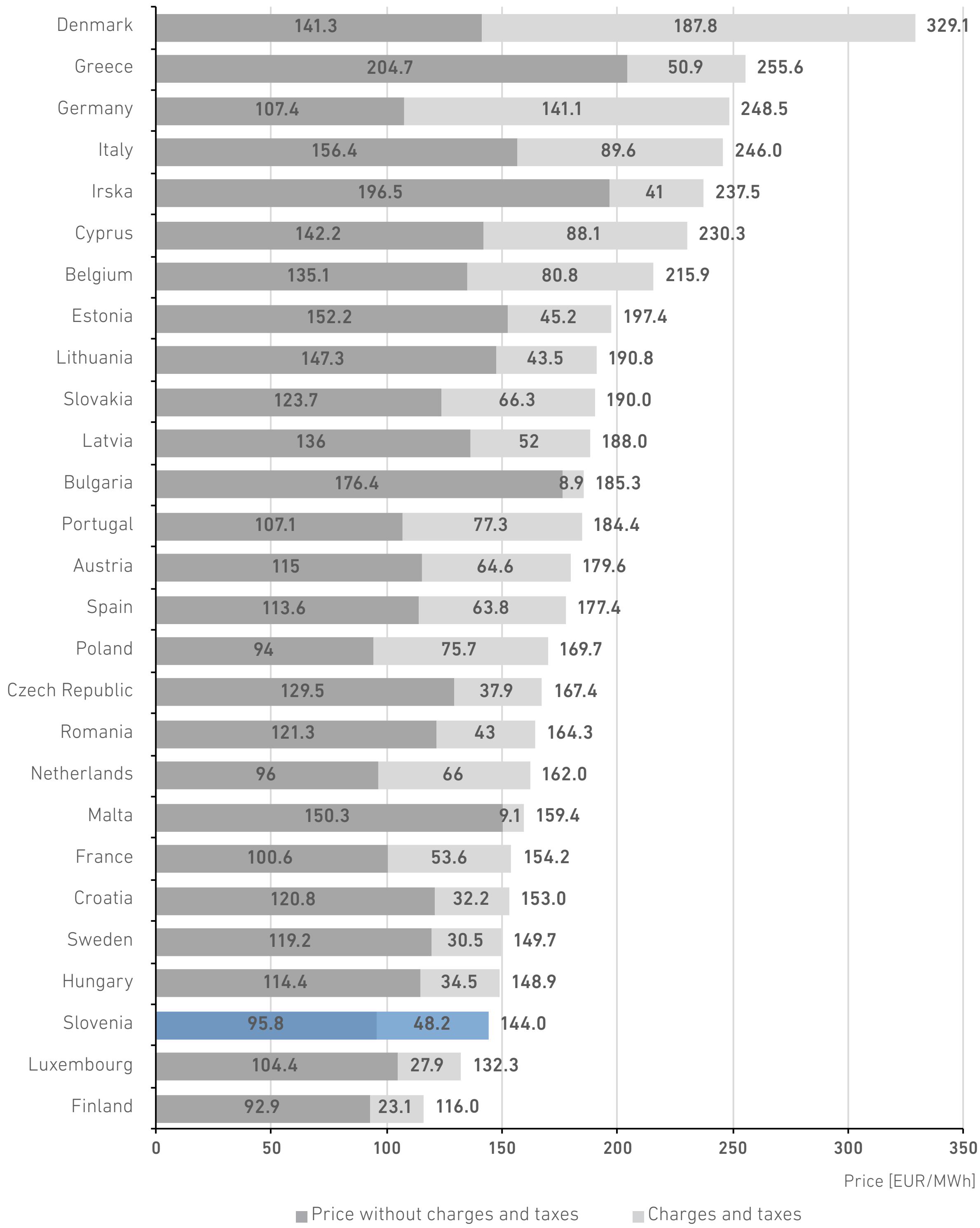
Figures 84 and 85 show the comparison of the final electricity prices in the EU Member States in 2021 for typical household and business consumers selected in accordance with the Eurostat methodology. Taxes and charges include levies, excise duty and VAT, while the price without charges and taxes includes the price of energy and the network charge.

FIGURE 84: COMPARISON OF FINAL ELECTRICITY PRICES FOR A TYPICAL HOUSEHOLD CONSUMER WITH AN ANNUAL CONSUMPTION BETWEEN 2500 kWh AND 5000 kWh (Dc) IN EU MEMBER STATES IN 2021 IN €/MWh



SOURCE: EUROSTAT

FIGURE 85: COMPARISON OF FINAL ELECTRICITY PRICES FOR A TYPICAL BUSINESS CONSUMER WITH AN ANNUAL CONSUMPTION BETWEEN 20 MWh AND 500 MWh (Ib) IN EU MEMBER STATES IN THE SECOND HALF OF 2021 IN €/MWh



SOURCE: EUROSTAT

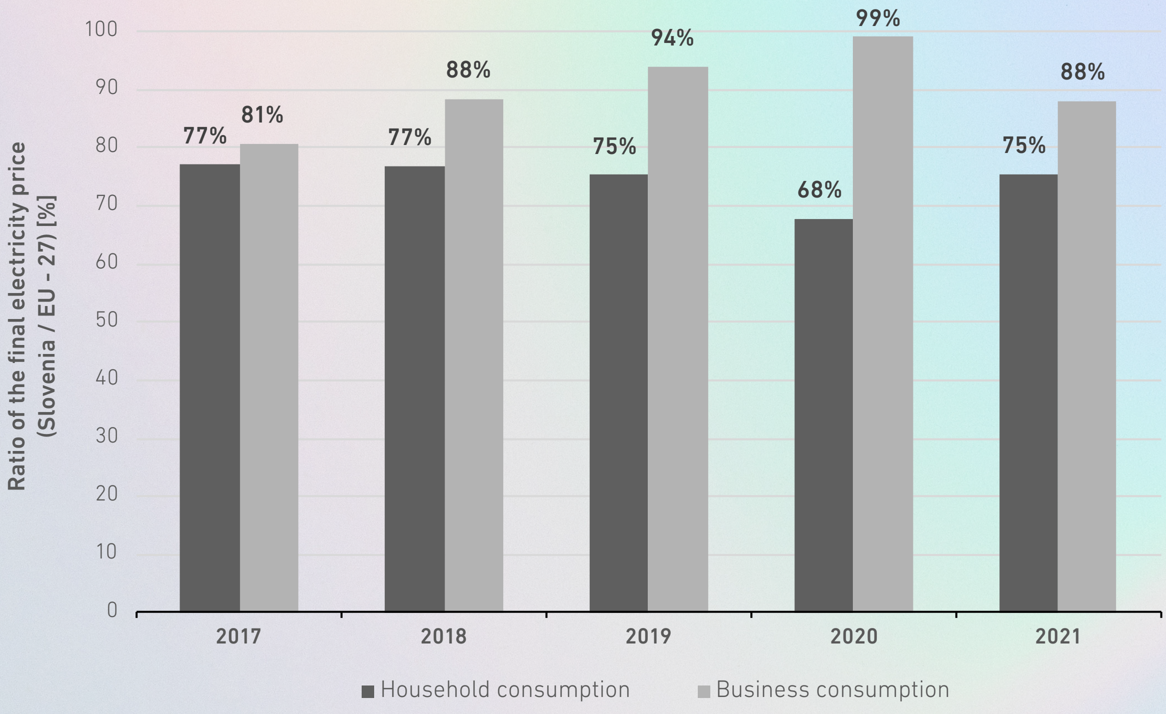
In the internal electricity market, the retail electricity pricing is market-based. It depends on the structure of production sources and accessibility of neighbouring markets, as well as on market activities. Despite a well-functioning market where electricity prices converge over the years, differences in final supply prices occur in network charges, charges in support of renewable energy production policies and in taxes. The nominal total price for a typical Slovene household consumer was below the EU average and also lower than in Austria and Italy, but higher than in Croatia and Hungary.

The total electricity price for a typical Slovene business consumer at the nominal level is considerably below the EU average and at the same time lower than in Austria, Italy, Hungary and Croatia.

Figure 86 shows the final electricity prices for a typical household consumer and a selected business consumer (Ic)[29] in Slovenia in relation to the EU 27 average in the five-year observation period. Analysis shows that in 2021, the final price for household consumption in Slovenia increased by approximately 7 percentage points compared to the preceding year, reaching a ratio to the EU 27 average price that it had in the 2017–2019 period. On the other hand, a drop of the final price for business consumption is detected in Slovenia in comparison with the EU 27, which indicates indirectly that the growth of the price for a typical business consumer in the EU 27 was greater than in Slovenia.

Slovenia has one of the lowest final prices for typical business consumers (Ib) in the EU

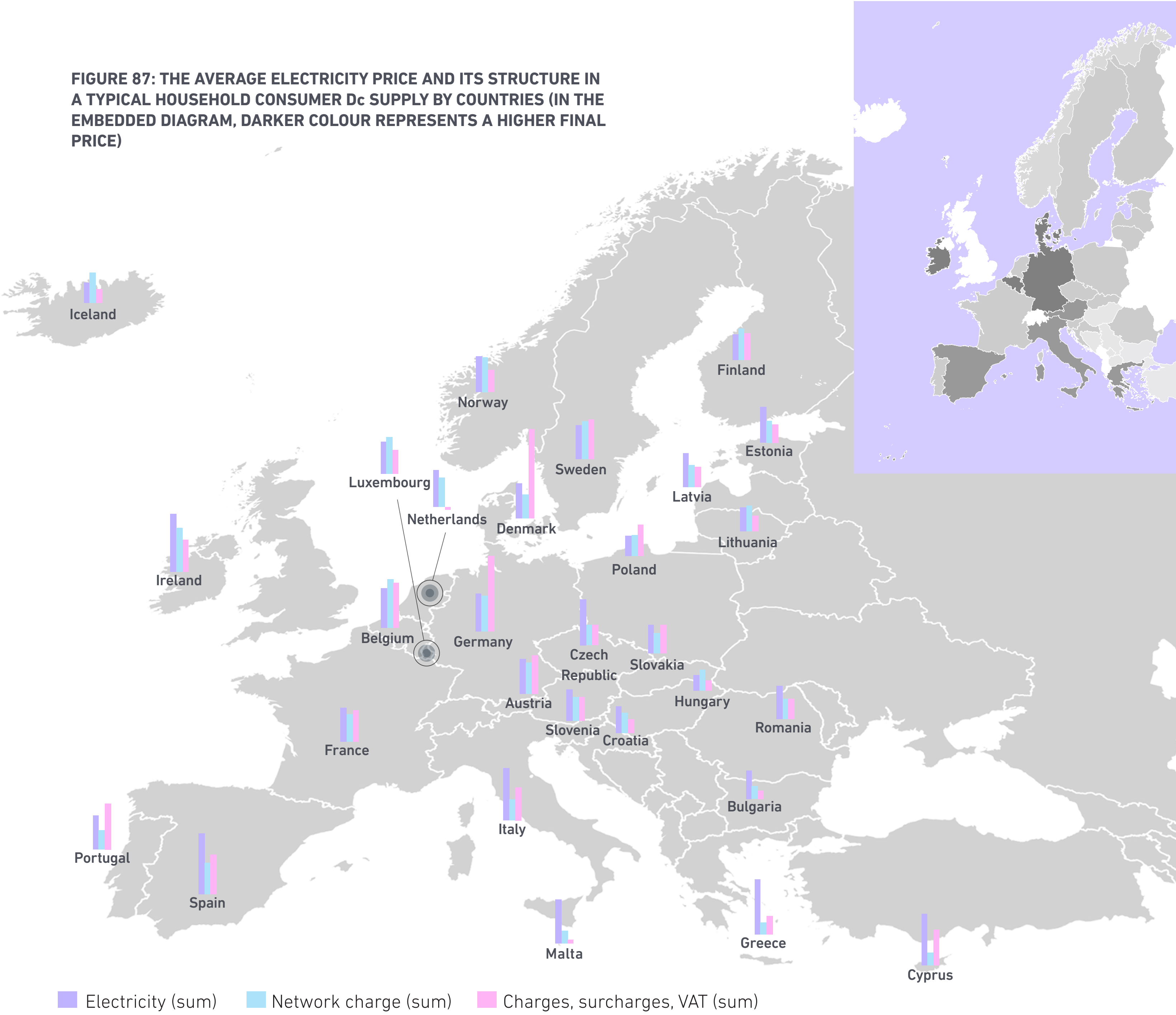
FIGURE 86: RATIO OF THE FINAL ELECTRICITY PRICE FOR A TYPICAL HOUSEHOLD (Dc) AND BUSINESS (Ic) CONSUMERS IN SLOVENIA TO THE EU 27 AVERAGE IN THE 2017–2021 PERIOD



SOURCE: EUROSTAT

29 Consumption profile: consumer group Dc, annual consumption 2500 kWh to 5000 kWh (household consumption) and consumer group Ic, annual consumption 500 MWh to 2000 MWh (business consumption)

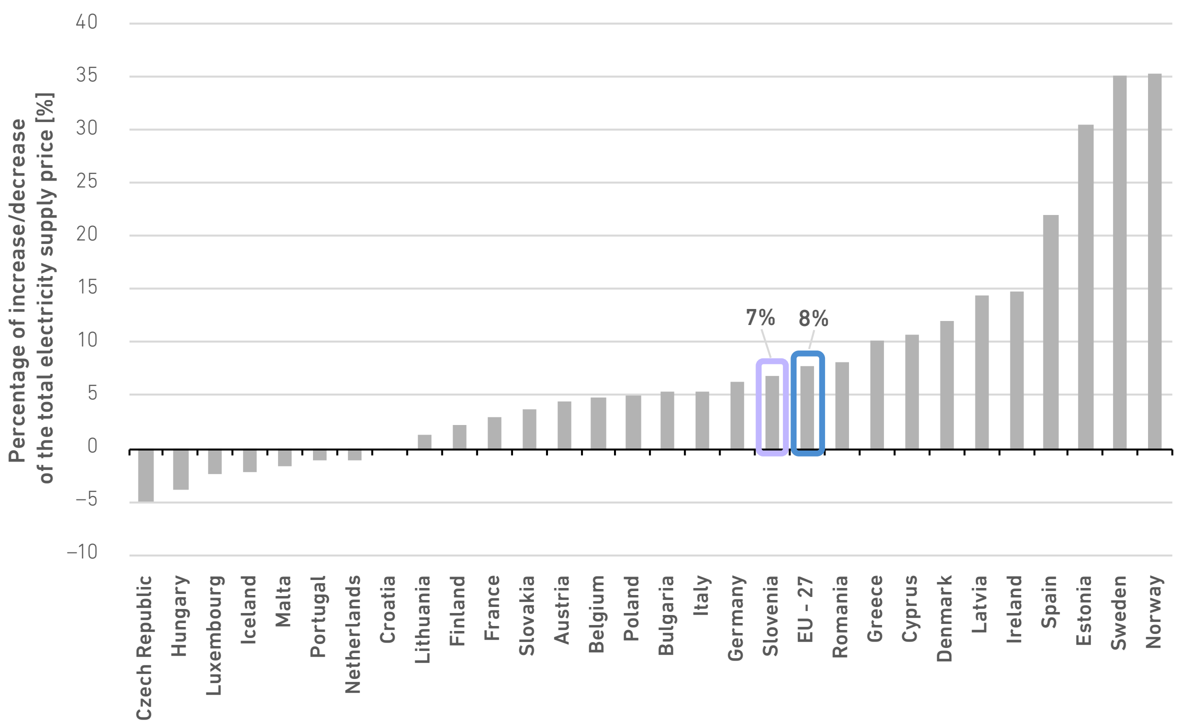
FIGURE 87: THE AVERAGE ELECTRICITY PRICE AND ITS STRUCTURE IN A TYPICAL HOUSEHOLD CONSUMER Dc SUPPLY BY COUNTRIES (IN THE EMBEDDED DIAGRAM, DARKER COLOUR REPRESENTS A HIGHER FINAL PRICE)



SOURCE: EUROSTAT

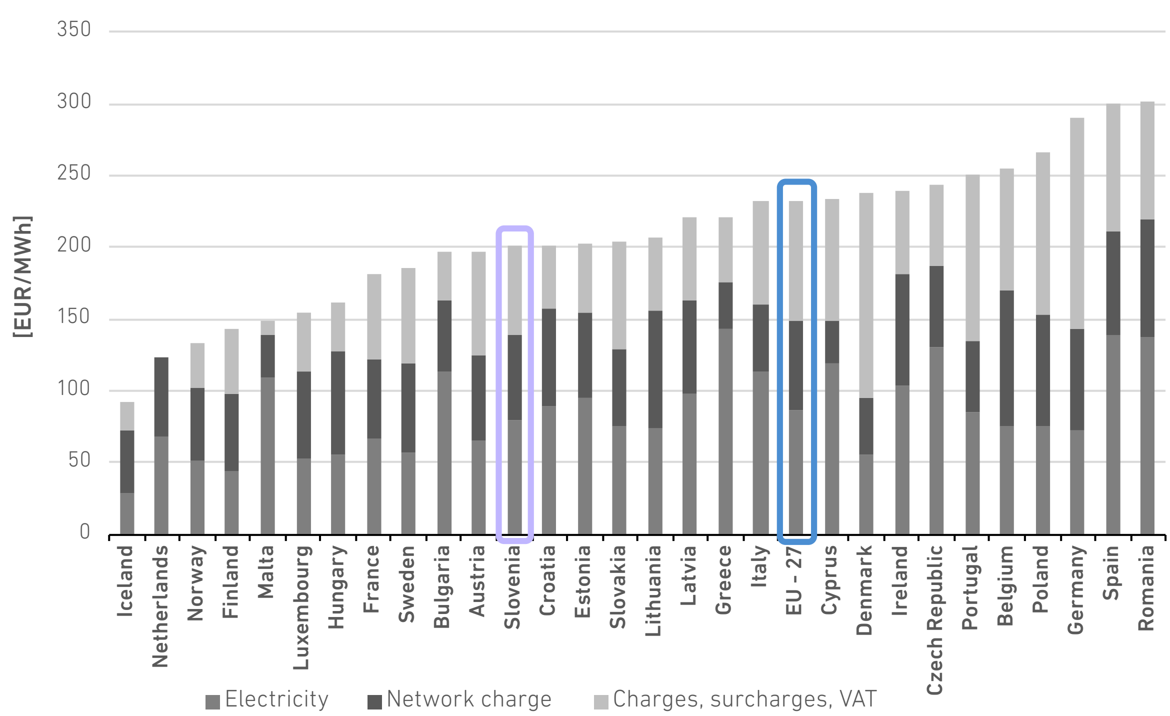
There is a similar trend in price increases in most EU member states. In 2021, an increase in the price of electricity supply for household consumers is particularly evident when observed in relation to the purchasing power index. The percentage of change in Slovenia is comparable to the EU average, but is one of the highest among the neighbouring countries.

FIGURE 88: PERCENTAGE OF INCREASE OR DECREASE OF THE TOTAL ELECTRICITY SUPPLY PRICE FOR A TYPICAL HOUSEHOLD CONSUMER Dc ACCORDING TO THE PURCHASING POWER INDEX COMPARED TO THE PREVIOUS YEAR



SOURCE: EUROSTAT

FIGURE 89: COMPARISON OF THE TOTAL PRICE OF ELECTRICITY SUPPLY FOR A TYPICAL HOUSEHOLD CONSUMER Dc IN THE EU MEMBER STATES ACCORDING TO THEIR PURCHASING POWER INDEX

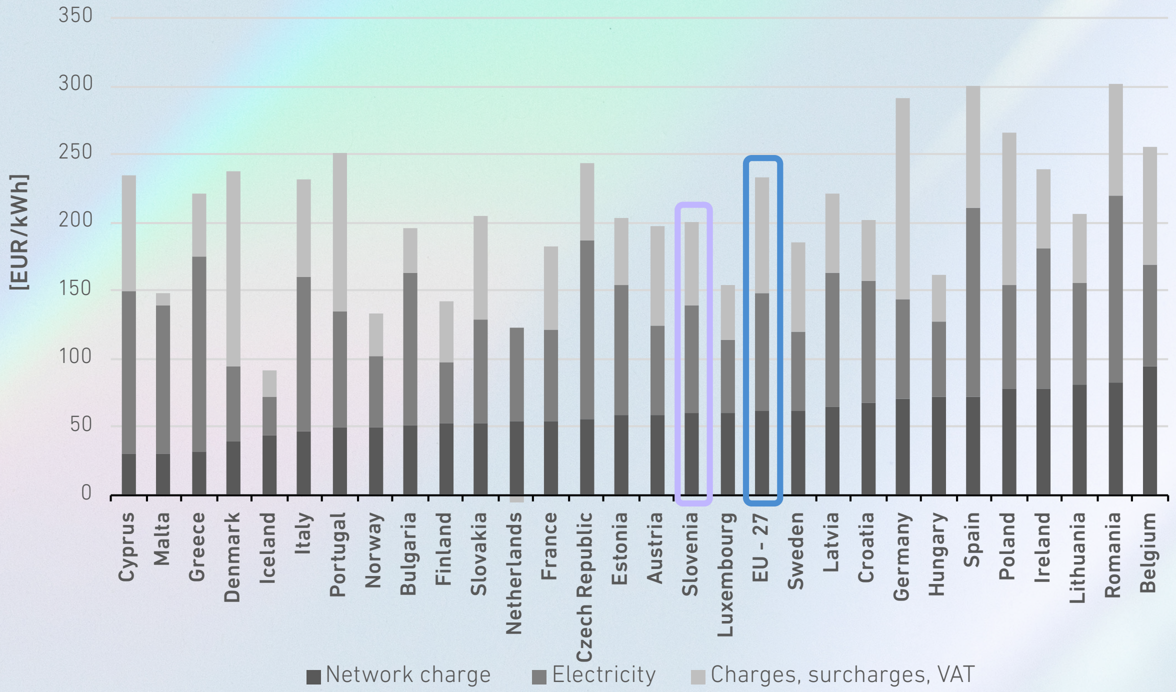


SOURCE: EUROSTAT

Figures 89 and 90 show the comparison between percentages of the total price of supply in the EU according to the purchasing power standard[30]. In this case, the price of supply for a typical household consumer in Slovenia is comparable with the prices in the neighbouring countries and below the EU average. The same applies to the network charge, which is even higher in Slovenia than in Austria or Italy for this type of consumer, lower than in Croatia or Hungary and comparable with the EU 27 average.

The final electricity prices for a typical household consumer (Dc) remain below the EU average

FIGURE 90: COMPARISON OF THE SHARES OF THE NETWORK CHARGE IN THE TOTAL PRICE OF ELECTRICITY SUPPLY FOR A TYPICAL HOUSEHOLD CONSUMER Dc IN THE EU MEMBER STATES ACCORDING TO THEIR PURCHASING POWER INDEX



SOURCE: EUROSTAT

Margin and Responsiveness of Retail Prices

An analysis of the correlation between the wholesale prices and the energy component of retail prices for household consumers represents the suppliers' estimated gross margin but it also indicates the level of responsiveness of retail prices to changes in the wholesale prices. The analysis illustrates the total indicators for Slovenia and does not compare the margins of individual suppliers.

Here, the margin is only a theoretical indicator and does not imply the suppliers' profit since they have other expenses related to their comprehensive offer besides electricity supply.

In that context, the margin is the difference between the price on the energy bills of a typical household consumer with an annual consumption of between 2,500 kWh and 5,000 kWh (consumer group Dc) and the estimated costs of supplying that energy. To estimate the costs of energy supply, we use the wholesale price index, which is weighted to represent an approximation of the optimum strategy for energy supply in forward and daily wholesale markets[31].

30 The Purchasing Power Standard (PPS) is an artificial currency. It equals to one euro at the average level of the EU Member States. In theory, one PPS can buy the same amount of goods and services in any Member State. Cross-border price level differences mean that different amounts of units in the national currency are necessary for the same goods and services. The PPS is calculated by dividing any economic aggregate of a country in its national currency into its purchasing power parities. Purchasing power parities are exchange rates that equalise the purchasing power of different currencies by eliminating price level differences between countries.

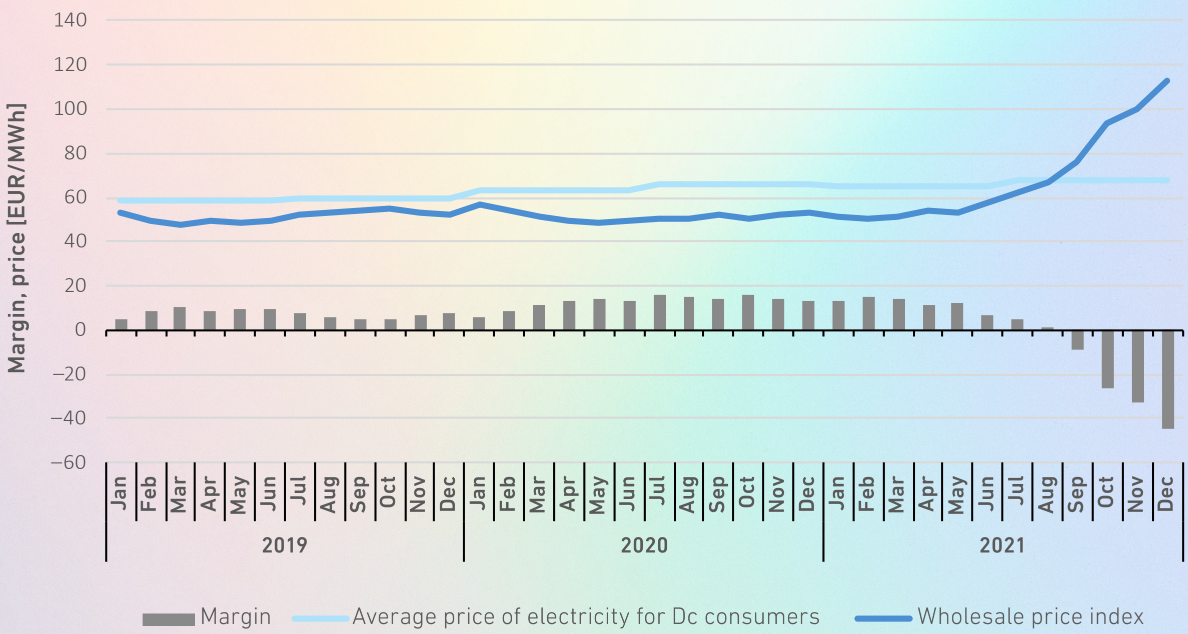
31 The methodology is explained in more detail in Annex 6 of the ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014.

The level of convergence between the energy component of retail prices and the wholesale prices over a longer period of time can be used as an additional indicator of the efficiency and competitiveness of the retail market.

In 2021, the average retail margin, which in 2020 amounted to €12.9/MWh, dropped to €-2.8/MWh.

In the last month of 2021 in particular, in which the average price for household consumers had not yet increased considerably, the influence of fast-growing short-term wholesale prices was felt and the forward prices started to grow as well.

FIGURE 91: MARGIN AND RESPONSIVENESS OF THE ENERGY COMPONENT OF RETAIL PRICES



SOURCES: ENERGY AGENCY, SURS

Figure 91 shows the relative convergence of the wholesale prices and the energy component of retail prices until mid-2021. Compared to the previous year, the energy components of retail prices for household consumption increased by 2.9% in 2021, while the wholesale price index increased by 34.1%. The correlation coefficient of the monthly levels of these two price elements is 0.78 over the last year, indicating moderate convergence, even though the increases in retail prices lag behind for at least a few months. In principle, positive correlations are good since they imply appropriate responsiveness and a higher level of competitiveness in the retail market. The low level of responsiveness of retail prices in 2021 may be a consequence of either the good management of market risks by major suppliers or an increase in supplier switches made by consumers at the end of the year.

Negative retail margin in the last four months

Transparency

Financial Transparency of Suppliers, Transparency of Invoices and the Obligation of Public Price Quotes

Suppliers' annual reports are drawn up pursuant to the Companies Act (ZGD-1). Even though the transparency of invoices is not explicitly systemically regulated, the framework legislation in this area ensures an appropriate level of transparency. The suppliers' invoices display a breakdown of the costs of electricity, the network charge, levies, excise duty and VAT. In addition, the invoices include information on the structure of primary electricity sources, carbon dioxide emissions and the resulting radioactive waste. Suppliers have to provide household consumers and small business consumers with transparent information on their electricity supply and the related price lists, as well as the general terms and conditions for their supply services, at least by publishing this information on their website.

The anticipated reform of the network charge tariffs system introduces a more complex tariff for the use of the network. This will add to the greater complexity brought about by the new regulatory framework, according to which certain retail suppliers are obliged to provide, in addition to products with a fixed price, products based on dynamic energy prices, connected to wholesale prices, e.g. prices in the day-ahead market. For suppliers, both novelties represent a new challenge in terms of invoice structure and will certainly require the development of appropriate electronic data services to enable suppliers to control the charged quantities in more detail. The novelties certainly require an analysis of the regulatory framework in place and, if necessary, appropriate amendments.

Publication of the Structure of Energy Sources

In order to ensure transparency, energy suppliers must make sure that the proportions of individual electricity production sources are shown in the overall structure of electricity supplied in the previous year on the issued invoices, web pages and promotional materials. Suppliers must publish information on the structure of energy sources for the previous calendar year in the period between 1 July of the current calendar year and 30 June of the following year.

If suppliers include electricity products from various sources in their offers, they must, in the information provided to the final consumers, first indicate the breakdown of electricity generation by energy source for a specific product and only then for the total electricity supplied. Information is presented to the final consumers in a table with the prescribed form and with a pie chart. The pie chart must show the proportions of coal, lignite, natural gas, oil products, nuclear fuel and RES used. In the table, suppliers (except those suppliers who do not supply electricity from RES) must present separately the individual RES (hydro, wind, solar and geothermal energy and energy from biomass). The share of the supplied electricity from RES can be presented exclusively on the basis of cancelled guarantees of origin. Other sources are specified on the basis of the total remaining structure of energy sources, determined by the Agency pursuant to the remaining national and European production, and published on its web page.

Guarantees of Origin for Electricity

A guarantee of origin is a document issued by the Agency at the request of a producer of electricity. It contains information on the electricity source, the date of issue of the guarantee, information on the quantities of the produced energy for which the guarantee is issued, data on the producer and production facility (rated capacity, source, technology, entry into service), information on the support for the electricity produced and production period. The guarantees are issued electronically in the register of guarantees of origin. The register enables the electronic transmission of guarantees of origin between the consumers of the register, import and export of guarantees and their cancellation. With its cancellation, the guarantee of origin is used and serves suppliers as proof of the source of electricity supplied to the final consumers.

In 2021, 5243 GWh guarantees of origin were issued (5067 GWh for electricity from RES and 176 GWh for electricity from CHP). Of those, 1466 GWh of guarantees of origin were cancelled on the domestic market (1364 GWh for electricity produced from RES and 102 GWh for electricity produced in CHP). 4158 GWh of guarantees of origin for electricity from RES were transferred to other EU member states, while 1550 GWh of guarantees of origin for electricity from the same source were transferred from other EU members to Slovenia where they were or will be cancelled.

Ensuring Retail Market Transparency

Transparency in the retail market, where numerous participants offer a very large and diverse range of services, is ensured in particular by making all the necessary information publicly available. Suppliers publish information about their offers and products, as well as the terms and conditions related to their services, on their websites. The increasing flexibility of the retail market will contribute to even more variety of services with new participants entering the market. Information is distinctly scattered, while transparency is ensured by the Energy Agency and Borzen with their electronic services pursuant to the applicable law.

The monitoring process is carried out based on public and other data that the Energy Agency obtains from persons with a reporting obligation. Based on the results of monitoring, reports on violations or restrictive practices, etc., the Energy Agency carries out surveillance activities and implements measures with the aim of providing transparency. Those include bilateral cooperation, drawing up legislative amendments, influencing the regulatory provisions of secondary legislation to which the Energy Agency provides its opinion or consent, carrying out public consultations, undertaking corrective action aimed at the operation of market participants by implementing supervisory procedures, and guiding stakeholders through their participation in professional associations (e.g. the Energy Market Data Exchange Section (IPET Section) of the Energy Industry Chamber of Slovenia). The Energy Agency contributes to transparency by publicly publishing information and services at its single point of contact[32], which comprise:

- comparison and validation e-services, including a list of suppliers and electricity system operators that includes the identity cards of individual companies;
- key indicators in energy markets (eMonitor portal);
- reports on the state of the retail and wholesale markets and
- other useful data and relevant and up-to-date information contributing to the transparency of the retail market and services (structured list of legislation, explanation of the invoice, etc.).

The set of comparison e-services enables users to calculate and compare the costs of electricity supply according to individual consumption types. Comparative calculations can be carried out for the supply to household and small business consumers. Suppliers submit information about their offers to the Energy Agency in a standard format on a monthly basis in accordance with the Act concerning the method of electronic data reporting for the comparison of valid regular tariffs of electricity and natural gas suppliers for household and small business consumers.

The web application Check Your Monthly Bill enables consumers to verify the accuracy of the issued monthly electricity bill according to the selected supplier, supply offer and type of consumption. This calculation is performed separately according to the bill's legally required items; it is possible for all the products on the market but does not support checking balance payments.

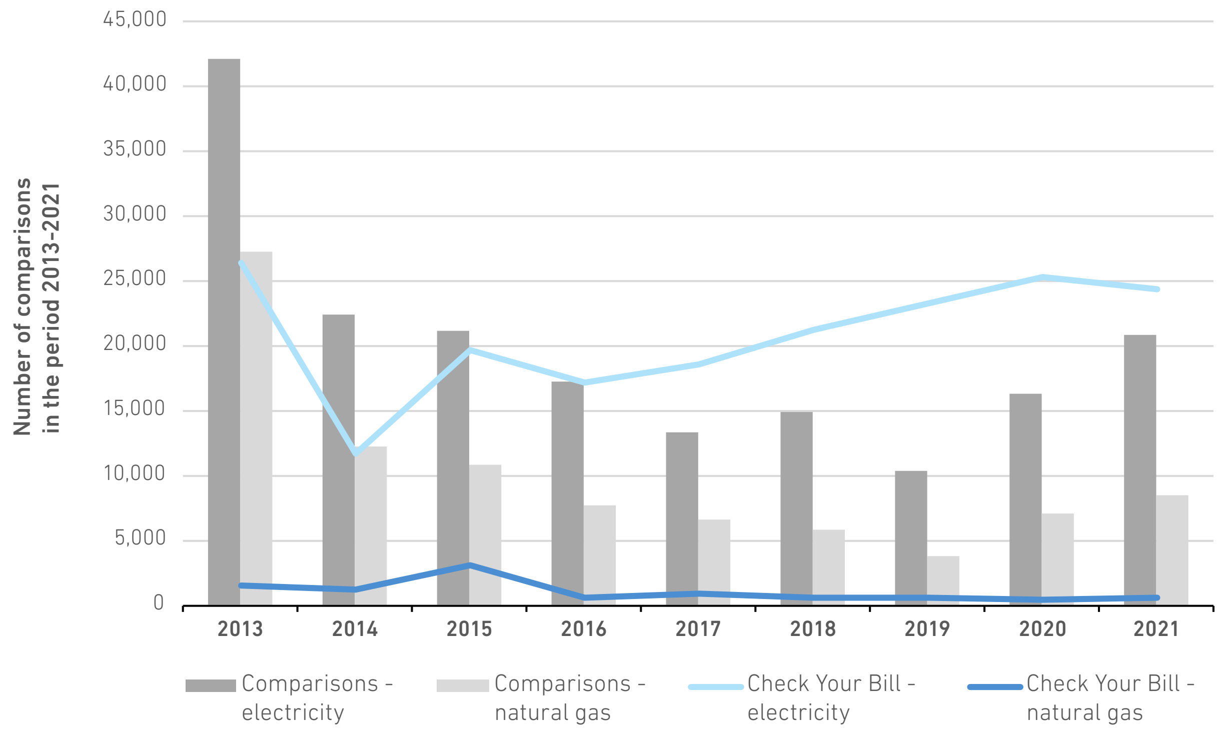
As part of its comparison services, the Energy Agency enables users to make a comparative calculation of the costs for the use of the network for all consumer groups according to the user's consumption type (app Calculate the Costs for the Use of the Network).

An independent comparison of all the offers on the market in one spot surely fundamentally contributes to more transparent offers in the retail market. As part of its comparison services, in 2021, the Agency provided comparisons of all the offers on the retail market, with individual exceptions: only individual offers from suppliers whose design or characteristics did not ensure a minimum level of comparability or would distort the comparison were excluded.

An analysis of the number of comparisons and invoice verifications performed confirms the increased interest of consumers: the number of comparisons carried out has increased by 28% (electricity supply) and 20% (natural gas supply) compared to 2020. At the same time, the number of consumers who carried out comparisons increased by 138% for electricity supply and by 73% for natural gas supply.

32 https://www.agen-rs.si/skt/ee

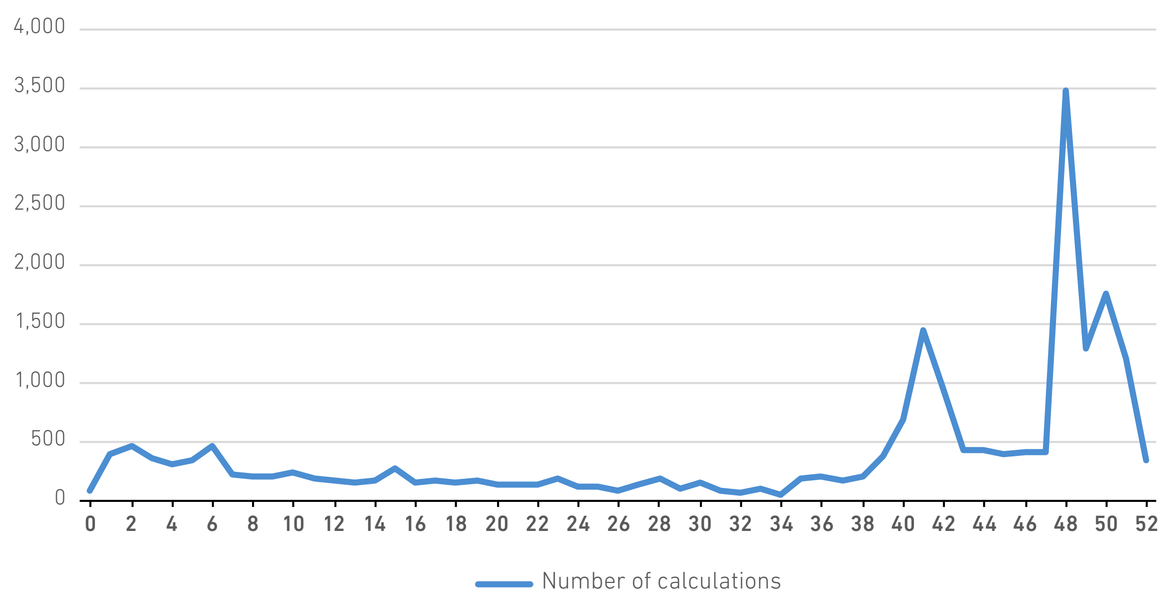
FIGURE 92: ANALYSIS OF THE NUMBER OF COMPARISONS CARRIED OUT AS PART OF THE AGENCY'S SERVICES



SOURCE: ENERGY AGENCY

The emergence of the energy crisis in the last quarter of 2021 and attempts by certain suppliers to cancel contracts or their announcements that they would stop pursuing the activities of energy supply prompted customers more strongly to use the Agency's comparative services, as shown in Figure 93.

FIGURE 93: ANALYSIS OF THE NUMBER OF COMPARISONS CARRIED OUT FOR ELECTRICITY SUPPLY ON A WEEKLY BASIS IN 2021



SOURCE: ENERGY AGENCY

Due to the end of the service life of the existing solution, the Energy Agency carried out a project to renovate the comparison services in 2021 to ensure compliance with the Clean Energy for All Europeans package and the CEER recommendations. The key novelty and, at the same time, challenge in the area of comparison services will be to support the comparison of offers on the basis of dynamic tariffs and, later, flexibility products. The renovation will address the shortcomings and limitations of the current solution and provide consumers with a better user experience. The introduction of the new solution is planned for 2022 when at least the outlines of energy supply products based on dynamic prices should finally be known.

Borzen established the Sustainable Energy web portal[33] with the aim of creating an information hub, a contact point for access to information on the efficient use of energy and RES in Slovenia. It brings together in one place, in a simple and transparent way, high-quality and expert information that helps consumers use energy more efficiently, while also serving an educational purpose, with the aim of raising awareness of the benefits of RES and their use. While not directly related to the retail market, the information published helps, among other things, to raise awareness among consumers on the importance of more environmentally friendly energy supply products, the potential for conservation and thus energy supply cost savings, and provides an overview of the opportunities and benefits of self-supply from RES, which has an impact on the choice of electricity supply products.

Market Effectiveness

The Energy Agency monitors the effectiveness and competitiveness of the retail market by continuously gathering data from market participants and public data aggregators (Ministry of Infrastructure). Based on the data on electricity volumes charged by suppliers to final consumers, the market shares of suppliers in individual market segments and their changes compared to 2020 are shown below.

Market Shares and Concentration in Retail Markets

Electricity Supply to all Consumers

Table 28 shows the market shares of suppliers according to their electricity supply, taking into account the supply in the entire retail market, which also includes large final consumers connected to the transmission system and closed distribution systems. An HHI of between 1,000 and 1,800 indicates a moderately concentrated retail market. Compared to 2020, when it was 1236, the HHI saw a slight increase to 1259.

Medium market concentration in the retail electricity markets

33 http://www.trajnostnaenergija.si/

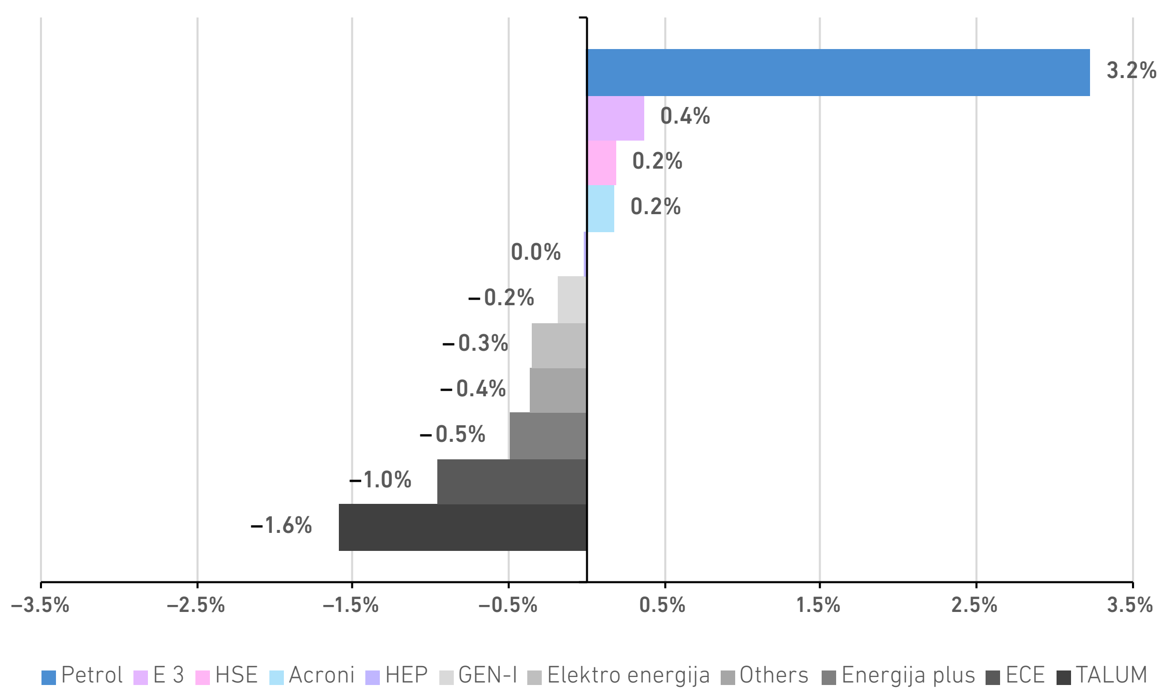
TABLE 28: MARKET SHARES AND HHI OF SUPPLIERS TO ALL FINAL CONSUMERS

SUPPLIER	Supplied Electricity (GWh)	Market Shares
GEN-I	2,764.2	20.7%
Petrol	1,974.8	14.8%
ECE	1,942.1	14.5%
Energija plus	1,648.0	12.3%
E 3	1,514.0	11.3%
Elektro energija	673.8	5.0%
Others	651.6	4.9%
HEP	637.7	4.8%
HSE	595.1	4.5%
TALUM	582.0	4.4%
Acroni	366.6	2.8%
Total	**13,349.8**[34]	**100%**
HHI of suppliers to all final consumers	**1,259**	

SOURCE: EPOS PORTAL

In comparison with the preceding year, the market share that increased the most in 2021 was that of Petrol. On the other hand, the greatest losses of market shares were recorded by Energija Plus, ECE and TALUM. In 2021, the latter continued the trend of reducing electricity consumption from 2019. In terms of the sizes of the changes, the market shares did not deviate considerably from the previous years, meaning that the market positions of suppliers did not change significantly, as shown in Figure 94.

FIGURE 94: CHANGES IN THE MARKETS SHARES OF SUPPLIERS TO ALL FINAL CONSUMERS IN 2021 COMPARED TO 2020[35]



SOURCE: EPOS PORTAL

34 The difference between the total and the sums of individual suppliers is due to rounding to one decimal place.
35 Changes in the markets shares of suppliers in 2021 compared to 2020 are rounded to one decimal place.

Electricity Supply to Business Consumers

Table 29 shows the market shares of electricity suppliers in the retail market to business consumers in 2021. The retail market for business consumers continued registering medium market concentration in 2021. The HHI was 1193, which is a slight raise compared to 2020, when it was 1180.

TABLE 29: MARKET SHARES AND HHI OF SUPPLIERS TO BUSINESS CONSUMERS

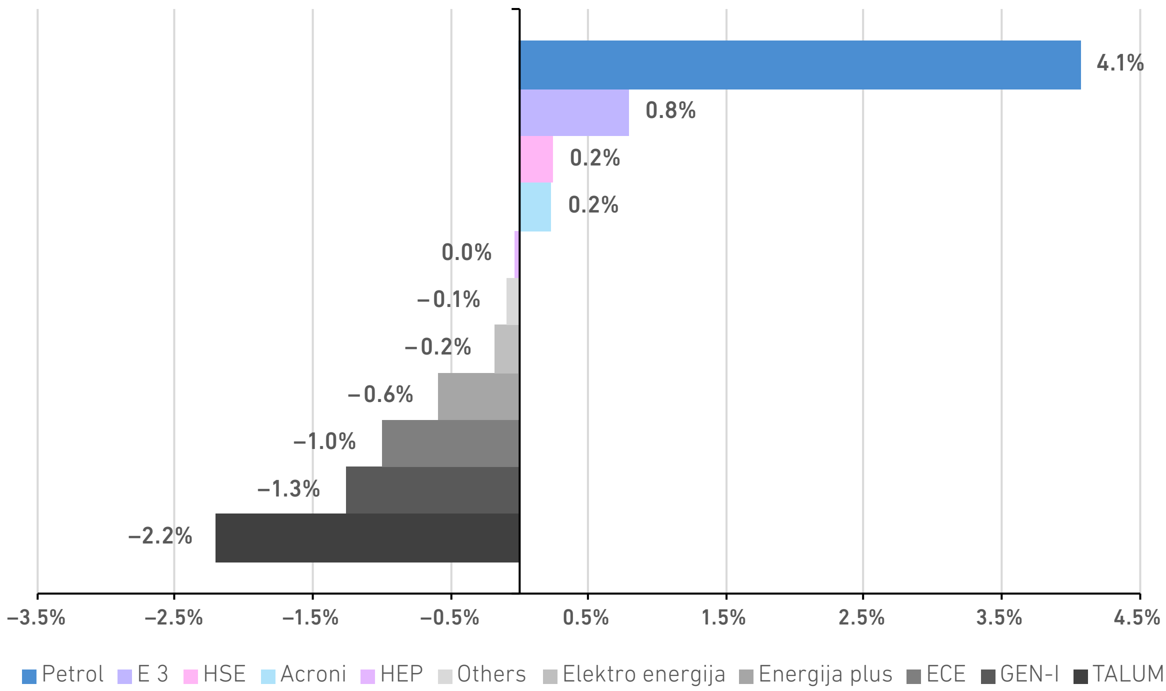
SUPPLIER	Supplied Electricity (GWh)	Market Shares
GEN-I	1,697.1	17.4%
Petrol	1,585.9	16.3%
ECE	1,406.6	14.5%
Energija plus	1,186.3	12.2%
E 3	1,020.4	10.5%
HEP	637.7	6.6%
HSE	595.1	6.1%
TALUM	582.0	6.0%
Others	430.2	4.4%
Acroni	366.6	3.8%
Elektro energija	218.1	2.2%
Total	**9,725.8**[36]	**100%**
HHI of suppliers to business consumers	**1,193**	

SOURCE: EPOS PORTAL

As shown in Figure 95, the largest market share compared to 2020 was gained by Petrol and E3. The greatest loss of market share compared to 2021 was recorded by TALUM, GEN-I and ECE.

36 The difference between the total and the sums of individual suppliers is due to rounding to one decimal place.

FIGURE 95: CHANGES IN THE MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN 2021 COMPARED TO 2020[37]

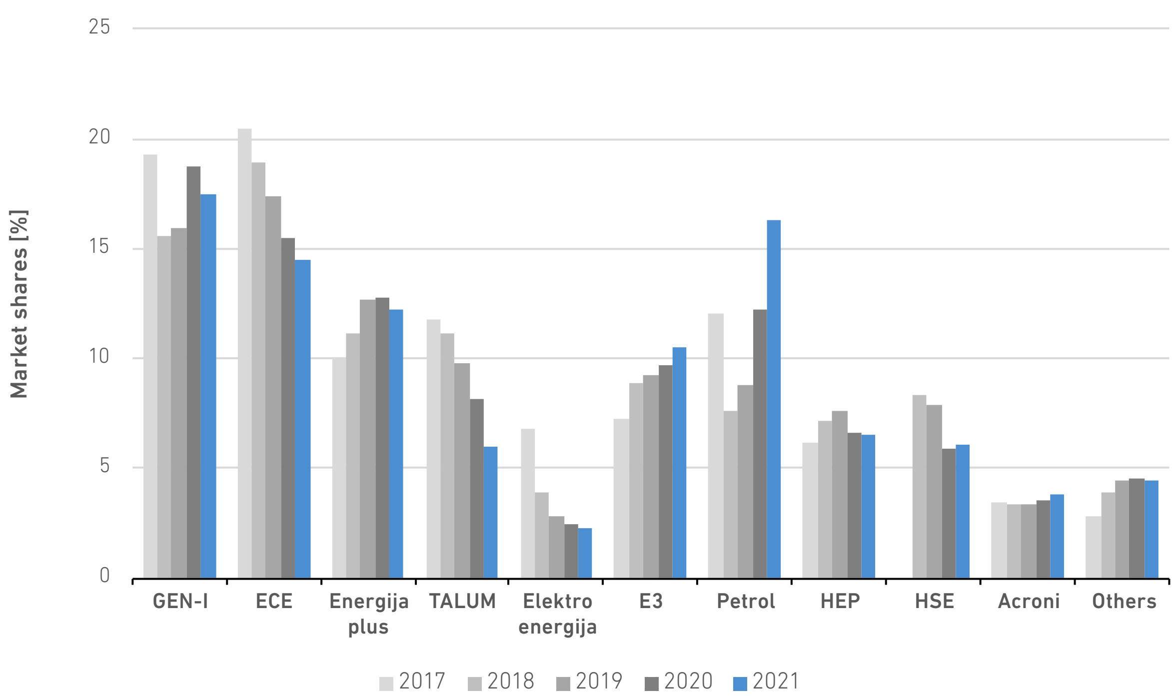


SOURCE: EPOS PORTAL

Figure 96 shows the five-year evolution of the market shares of suppliers to business consumers. ECE, TALUM and Elektro energija have been losing their market shares in this segment in recent years, while E3, Petrol and, to a lesser extent, Acroni have been increasing their market shares.

Having increased their market share for three consecutive years in the 2018-2020 period, GEN-I lost a part of their market share in 2021. Similarly, Energija plus lost their market share in 2021 after several years of growth.

FIGURE 96: COMPARISON OF THE MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN THE 2017–2021 PERIOD



SOURCE: EPOS PORTAL

37 Changes in the markets shares of suppliers in 2021 compared to 2020 are rounded to one decimal place.

Electricity Supply to Household Consumers

The retail market for household consumers was registering medium market concentration in 2021. The HHI was 1725, which is a slight raise compared to 2020, when it was 1636.

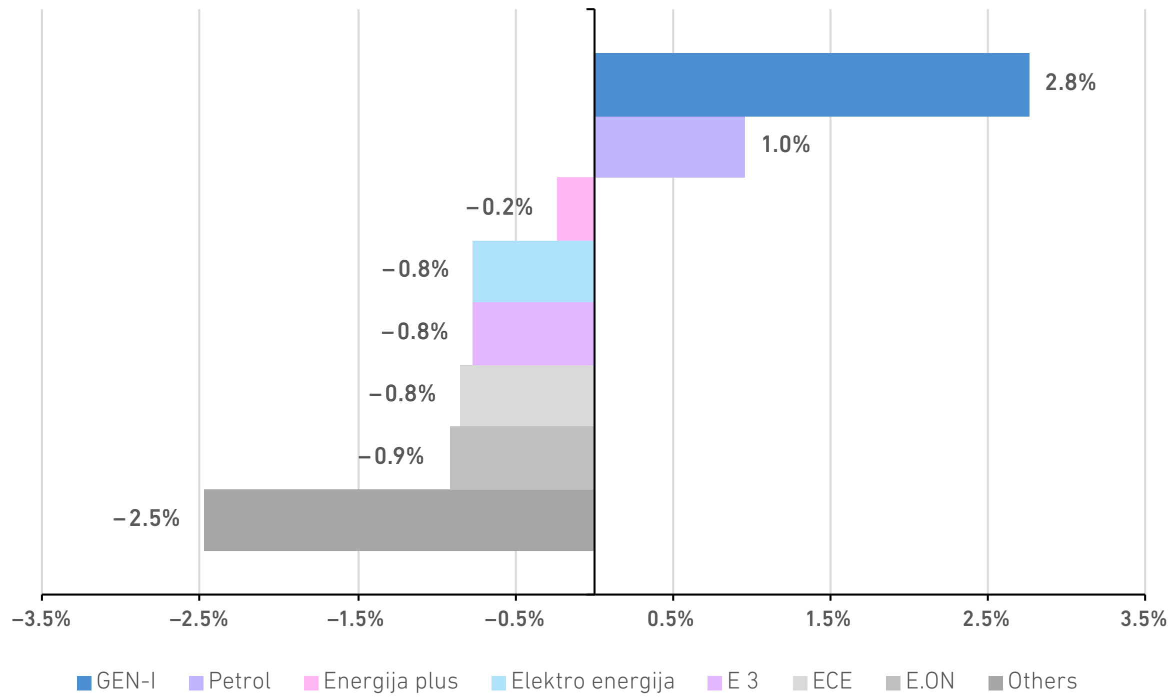
TABLE 30: MARKET SHARES AND HHI OF SUPPLIERS TO HOUSEHOLD CONSUMERS

SUPPLIER	Supplied Electricity (GWh)	Market Shares
GEN-I	1,067.1	29.4%
ECE	535.5	14.8%
E 3	493.6	13.6%
Energija plus	461.6	12.7%
Elektro energija	455.7	12.6%
Petrol	389.0	10.7%
E.ON	124.4	3.4%
Others	97.1	2.8%
Total	**3,624.0**	**100%**
HHI of suppliers to household consumers	**1,725**	

SOURCE: EPOS PORTAL

Compared to 2020, the largest increase in market share in the household consumption segment in 2021 was recorded by GEN-I and Petrol, as shown in Figure 97. The market share of the three largest suppliers was 57.8% and has increased by 1.1 percentage point compared to 2020. The greatest loss of market share compared to 2020 was recorded by other smaller suppliers.

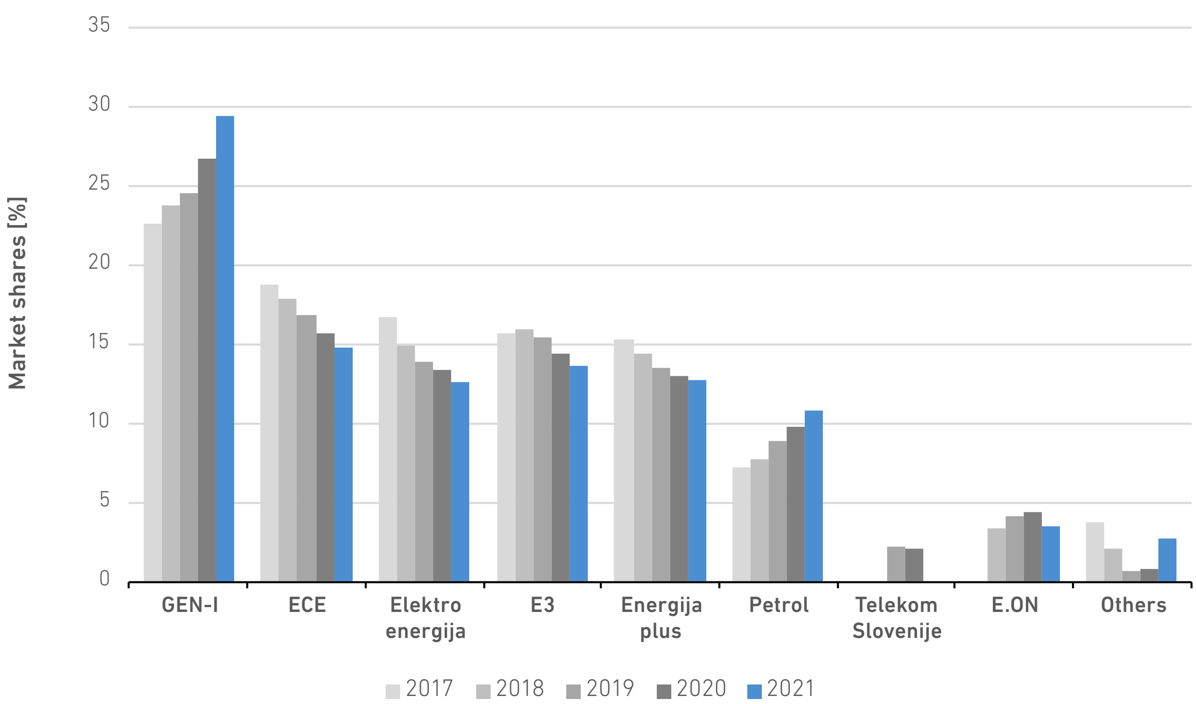
FIGURE 97: CHANGES IN THE MARKETS SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS[38]



SOURCE: EPOS PORTAL

Figure 98 shows the market shares of suppliers to household consumers. It presents their market shares in the 2017–2021 period. In this five-year period under review, ECE, Elektro energija and Energija plus were continuously losing their market shares. On the other hand, GEN-I and Petrol had been gaining market shares every year over the same period.

FIGURE 98: COMPARISON OF THE MARKET SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS IN THE 2017–2021 PERIOD



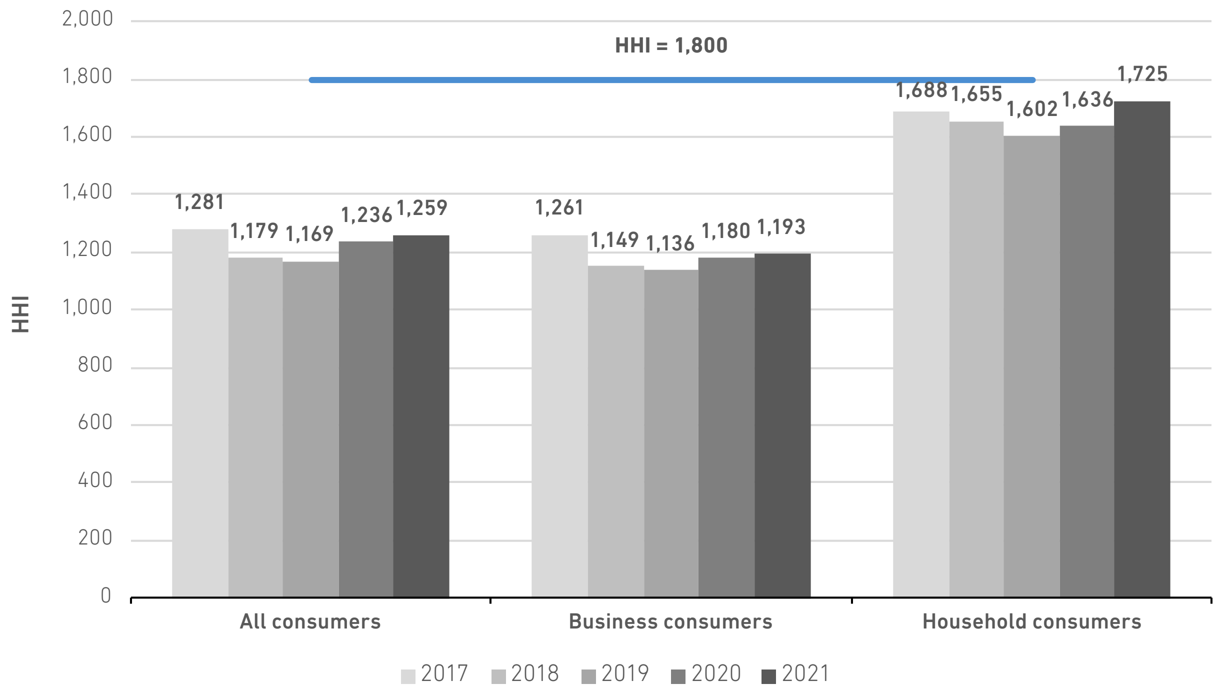
SOURCE: EPOS PORTAL

38 Changes in the markets shares of suppliers in 2021 compared to 2020 are rounded to one decimal place.

Comparison of Concentrations in the Relevant Markets

As shown in Figure 99, the HHI increased in all retail markets under review in 2021, which indicates lower competition in the relevant market, mostly in the case of household consumers.

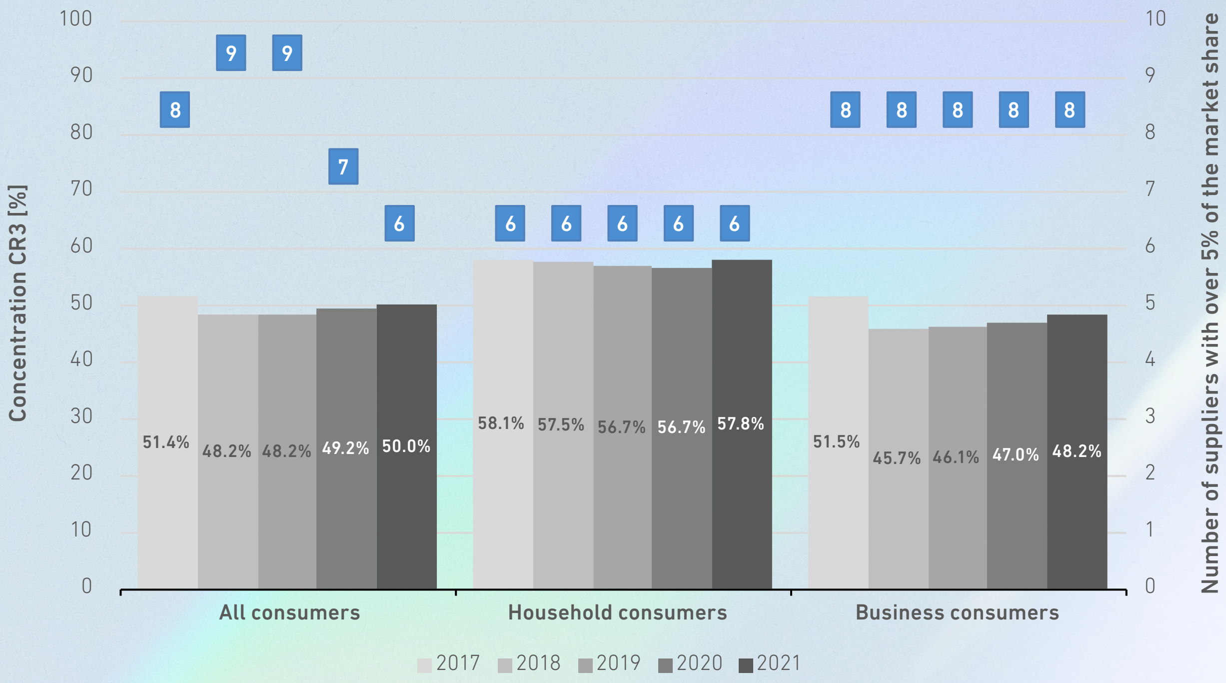
FIGURE 99: HHI EVOLUTION IN RETAIL MARKETS IN THE 2017–2021 PERIOD



SOURCE: EPOS PORTAL

A concentration ratio (CR) is a standard indicator of market concentration according to market shares. For the purposes of this report, CR3 is shown, which measures the total market share of the three largest suppliers in the market. The CR3 in all the markets under review indicates medium market concentration, as shown in Figure 100, showing the number of suppliers with over 5% of the market share.

FIGURE 100: CONCENTRATION (CR3) IN THE RETAIL MARKETS AND THE NUMBER OF SUPPLIERS WITH OVER 5% OF MARKET SHARE IN THE 2017–2021 PERIOD



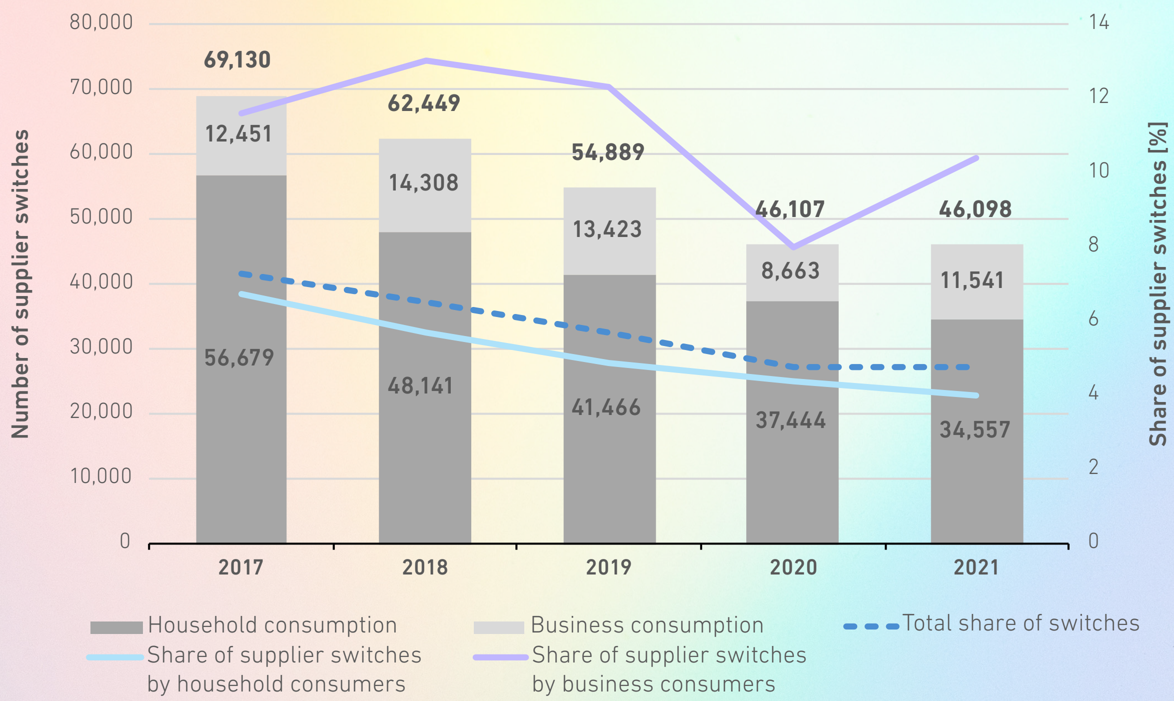
SOURCE: EPOS PORTAL

Switching Suppliers

In 2021, there were 46,098 electricity supplier switches, of which 34,557 were by household consumers and 11,541 by business consumers, which is a similar number of switches to the year before. On average, 2880 household consumers and 962 business consumers switched their electricity supplier every month. The number of switches has decreased for the sixth consecutive year and is the lowest in the period under review. In the last quarter of 2021, the trend of a decrease in switches started reversing to growth due to the increase of prices by some suppliers in the retail market. Figure 101 shows the trends in the total number of switches according to consumption type and the share of switches made by household and business consumers in the 2017–2021 period.

The number of switches has decreased for the sixth consecutive year

FIGURE 101: TRENDS IN THE NUMBER OF SUPPLIER SWITCHES IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, SODO

7.7%
fewer supplier switches by household consumers

33.2%
more supplier switches by business consumers

The share of supplier switches made by household consumers was 4% in 2021, 0.4 percentage point less than in the previous year. A decreasing share of supplier switches has a negative impact on the level of market competitiveness since consumer inactivity affects the activities of the suppliers in the market. For the sake of comparison[39]: two EU countries had a share of supplier switches by household consumers (according to metering points) higher than 20% in 2020, of which Belgium had 21%, while the share of another nine countries was over 10%, which is considerably more than in Slovenia, where it was 4.4%.

Figure 102 shows the number of supplier switches in 2021 by month, with three periods standing out in terms of increased switching: the spring period in April, the summer period in July and the autumn-winter period in October, November and December. The considerable increase in the number of supplier switches during the last period is a consequence of several influential factors. The increase in retail prices was primarily the consequence of the conclusion of promotional offers that were not replaced by new ones and of the increase, or announcements of the increase, in the prices of existing offers (one of the first suppliers to announce an increase in retail prices was Petrol). The number of supplier switches was additionally raised by the announcement of Telekom that they would leave the retail market at the beginning of 2022, the exclusion of Involta from the market and the attempt at the unilateral termination of supply contracts due to changed circumstances of the supplier Elektro prodaja E.U., which is described more in detail in the chapter Consumer Protection. These suppliers' customers were informed about the possibility of supply on the basis of last resort supply, unless they signed a supply contract with a new supplier[40]. In the period from October to December, Petrol, E3[41], Telekom Slovenije, Elektro prodaja E.U. And Elektro Energija lost the largest numbers of household consumers.

39 ACER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2020 – Energy Retail Markets and Consumer Protection Volume, November 2020, Figure 22

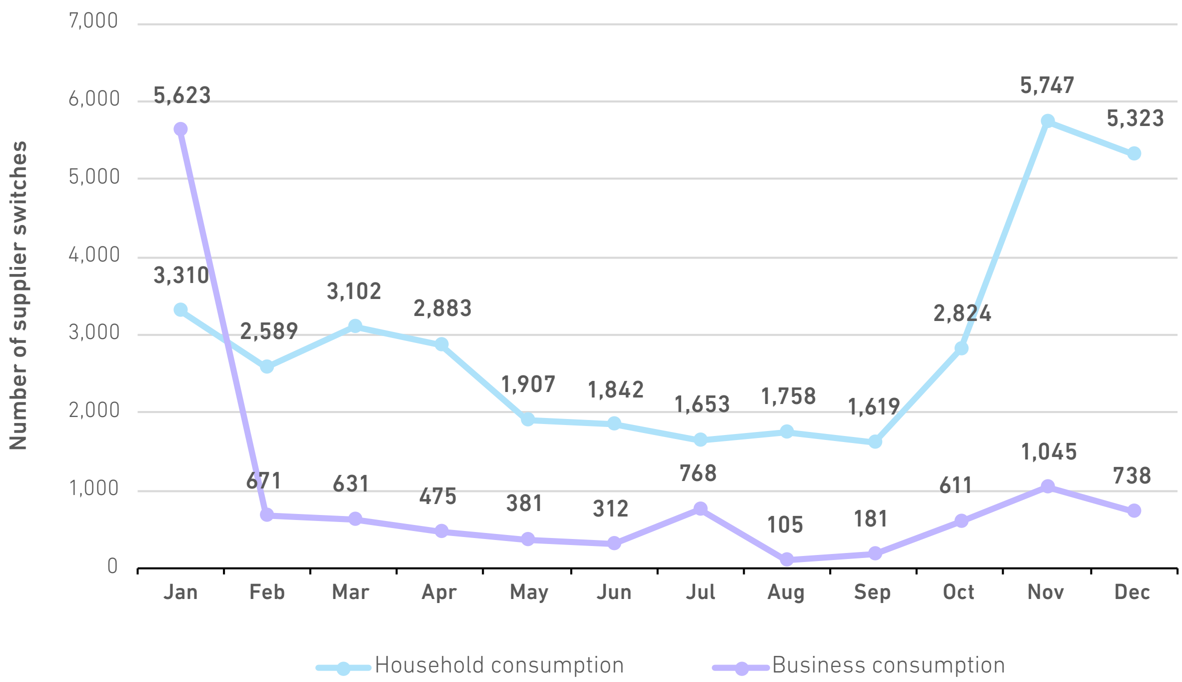
40 The number of transitions to last resort supply is not included in the data on supplier switches. In December 2021, 541 final consumers were supplied with electricity based on last resort supply, while in the rest of 2021, the number of consumers supplied on the basis of last resort supply moved between 2 and 4.

41 E3 did not cancel supply contracts; however, at the end of the year, the validity of certain offers terminated and were replaced by less favourable ones.

In the same period, the most new household consumers compared to September were acquired by Energija Plus and GEN-I. The former had a promotional offer in October and November, while GEN-I announced that they had no intention of raising retail electricity prices for household consumers in the short term.

In 2021, there were 7.7% fewer supplier switches by household consumers and 33.2% more supplier switches by business consumers compared to the year before. A higher number of switches by business consumers is usual at the beginning of the year, when most one-year supply contracts expire. However, there was a leap in the case of business consumers at the end of the year as well, which did not occur in the previous years. That leap indicates that consumers are sensitive to the movement of retail electricity prices.

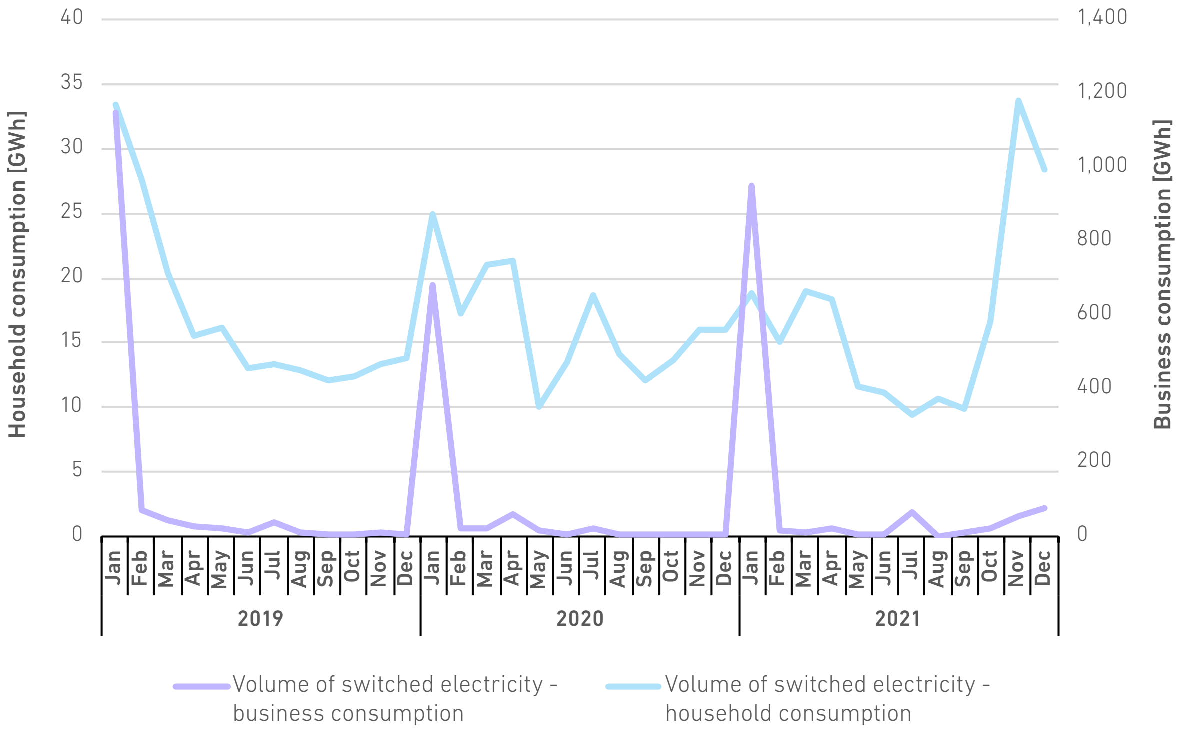
FIGURE 102: THE DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES IN 2021 BY CONSUMPTION TYPE



SOURCES: ENERGY AGENCY, SODO

Figure 103 shows the trends in the switched volume of electricity in the 2019–2021 period. The volume of switched electricity is closely related to the number of supplier switches. Switched electricity is the volume consumed by a consumer over one year that will cause an increase in electricity consumption for another (new) supplier due to the switch. This is why a higher number of supplier switches made by household and business consumers implies a higher volume of switched electricity. The leap in the volume of switched electricity in household consumption in the last quarter of 2021 is clearly evident in the figure. That leap indicates that, similarly to business consumers, household consumers are sensitive to the movement of retail electricity prices.

FIGURE 103: VOLUMES OF SWITCHED ELECTRICITY BY CONSUMPTION TYPE



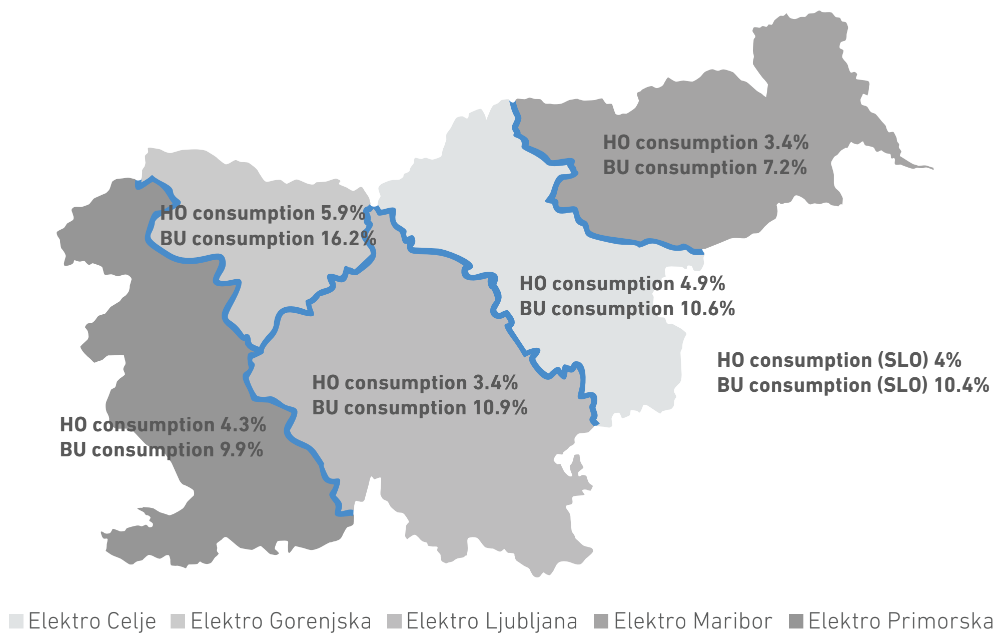
SOURCES: ENERGY AGENCY, SODO

Despite the potential savings (see the chapter Assessment of the Potential Benefits of Switching Suppliers), the number and share of supplier switches made by household consumers in Slovenia has been steadily decreasing in recent years. However, in the last quarter of 2021, that trend started to change.

To discover any deviations from the Slovenian average, the Energy Agency has performed an in-depth analysis of supplier switches made by household and business consumers in individual geographical areas. The results have enabled an analysis according to individual distribution areas. The consumer's choice (supplier, product) does not depend on their location but the economic and demographic development of the areas is diverse. There are still suppliers on the market that historically originate from electricity distribution companies, i.e. the owners and contractual managers of networks in individual distribution areas. Some suppliers still have ownership affiliation with those companies, which, in case of the ineffective division of activities, could be a potential obstacle to choosing suppliers freely.

Electricity suppliers supply electricity on the entire Slovenian territory, so all consumers are guaranteed the same freedom of choice. If the consumers' level of engagement was the same over the entire Slovenian territory, so just in theory, the number of supplier switches would be proportional to the total number of connected household consumers in individual areas of the distribution system. Consequently, the shares of switches would be the same. Nevertheless, the actual data indicates various shares of supplier switches, as shown in Figure 104.

FIGURE 104: SHARE OF SUPPLIER SWITCHES MADE BY HOUSEHOLD AND BUSINESS CONSUMERS IN THE AREAS OF INDIVIDUAL DISTRIBUTION COMPANIES



SOURCES: ENERGY AGENCY, SODO

The analysis showed that the largest share of supplier switches by household consumers was recorded in the distribution area of Elektro Gorenjska, while the smallest share was seen in the distribution areas of Elektro Ljubljana and Elektro Maribor. Compared to the overall share of switches made by household consumers in the Slovenian retail market, which was 4% in 2021, the share of switches was higher in the distribution areas of Elektro Gorenjska, Elektro Celje and Elektro Primorska, and lower in the other two areas (Elektro Maribor and Elektro Ljubljana).

The higher or lower shares of switches in the areas of individual distribution companies may be due to larger or smaller price elasticities of demand in those areas. The number of switches also depends on the consumers' increased activity in previous periods, targeted advertising by suppliers, the loyalty to suppliers that are or used to be integrated with a distribution company, consumer trust in a brand, etc.

The retail market in Slovenia has experienced considerable changes in recent years. Market competition has increased due to the introduction of new suppliers, access to information is easier due to the progress in digitisation, there are numerous new services available on the market, and the suppliers' business models are also different. All of this contributed to increased consumer activity in the last quarter of 2021 when electricity prices in the retail market started to raise.

Assessment of the Potential Benefits of Switching Suppliers

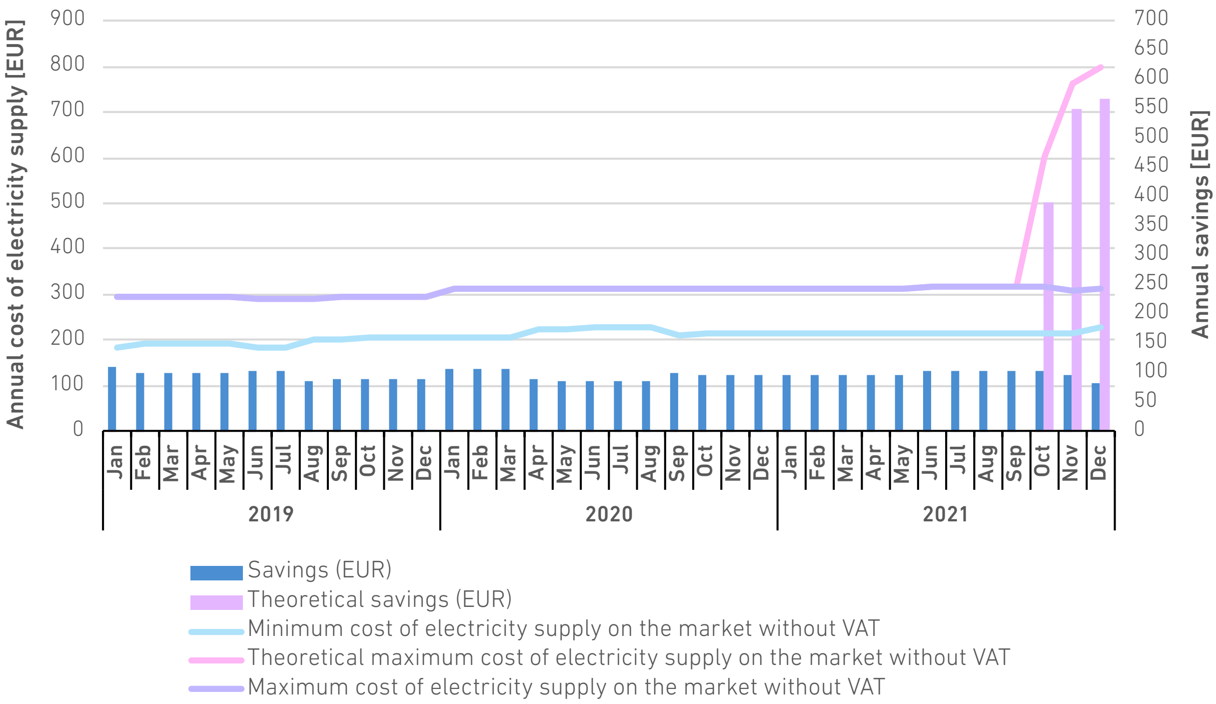
By switching their supplier, every consumer can reduce their annual electricity costs, coordinate and improve the contractual relations with its supplier and therefore gain additional benefits.

Figure 105 shows trends in the minimum, maximum and theoretically maximum costs of a typical Slovenian household consumer[42] for electricity supply in the retail market on an annual basis without the network charge, levies, excise duty and VAT, stemming from the offers published in the Supply Cost Comparator - a web application for comparing electricity supply costs.

The theoretically maximum (annual) costs take into account the most expensive offer in the retail market, which has not been used or was used to supply an insignificant number of customers, while the maximum (annual) costs take into account the most expensive offers in the retail market that were used to supply electricity to a considerable number of consumers. The minimum (annual) costs consider the cheapest offer published in the Supply Cost Comparator and available to any consumer. When determining the potential benefits on a monthly level, the difference between the maximum or theoretically maximum and the minimum costs is not taken into account.

42 Consumption profile: billed capacity 8 kW, annual consumption 2100 kWh (off-peak tariff) in 1996 kWh (peak tariff)

FIGURE 105: POTENTIAL ANNUAL SAVING BY SWITCHING SUPPLIER BASED ON THE DIFFERENCE BETWEEN THE MOST EXPENSIVE AND THE CHEAPEST SUPPLY OFFER ON THE MARKET



SOURCE: ENERGY AGENCY

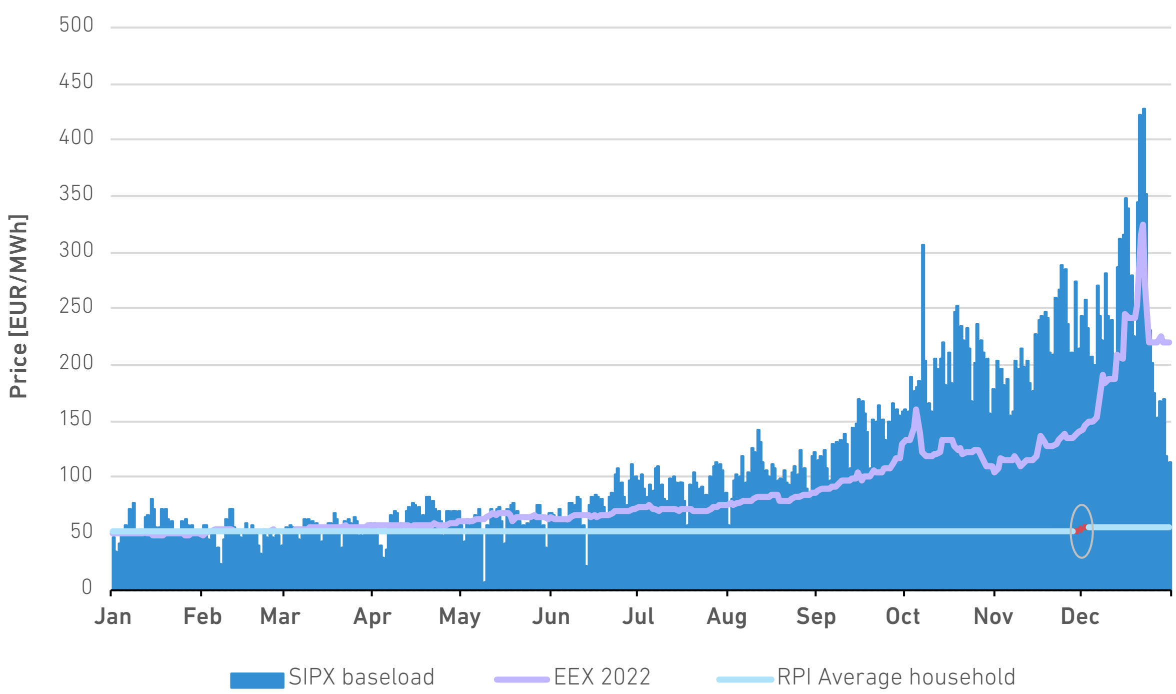
If a consumer whose 2021 supply was provided based on the most expensive offer opted for the cheapest offer in the market, their potential saving in that one-year period would be between EUR 98 and EUR 104.34 (if the prices remained the same throughout the year). Compared to 2019 and 2020, the potential savings for consumers with the most expensive supply have not changed much. At the end of the year, the price of the cheapest offer in the market increased, as shown in Figure 105. Consequently, the potential savings decreased, as the difference between the cheapest and the most expensive offers in the market was reduced. In the last quarter of 2021, we started to notice the transmission of higher wholesale prices, which was reflected in new offers prepared by suppliers. In general, the prices in the new offers were higher than in the previous ones. Very often, consumers did not accede to the new offers at all, or did so in a very limited number (after the conclusion of a promotional offer). The cost based on these offers are represented in Figure 105 as the theoretically maximum cost of electricity supply. From the difference between the theoretically maximum costs and the costs based on the cheapest offer in the retail market, the so-called theoretical savings are derived, which became relevant in the last quarter of 2021 due to the emergence of new, more expensive offers, and have grown considerably since then. For a handful of consumers[43] supplied based on products from these offers, the potential savings recovered from switching would be enormous (in December, the theoretical potential savings would be six times higher than the previously calculated, more realistic potential savings).

43 According to the suppliers' data, 0.02% of all household consumers were supplied in that manner in November and December based on two different offers.

CASE STUDY: THE IMPACT OF RAISING WHOLESALE ELECTRICITY PRICES ON THE RETAIL MARKET

In 2021, the growth of electricity prices was the predominant trend in the wholesale market. It was particularly distinct in the second half of the year. Figure 106 shows the trends in the futures baseload contracts for the 2022 supply on the German EEX and the trends of the SIPX baseload index on the Slovene BSP Southpool Energy Exchange.

FIGURE 106: TRENDS IN THE FUTURES BASELOAD CONTRACTS FOR THE 2022 SUPPLY ON THE GERMAN EEX, THE TRENDS OF THE SIPX BASELOAD INDEX ON THE SLOVENE BSP SOUTHPOOL ENERGY EXCHANGE AND THE RPI TRENDS FOR AN AVERAGE HOUSEHOLD CUSTOMER IN 2021



SOURCE: MONTEL

The movements of wholesale electricity prices are transmitted to the retail market with a delay. The duration of the delay differs among suppliers and depends on the structure and degree of closeness of the individual supplier's portfolio. A supplier with a lower degree of portfolio closeness is more sensitive to the effects of increasing wholesale prices and will transmit them to the retail market more quickly. On the other hand, a supplier with a higher degree of portfolio closeness[44] is less exposed to price fluctuation in the wholesale market. In general, prices are transmitted from the wholesale to the retail market with an approximately six-month delay. Besides the trends in wholesale electricity prices, Figure 106 shows the trends of the retail price index for an average household consumer, which reflects the changes in the retail electricity market for household consumers. It can be seen that the retail price index for an average household consumer started growing at the end of the year when several suppliers decided to raise the retail electricity prices in their offers.

44 The degree of portfolio closeness depends on the relationship between the foreseen sales volumes in the retail market in the upcoming period and the actual purchases of futures in the wholesale market in the upcoming period.

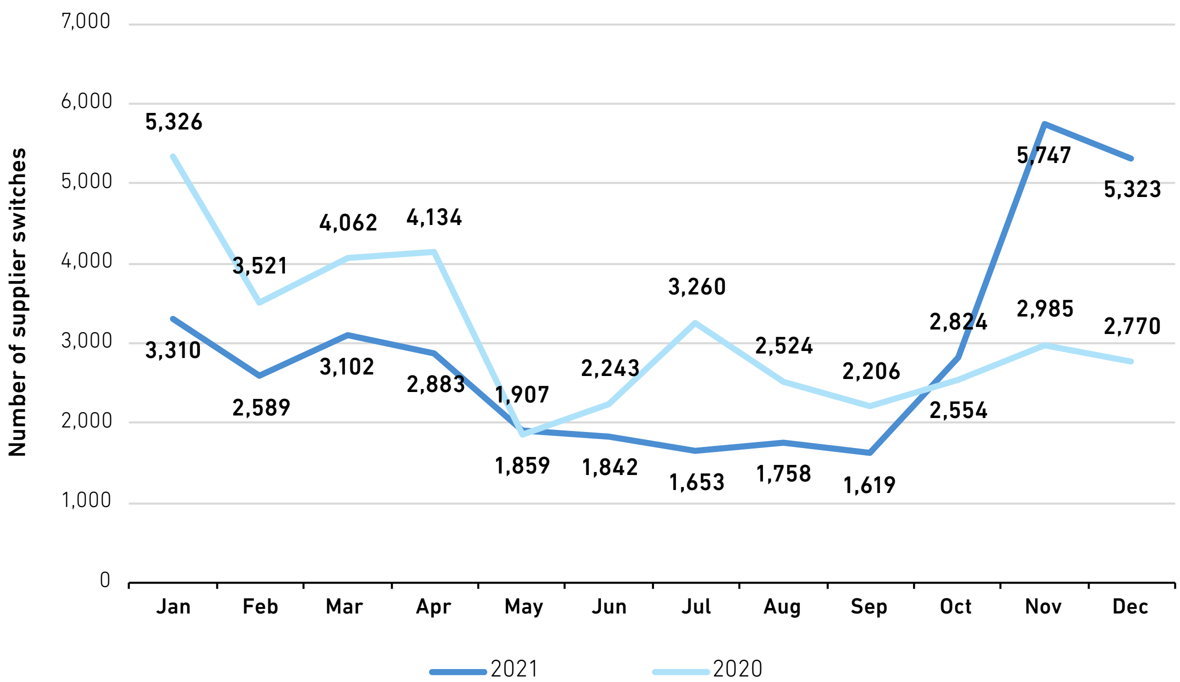
For more about the retail index, see the chapter Retail Price Index for Typical Household Consumers. Despite trends in the wholesale markets, some suppliers maintained their retail prices at the existing level.

Figure 107 shows the trends of the number of electricity supplier switches by household consumers in 2021 and 2020. Comparing the trends, we can clearly see the differences between the last two quarters. In the last quarter of 2021, the activity of household consumers increased significantly. In October 2021 there were approximately 11% more supplier switches than in the same period of the year before, in November there were around 93% more supplier switches than in the same period of the year before, and in December there were around 92% more supplier switches than in the same period of the year before. Together, there were around 67% more supplier switches in the last quarter of 2021 than in the same period of the year before. Moreover, the last quarter of 2021 also saw the end of the downward trend of household consumers' activity, which had lasted for several years and was reflected in a reduced share of supplier switches by household consumers.

The main reasons for those changes were connected with the announced raises in retail prices, controversial suppliers' practices, such as the attempt by Elektro prodaja E.U. and Sonce to terminate supply contracts unilaterally in the last quarter of 2021, as well as with exits by suppliers from the retail electricity market, namely the exclusion of Involta in mid-December and the exit by Telecom on 1 January 2022 (for more details, refer to the chapter Switching Suppliers). Increased consumer activity can also be recognised in the analysis of the number of comparisons carried out as part of the Agency's services and the analysis of the number of comparisons carried out for electricity supply on a weekly basis, which are presented in the chapter Ensuring Retail Market Transparency. The latter, in particular, shows increased activity by the final consumers in the last quarter.

67% more supplier switches by household consumers in the last quarter of 2021 than in the same period of the year before

FIGURE 107: THE DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES BY HOUSEHOLD CONSUMERS IN 2021 AND 2020



SOURCES: ENERGY AGENCY, SODO

Based on the RPI trends, the increase in the theoretically maximum retail prices presented in chapter Assessment of the Potential Benefits of Switching Suppliers and the increased final consumers' activity in the last quarter of 2021, it can be concluded that the developments in the wholesale markets started to reflect intensely in the retail market with a six-month delay.

Measures for Promoting Competition

The Energy Agency monitors the retail electricity market and, in so doing, cooperates with the regulatory and supervisory authorities at the national level, e.g. the Market Inspectorate of the Republic of Slovenia, the Slovenian Competition Protection Agency and, when appropriate, independent and non-profit consumer organisations. The Energy Agency's measures are varied and derive from its internal analyses, bilateral operations and the results of public consultations.

Retail electricity prices are not regulated so the Energy Agency does not issue any recommendations on retail pricing. The only exception is the price of electricity for last resort supply, which is regulated and provided by the DSO. The price of that supply is set and made public by the DSO. It must be higher than the market price of the supply to a comparable consumer but it must not exceed it by more than 25%. If the DSO does not set the price or sets it contrary to the regulations, it is set by the Energy Agency.

CASE STUDY: REGULATION OF THE LAST RESORT SUPPLY PRICES AMID STRESSED MARKET CONDITIONS

Pricing of the last resort supply is regulated and was carried out in line with the Electricity Supply Act (hereinafter ESA), which stipulates that the price has to be public and higher than the market price of supply to a comparable customer, but not by more than 25%. The price is set at the level that covers the long-term electricity supply price and the additional costs of providing and ensuring last resort supply.

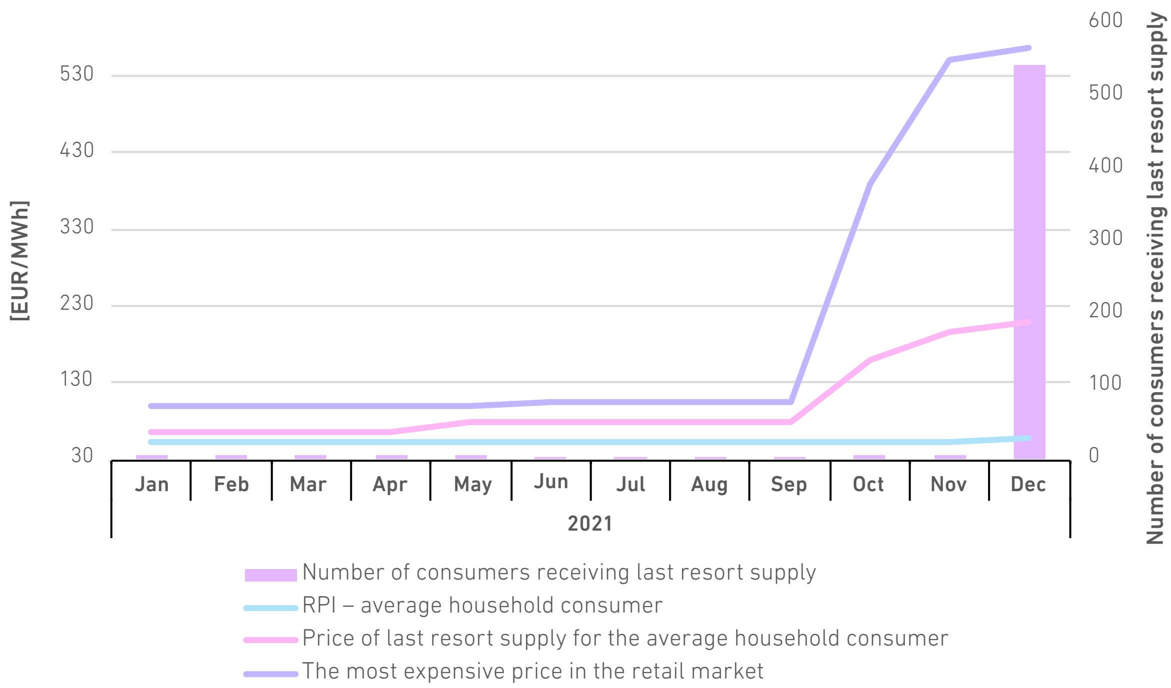
In 2021, SODO changed the last resort supply price list four times. Those changes were the consequence of rapidly changing conditions in the wholesale market and continuous growth of the wholesale electricity prices from month to month. The price list was modified in May, October, November and December. Figure 108 shows the trends of the annual costs for energy from the last resort supply for an average household consumer[45], as well as the trends of the price based on RPI[46] and the trends of annual costs of energy based on the most expensive offer in the retail market for an average household consumer.

At the beginning of October, the Energy Agency, SODO and the Ministry of Infrastructure started cooperating actively on the basis of the active monitoring of the retail market conditions[47], with the aim of establishing a relevant pricing methodology for last resort supply. The materialisation of the risk of an unexpected increase in the number of consumers supplied on the basis of last resort supply and the increased need for the regular lease of energy on the basis of short-term futures (e.g. in the day-ahead market) required a prompt arrangement of a suitable coverage of the costs for the provision of this service. In its primary role, SODO is not a supplier and does not compete with other suppliers in the retail market. In terms of costs for the provision of last resort supply, SODO must have a neutral position ensured, so that their provision of service does not create a loss that would be socialised.

Based on an agreement, from October on, the prices of last resort supply were formed on the basis of the average weighted wholesale-market electricity price of continuous day-ahead trading on the Slovenian electricity exchange BSP. The price of the single tariff for calculating the cost of electricity supplied to household consumers takes into account the consumption profile in the relationship between 70% baseload electricity and 30% peak electricity. Individual prices of last resort supply are determined by taking into account the wholesale prices of the last 30 days before the day of calculation and adding 5% based on the forecast for the development of prices until the next update of last resort supply prices. The calculated price also represents the basis for determining dual-tariff prices of last resort supply to household consumers and prices for small business consumers based on the preservation of the existing relationship between the higher, lower and single tariffs.

45 Consumption profile of an average household consumer in Slovenia: billed capacity 8 kW, 1996 kWh (peak tariff) and 2100 kWh (off-peak tariff) per year.
46 For more about the RPI index, see the chapter Retail price index for typical household consumers.
47 Attempts at the unilateral termination of supply contracts by suppliers, announcements of ceasing supply, etc.

FIGURE 108: RPI TRENDS, THE PRICE OF LAST RESORT SUPPLY, THE MOST EXPENSIVE PRICE IN THE RETAIL MARKET FOR THE AVERAGE HOUSEHOLD CONSUMER AND THE NUMBER OF CONSUMERS SUPPLIED ON THE BASIS OF LAST RESORT SUPPLY

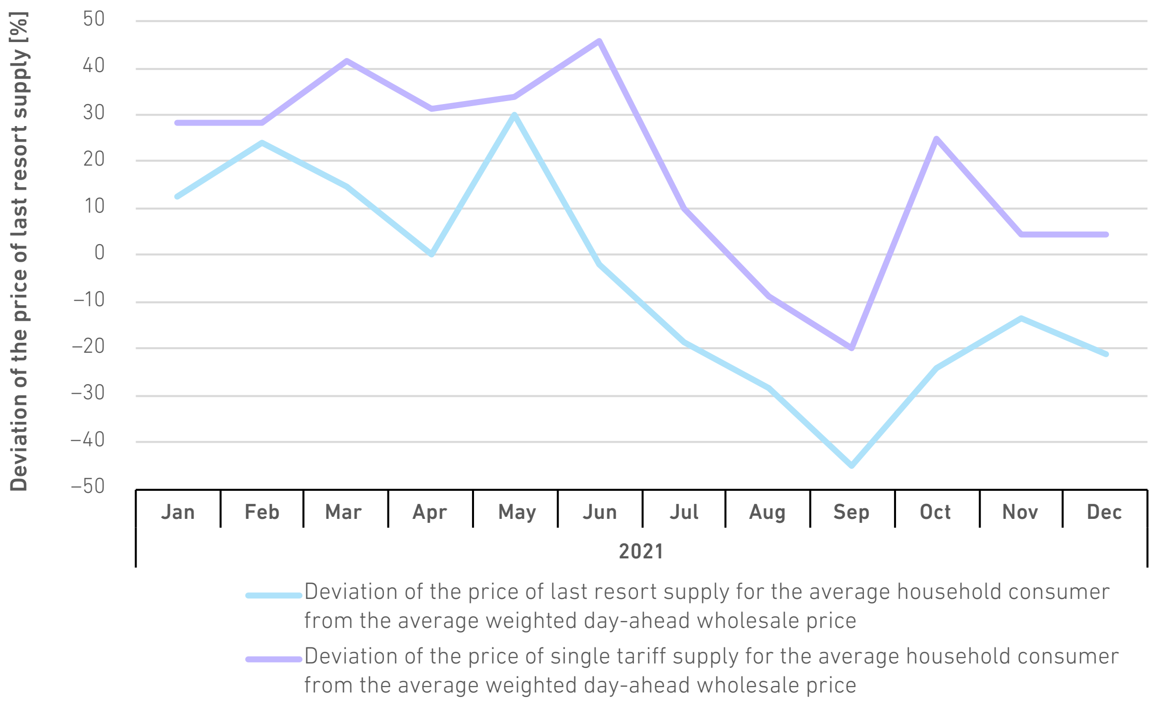


SOURCE: ENERGY AGENCY, SODO

In October, the price of last resort supply started deviating considerably from the RPI index due to the previously described intervention, as shown in Figure 108. In their portfolios, suppliers have several futures of different types, part of which could be concluded as early as a few years ago for supply in the given period of time. Therefore, the change in the wholesale market prices has not been reflected in the retail market yet. Some of the most exposed suppliers raised the prices in their offers significantly, which translated into an enormous increase in the maximum offer price. The Figure also shows the number of consumers supplied on the basis of last resort supply by month. A huge increase in the use of last resort supply can be seen in December, as the result of the transition of Involta's consumers to last resort supply.

Figure 109 shows the deviation of the price of last resort supply for consumers with the cost of electricity calculated according to a single tariff from the average weighted wholesale prices on the Slovene BSP Southpool Energy Exchange and the deviation of the price of last resort supply for the average household consumer from the average weighted wholesale prices on the Slovene BSP Southpool Energy Exchange in 2021. In the comparison of the wholesale price, the base load energy is taken into account in the amount of 70% and peak energy in the amount of 30%. Deviation in the positive sense means that the price of last resort supply exceeds the average weighted wholesale prices in the considered ratio, while deviation in the negative sense means that the price of last resort supply in the considered ratio does not exceed the average weighted wholesale prices.

FIGURE 109: DEVIATION OF THE PRICE OF LAST RESORT SUPPLY FOR CONSUMERS FROM THE AVERAGE WEIGHTED WHOLESALE PRICES ON THE SLOVENE BSP SOUTHPOOL ENERGY EXCHANGE



SOURCE: BSP, SODO

Based on a changed methodology, the price of last resort supply for consumers with the cost of electricity calculated according to a single tariff reached or slightly surpassed the level of the average weighted wholesale price again in November and December, which re-established SODO's neutral position. However, the analysis of the weighted average price, calculated on the basis of the profile of the average household consumer in that period shows a negative deviation even though the prices were determined with a mark-up (25% or 5%), which means that SODO's neutral position depended heavily on the individual profiles or methods of calculation used for a consumer on last resort supply. Oscillations of the price of last resort supply from the average weighted wholesale price in the period from October to November are due to the fact that it was very difficult for SODO to assess risks and hence determine mark-ups on the wholesale price.

The price of last resort supply is connected directly to the wholesale price due to the energy crisis, but because of management on a monthly basis, it became dynamic. Even though the ESA stipulates the right to conclude contracts with dynamic prices of electricity, none of the five suppliers that should offer contracts with dynamic prices of electricity to final consumers had such contracts published by the end of 2021. Continuous comparison of the price of last resort supply with dynamic prices that could represent reference offers for determining the price of last resort supply was not feasible under the extremely volatile circumstances.

The goal of the regulatory intervention was achieved. Nonetheless, the analysis also shows that the deviation of the price of last resort supply from the RPI trends for an average household customer increased from 25% in January to almost 275% in December, which, of course, is not in line with the ESA provisions[48]. Based on the analysis, the Energy Agency recommends an optimisation of the methodology for determining the price of last resort supply, so that it also takes into account the market conditions at the time of distinctively negative margins that are prone to severe risks. Furthermore, the Energy Agency recommends adequate amendments to the legislation.

48 Taking into account the calculated realised average weighted price for the same kind of average household customer, available only for December when it amounted to €61.4/MWh, i.e. 10% more than the RPI, does not have a significant influence on the findings regarding deviations of the price of last resort supply from the reference price on the basis of the ESA.

Impacts of the Revision of the Regulatory Framework

In 2021, the implementation of the Clean Energy for All Europeans package within primary legislation was concluded. The Package introduces new roles and concepts, as well as changes to some key processes, such as active consumption, independent aggregation, energy communities, split supply, dynamic pricing, the creation of a flexibility market and a faster supplier switching process. The changes will have a significant impact on the development of competition and dynamics in the retail market. New services and business models can be expected to emerge, based on investments in new technologies in the electricity system and by active consumers in the system, as suppliers complete the transition. In line with the new legislation, secondary legislation was revised as well, with the key activities focused on revising the rules for market operation, updating the system operators' operational instructions and overhauling the regulatory framework, including the methodology for calculating the network charge and tariff system.

Effective Data Exchange in Key Market Processes

As part of the measures implemented in line with its competencies aimed at unifying the most important data exchange processes at the national and regional levels, the Energy Agency has been establishing an efficient data exchange between market participants, steering the participants towards the use of open standards and the reuse of generic models of the European forum for energy Business Information eXchange (ebIX®) and ENTSO-E models to the greatest extent possible.

The new regulatory framework and the vision for the evolution of energy networks by 2050 envisage the full integration of energy networks (electricity, gas and heat) and the consumers' complete engagement (development of a flexibility market). The harmonisation of data exchange processes using open standards in energy markets is thus becoming even more important and a crucial action to eliminate certain barriers to entry for new market participants and to reduce entry costs. Data exchange has been becoming more and more complex and is usually required in near real-time or real-time. Due to the development of new business models and energy services, based on access to detailed metering data, there is a distinctive need in the retail markets as well to harmonise access to and the exchange of data on consumption or production, as access to this data must be ensured centrally or locally (on a metering device) for users eligible to access data (aggregators, suppliers, energy service providers, etc.), subject to the customer's authorisation. To support the green transformation, regulatory frameworks must ensure a sufficient level of data protection and privacy, tools for empowerment and the promotion of active consumption, a non-discriminatory environment and a level playing field for all stakeholders, a technologically neutral regulatory framework, and recognise the new roles of traditional actors. Besides the requirements regarding efficient and safe data exchange, Directive (EU) 2019/944 also defines the context for ensuring interoperability for the first time.

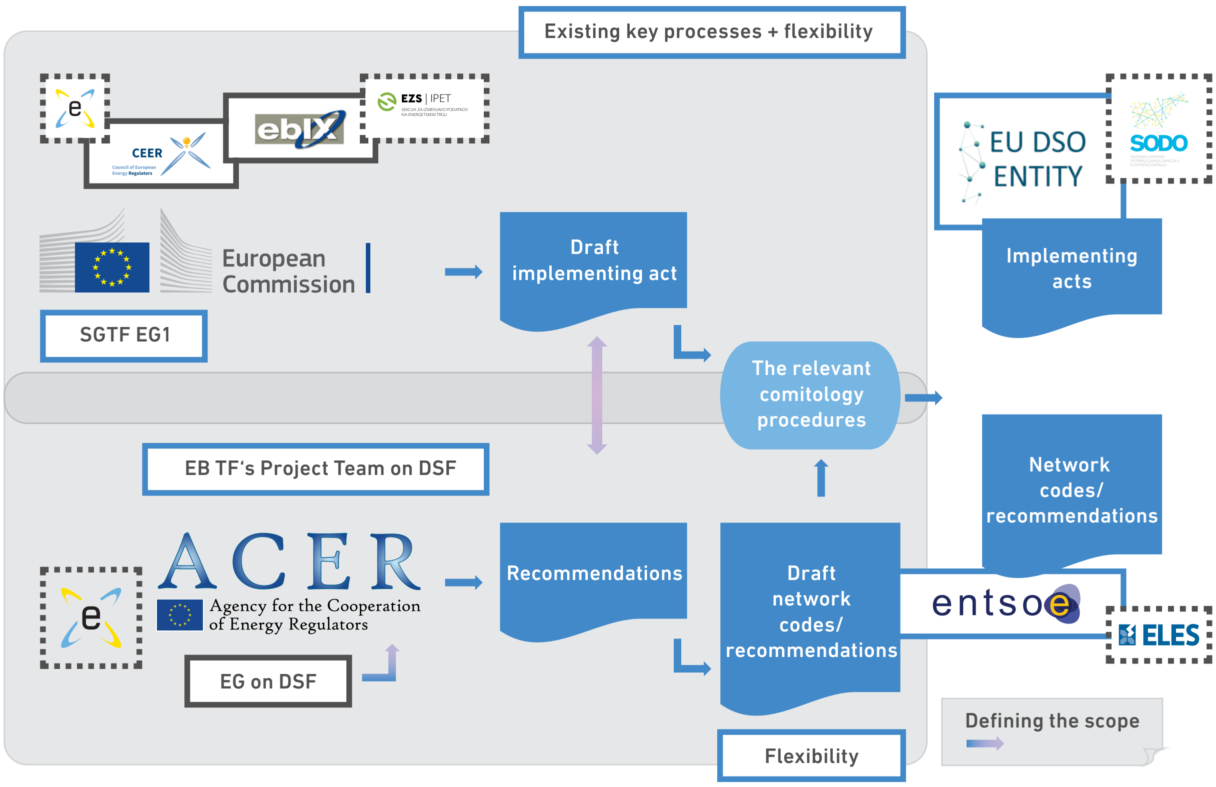
The Commission's strategy is to ensure harmonisation based on the introduction of a process reference model[49] that, to a large extent, can accommodate national practices and particularities. Two draft implementing acts have been in preparation, i.e. a general act for access to and the exchange of data and a sectoral act regulating access to the data on consumption. They should enter the comitology procedure for adoption in the first half of 2022. In their proposal of the definition of the work scope, the SGTF EG1 (Smart Grid Task Force Expert Group 1) proposed flexibility - the flexibility register domain as the next area of work. On the other hand, the field of flexibility has definitely been developing very intensely on the basis of the new regulatory framework: there are many ongoing research projects and studies and the first implementations have been taking place as well. ACER's aim is to ensure efficient instructions for testing various models, exchanging experience and making decisions regarding further harmonisation when the conditions are suitable. Through the EG on the DSF expert group ACER carried out the defining of the general framework at the EU level (vocabulary, principles, requirements for processes and processes of exchanging experience, best practices and areas where further harmonisation is necessary)[50]. Particular attention was dedicated to interaction with applicable codes, guidelines and implementing acts. It was concluded that the areas of metering, validation, settlement, baseline methodology and aggregation are mutually interconnected by the implementing acts on interoperability. Due to the situation in the market and the energy crisis[51], the Commission is supposed to start implementing the network code on flexibility on the basis of the ACER's general framework already in 2022.

49 A series of reference procedures for access to data describing the exchange of information between roles (not actors). It includes a semantic model of the data being exchanged, as well as a description of and connections between systems and procedures used for the control, access and exchange of this data.

50 In 2021, the EG on DSF, established by ACER, defined the scope of the necessary harmonisation.

51 Tackling rising energy prices: a toolbox for action and support: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A660%3AFIN&qid=1634215984101

FIGURE 110: THE REGULATORY FRAMEWORK FOR INTEROPERABILITY DEVELOPED AT THE EU LEVEL



SOURCE: ENERGY AGENCY

Preliminary Qualitative Analysis of the Compliance of Data Exchange Implementation with the Emerging Trends in the Field of Interoperability

The table below shows a short analysis of the compliance of data exchange implementation with the draft acts or emerging trends in the field of interoperability.

FIGURE 111: THE TECHNICAL AND PROCESS-RELATED ASPECTS OF THE COMPLIANCE OF IMPLEMENTATIONS WITH THE DRAFT IMPLEMENTING ACTS - THE AREA OF ELECTRICITY

Area	Respecting the General Reference Models	Implementation of Access to Data	Implementation of Processes in the Field of Flexibility - under Planning
Traditional Processes in the Market (e.g. supplier switching)	🙂	🙂	😐
Data Hub (mojelektro.si)	😐	🙂	😕
Local Access to Data (Smart Meters)	😐	😕	☹️
Developments in the Field of Flexibility	😕	☹️	☹️

SOURCE: ENERGY AGENCY

The implementation of data exchange between the participants in the Slovene electricity market is predominantly carried out in compliance with the relevant reference models (e.g. the ENTSO-E/ebiX/EFET harmonised model of roles in the electricity market, etc.). In 2021, the processes of the updated market model were intensely adapted to the concept of split supply[52], which is based on the introduction of a metering point[53] and will eliminate incompatibilities with the reference model at the national level and provide the optimum possibilities for the development of energy services. The on-line data portal mojelektro.si is designed to ensure the compatibility of the centralised data access with the draft implementing act on access to the data on consumption (B2C segment). The areas with the most incompatibilities are as follows: ensuring interoperability at the level of local access to data (I1 interface on the smart meter); implementation in the field of flexibility where planned deviations from reference models can be identified, and starting with unsuitable definitions of roles and responsibilities. As this is a developing area, the Energy Agency assumes those incompatibilities are of a transitional nature.

The Act on the identification of entities in the data exchange among participants in the electricity and natural gas markets requires market participants to use standardised identifiers of key data entities in the electronic exchange of data in the market. In accordance with the Energy Agency's general act, all key data entities in an electronic data exchange have to be determined with standardised identifiers.

The Energy Agency has been implementing its harmonisation strategy through public consultations, bilateral cooperation and participation in professional platforms, such as the IPET Section and ebIX®.

In 2021, the following key issues were considered in the framework of the IPET Section:

- The project of a single entry point of the national data hub, data quality and new functionality;
- Setting up a catalogue of data that is exchanged in the electricity market;
- Development of the EU regulation on cybersecurity in the energy sector and consideration of the draft framework of the network rules in the energy sector;
- Preparations for the inclusion of consumers with an installed capacity of 43 kW or lower in the metered diagram;
- Consideration of the draft amendments to the System operating instructions for the electricity distribution system (SONDSEE);
- Proposal of a method for substituting of the missing measurements in the customer's profiles.

In the framework of ebIX, the focus was on modelling the processes in the area of flexibility and on an active contribution to the emerging EU framework for ensuring interoperability.

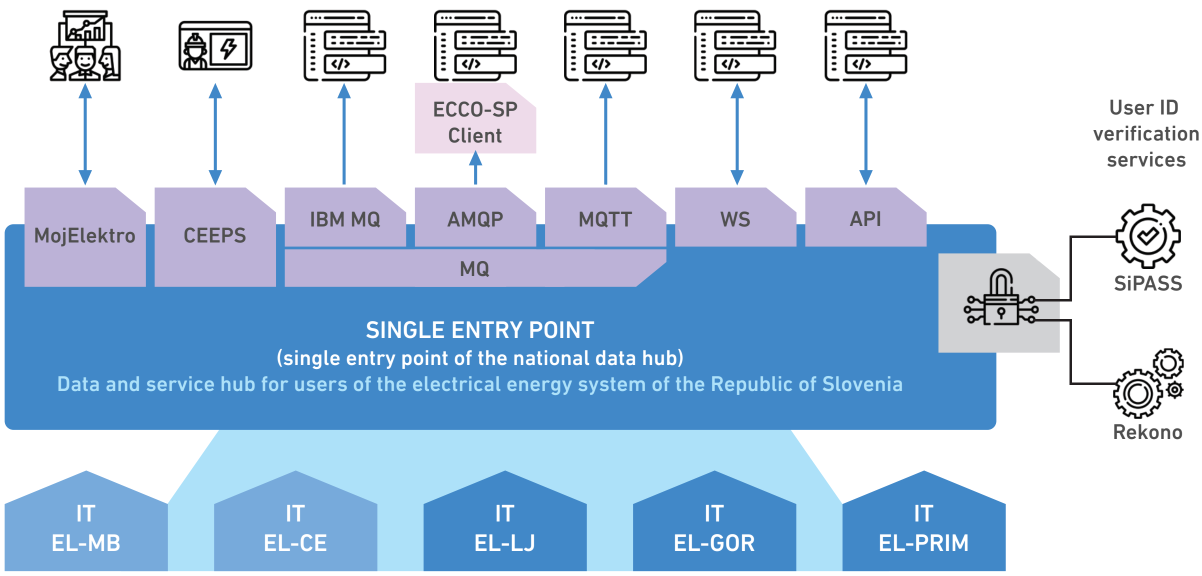
Providing Consumers with Standardised Data Services

The Government Decree on measures and procedures for the introduction and interoperability of advanced electric power metering systems (hereinafter the Decree) and the Plan for the introduction of an advanced metering system in the Slovenian electricity distribution system (hereinafter the Plan) define, among other things, the advanced metering system architecture, roles and responsibilities, its minimum functionalities, and some aspects of the implementation of data exchange based on relevant standards (CIM, etc.) The Decree requires the DSO to establish a single access point for accessing data in the advanced metering system. Based on the Plan mentioned above, the system is implemented as a central system for accessing metering data (national data warehouse), which is managed by the DSO and provides data exchange services among business entities and network users in the B2B and B2C domains, with a plan to further extend the area of exchange to the B2G segment.

The development was carried out within an initiative by distribution companies, united under the Electricity Distribution Economic Interest Grouping, with the participation of the DSO. The single entry point of the national data hub (EVT/Portal CEEPS) is a hub ensuring the exchange of data among distributors and suppliers of electricity, final consumers and their authorised representatives (e.g. aggregators, ancillary services providers) and at the same time the central data hub for the exchange of data in the electricity market.

52 See the USEF report.
53 Implementation of the Metering Point domain in compliance with the reference model.

FIGURE 112: HIGH-LEVEL ARCHITECTURE OF THE EVT NATIONAL DATA HUB



SOURCE: EDCs

The EVT provides a safe (two-step verification of a user's electronic identity) and unified registration and authentication with the Rekono application, as well as autonomous management of authorisations and user rights. It consists of the following building blocks:

- **The MojElektro Portal** – the online user portal intended for all end consumers and their authorised representatives who can access all the metering points and metering and accounting data that they are entitled to, regardless of their supplier or distribution area. It enables an overview and export of all available 15-minute data by metering points (received and delivered active/reactive power, possibility of aggregation by hour, day, month, etc.), monitoring consumption and production above the self-supply metering points, submission of a new tax ID number for a metering point, the submission and entry of the meter reading at a metering point;
- **CEEPS Portal** – for users eligible to access data, it fully replaces the PERUN in terms of functionality[54]. All electricity suppliers, Borzen, the Centre for RES/CHP support, the closed distribution systems and the distribution network operator are registered on the portal. It enables centralised imbalance settlement, access to and export of 15-minute data based on balance sheet eligibility, the submission and entry of meter readings on behalf of the final consumers, carrying out the supplier switching process in line with the SONDSEE requirements, access to accounting data (the so-called Annex A), management of all the changes on the metering points, etc.;
- **Massive data exchange - B2B MQ services**, continuous daily massive data exchange for the individual eligible user, daily transmission of the available 15-minute metering data for the previous day, the addition of new measuring points to the daily transmission and specific inquiries for the available 15-minute metering data.

In 2021, development activities in this area[55], in which all distributors in Slovenia were involved, included:

- Upgrading of the CEEPS portal by adding the Supplier Switching process on a metering post, which includes an automatic algorithm checking the accuracy of the data in the submitted online application;
- Upgrading user administration in the CEEPS portal with a completely autonomous administration of an individual entity;

54 The closing down of the PERUN portal is foreseen for the first quarter of 2022.
55 Metering data single access system (SEDMP) with B2B data services for suppliers and other eligible users.

- Completion of the concept design for the introduction of a metering point in data exchange and upgrading of the CEEPS and MojElektro portals;
- Integration of User ID verification through the SIPASS service (provided by the Ministry of Public Administration), which enabled the use of a single user account for the eGovernemnt and MojElektro.si services;
- Pilot design of the Fleksibilen.si portal intended for collecting the initiatives of active consumers in the distribution system regarding flexibility and for registration in the flexibility distribution system register. In the framework of the Green Transformation Consortium, a pilot mechanism to exchange data on flexibility services between the back-end management systems and the EVT has already been carried out in cooperation with Elektro Ljubljana.

Upgrading the functionalities and scope of the data exchange processes at the level of the national data warehouse in development.

In addition, distribution companies started a project of uniform data transmission in near real-time. For this purpose, they agreed with the transmission system operator to unify the architecture of the interfaces for access to the ECCoSP platform and to move the interfaces to the EVT within which the measuring data is submitted to the transmission system operator in near real-time through the ECCoSP of a consumer. In 2021, a presentation of the ECCoSP of an Elektro Ljubljana consumer was already carried out. In the first quarter of 2022, there will be a presentation of the ECCoSPs of other consumers in the shared address space, which will provide EVT with unified access to the transmission system operator's platform.

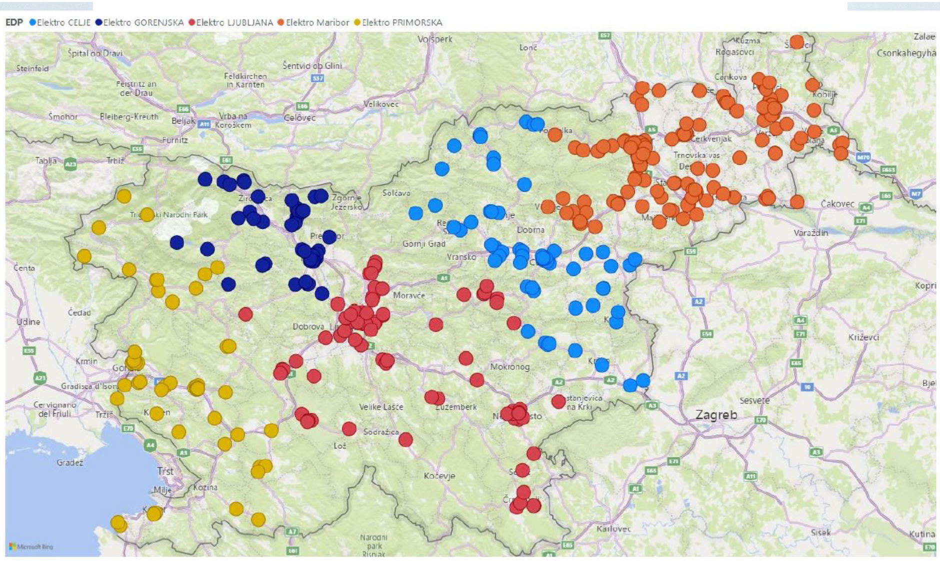
Almost 28,000 metering points registered in the mojelektro.si portal, daily B2B exchange of 15-minute metering data ensured for about 350,000 metering points

Thus, the number of users of the Moj Elektro portal has constantly been growing. At the end of 2021, there were 28,000 metering points in the Moj Elektro portal, which is 92% more than the year before.

At the end of 2021, electricity suppliers were receiving 15-minute metering data for more than 355,000 metering points daily through the EVT (B2B) services.

In 2021, all the metering points of the energy sources with an installed capacity of over 250 kW were equipped so as to enable data transmission to the network transmission system in near real-time, in line with the requirements of the tripartite contract between the two electricity system operators and distribution companies. Furthermore, the equipment of metering points with an installed capacity of over 100 kW has started and must be concluded by the end of 2022.

FIGURE 113: TOPOLOGICAL CHART OF METERING POINTS FOR THE CAPTURING AND TRANSMISSION OF DATA ON RES IN NEAR REAL-TIME



SOURCE: EDCs

Regretfully, the definition of the range of standardised data services provided by the DSO to system users either free of charge or for a fee remains undetermined. The issue of providing effective local access to metering data in real-time (in the I1 interface of a smart meter) to all users equipped with smart meters remains unresolved as well, especially due to the technical restrictions of built-in smart meters and the inadequate standardisation of the interface.

Other Measures

The same rules on the prevention and restriction of competition and the abuse of a dominant position apply to the electricity market as to other types of goods. As publicly available information indicates, the Slovenian Competition Protection Agency did not identify any restrictive practices or possible dominant position on the market in companies operating on the electricity market in 2021. In the framework of its 2021 assessment of concentration, the Slovenian Competition Protection Agency issued a decision on the concentration of the companies HSE d.o.o. and ECE, d.o.o., in which it did not oppose the concentration, declaring it to be in compliance with competition rules (Decision of the 30 August 2021). However, the notification of concentration of the companies HSE d.o.o. and Energija Plus d.o.o. (Date of notification: 9 July 2021) has not been decided yet.

Active Consumption, Flexibility Market and Other Development-Related Aspects

The use of active consumption adjustment is still in its early stage

In 2021, the ESA came into effect, containing the key provisions of the Clean Energy for All Europeans package necessary to empower active consumers and to introduce citizen energy communities, consequently enabling the free development of active consumption and independent aggregation.

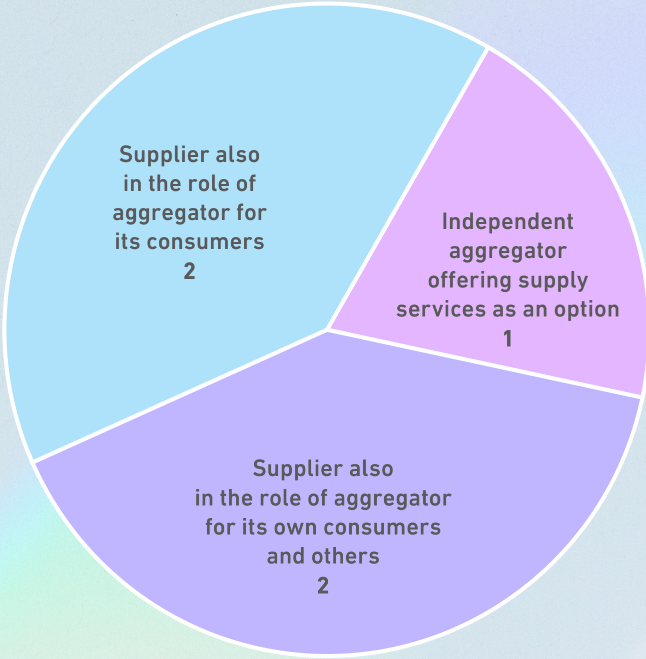
Active consumption is one of the key factors that would reduce greenhouse gas emissions and increase the share of RES in the end-use of energy, while still ensuring an appropriate level of cost-effective supply quality. Active consumers and citizen energy communities can adjust their consumption and production of electricity to their needs and external signals and offer flexibility services in the electricity market independently or via aggregators.

An aggregator is a role in the market that can be assumed by an independent aggregator[56] or an electricity supplier. Out of 22 suppliers that were active in the Slovene electricity market in 2021, five were also active in the field of aggregating active consumers[57]. The trading took place partially in the ELES' market of ancillary services and partially in Borzen's balancing market. The NGEN company is the only one with aggregation as its primary business model. According to their estimations, approximately 2.5% of their total realised negative aFRR in 2021 was ensured with increased consumption by active consumers. So far, flexibility has only been in demand by the DSO or distribution companies in the framework of pilot platforms in which only the Elektro Energija has been active. Therefore, we conclude that the use of active consumption adjustment is still in its early stage.

56 "Independent aggregator" means a participant in the market who performs the activities of aggregation and is not connected with a consumer's supplier.

57 "Active consumer" means a final consumer or a cooperating group of end-consumers who consume or store electricity produced on locations of their own inside limited areas or on other locations, or who sell energy from their own production, or who participate in flexibility programmes or energy efficiency programmes, if those activities are not their primary commercial or professional activities.

FIGURE 114: NO OF AGGREGATORS IN 2021 DISTRIBUTED BY THEIR BUSINESS MODELS



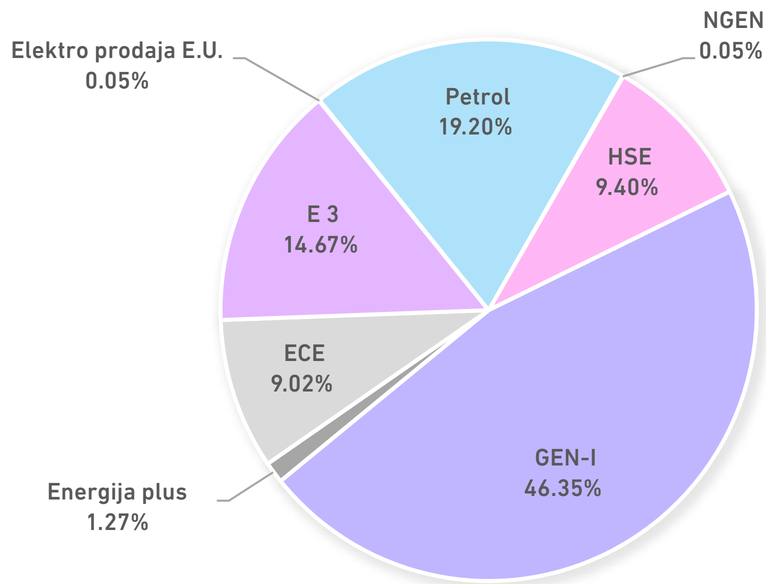
SOURCE: SUPPLIERS

The ESA has extended the right to conclude contracts with dynamic prices of electricity to all consumers. This means that contracts on electricity supply reflecting the changes of prices in the current markets, including the day-ahead markets and intraday markets, in intervals equal to or longer than the chargeable interval of the market should also be available to household consumers. In 2021, eight suppliers had contracts with consumers concluded on the basis of dynamic prices of electricity supply. According to the suppliers' data, 1.73 TWh of electricity was sold on the basis of such contracts in 2021, mostly to business consumers.

1.73 TWh

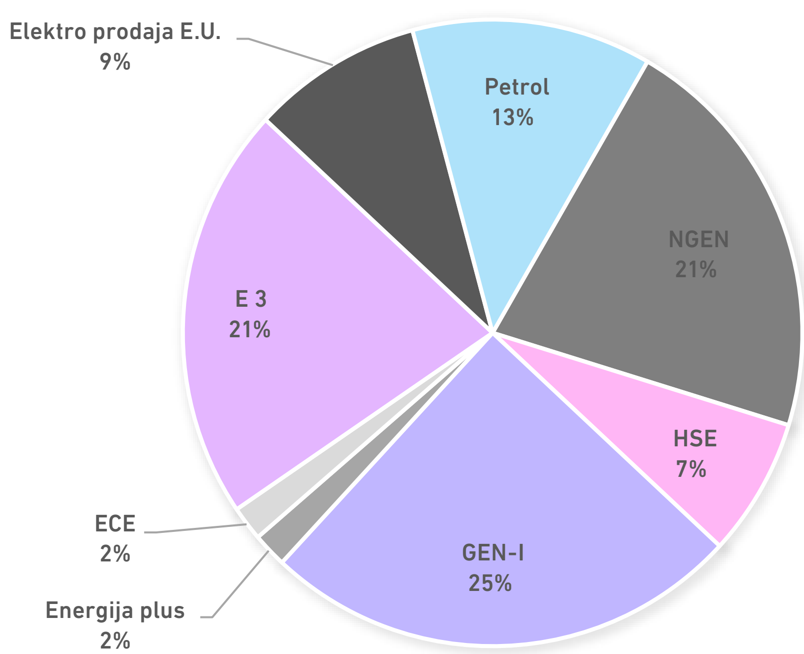
of electricity sold on the basis of contracts with dynamic prices

FIGURE 115: SHARES OF ELECTRICITY SOLD ON THE BASIS OF CONTRACTS WITH DYNAMIC PRICES



SOURCE: SUPPLIERS

FIGURE 116: SHARES OF THE NUMBER OF CONTRACTS BASED ON THE DYNAMIC PRICES OF ELECTRICITY BY SUPPLIERS



SOURCE: SUPPLIERS

In 2021, the Act on the Promotion of the Use of Renewable Energy Sources entered into force as well, enabling community self-supply, the self-supply of multi-dwelling buildings, the self-supply of communities for supplying energy from RES and self-supply of renewable energy community, which is also a legal entity. This, together with citizen energy communities according to the ESA, concludes the set of possible communities in the field of the self-supply of electricity. The first available data from the suppliers indicate that the number of consumers included in various self-supply and other communities is between 100 and 200[58]. Based on publicly available data, it is possible to identify two different communities.

The ESA enables, inter alia, the exchange of electricity between active consumers within the same balance responsible party[59]. In 2021, only the so-called SunContract Energy Market[60] was open for this purpose, with its trading volume amounting to 9.03 GWh. 1302 household consumers, 192 business consumers, 1007 active consumers (owners of a production facility, energy storage device, etc.) and 171 producers (RES, production connected directly to the distribution network) participated in the trading.

Promoting Active Consumption and the Introduction of the Flexibility Market

The year 2021 was marked by public consultations and the key Agency's project of overhauling the methodology for calculating the network charge and tariff system[61], which entered the implementation stage. The renewed methodology is in compliance with the requirements from the Clean Energy for All Europeans package (CEP) and will promote the further development of active consumption and the new roles in the electricity market, introduced by the CEP. The methodology determines the categories of consumers in the system and their mutual relationships in such a way that the individual tariff rates of the network charge reflect the costs caused by the users of the electricity system.

The project of overhauling the methodology for calculating the network charge and tariff system entered the implementation stage

With this project, the Energy Agency will set the basis for the systemic promotion of demand response on the basis of the new tariff for the use of the network.

Consumers in the system have to cover the costs of the network they are connected to and the costs of other, higher levels according to their share in the common load of the network. For that purpose, users are distributed in individual user groups according to their voltage level and type of connection. The network charge for the transmission or distribution system is paid by the consumers in the system when they are delivered electricity at individual delivery points. The tariff rates of the network charge for the transmission or distribution system are determined on the basis of billed capacity and electricity delivered, while a consumer in the system is separately charged the network charge for the connected load and for electricity.

For the effective use and sustainable development of the electricity network, the tariff rates of the network charge must differ according to the seasons and within the day, as this stimulates the consumers to use the network in the periods with lower loads and, vice versa, discourages them from using the network when the demand is greater and the probability of congestion higher. That is why a day is divided into various time slots, which are determined differently for the high and low season, working days and holidays.

To promote active consumption and an adequate use of the electricity network, the billed capacity is calculated on the basis of the contracted capacity and the excess capacity, which is the metered load exceeding the contracted capacity. A consumer in the system can change the contracted capacity determined by the electricity system operator. The excessive capacity is determined on the basis of the consumer's achieved capacity exceeding the contracted capacity, measured with the registrator of 15-minute maximum electricity consumption within an individual time slot. If a consumer in the system does not exceed the contracted capacity, the billed capacity is calculated on the basis of the contracted capacity within an individual time slot and the tariff rates of the network charge for connected load and an individual time slot. If, on the other hand, a consumer in the system exceeds the contracted capacity, the network charge for connected load will include the excess capacity as well.

58 Data provided by suppliers and by the DSO can differ due to the various levels of realisation of individual communities.
59 »peer-to-peer« trading.
60 https://suncontract.org
61 https://www.agen-rs.si/posvetovanja/-/asset_publisher/M2GdU2jRtCxV/content/vzpostavitev-trga-s-proznostjo-aktivnega-odjema-v-sloveniji-izhodis-1

Due to the specific use of the electricity system, the Act also determines the method for calculating the network charge for the transmission or distribution system for:

- energy storage devices which provide an ancillary service,
- final consumers with a production unit installed for self-supply,
- members of citizen energy communities, renewable energy communities or community self-supply,
- consumers in the system that contribute to the provision of ancillary services.

The new tariff for calculating the network charge can also include location-specific dynamic tariff rates for a distribution system for an individual geographical area. A dynamic tariff rate is additionally calculated, which is intended primarily to incentivise the reduction of consumption by consumers in the system at the time of the critical peak load of the local network or to increase the consumption by consumers in the system during the critical net production of the local network, in order to unburden the distribution system as much as possible and reduce energy losses, as well as to ensure the right voltage quality in the local network. The levels and period of validity of the dynamic tariff rates are determined by the DSO on the basis of predictions of the operating conditions, taking into account environmental factors and the availability of energy from distributed sources.

Price signals, such as the previously mentioned network charge tariff rates fall into the category of implicit flexibility of active consumption, while the explicit flexibility category means flexibility activities carried out on the basis of closed contracts.

Data exchange and coordination between the two electricity system operators is of key importance for the development of the flexibility market

With the exception of one pilot project, the use of explicit flexibility in 2021 was still limited to the transmission system operator's demand, as it is the operator who has to determine the relevant flexibility products before publishing tenders for the purchase of flexibility. The development continued with activities within various research and innovation projects held by the electricity system operators and EDCs who usually carry out such projects in a broader context of various European and national consortia. The higher volatility of RES, increased demand for flexibility services according to the DSO's needs and the consequent increase of the flexibility market will make the coordination between the two electricity system operators more and more demanding. This is relevant because the introduction of flexibility markets is based on the efficient provision of data services to market participants (including final consumers who mainly participate indirectly through aggregators), coordination between the two electricity system operators to manage the limitations in the electricity system, and efficient data exchange, including the exchange of real-time metering data. Due to the limitations of the telecommunication technologies used, metering equipment and other limitations, the current solutions present a certain real barrier to the development of flexibility markets, especially for trading intraday flexibility products.

OneNet[62] and INTERRFACE[63] are two of the most important projects in this area, dealing primarily with the efficient integration of actors along the entire European electricity value chain in order to optimise system operation and prepare an open and fair market structure.

ONENET
one network for Europe

The first experience with reducing the load of the Elektro Ljubljana network through the purchasing flexibility of household consumers, carried out in the framework of the OneNet project at the level of one transformer station, indicates the need to develop an algorithm to determine the right activation time in order to prevent the reverse effect, since a potential increase in the load after an activation ends can cause an even bigger overload of the transformer than a situation without any activation at all.

INTERRFACE

62 Ang. One Network for Europe; This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957739.
63 Ang. TSO-DSO-Consumer INTERFACE architecture to provide innovative grid services for an efficient power system; the project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824330.

Also, setting-up new pilot platforms has started, as well as the use of adapted support systems for trading with electricity and active consumption flexibility. In the framework of the INTERRFACE project, partners have been developing the EFLEX trading platform, which enables active consumers, aggregators and electricity system operators to trade using smart contracts with blockchain technology.

Elektro Ljubljana has been developing a pilot system for reducing the network load (SRO) which, in connection with the metering data single access system (SEDMP), enables the gathering of information about consumers' or authorised aggregators' flexibility for the needs of the DSO. On the basis of analysis of the data received and in correlation with the needs, locations are determined where flexibility is introduced provisionally as a measure to reduce the network load. The system also includes the option for the consumer or aggregator to enter the offer prices and select the cheapest offer. After the activation on the basis of the concluded contracts, the SRO calculates the adapted energy of an individual consumer on the basis of the analysis of measurements. At the end of the month, it produces a report with data for monthly billing in the form of a credit note for successful activation. Providing the flexibility services for the needs of the transmission system with sources connected to the distribution network, requires coordination between the two electricity system operators which is attained by informing the transmission system operator and the authorised aggregators about limitations in the distribution network. To this end, the concept of a traffic light is used, with the DSO turning on the red light if an increase in consumption in the part of the network where a consumer is connected would cause an overload. Thus, the pilot system should enable some functionalities of the flexibility register.

The flexibility register is most probably a new role or several new roles[64] in the organised electricity market and has a key function in managing network limitations and providing balancing or other services. It enables electricity system operators to gather and share data about the potential sources of flexibility, including suitable network connections, information on locations, etc. The register can be introduced in various ways with different stakeholders or business entities, either decentralised or centralised, and it can make use of the partial solutions already available. This helps ensure efficiency and avoid an unnecessary increase in costs at the national level. The current implementation of the national regulatory framework does not explicitly include the establishment of a flexibility register. However, the implementation of explicit trading with flexibility is in fact not feasible without the functionalities provided by the register. The Agency's proposal in the framework of the INTERRFACE project consortium was to prepare an appropriate regulatory basis in the framework of new network rules on active consumption flexibility or other related forthcoming legal acts. At the national level, the Energy Agency carried out activities to identify connections between the functions of the flexibility register and the holders of various roles in the electricity market, in order to prepare a draft design of the Flexibility Register (centralised or distributed architecture etc.), including the proposal of the assignment of roles to the most suitable stakeholders.

Electromobility

43% annual growth in the total number of electric vehicles

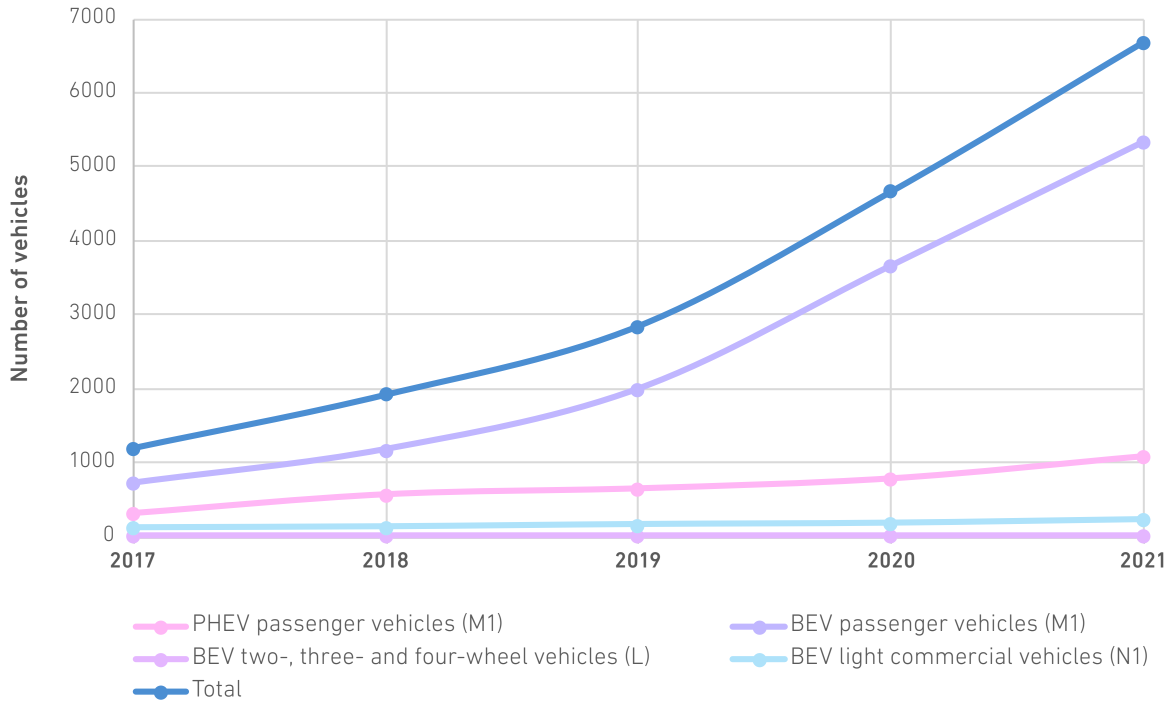
The Energy Agency monitors the development of electromobility from the point of view of the development of the electricity market. As e-mobility booms, electric vehicles can be expected to join the flexibility market with so-called smart recharging, where recharging parameters can be adjusted according to the needs of the vehicle's user, as well as those of the electricity system. In 2021, the Energy Agency continued promoting the development of the recharging infrastructure with network charge tariffs earmarked for connecting recharging stations and using the network.

In Slovenia, the total number of electric vehicles in 2021 was 6,696[65], an increase of around 43% compared to the previous year. Like the year before, the biggest contributor was battery electric vehicles (BEV). In the passenger vehicles category (M1), the annual increment of these vehicles was approximately 46%. The number of plug-in hybrids (PHEV) in the same category increased by around 37%. Together, BEVs and PHEVs account for 0.57% of all passenger vehicles in Slovenia. At the EU level, the comparable figure is 1.61%. In 2021, Sweden was the country with the highest number of registered new electric vehicles, with their share amounting to 41% of all newly registered vehicles. The number of light BEVs, which include two-, three- and four-wheel vehicles (category L), remains the same as the year before. The number of light commercial BEV (category N1) grew by 47, which means a 25% increase. Figure 117 shows the trend in the number of electric vehicles in Slovenia by the above-mentioned categories, showing a significant increase in the total number of electric vehicles.

64 There have been intense ongoing activities aimed at including the Flexibility Register in the ENTSO-E/ebIX/EFET harmonised model of roles in the electricity market.

65 Data as at 13 April 2022 (Source: EAFO, SURS)

FIGURE 117: NUMBER OF REGISTERED ELECTRIC VEHICLES IN SLOVENIA



SOURCE: EAFO

Compared to the previous year, the number of new registrations[66] in the passenger vehicles category in Slovenia shows a similar increase in the introduction of electric vehicles in the vehicle fleet. In the light BEVs category, there were no new registrations of vehicles in 2021. The total number of newly registered electric vehicles in Slovenia has increased by 12% compared to the previous year[67]. As shown in table 31, that figure at the EU level is quite different, as the number of newly registered passenger vehicles in the whole EU has grown by 67%. At the same time, the structure of new registrations by category is different than in Slovenia. At the EU level, a comparable number of PHEVs and BEVs are newly registered, while in Slovenia the number of new registrations of PHEVs is not as high.

TABLE 31: NUMBER OF NEWLY REGISTERED ELECTRIC VEHICLES IN SLOVENIA AND THE EU

		Slovenia			European Union		
		2020	2021	2021/2020 Ratio	2020[68]	2021	2021/2020 Ratio
Passenger Vehicles (M1)	**BEV**	1,666	1,679	101%	535,836	873,560	163%
	PHEV	118	296	251%	510,231	865,595	170%
Light Vehicles (L)	**BEV**	4	0	0%	44,842	84,185	188%
	PHEV	0	0	/	0	0	/
Commercial Vehicles (N1)	**BEV**	18	47	261%	27,147	44,821	165%
	PHEV	0	0	/	398	1,513	380%
	Total	**1,806**	**2,022**	**112%**	**1,118,454**	**1,869,674**	**167%**

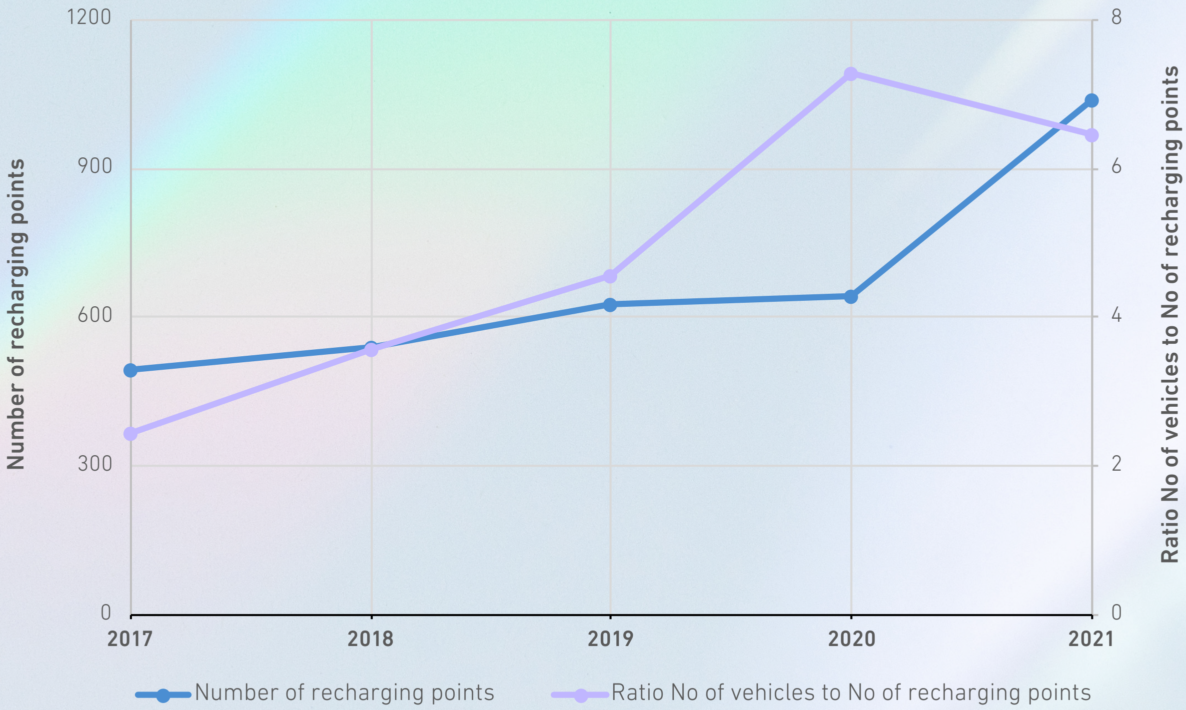
SOURCE: EAFO

66 Data as of 13 April 2022 (Source: EAFO)
67 Volatile updating of the data source enables the total compliance of the data according to individual years reported by the Energy Agency.
68 The EAFO data was changed in line with the Report on the Energy Situation in Slovenia in 2020.

The number of recharging points for electric vehicles in Slovenia has increased significantly, namely by 397, which represents a 62% annual increment. The entire EU recorded a 42% rise in the number of recharging points. Figure 118 shows the evolution of the number of recharging points in Slovenia and the corresponding ratio of the number of electric vehicles[69] according to the number of recharging points in the 2017–2021 period. The data shows that in 2021 there were approximately 6.4 electric vehicles per recharging point in Slovenia, which is in line with the envisaged EU framework[70]. The ratio for the whole EU was 14.2 electric vehicles per recharging point.

The number of recharging points per number of electric vehicles in Slovenia complies with the EU regulative framework

FIGURE 118: THE NUMBER OF RECHARGING POINTS IN SLOVENIA[71]



SOURCE: EAFO

In 2021, the Slovenian Environmental Public Fund (Eco Fund) also offered incentives for the purchase of electric vehicles and incentives for setting up recharging infrastructure for battery electric vehicles in the business and public sectors.

The Energy Agency's analytical work in monitoring the development of electromobility in Slovenia is hindered by the volatility of the data in the reference databases EAFO[72] and SURS, where it is possible to detect changes in data even for the past.

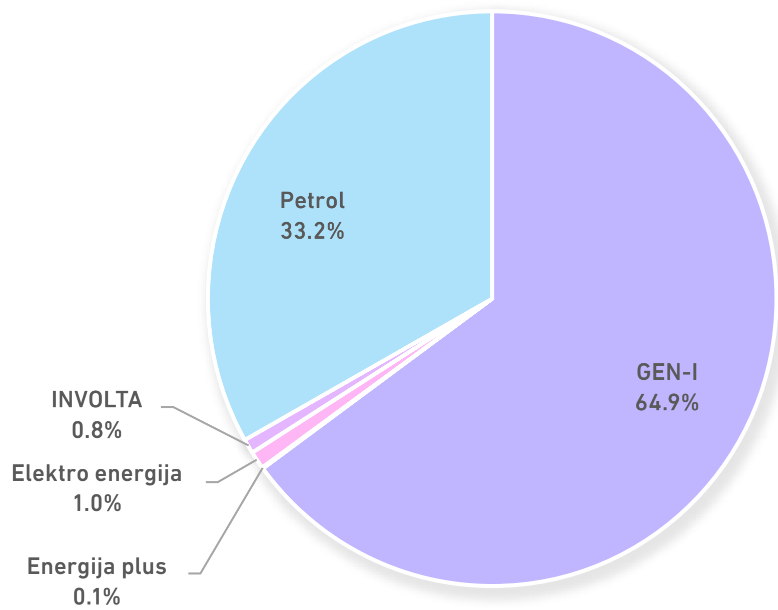
Another problem is the inconsistency of the goals in the field of electromobility in the reference national documents: while the sectoral strategy[73] indicates seven vehicles per public recharging point as the optimum ratio between the number of electric vehicles and recharging points, the optimum ratio according to the action plan[74] is 10 vehicles per public recharging point, which is also in line with the guidelines from Directive 2014/94/EU.

69 The total number of electric vehicles includes the vehicles in all the categories mentioned above (M1, L and N1).
70 As an indication, the appropriate average number of recharging points should be equivalent to at least one recharging point per 10 cars, also taking into consideration the type of cars, charging technology and available private recharging points. (Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure)
71 The EAFO data was changed in line with the Report on the Energy Situation in Slovenia in 2020.
72 European Alternative Fuels Observatory
73 Market Development Strategy for the Establishment of Adequate Alternative Fuel Infrastructure in the Transport Sector in the Republic of Slovenia of the 12 October 2017
74 Action plan for alternative fuels in transport of the 6 June 2019. At the time of the preparation of this report, the draft action plan for alternative fuels in transport 2022-2023 is still under consideration.

The Energy Agency expects the described situation to improve with the revision of the national documents and the use of the results of the IDACS project to ensure better quality data on the recharging infrastructure for electric vehicles.

The future monitoring of market development carried out by the Energy Agency will in part be based on the data provided by the electricity system operators and EDCs, which will enable the development of the recharging infrastructure according to the typical segments of power output. It is important to distinguish between recharging points with different power outputs, since fast recharging with a high power output is of key importance for short stops on transit routes, while slow charging is the most important for longer periods of inactivity (e.g. at work) or overnight (e.g. at home). So far, suppliers revealed that between them, they consumed 3.92 GWh of electricity for the services of recharging electric vehicles in 2021.

FIGURE 119: SHARES OF ELECTRICITY USED FOR THE SERVICES OF CHARGING ELECTRIC VEHICLES BY SUPPLIERS



SOURCE: SUPPLIERS

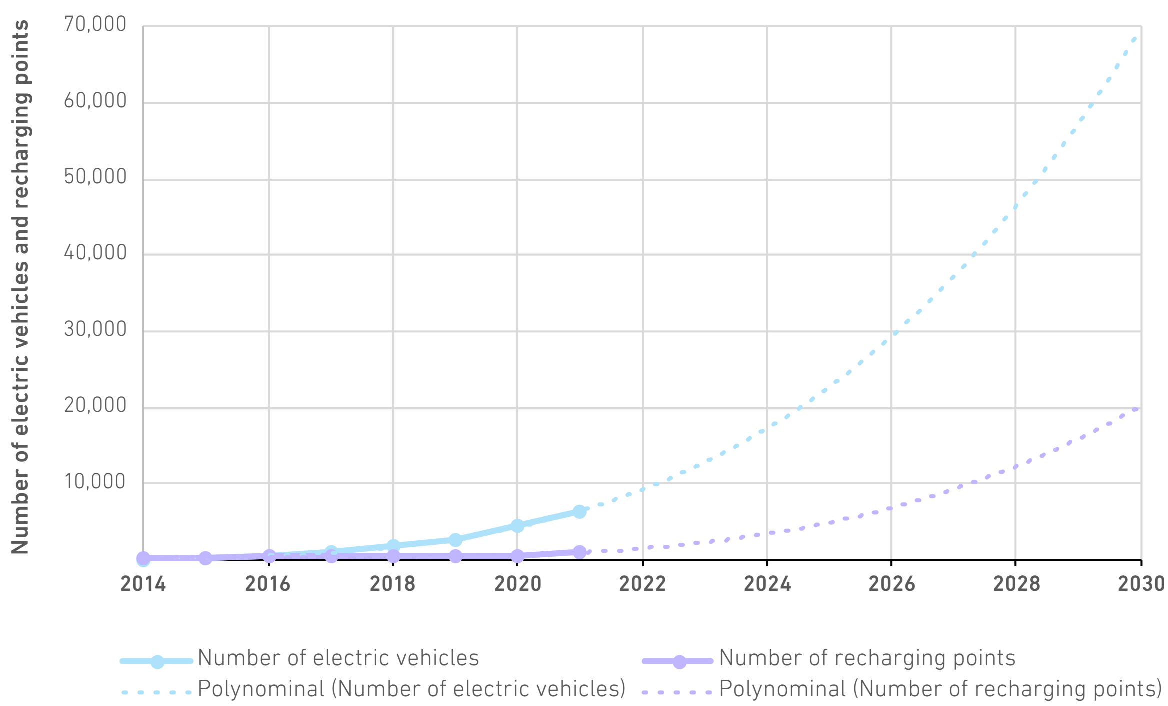
CASE STUDY: PROSPECTS OF THE FUTURE DEVELOPMENT OF ELECTROMOBILITY

A prudent development of the necessary recharging infrastructure depends on the trends in the number of electric vehicles. Based on several years' trends in the number of electric vehicles and recharging infrastructure, it is possible to make projections for future development and the attainment of the goals set in the relevant national documents.

Taking into consideration the trends in the 2014–2021 period and the continuation of this trend until 2030 (Figure 120), we can see that the average increment of the number of electric vehicles was 1.54% a year[75]. Therefore, we can expect that there will be about 1,365,734 registered electric vehicles in Slovenia in 2030 (M1). Among the target shares of various alternative fuels in the best case 2030 scenario, the share of electric vehicles[76] would amount to 17.5% of all passenger vehicles. That would mean 241,188 electric vehicles on Slovenian roads. According to that scenario and taking into consideration the guidelines from the Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure, we would need 24,118 recharging points by 2030. Given the slower real growth in the number of electric vehicles, it is most probable that the estimated number will not be needed by 2030 yet. If the past trends continued, the number of electric cars in 2030 would be about 69,640, meaning that, in line with the above-mentioned Directive, we would only need approximately 6,964 recharging points by 2030. On the other hand, the past trends in the number of recharging points show that the number of recharging points would reach about 20,220 by 2030, which means a considerably lower ratio (around 3.4) than the appropriate average indicated by the Directive. The trends also indicate that the time necessary to reach the target share of 17.5% electric vehicles among passenger vehicles would be longer - approximately by 2037.

The findings of this short analysis have to be understood in the sense that it is necessary to accelerate the introduction of electric vehicles in the Slovene vehicle fleet in order to reach the target share of electric vehicles. Parallel to that, it is necessary to develop an appropriate recharging infrastructure. The present analysis does not distinguish between charging points with different power outputs.

FIGURE 120: PROJECTION OF THE TRENDS IN THE NUMBER OF ELECTRIC VEHICLES AND RECHARGING POINTS FOR ELECTRIC VEHICLES IN SLOVENIA[77]



SOURCES: ENERGY AGENCY, EAFO, SURS

75 Data as of 15 April 2022 (Source: Statistical Office of the Republic of Slovenia).
76 The best case 2030 scenario foresees a 20% share of vehicles powered by alternative fuels. Judging by the past trends in passenger vehicles, the share of electric vehicles is 17.5, while the rest is distributed among various types of gasses.
77 The EAFO data was changed in line with the Report on the Energy Situation in Slovenia in 2020.

Reliability of the Electricity Supply

The reliability of the electricity supply is determined by the probability that the system will be capable of supplying energy of sufficient quality to all the delivery points in sufficient quantities. The reliability of the supply is quantified using two basic parameters – sufficiency and security. Sufficiency is an indicator of the system's ability to meet the consumers' demand for electricity and power under all the anticipated operational conditions, i.e. taking into account planned and unplanned outages of the system's elements. Operational security is the system's ability to maintain a normal state or to return to a normal state as quickly as possible, that is, to withstand a set of disturbances in a specific operational condition (e.g. short circuits in the network, outages of the system's elements and unexpected changes in consumption in relation to generation constraints) so that consumers do not feel the consequences of a disturbance, which is eliminated without jeopardising the system's integrity.

In 2021, a number of restrictive measures were adopted in response to the COVID-19 epidemic, which manifested themselves in the shutdown of public life and certain activities, the introduction of protective preventive measures and restrictions on services. Despite that, the transmission and distribution system operators, along with the EDCs, energy production companies and other stakeholders, continued to produce, transmit and distribute electricity without interruption and perform all the necessary maintenance, while observing all the necessary protection measures.

The entry into force of network codes on system operation and electricity emergencies and restoration laid down detailed rules on how TSOs and other relevant participants have to operate and cooperate to ensure the system's security. The adopted Clean Energy for All Europeans legislative package has set out a common framework of rules on how to prevent and manage electricity crises.

Commission Regulation (EU) 2017/1485 establishing a guideline on electricity transmission system operation sets the minimum standards for the system operational security, operational planning and frequency management in order to ensure the safe and coordinated operation of the electricity system throughout Europe, taking into account the growing share of renewables, while creating a standardised framework for regional cooperation, including balancing markets. The Regulation necessitates the adoption of several proposals or methodologies, all of which are already in force. With respect to operational security, the KORRR methodology defines the key organisational requirements, roles and responsibilities in relation to data exchange. Of crucial importance in operational planning are the methodologies for developing common grid models for year-ahead, day-ahead, and intraday time-frames, the methodology for assessing the relevance of assets for outage coordination, the methodology for coordinating the operational security analysis and the common provisions for the regional operational security coordination. In the context of load-frequency control, the SAFA agreement has been adopted at the level of the Continental Europe synchronous area, which lays down the policy on dimensioning frequency reserves. Likewise of crucial importance from the perspective of dimensioning Slovenian reserves is the operational agreement of the SHB load-frequency control block, which involves Slovenia, Croatia and Bosnia and Herzegovina and enables the more efficient operation of electricity systems and mutual assistance in terms of control reserves between the three countries.

Commission Regulation (EU) 2017/2196 establishing a network code on electricity emergencies and restoration is essential for ensuring the reliable operation of the transmission system and an uninterrupted supply of electricity both in Slovenia and across Europe in general, since it specifies the requirements for grid management and the implementation of measures in an emergency, in a blackout state or during system restoration following a blackout. All the requirements specified in the Regulation have already been adopted in Slovenia. The Regulation sets out a plan for the maintenance of the system and a plan for the restoration of the system. The measures set out in these plans have as their objective the defence of the Slovenian electricity system against blackouts and/or a restoration of the normal state in the event of an emergency or a blackout. The Regulation also sets out the test plan, which specifies how the tests are to be carried out, and specifies the test success criteria and the frequency for testing the equipment and installations that are important in carrying out the procedures in the plans for the maintenance and restoration of the system.

Commission Regulation (EU) 2019/941 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC lays down rules for cooperation between Member States with a view to preventing, preparing for and managing electricity crises in a spirit of solidarity and transparency and with full regard for the requirements of a competitive internal market for electricity. This regulation foresees the adoption of several methodologies, most of which have already been adopted. The methodology for short-term and seasonal adequacy assessments establishes a procedure for assessing seasonal and short-term adequacy, namely in the monthly and week-ahead to at least the day-ahead timeframe, while taking into account several kinds of uncertainty. The methodology for identifying regional electricity crisis scenarios establishes a procedure for identifying the most relevant regional electricity crisis scenarios. These scenarios form the basis for identifying the most relevant regional and national electricity crisis scenarios, which have already been defined at the European and Slovenian levels. On the basis of the regional and national electricity crisis scenarios, the competent authority of each Member State shall establish a risk-preparedness plan that is currently being harmonised among the relevant stakeholders and needs to be finalised by the beginning of January 2022. This plan consists of national, regional and bilateral measures for preparing for, preventing and mitigating electricity crises.

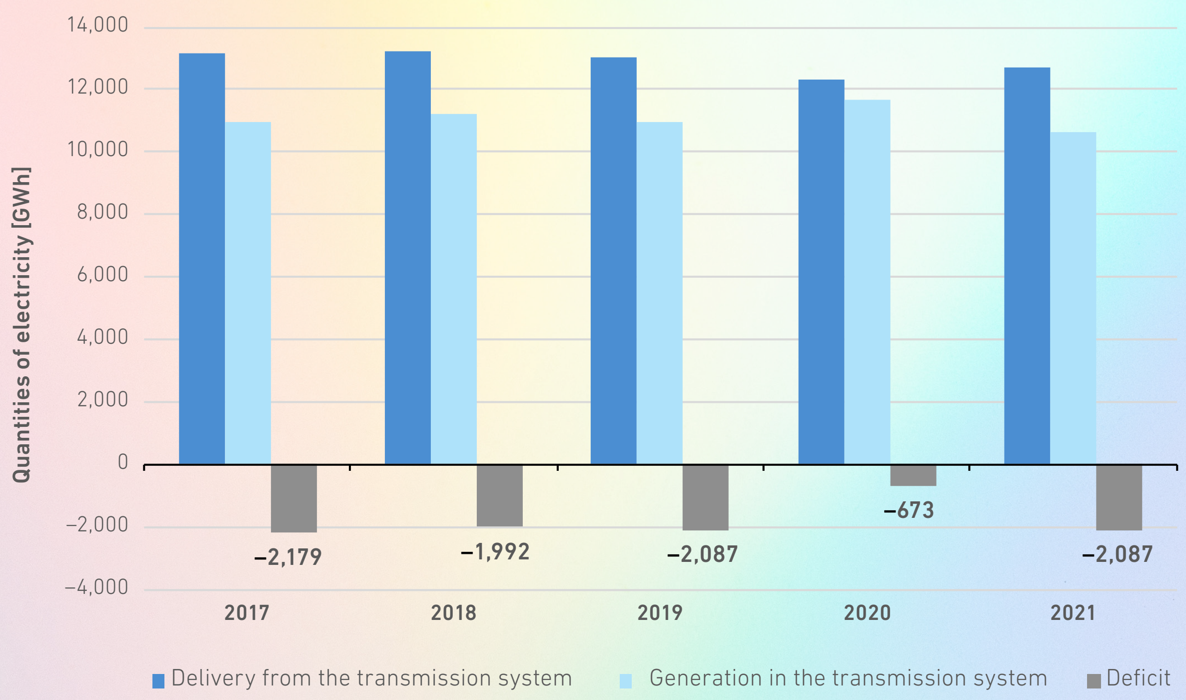
The required level of security of electricity supply in a country is transparently represented by a reliability standard typically expressed using the Loss of Load Expectation (LOLE) indicator. The reliability standard is defined on the basis of a marginal reduction in the Expected Energy Not Served indicator in the results of the latest national, regional and European resource adequacy assessments, which include assessments of the LOLE and EENS indicators. The LOLE reliability standard is calculated by taking into account the Value of Lost Load, or VOLL, and the Cost of New Entry, or CONE, of the generation technologies that can take part in the reduction of the LOLE indicator. In 2021, the Ministry of Infrastructure designated the transmission system operator as the competent authority for the development of the reliability standard. The national resource adequacy assessment, which does not take into account the level of cross-border interconnection of the Slovenian electricity system, found a maximum hourly value of energy not supplied of 898 MWh, resulting in a LOLE reliability standard indicator of 39 hours and an EENS indicator of 35 GWh. Relevant for the determination of the reliability standard, however, is the European Resource Adequacy Assessment (ERAA 2021), in which it was assessed that Slovenia should not encounter resource adequacy problems in any of the scenarios analysed, as the values of the LOLE and EENS indicators are zero in all cases.

Monitoring the Balance Between Generation and Consumption

In 2021, the delivery of electricity from the transmission system increased quite a bit compared to the year before, namely by 3.4%. This increase is undoubtedly a consequence of the considerable reduction in electricity consumption on the transmission network in 2020 due to the epidemic. Taking into account half of the capacity of the Krško NPP, electricity generation in the transmission system was almost 8.6% lower in 2021 than the year before, mostly due to the decrease of just over 10% in generation by thermal power plants and the nuclear power plant. Generation in hydropower plants was likewise lower than in the previous year. Due to the large quantity of electricity drawn from the transmission system and the reduction in electricity generation, the deficit in 2021 is significantly higher than in the previous year, being virtually the same as the 2019 deficit at 2087 GWh.

The consumption of electricity from the transmission system covered by domestic production in 2021 is the same as in 2019 and considerably less than in 2020

FIGURE 121: ELECTRICITY CONSUMPTION AND GENERATION IN THE SLOVENIAN TRANSMISSION SYSTEM WITHOUT TAKING INTO ACCOUNT LOSSES IN THE 2017–2021 PERIOD



SOURCE: ELES

Monitoring Investment in Production Capacities to Ensure a Reliable Supply

Besides taking into account the anticipated economic developments to estimate future electricity consumption in Slovenia, the requirements of the European Network of Transmission System Operators (ENTSO-E) from the ten-year EU development plan have been considered to the greatest extent possible, along with the scenarios from the NECP. Electricity demand at the transmission level is mainly covered by sources connected to the transmission system. So, in order to provide a forecast of the situation in the Slovenian electricity system that is as accurate as possible, those planned production sources whose construction is considered less likely should be excluded.

Due to siting difficulties and unfavourable market signals, the construction of new production sources in the transmission system is very time-consuming

Table 32 shows the changes to Slovenian electricity producers envisaged in the Slovenian Network Development Plan 2021–2030. A positive value of capacity in the second column means that it is a new production facility or a renovation of an existing one, where an increased capacity is envisaged. A negative value means a shutdown or a reduction of the unit's installed capacity. The mark in the last column indicates a vision of development or the scenario under which the investment is expected to be carried out. Scenario 1 is the most pessimistic, taking into account only the generation sources that are already under construction or that have obtained planning permission, scenario 2 considers investments in generation units that can be realistically expected while taking into account delays in the construction of new hydropower plants, and scenario 3 envisages a similar realisation of power plant construction as in scenario 2, except that no HPP construction is anticipated beyond the ten-year development period. Most ambitious in terms of the integration of new production units is scenario 4, which foresees the construction of all the investments identified in the NECP, as well as all those announced by investors. Scenario 4 also foresees the construction of the second unit of the Krško NPP in 2030.

None of the scenarios foresee any HPP being constructed on the Mura river by 2030. Due to the suspension of the liquidation process, the two gas units in Trbovlje TPP will continue to operate until at least 2030 in order to provide ancillary services. Unit 4 of the Šoštanj TPP also has an operating permit until the end of 2022 but it has not been running since 2018, when the more efficient Unit 5, scheduled to be taken offline in 2028, was reintegrated into the power grid after environmental rehabilitation had been completed. In the coming years, an upgrade of the high-pressure turbine in the Krško NPP is planned, which is expected to increase the capacity of the plant by one percent.

The results of the TSO's analyses for the 2021–2030 period show a similar deficit of national production in all four scenarios, which can mostly be attributed to the operation of the available national production being uneconomical. An exception to this is scenario 4, under which the second unit of the Krško NPP comes online in 2030.

TABLE 32: CHANGES TO THE GENERATION FACILITIES IN THE TRANSMISSION SYSTEM BY 2030

	Installed capacity (MW)	Anticipated year of change	Scenario
Hydropower plants			
HPPs on the Drava River			
Kozjak PSHPP	420	2028	4
HPPs on the Sava River			
Mokrice	28	2025	2, 3, 4
Suhadol	44	2026	4
Trbovlje	36	2029	4
HPPs on the Soča River			
Učja	34	2027	4
Thermal power plants			
Šoštanj TPP			
TEŠ Block V	–305	2027	
Šoštanj TPP PT 51	–42	2027	
Šoštanj TPP PT 52	–42	2027	
Brestanica TPP			
PB 1	–23	2024	
PB 2	–23	2024	
PB 3	–23	2029	
TPP TOL			
Unit I, coal	–39	2022	
Unit II, coal	–39	2022	
PPE TOL 1	57	2022	1, 2, 3, 4
TPP TOL 1	57	2022	1, 2, 3, 4
JEK2	1,100	2030	4

SOURCE: ELES

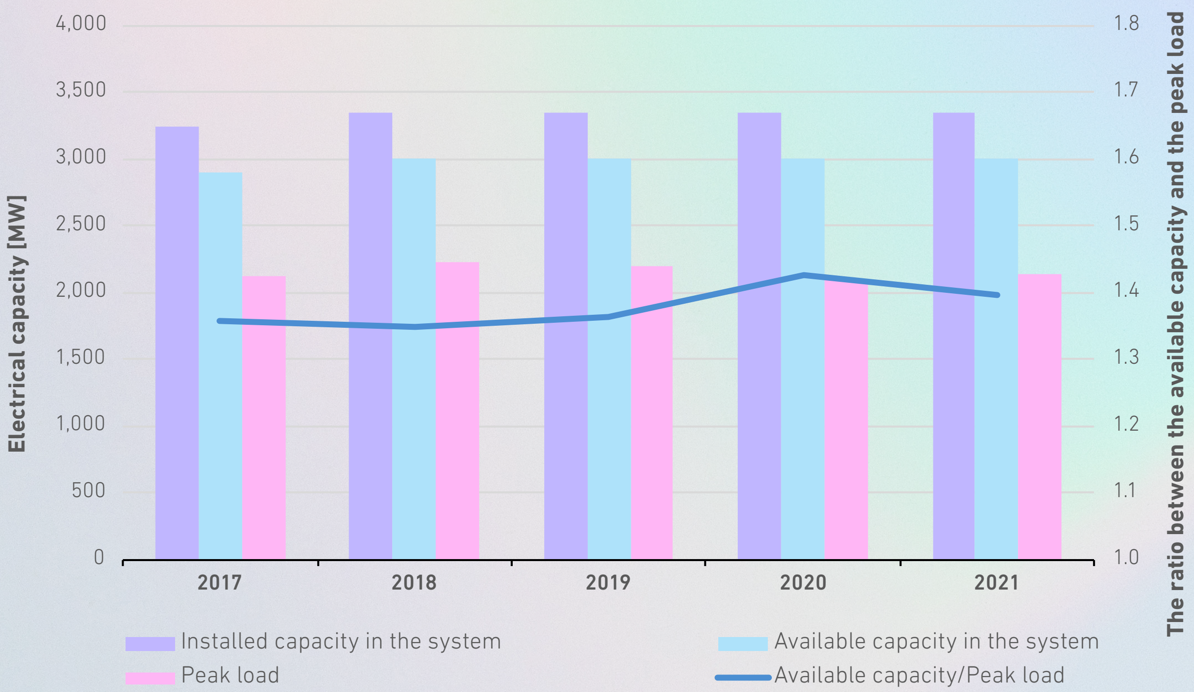
Measures to Cover Peak Demand and Shortages of Electricity

The ratio between the installed or available capacity of production sources and peak load is an indicator of the sufficiency of production sources. The system must have enough power at its disposal to cover demand and reserve power during normal operation and in the event of unforeseen circumstances. The actual capacity available on the Slovenian market is equal to the total installed capacity of the production facilities minus half of the power from the Krško NPP that belongs to Croatia. The ratio between the available capacity and the peak load in the transmission system in 2021 was worse than the year before. Compared to 2020, this ratio declined by approximately 2.1% due to an increase in demand at peak load.

Peak load in Slovenia occurs during the winter, increasingly often around noon

In the past, peak load in the Slovenian electricity system always occurred in the evening during the winter months, correlating with cold weather. In the last five years, with 2017 as the sole exception, peak load has been occurring around noon.

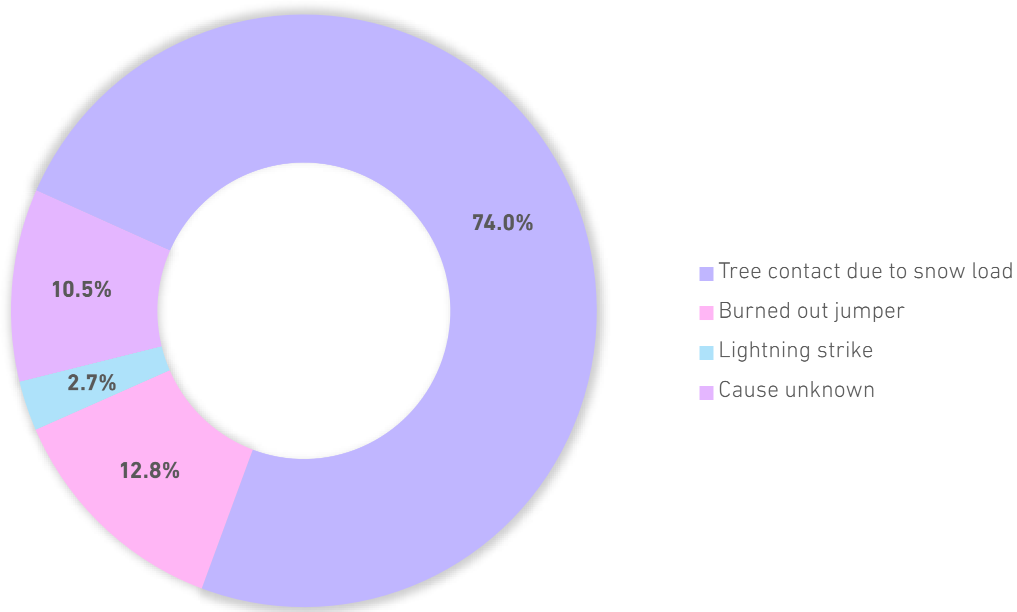
FIGURE 122: INSTALLED CAPACITIES OF PRODUCTION FACILITIES, CAPACITIES AVAILABLE FOR THE SLOVENIAN MARKET AND PEAK DEMAND, AND THE RATIO BETWEEN THE AVAILABLE CAPACITY AND PEAK LOAD IN THE TRANSMISSION SYSTEM IN THE 2017–2021 PERIOD



SOURCE: ELES

Extreme weather or damage to the grid can lead to supply interruptions. Energy not supplied (or Energy not Served) is the energy that could potentially be delivered by the system had there not been an interruption of supply. The volume of electricity not supplied from the transmission system in 2021 was 10.3 MWh, nine times less than the year before. The bulk of that amount, 7.6 MWh, was a consequence of heavy snowfall, which led to trees contacting the phase conductors, while 1.3 MWh of energy not supplied was due to a burned-out jumper on a transmission line. Electricity that is not supplied is calculated in accordance with the Act on the rules for monitoring the quality of the electricity supply. Therefore, the actual volume of not supplied electricity may be lower than indicated since a significant share of consumers in the affected areas could be oversupplied by the medium-voltage network.

FIGURE 123: ELECTRICITY NOT SUPPLIED FROM THE TRANSMISSION SYSTEM IN 2021 ACCORDING TO THE CAUSE



SOURCE: ELES

2,042
NEW

NATURAL GAS CONSUMERS ON DISTRIBUTION SYSTEMS

6%
HIGHER

TOTAL CONSUMPTION OF ALL CONSUMERS THAN THE PREVIOUS YEAR - THE HIGHEST IN A DECADE

12.9%
MORE

THAN THE AVERAGE OF THE PREVIOUS FIVE YEARS GAS CONSUMED ON DISTRIBUTION SYSTEMS

Natural gas - important role of gas in the energy transition

5.5%
MORE

NATURAL GAS TRANSFERRED FOR THE SUPPLY OF DOMESTIC CONSUMERS

52%
INCREASE

IN LNG CONSUMPTION

THE COVID-19 EPIDEMIC DID NOT CAUSE ANY DISRUPTION TO NATURAL GAS SUPPLIES IN 2021

FINAL NATURAL GAS PRICES FOR HOUSEHOLD AND BUSINESS CONSUMERS REMAIN BELOW THE EU-27 AVERAGE

77.3% OF NATURAL GAS PURCHASES UNDER SHORT-TERM CONTRACTS

10.2% GROWTH IN VOLUMES ON THE FREE MARKET

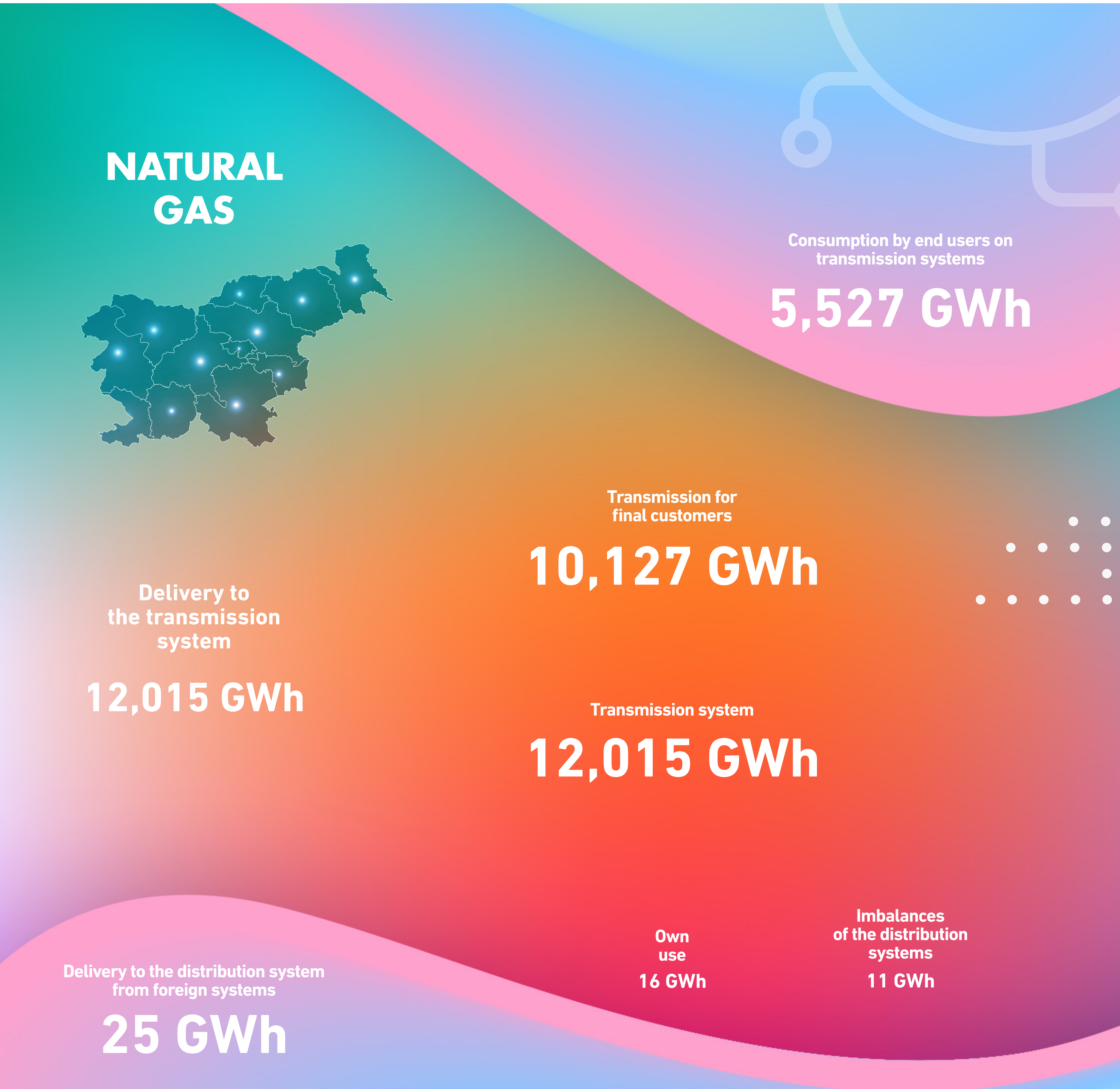
2020 NETWORK CHARGES FOR CONSUMERS ON DISTRIBUTION SYSTEMS REMAIN AT THE LEVEL OF THE PREVIOUS TWO YEARS

€147.6 MILLION FOR THE OPERATION OF THE TRANSMISSION SYSTEM

€154.5 MILLION FOR THE OPERATION OF DISTRIBUTION SYSTEMS IN THE 2022-2024 REGULATORY PERIOD

NATURAL GAS

FIGURE 124: BASIC DATA ON THE QUANTITIES OF NATURAL GAS TRANSFERRED, DISTRIBUTED AND CONSUMED



Supply and Demand of Natural Gas

In 2021, 12,015 GWh of natural gas was transported through the natural gas transmission system, a 28% decrease compared to the previous year. The drop in volumes is due to a significant decrease in transmission volumes to neighbouring transmission systems, while transmission for the needs of domestic customers increased compared to the previous year. For the supply of domestic customers, 10,127 GWh or 5.5% more than in the previous year were transferred, while 1829 GWh of natural gas were transferred to other transmission systems. The difference of 59 GWh is due to system differences and own use of the transmission system. Transfers to other transmission systems fell by just over 74%, reaching by far the lowest level of cross-border natural gas transfers in the last decade.

SOURCE: ENERGY AGENCY

The total consumption by domestic natural gas consumers was 10,163 GWh, or 6% higher than the previous year, reaching the highest level in the last decade. Consumption increased overall for all consumer groups. Household and non-household consumers connected to distribution systems together consumed just over 10% more natural gas. Households consumed almost 12% more gas and non-household consumers consumed just over 9% more gas than a year earlier. Non-household consumers in the transmission system and on the CDSs also consumed more gas compared to the previous year. Consumption in the transmission system was almost 3% higher. In addition to the higher number of consumers, weather factors with annual temperature deficits and other individually determined factors also had an impact on the consumption of individual customer groups, and it is very likely that the end-of-year gas price increases affecting individual customer groups did not yet have a significant impact on the volumes consumed.

28% less natural gas volumes were transported due to a decline in transmission to other transmission systems

The highest natural gas consumption in a decade

At the end of 2021, 137,192 end-users were connected to the natural gas transmission, distribution systems and CDSs. Natural gas distribution activities were carried out by 13 DSOs and five TSOs.

TABLE 33: NUMBER OF CONSUMERS ACCORDING TO CONSUMPTION TYPE IN 2020 AND 2021

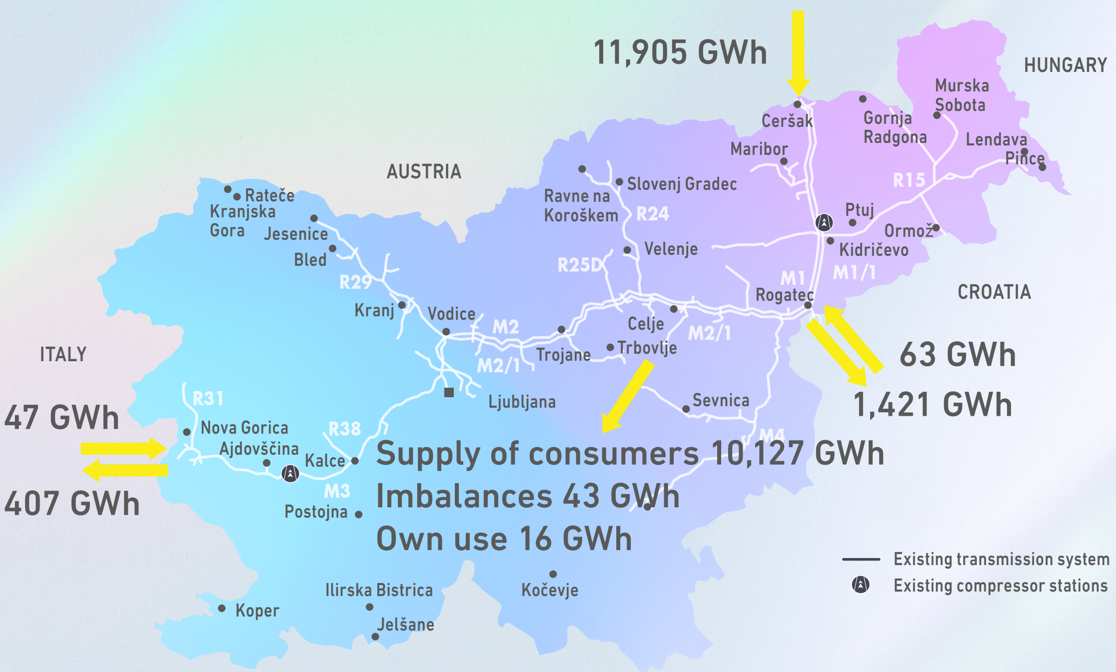
Number of consumers according to consumption type	2020	2021	Index
Business consumers in the transmission system	142	143	100.70
Business consumers in the distribution systems	14,477	14,600	100.85
Business consumers on CDSs	49	49	100.00
Household consumers	121,616	122,400	100.64
Total	**136,284**	**137,192**	**100.67**

SOURCE: ENERGY AGENCY

Transmission of Natural Gas

The transmission system is owned and operated by the transmission system operator, Plinovodi. It consists of 985 kilometres of high-pressure pipelines with a nominal pressure above 16 bar and 211 kilometres of pipelines with a nominal pressure below 16 bar. The transmission network also consists of 209 metering and regulating stations (MRP), 43 metering stations (MP), eight reduction stations and compressor stations in Kidričevo and Ajdovščina. The transmission network is connected to the natural gas transmission networks of Austria (MRP Ceršak), Italy (MRP Šempeter pri Gorici) and Croatia (MRP Rogatec). At the border crossing points with Italy and Croatia, the two-way transmission of natural gas is possible, while at the border crossing point with Austria, gas only flows to Slovenia. The border points are also relevant points in the transmission system. The sixth relevant point is the exit point in the Republic of Slovenia. Trading in natural gas on the wholesale market takes place at a virtual point.

FIGURE 125: NATURAL GAS TRANSMISSION SYSTEM AND TRANSFERRED QUANTITIES OF GAS AT ENTRY AND EXIT POINTS

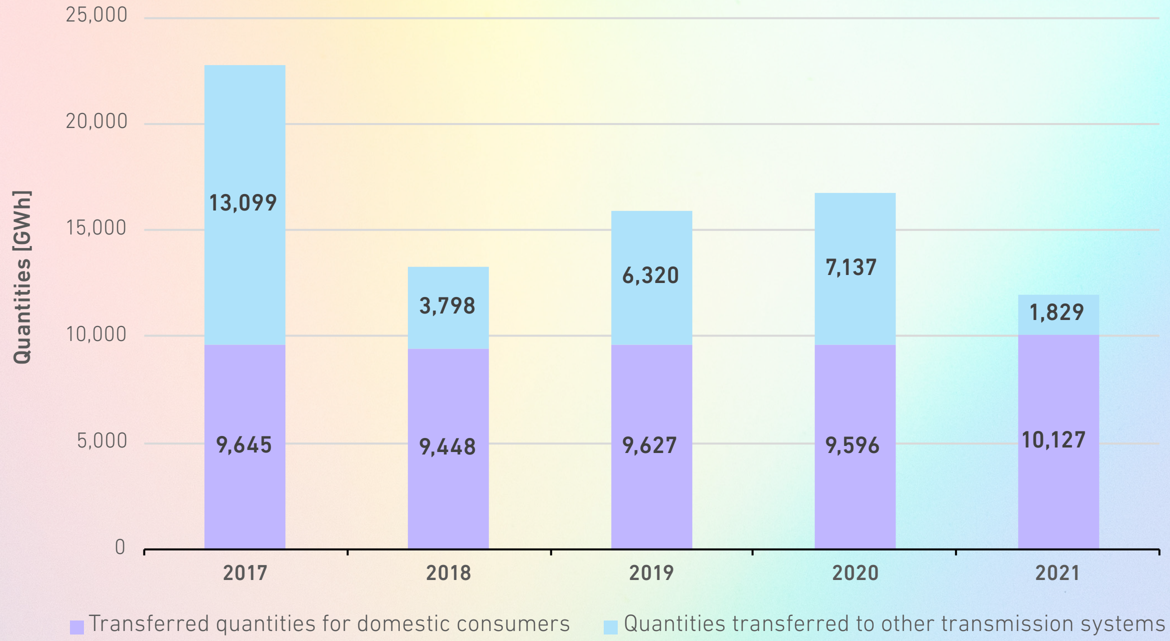


SOURCES: ENERGY AGENCY, PLINOVODI

Consumption of natural gas by Slovenian consumers in 2021 was the highest since 2010, up 6% from the previous year. After three consecutive years of increasing quantities transferred to other transmission systems, quantities transferred to other transmission systems were at record lows in 2021. Compared to 2017, when Croatia was largely supplied through Slovenia, only 1,829 GWh of natural gas was transferred through Slovenia in 2021, 14% of the 2017 volumes.

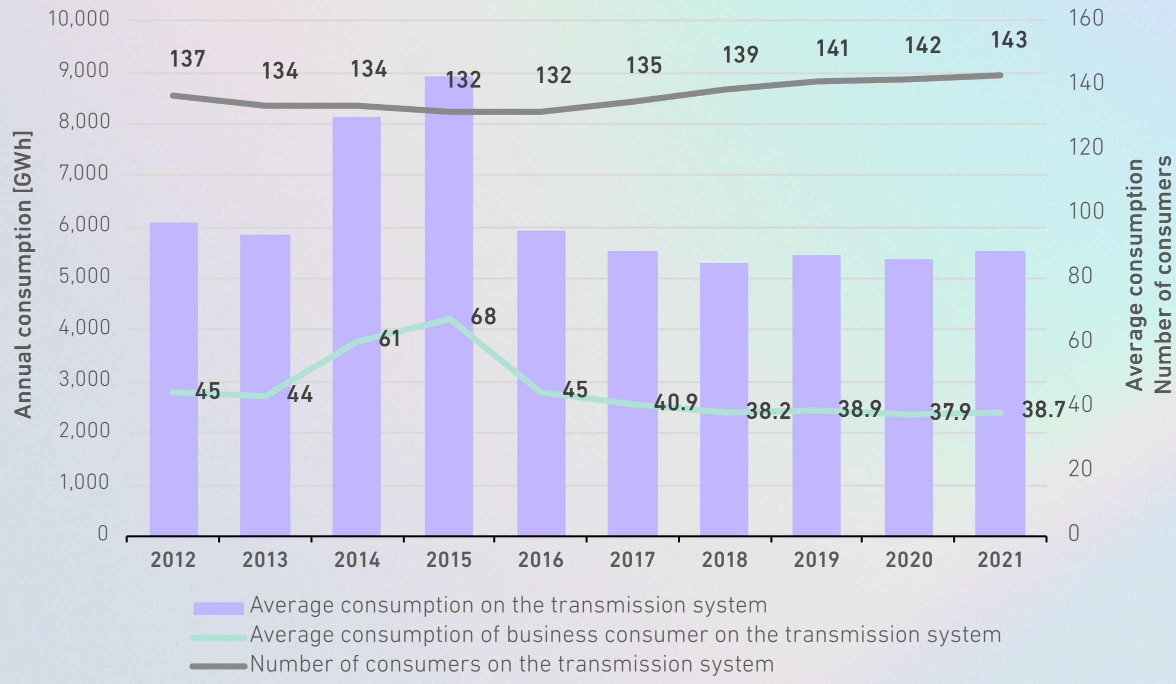
6% increase in consumption by Slovenian natural gas consumers

FIGURE 126: QUANTITIES OF NATURAL GAS TRANSFERRED IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

FIGURE 127: TOTAL AND AVERAGE CONSUMPTION OF A BUSINESS CONSUMER, AND THE NUMBER OF CONSUMERS IN THE NATURAL GAS TRANSMISSION SYSTEM IN THE 2012–2021 PERIOD

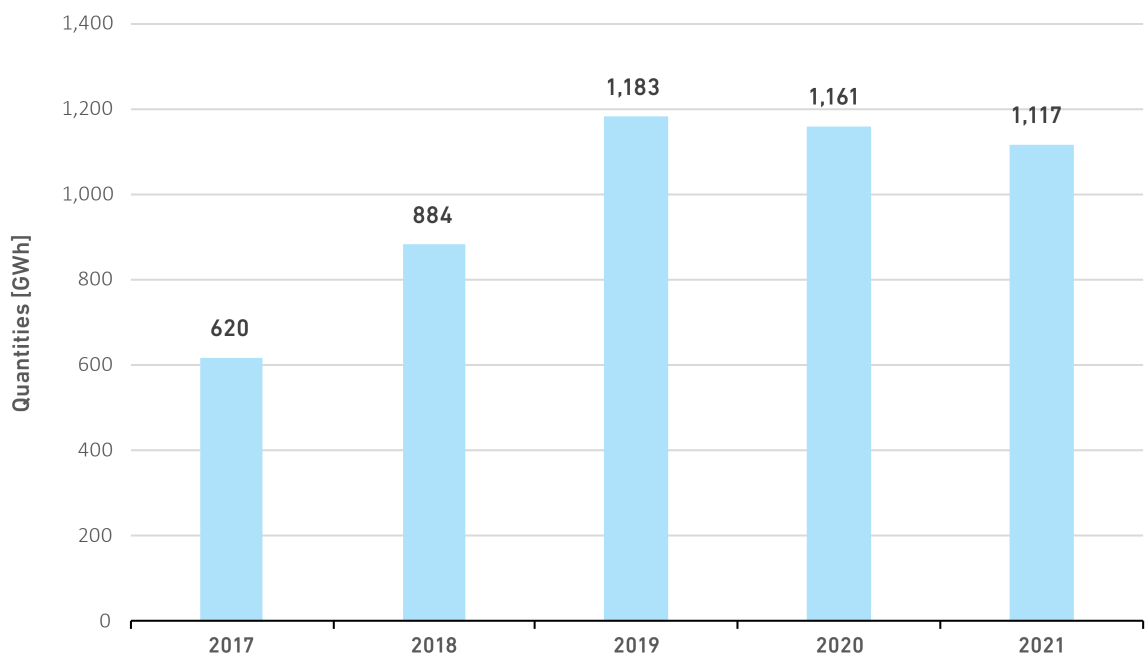


SOURCES: ENERGY AGENCY, PLINOVODI

Four new end-users were connected to the transmission system, while three end-users stopped using gas due to business closures or were taken over or reorganised. This brings the number of end-users to 143. In 2016, some customers in the transmission system acquired the status of CDS, and therefore there is a noticeable decrease in the consumption of customers on this system, as their consumption is no longer taken into account as consumption by customers in the transmission system.

The TSO consumed 15.5 GWh of natural gas for its own use or to power the compressors in the two compressor stations, an increase of 7% compared to the previous year. The volumes transported per unit of natural gas consumed for captive use decreased slightly for the second year in a row.

FIGURE 128: QUANTITIES OF NATURAL GAS TRANSPORTED WHEN CONSUMING ONE GIGAWATT-HOUR OF GAS FOR OWN USE DURING THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

Distribution of Natural Gas

The distribution of natural gas is carried out as an optional local service of general economic interest of the distribution system operator to supply general consumption consumers in urban areas and settlements and as distribution to industrial and commercial customers in the CDS areas.

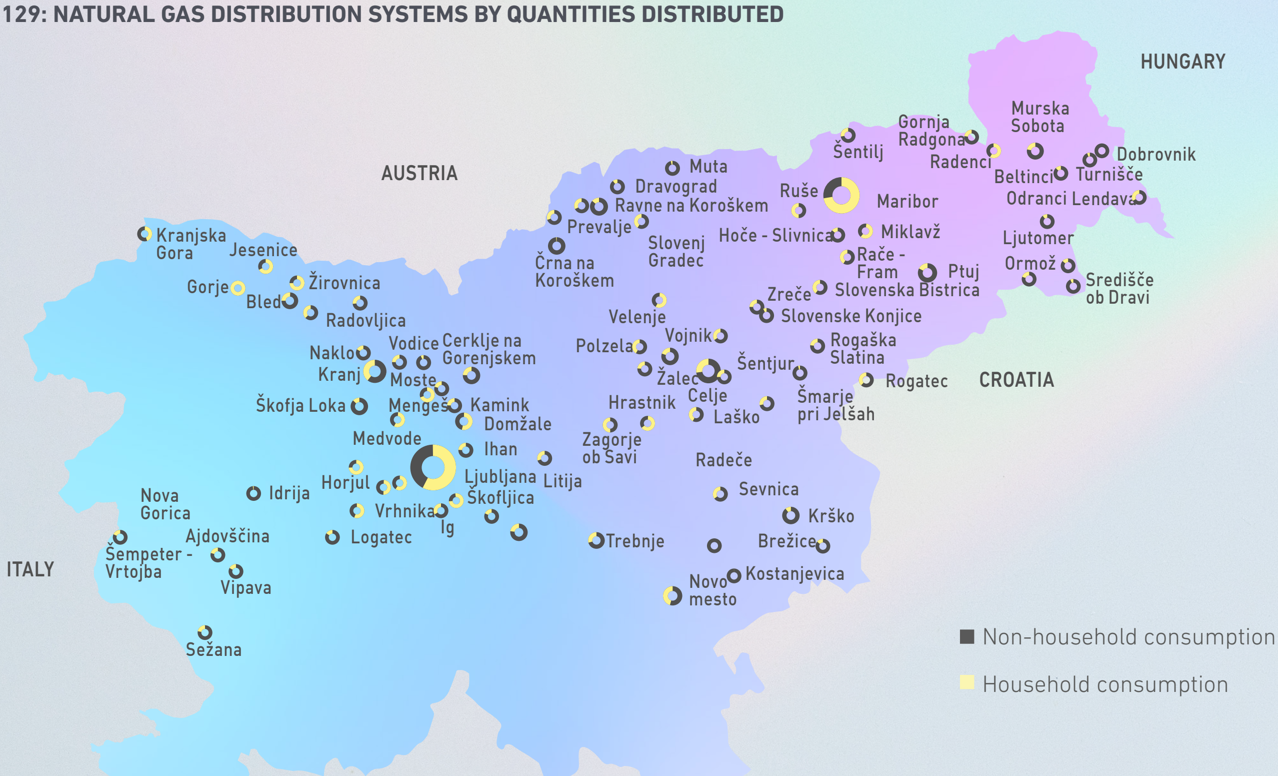
Natural gas distribution in the form of a local service of general economic interest is carried out in 85 municipalities, newly introduced in the municipality of Grosuplje

The content and data below, where it is not explicitly stated that they refer to the CDSs, describe the distribution areas with an organised optional local service. All distribution and closed distribution system operators carried out distribution without interruptions and, subject to safeguards, provided a safe and reliable supply to the final customers. In 2021, natural gas distribution as a local service was provided in 85 municipalities in most of the urban areas of Slovenia, with the exception of the Primorska Region.

As of November, natural gas distribution was newly launched in the municipality of Grosuplje, where the commercial distribution of other energy gases was previously carried out. In 2021, natural gas distribution was provided as a local service of general economic interest by 13 DSOs. In 70 municipalities, this activity is organised through a concession relationship between the concession holder and the local community, in 14 it is carried out by public undertakings, and in one municipality the local service of general economic interest is implemented in the form of a public capital investment in the activity of private law entities. In Šenčur and Hrastnik, two distribution system operators performed the GJS activity on the basis of concession contracts concluded with the municipality. In some municipalities with an existing concession for natural gas distribution activities, the supply has not yet been made possible because the distribution network has not yet been built or put into operation or because connection to the transmission system is not yet possible.

The epidemic continued to cause no supply disruptions in 2021

FIGURE 129: NATURAL GAS DISTRIBUTION SYSTEMS BY QUANTITIES DISTRIBUTED



SOURCES: ENERGY AGENCY, DSOs

Distribution system operators distributed 3,986 GWh of natural gas in 2021, an increase of just over 10% compared to the previous year and just under 13% more than the average for the five-year period 2016-2020. According to the operators, consumption by household consumers increased by almost 12% in 2021, while non-household consumers consumed just over 9% more than the previous year. The number of consumers increased in both groups. At the end of 2021, 122,400 household and 14,600 non-household consumers were recorded. The number of household and non-household consumers increased by 784 and 123 respectively in 2021. Most of the new consumers were registered

Consumers in the distribution systems consumed 3,986 GWh of natural gas, 12.9% more than the five-year average

in customer groups CDK3 to CDK5, consuming between 5,000 kWh and 50,000 kWh of natural gas per year. To a lesser extent, the number of customers in customer groups CDK6 and CDK7, which consume between 50,000 kWh and 300,000 kWh of natural gas per year, also increased.

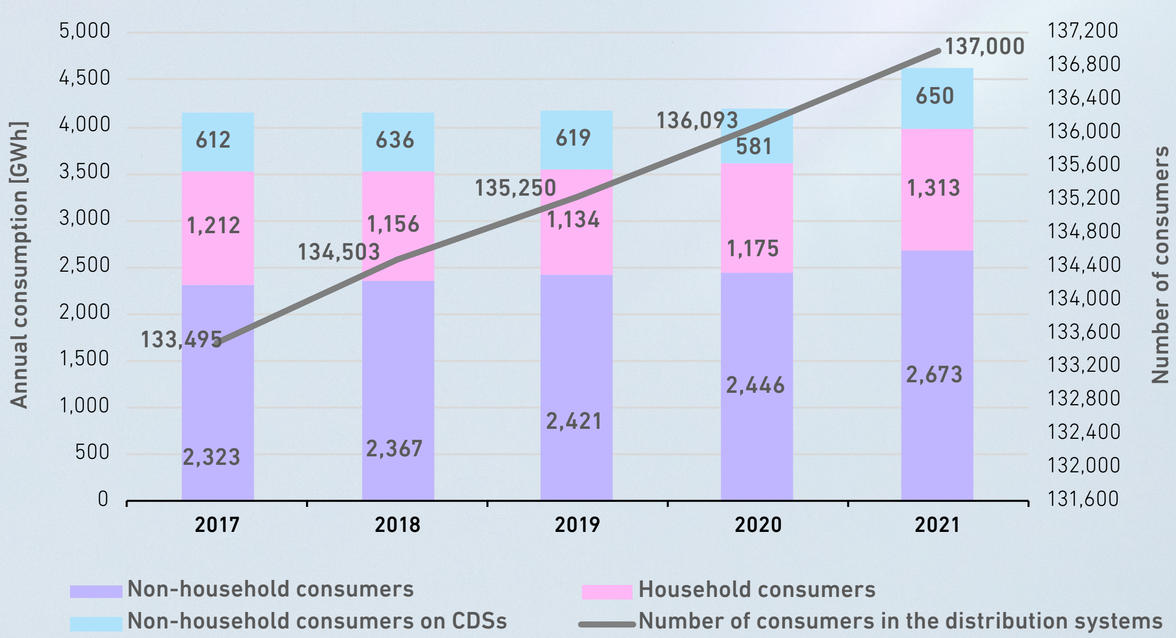
Historically highest consumption in the distribution systems

In the five CDS areas of Jesenice, Kranj, Kidričevo, Štore and Anhovo, 49 customers were registered at the end of 2021, unchanged compared to the previous year. In these closed distribution areas, the distribution of natural gas is not carried out as a local service of general economic interest. Access to the CDS is only granted to customers within the rounded geographical area of these systems. The CDS operators have distributed 650 GWh of natural gas in these areas. Compared to 2020, consumption was 11.9% higher.

The consumption of household and non-household consumers in distribution systems and CDSs and their number by customer type and system type for a period of five years is shown in Figure 130.

11.9% more natural gas consumed in the CDS areas

FIGURE 130: CONSUMPTION BY CONSUMERS IN THE DISTRIBUTION SYSTEM AND CDS BY THE TYPE OF CONSUMERS AND THE NUMBER OF ACTIVE CONSUMERS IN THE 2017–2021 PERIOD

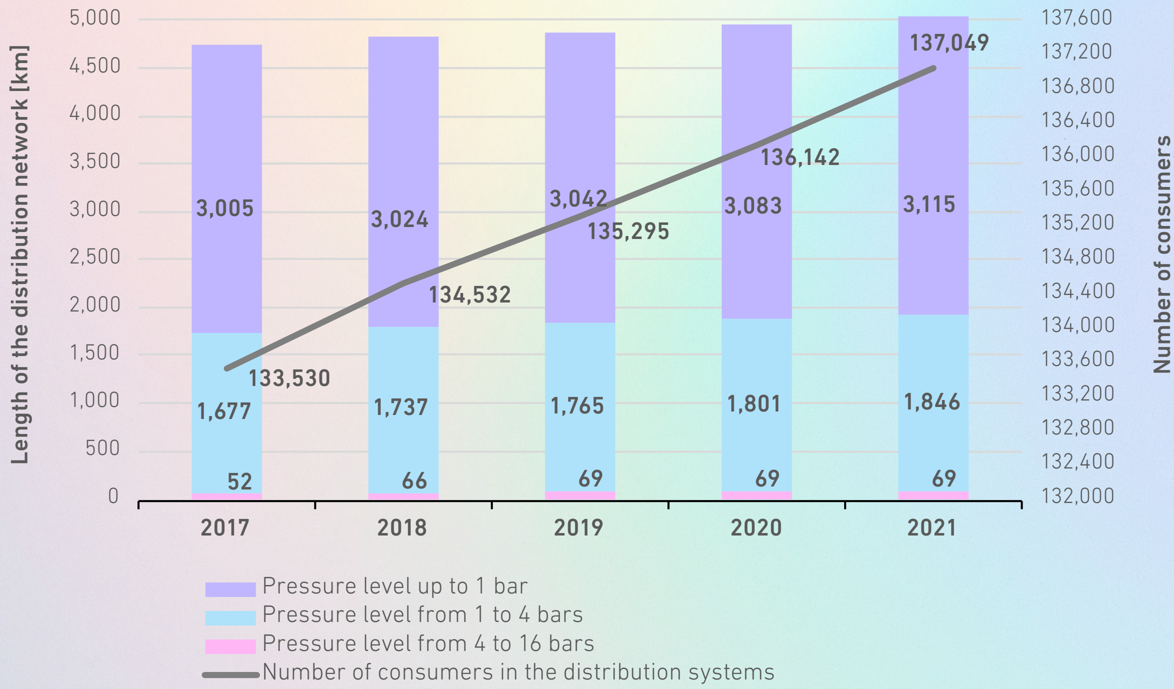


SOURCES: ENERGY AGENCY, DSOs

The length of the distribution network has increased again. At the end of 2021, the total recorded length of active lines in distribution systems and CDSs was 5,030 kilometres, an increase of 1.6% compared to the previous year. Distribution lines and associated infrastructure are mainly owned by DSOs. In the five CDS areas, 15.7 kilometres of activated pipelines were recorded, including 8.5 kilometres of pipelines with a pressure level of 4 to 16 bar, about 5 kilometres with a pressure level of 1 to 4 bar and 2.2 kilometres with a pressure level of up to 1 bar. Over the last five years, the distribution network has been extended by an average of 1.5% per year.

The length breakdown of distribution systems and CDS, pressure levels, extensions of pipelines together with connections and the growth in the number of consumers in the 2017–2021 period are shown in Figure 131.

FIGURE 131: LENGTH OF DISTRIBUTION NETWORKS AND CDSS, AND THE NUMBER OF ACTIVE CONSUMERS IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, DSOs

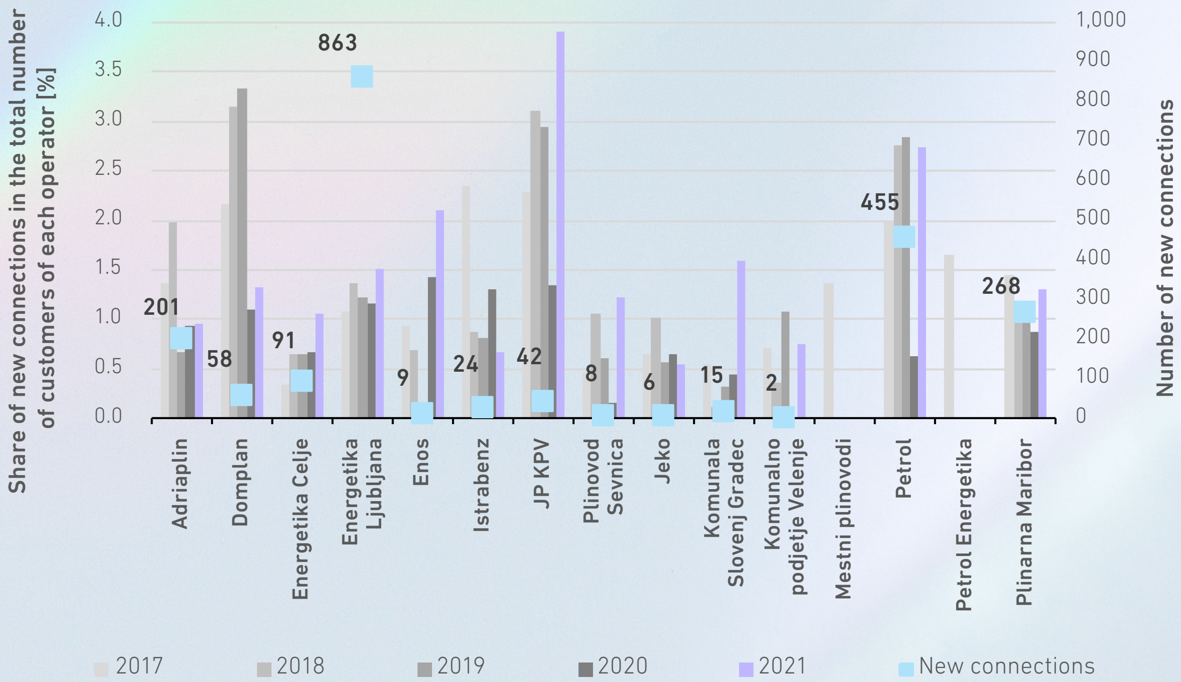
Natural gas distribution system operators connected 2,042 new customers to their distribution networks. The number of new connections increased by almost 54% compared to the previous year. The average growth in the number of customers over the five-year period was just over half a percent, with 0.7% in the last year. The total number of customers connected to the distribution systems, taking into account simultaneous disconnections, increased by 907, which is 19 more than in 2020. At the end of 2021, 137,000 final customers were connected to the distribution systems.

2,042 new consumers on natural gas distribution systems

The growth in the number of customers can be attributed to the expansion of distribution systems in existing and new geographical areas, as well as to the promotion of natural gas supply, which has attracted new customers in recent years. The largest increases in the number of customers were recorded in the new distribution areas in the municipalities of Šentjernej, Šmarje pri Jelšah, Grosuplje, Idrija and Škocjan, where there were 188 more customers at the end of the year than the year before. These areas recorded an average growth of almost 58% in the number of customers. As customers are generally connected before the start of the new heating season, it can be assumed that the favourable prices of natural gas supply and the competitiveness of the total cost of supplying this energy product have also had a positive impact on the decisions of new customers. The problem of high natural gas supply prices only started to become apparent in October and November 2021, when new supply contracts had to be concluded for shared boiler rooms, and the new prices were completely incomparable to those of the previous years. The shares of new connections in relation to the total number of customers of each operator and the number of new connections to the distribution systems of each operator are shown in 132. There were no new connections recorded to the CDSs in 2021.

Distribution systems are still without connected generation sources

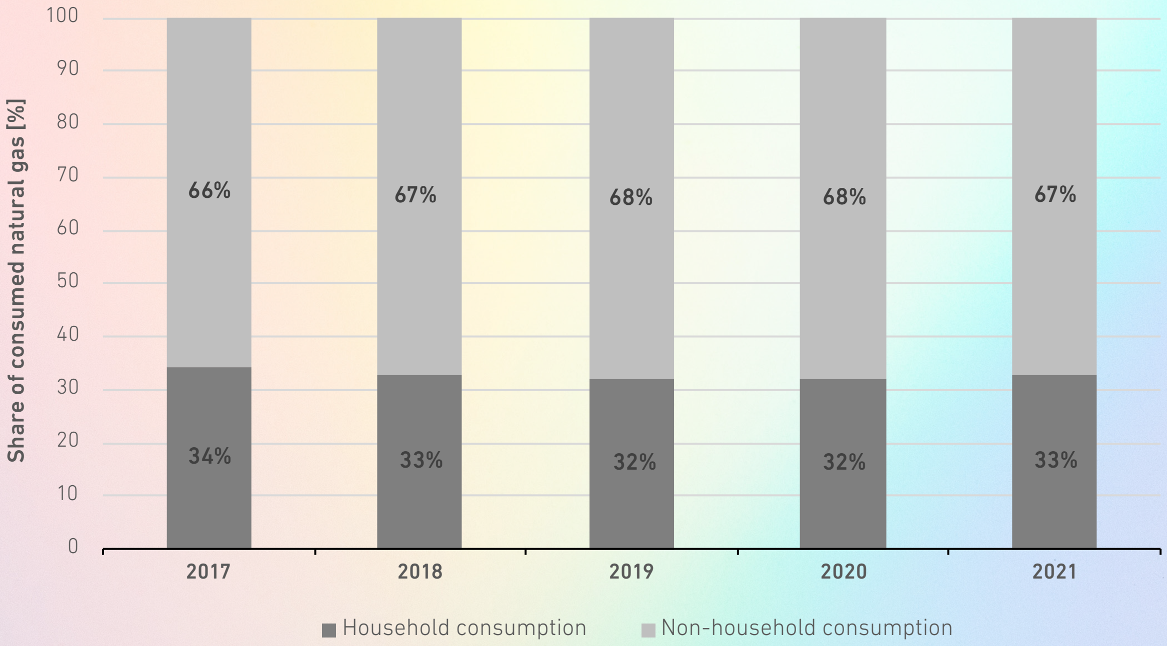
FIGURE 132: SHARE AND NUMBER OF NEW CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2016–2020 PERIOD



SOURCES: ENERGY AGENCY, DSOs

The consumer structure remains the same. Household consumers accounted for almost 90% of all consumers in the distribution systems. The data on natural gas quantities distributed in 2021 does not show any significant changes in the share of household and non-household consumers compared to previous years.

FIGURE 133: SHARE OF CONSUMED NATURAL GAS FROM THE DISTRIBUTION SYSTEMS FOR HOUSEHOLD AND NON-HOUSEHOLD CONSUMERS IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, DSOs

Just over 90% of consumers in distribution systems consumed less than 25,000 kWh of natural gas per year.

The share of consumers with an annual natural gas consumption above 50,000 kWh was 3.7% of all consumers and their consumption represents almost 68% of the total consumption of all consumers connected to the distribution networks.

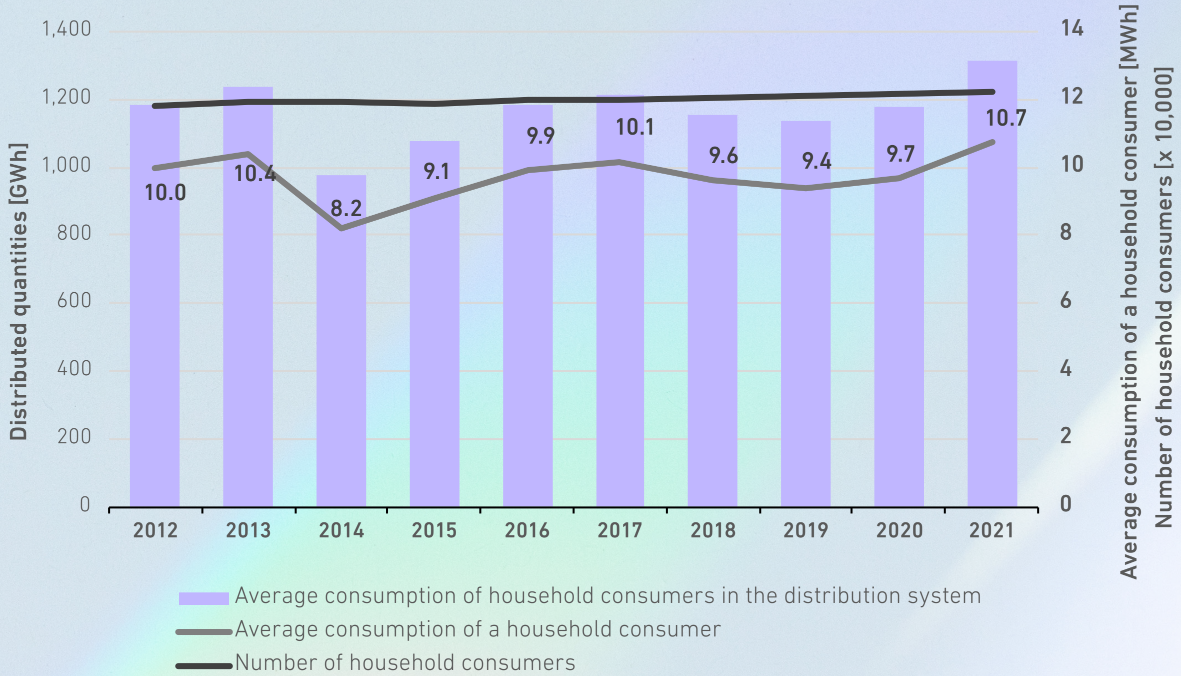
Household consumers use natural gas mainly for space heating and hot water, and to a lesser extent for cooking. Among household consumers, more than 94% consumed up to 25,000 kWh per year, and 99.4% consumed less than 50,000 kWh.

The total share of the consumption quantities of household consumers with an annual consumption up to 25,000 kWh was 70.7%, while those with a consumption up to 50,000 kWh accounted for just over 85.1% of the total household consumption. The household consumption also includes the consumption points of the shared boiler rooms owned by the residents, where natural gas is used for the central heating of multi-apartment buildings and for the preparation of domestic hot water. The total consumption of household consumers with an annual consumption above 50,000 kWh (shared boiler rooms owned by the residents) was less than 15% of the total consumption of household consumers in 2021.

The average annual consumption of household customers increased by almost 12%, the main reason for the increase being the lower temperatures compared to the previous three years. The total and average natural gas consumption of household customers and the number of these customers in each year of the 2012-2021 period are shown in Figure 134.

There was significantly higher average consumption of household customers due to lower temperatures

FIGURE 134: TOTAL AND AVERAGE CONSUMPTION OF HOUSEHOLD CONSUMERS IN THE DISTRIBUTION SYSTEM IN THE 2012–2021 PERIOD

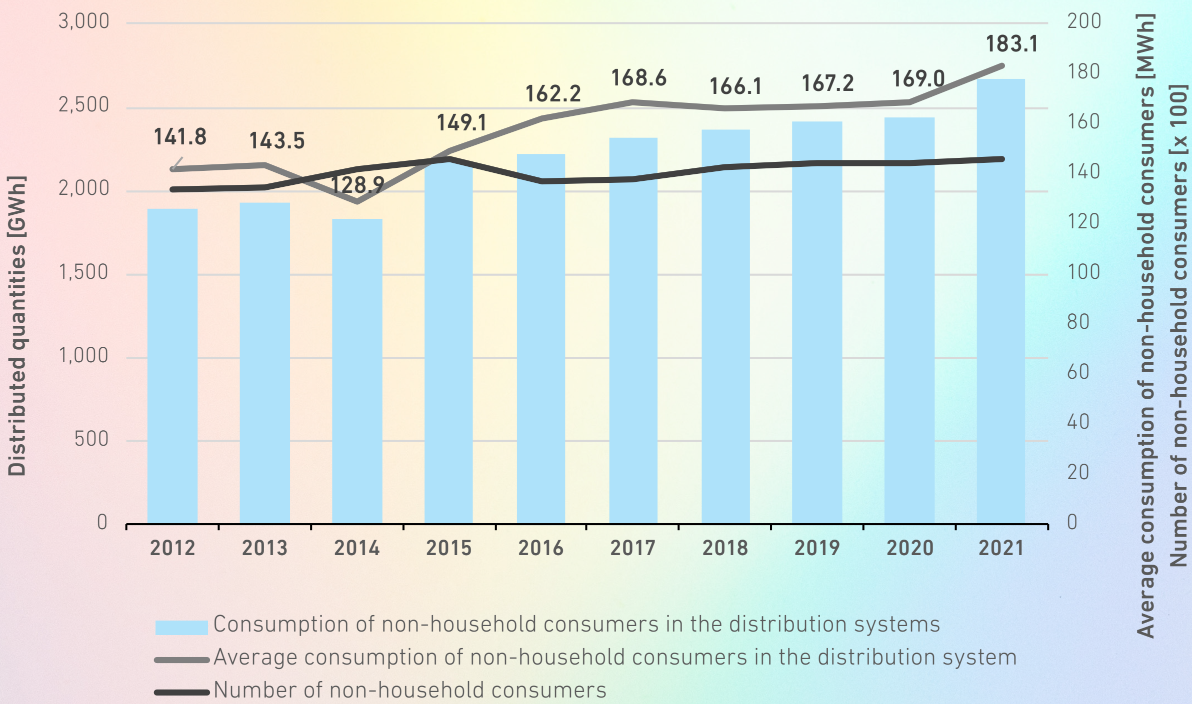


SOURCES: ENERGY AGENCY, DSOs

In addition to heating, non-household consumers used natural gas for technological and production processes, cooling, and other activities. At the end of 2021, 123 more consumers were connected to the distribution system than the year before, and the total annual consumption of non-household consumers increased by more than 9%. The consumption of non-household consumers was 13.4% above the average for the 2016-2020 period. The evolution of consumption and the number of non-household consumers is shown in Figure 135.

The highest number of non-household consumers on distribution ever recorded

FIGURE 135: TOTAL AND AVERAGE CONSUMPTION OF NON-HOUSEHOLD CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2012–2021 PERIOD



SOURCES: ENERGY AGENCY, DSOs

In none of the five CDSs did operators serve household consumers. The average annual consumption of natural gas by consumers connected to the DSOs was significantly higher compared to consumers in the distribution systems. In 2021, the average annual consumption of these consumers was 13.3 GWh, which is around 34% of the consumption of an average consumer in the transmission system.

The majority of the consumption in the CDS areas is for industrial customers' technological and production processes, with a negligible part of consumption by smaller commercial customers.

None of the DSOs and CSOs had a connected production source of natural gas, biomethane, or synthetic methane, and no hydrogen was added to any distribution systems.

The Use of Compressed and Liquefied Natural Gas and Other Gases from Distribution Systems

Compressed Natural Gas in Transport

Compressed natural gas (CNG) is mainly used in transport for personal, delivery and goods vehicles, as well as public bus transport, especially for short and medium distances. In 2021, the number of public filling stations did not change. A supply was provided at five public refuelling stations, two in Ljubljana and one each in Maribor, Celje and Jesenice.

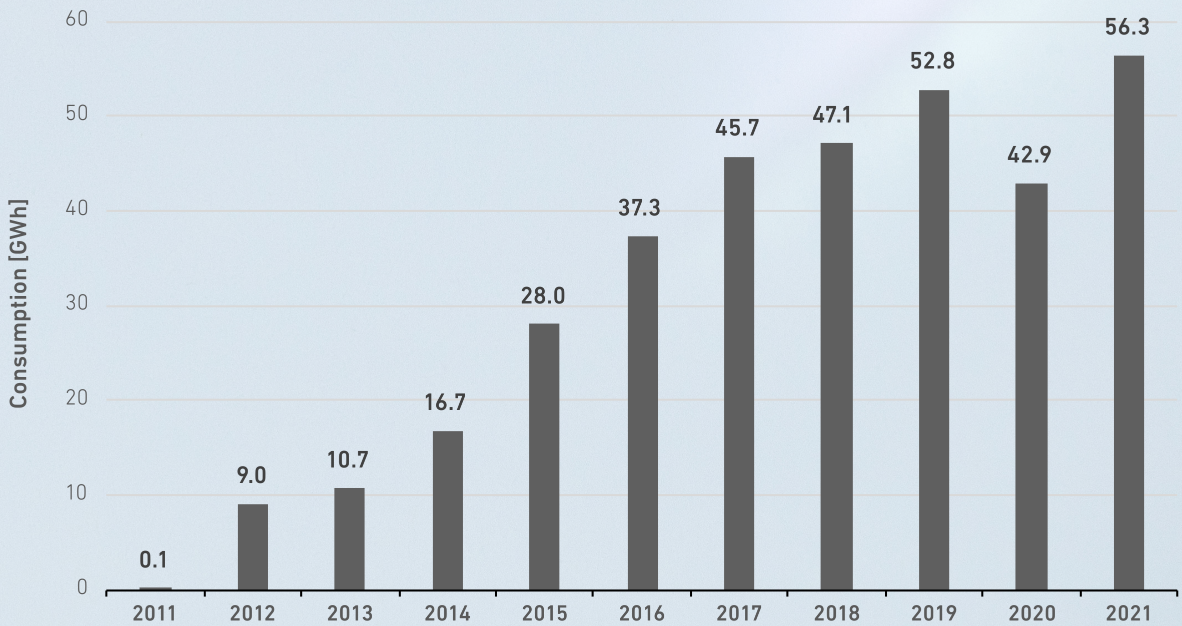
31% higher consumption of CNG in transport than in 2020 and 7% higher than in 2019

The expansion of the public infrastructure is one of the key factors for increasing the number of users, alongside a competitive supply price and an adequate supply of competing vehicles. Individual existing charging service providers are planning to expand their charging network, but there have been delays due to the changed market conditions resulting from epidemic-related measures. Potential new providers are rather reluctant to make planned investments, and the increasingly less stable market conditions and the increase in natural gas prices on the wholesale markets witnessed from the second half of 2021 onwards may have a negative impact on the deployment of new filling infrastructure in the areas of all major cities with an available gas network, or may even halt such investments altogether. The risk of further expansion is particularly high due to the changed situation in gas markets, not only in terms of high prices but also of a deterioration in the security of supply, which may be reflected in possible gas supply constraints. To achieve the intended objectives of the Decree establishing the infrastructure for alternative transport fuels, natural gas distribution system operators should have provided a total of at least 10 publicly accessible supply points for CNG in major urban areas and at least four publicly accessible supply points for CNG on the motorway network by the end of 2020, which has not been the case. The epidemic in early 2020 has further jeopardised the achievement of the national targets due to lower public passenger transport consumption. In 2021, passenger transport consumption increased again, but potential investors' decisions are likely to have already been influenced by the decline in the price competitiveness of natural gas as an energy source, and perhaps also by the transition to a climate-neutral society and better-publicised electromobility.

The objectives of the Decree establishing the infrastructure for alternative transport fuels are not achieved

The total CNG consumption in transport rebounds in 2021 compared to 2019 and 2020, increasing by more than 31% compared to 2020 and by almost 7% compared to 2019. The increase in consumption compared to 2020 is mainly driven by measures to re-launch public passenger transport, as well as public life. Annual consumption was higher in all areas with an established public supply. One of the major obstacles to the growth in the number of individual users is still the low visibility of this type of fuel, in addition to the low number of filling stations and the relatively negligible supply of CNG vehicles. An adequate supply is ensured mainly for users on the Maribor-Celje-Ljubljana-Jesenice route. Taking into account the retail price per kg of CNG in Ljubljana, which was unchanged at €0.92 from October 2015 to July 2021 before decreasing further to €0.85 in the second half of the year, users were able to achieve high cost-efficiency per kilometre travelled compared to conventional fuels. In Celje, the cost of refuelling was slightly higher at €0.95, while the retail price in Maribor was higher at €1.1 until November and then at €1.3 per kg. The annual consumption of CNG at Slovenian public charging stations is shown in Figure 136.

FIGURE 136: CONSUMPTION OF CNG IN TRANSPORT IN THE 2011–2021 PERIOD



SOURCES: ENERGY AGENCY, OPERATORS OF CNG FILLING STATIONS

Liquefied Natural Gas

Liquefied natural gas (LNG) was used for the permanent and temporary supply of industrial consumers, as an alternative fuel for lorries, and for the permanent supply of the natural gas distribution system in the municipality of Grosuplje until November 2021, when it was connected to the existing gas pipeline network of Energetika Ljubljana in the municipality of Škofljica.

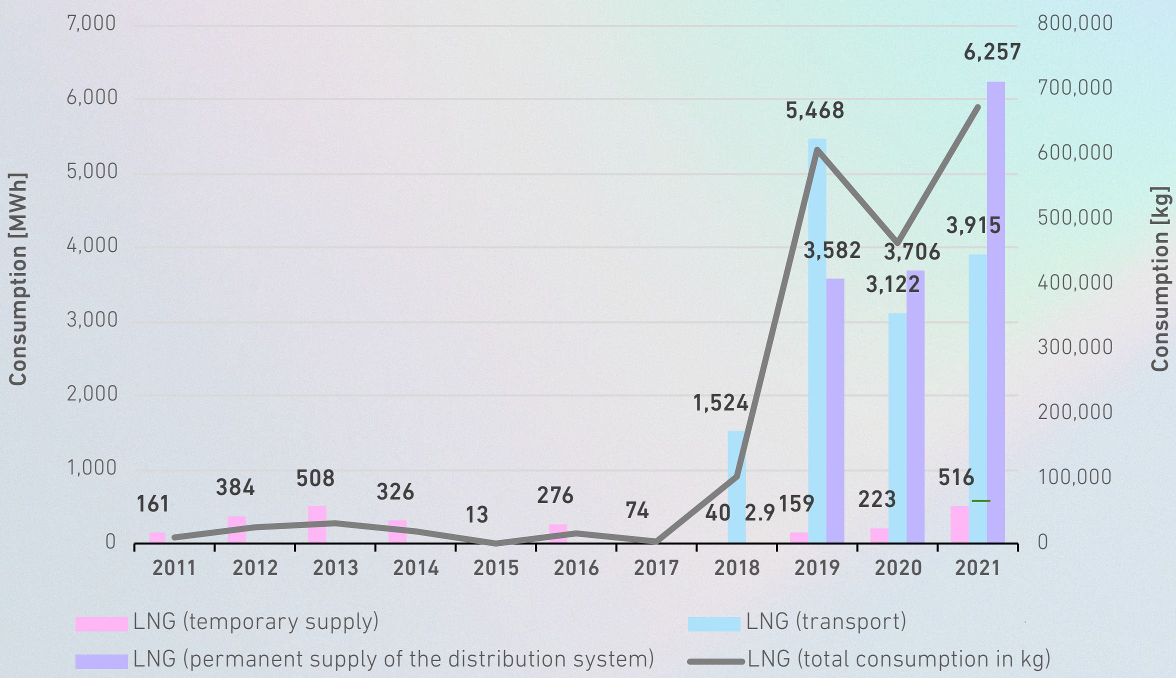
52% higher consumption of LNG

Lack of interest in building new LNG filling stations

The total volumes of LNG sold in 2021 increased by almost 52% compared to the previous year and by almost 16% compared to 2019. The total quantities of LNG consumed for the temporary emergency supply of gas systems and the permanent supply of industrial customers and the natural gas distribution system in the Grosuplje area increased by almost 72% compared to the previous year. Of the total LNG consumption, the share of the permanent supply to the distribution system was more than 58%, the share of volumes for lorries was just over 36%, and the share of temporary supply to gas systems was less than 5% of the total consumption.

In transport, LNG is used as an alternative fuel for refuelling heavier road vehicles over longer distances and for shipping. In 2021, only the public LNG filling station in Sežana was in operation. A second filling station on Letališka Cesta in Ljubljana is planned to open in spring 2022. Due to the rising natural gas prices, the limited availability of purchased gas volumes on international markets, and the lack of incentives for using alternative fuels for road freight transport, there is a severe risk that no additional LNG filling stations will be built. LNG volumes sold for transport are projected to increase by more than 25% in 2021 compared to 2020. The LNG filling station in Sežana provides a competitively priced alternative fuel supply to all interested freight vehicle users. The share of the total LNG consumption in volume terms is just under 19% of the sales of CNG. The quantities sold by year are shown in Figure 137.

FIGURE 137: CONSUMPTION OF LNG IN TRANSPORT IN THE 2011–2021 PERIOD



SOURCE: ENERGY AGENCY

Other Energy Gases from Distributions Systems

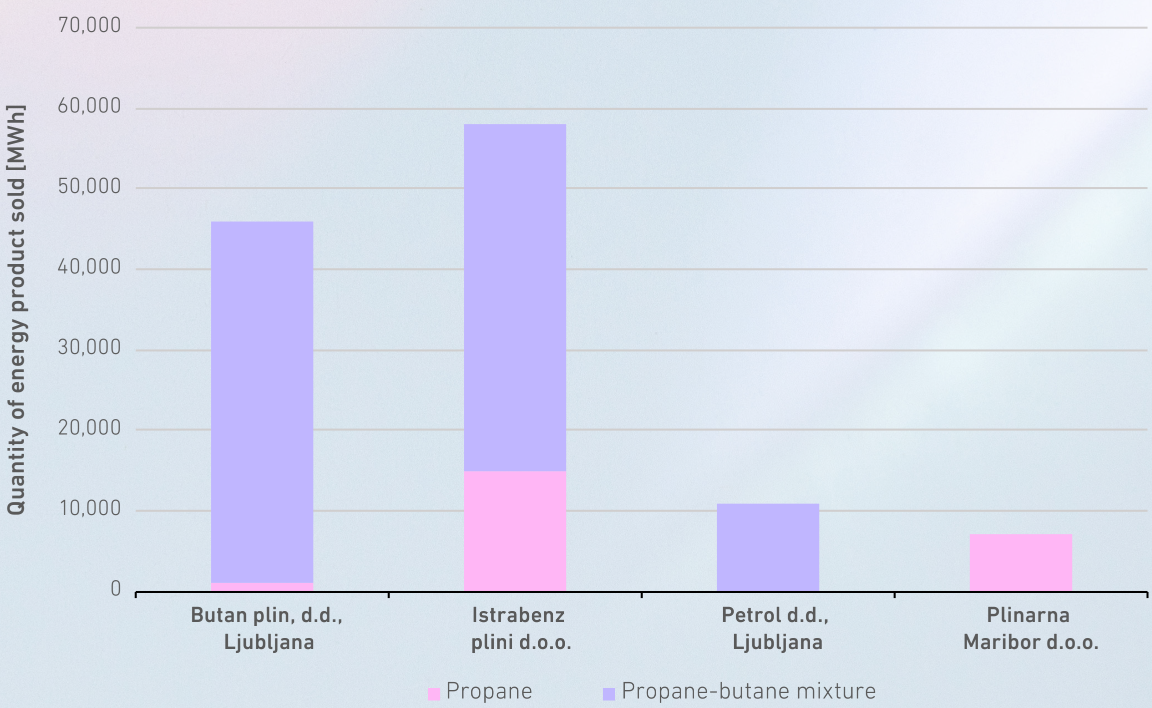
The distribution of other energy gases (energy gases used as an energy fuel other than natural gas) from CDS was carried out by four distribution companies in Slovenia in 2021. Propane and propane-butane mixture were primarily distributed as other energy gases. Other energy gases were distributed from 547 distribution systems in 123 Slovenian municipalities. In 118 municipalities, distributors from 505 distribution systems supplied as a commercial activity, while in the remaining 42 distribution systems in eight municipalities, the supply took the form of a service of general economic interest.

6.9% fewer customers of other energy gases from distribution systems

In 2021, 7167[78] customers were supplied with other energy gases from distribution systems, a 6.9% decrease compared to the previous year, and the distributed energy value of the gases reached 128 GWh, a 5.2% increase compared to the previous year. The average annual consumption of a customer in 2021 is 17.86 MWh, an increase of 13% compared to the previous year. The number of customers connected to the DSO in each municipality ranged from 2 to 1565, with an average of 13 customers per distribution system.

The total length of the distribution systems decreased by 3.5% compared to 2020 and amounted to 114.7 kilometres. Figure 138 shows distributors by type and quantities of other energy gas sold.

FIGURE 138: DISTRIBUTED QUANTITIES OF OTHER ENERGY GASES BY DISTRIBUTORS AND THE TYPE OF GAS

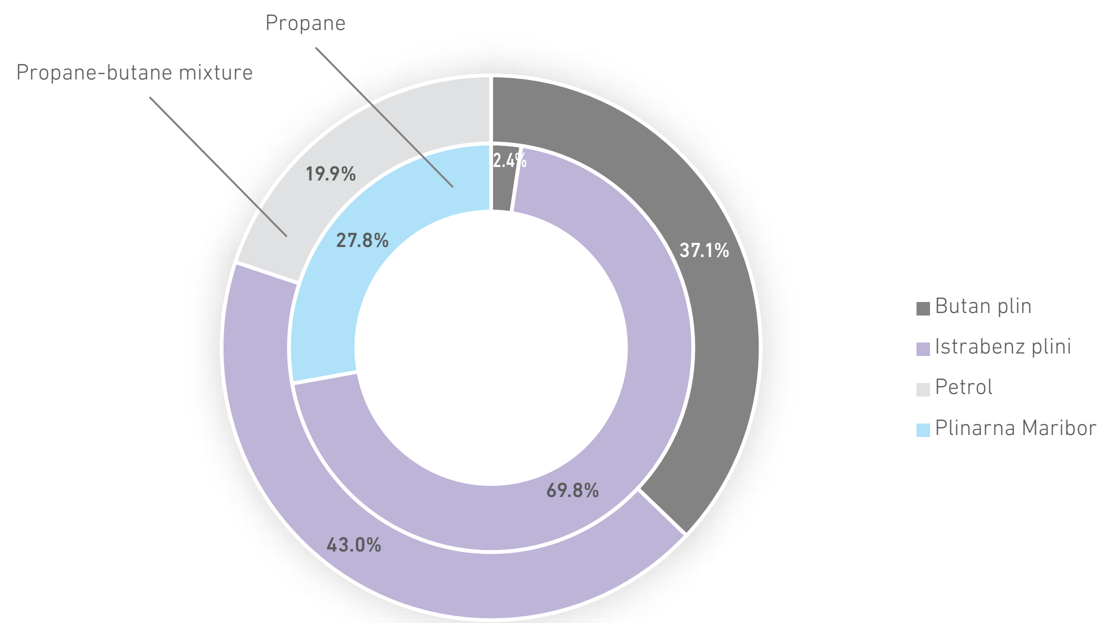


SOURCE: ENERGY AGENCY

The market shares of distributors of other energy gases by type of energy gas and the energy value of quantities sold in 2021 are shown in Figure 139, and Figure 140 shows the market shares of distributors by the type of energy gas sold and the number of consumers served.

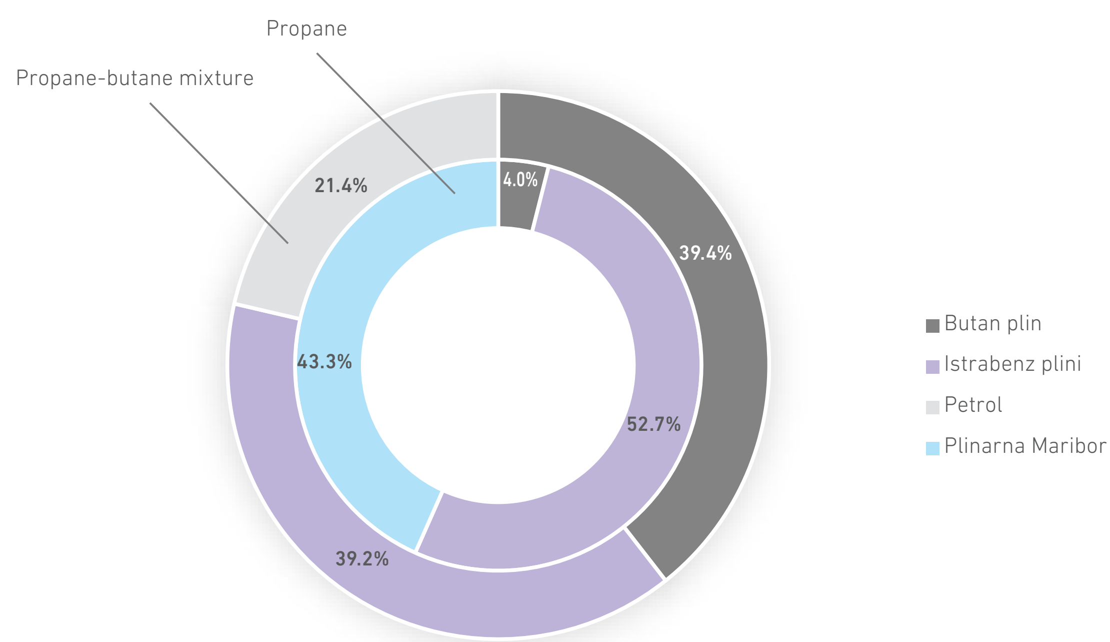
78 For 2020, the number of consumers was misreported by the distributor of other energy gases. The figures for 2021 are correct.

FIGURE 139: MARKET SHARES OF OTHER ENERGY GAS DISTRIBUTORS (ENERGY VALUE OF QUANTITIES SOLD)



SOURCE: ENERGY AGENCY

FIGURE 140: MARKET SHARES OF OTHER ENERGY GAS DISTRIBUTORS (NUMBER OF CONSUMERS)



SOURCE: ENERGY AGENCY

The Regulation of Network Activities

Unbundling

In Slovenia, in 2021, one operator performed the obligatory service of general economic interest of natural gas TSO, while in the same period, the service of general economic interest of gas DSO was carried out by 13 entities and remained unchanged compared to the previous year. The TSO, Plinovodi, owns the assets with which it carries out its activities and is certified and designated as an independent TSO. The transmission system operator is owned by Plinhold, of which the Republic of Slovenia is the majority shareholder with a 60.10% share.

Distribution system operators are not legally separated, as there are no more than 100,000 consumers connected to each distribution system. Given that other energy and market activities were carried out by distribution system operators, they prepared separate accounts following Article 235 of the EZ-1. System operators are required to prepare annual financial statements as required by the Companies Act for large companies. In the audited annual financial statements, natural gas undertakings have to disclose the criteria for business allocation. The criteria adequacy and the application's correctness have to be audited annually by the auditor who makes a special report.

Technical Functioning

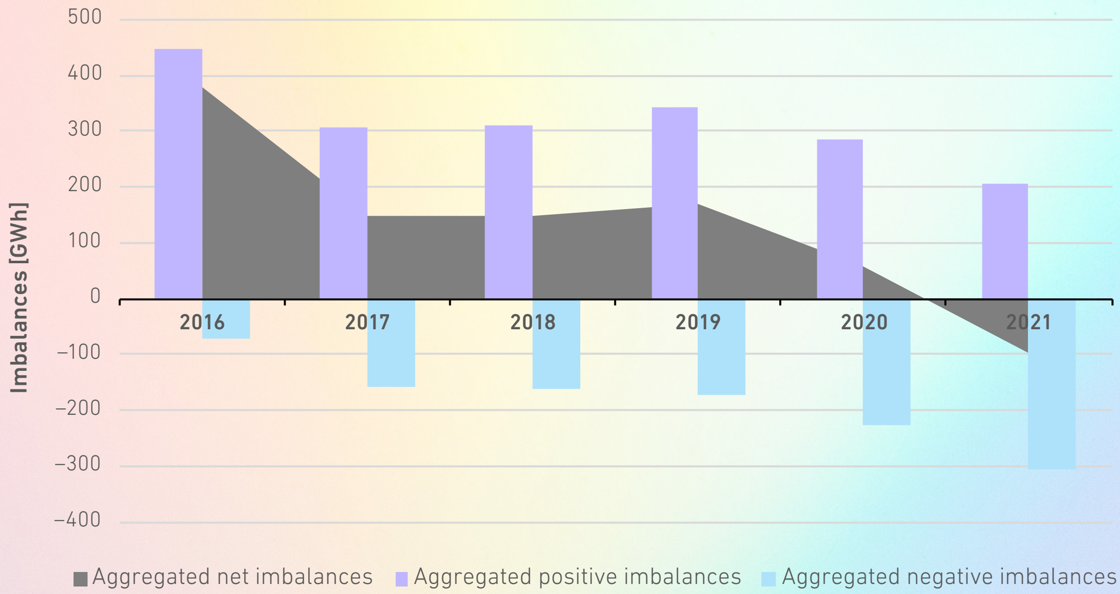
Balancing Services

In 2021, there were 21 active balance group leaders in Slovenia, three more than the year before. Of these, nine also transported natural gas through Slovenia to other transmission systems.

Through the purchase and sale of natural gas on the trading platform and by means of an annual balancing contract, the transmission system operator has managed to balance the transmission system and carry out imbalance accounting. The entire transmission system is one balancing area; the imbalances are determined on a daily basis and calculated on a monthly basis for each gas day.

207 GWh of positive imbalances (28% of annual decrease),
304 GWh of negative imbalances (34% annual increase)

FIGURE 141: AGGREGATED NET IMBALANCES OF BALANCING GROUP LEADERS IN THE 2016–2021 PERIOD

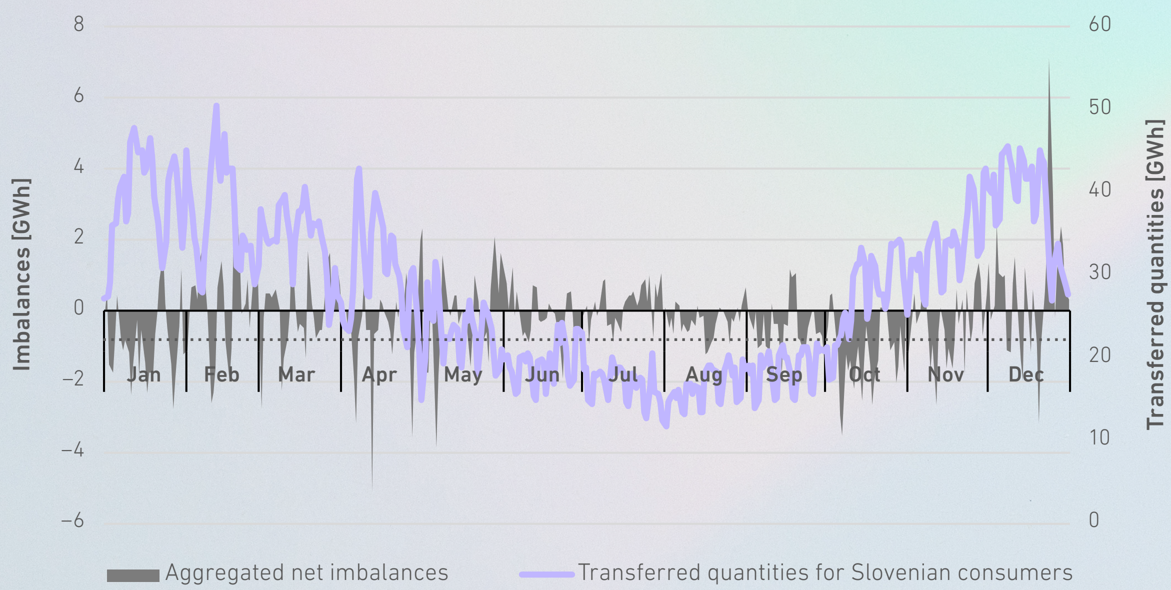


SOURCES: ENERGY AGENCY, PLINOVODI

In 2021, for the first time since the adoption of the new rules in 2015, the aggregate net imbalances were negative. The trend of decreasing positive imbalances and increasing negative imbalances has been observed for several years, but with the change in the methodology for determining the applicable price for the calculation of the daily imbalance costs in 2020, negative imbalances seem to have been recognised by the balancing group leaders as more favourable or less risky than positive imbalances. In the coming period, trends in daily imbalances will need to be monitored even more closely.

The aggregate net imbalance was negative for the first time since the adoption of the new rules (2015)

FIGURE 142: AGGREGATED NET IMBALANCES OF BALANCE GROUP LEADERS AND TRANSFERRED QUANTITIES FOR SLOVENIAN CONSUMERS



SOURCES: ENERGY AGENCY, PLINOVODI

Imbalances of balancing group leaders at the annual level amounted to 5% of quantities consumed by Slovenian natural gas consumers, which is 0.3 percentage points lower than the previous year. Figure 142 shows that the aggregated negative net imbalances of the balance group leaders were highest in the last quarter of 2021, which may be due to the start of the heating season and the simultaneous extraordinary increase in the CEGHIX stock index prices. It can be concluded that some balancing group leaders risked negative imbalances to compensate for daily natural gas shortfalls rather than buying the shortfall at unexpectedly high prices on the daily natural gas market.

By trading on the trading platform and dynamic pressure control, the TSO managed to ensure the regular operation of the transmission system. For the first time since 2018, it used system balancing services to balance the transmission system. In November, it purchased gas, and in the last days of December, it sold it under the annual balancing contract for the transmission system.

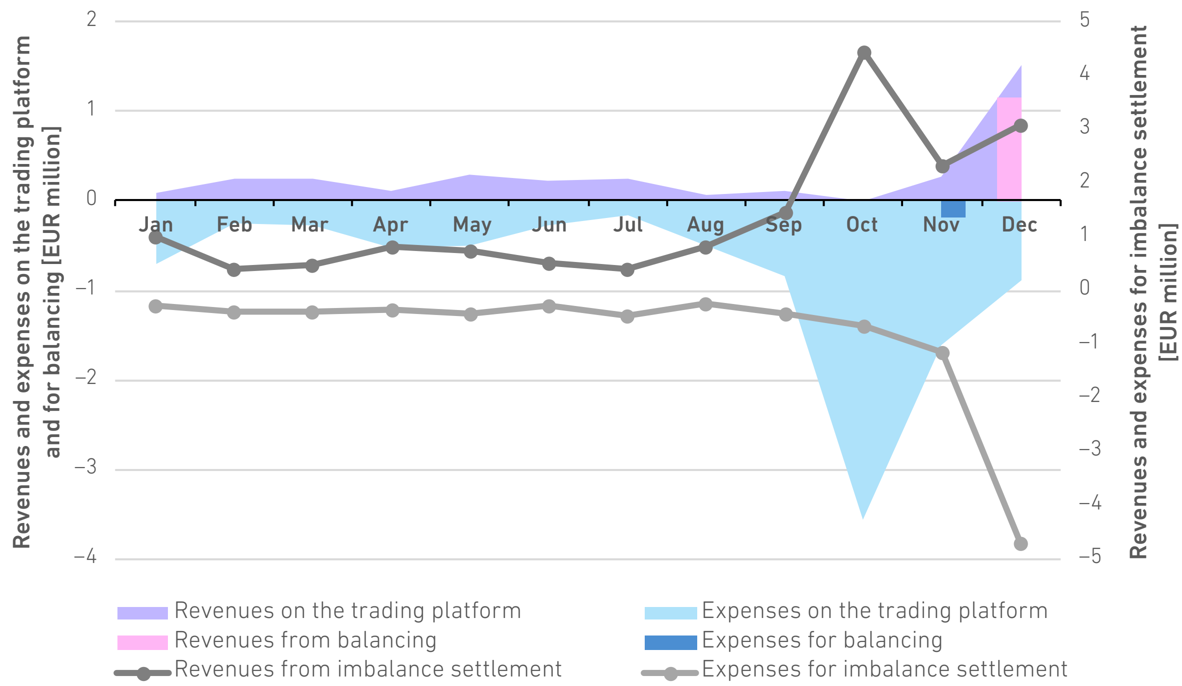
On the trading platform, the TSO generated 2.4 times more revenues than the previous year while incurring 4.8 times more expenses than the year before. The TSO is cost-neutral in the accounting of imbalances, the purchase and sale of gas for balancing the transmission system, and in trading on the trading platform, i.e., it distributes surpluses or deficits proportionally among the balance group leaders. In 2021, it generated a surplus of €0.88 million, a good quarter more than the year before.

TABLE 34: REVENUES AND EXPENSES OF TSO ON THE TRADING PLATFORM, SETTLEMENT OF DAILY IMBALANCES AND AVERAGE SALES/PURCHASE PRICE

Activity/service TSO		2020	2021
Trading platform	Revenues (EUR million)	1.4	3.4
	Average sales price (EUR/MWh)	7.5	37.9
	Expenses (EUR million)	–2.1	–10.1
	Average purchase price (EUR/MWh)	14.3	50.4
System balancing service	Revenues (EUR million)	0	1.1
	Average purchase price (EUR/MWh)	/	103.4
	Expenses (EUR million)	0	–0.2
	Average purchase price (EUR/MWh)	/	76.3
Imbalances	Revenues (EUR million)	3.5	16.4
	Average marginal purchase price - settlement of negative imbalances (EUR/MWh)	14.7	51.5
	Expenses (EUR million)	–2.1	–9.8
	Average marginal sales price – settlement of positive imbalances (EUR/MWh)	7.3	42.1

SOURCES: ENERGY AGENCY, PLINOVODI

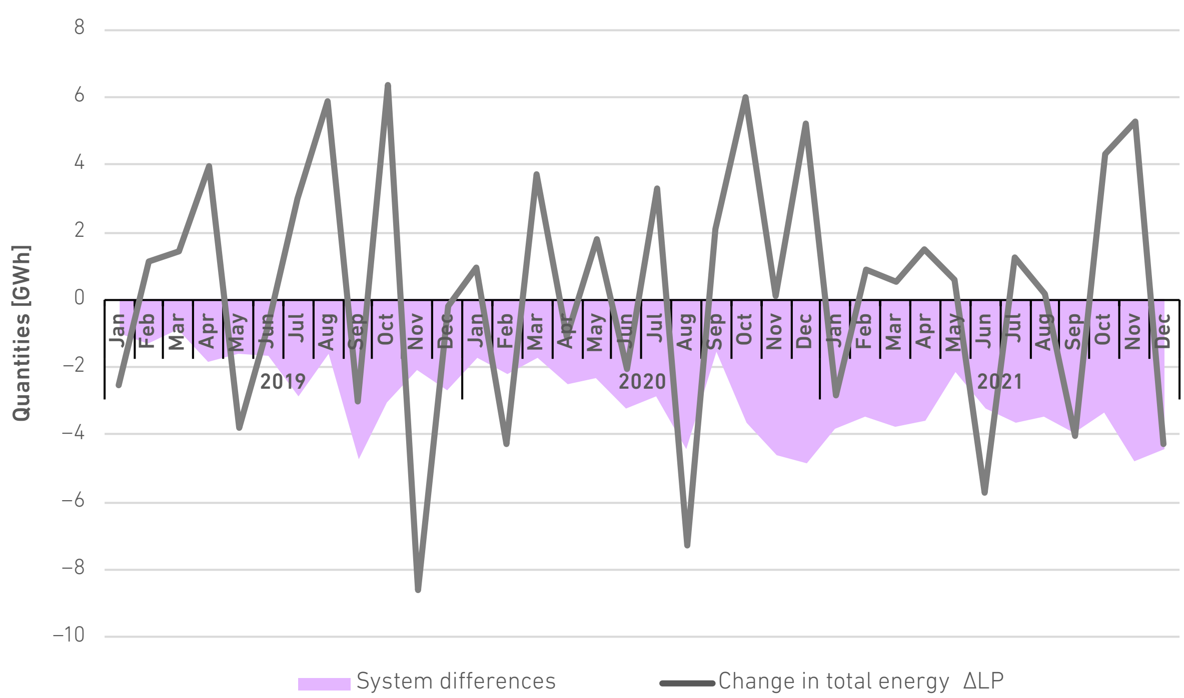
FIGURE 143: REVENUES AND EXPENDITURE OF TSO ON THE BALANCING MARKET



SOURCES: ENERGY AGENCY, PLINOVODI

System differences were negative throughout the year, while they were 22% higher compared to the previous year.

FIGURE 144: SYSTEM DIFFERENCES AND THE CHANGE IN TOTAL ENERGY ΔLP IN THE 2019–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

CASE STUDY: SYSTEM DIFFERENCES IN THE NATURAL GAS TRANSMISSION SYSTEM

System differences (referred to as imbalances until 2019) are identified shortfalls or peaks of natural gas in the transmission system resulting from measurement uncertainties and losses.

System differences cannot be measured but are calculated according to the equation:

$$Q_{pred}-Q_{prev}-\Delta LP-SR=0 \quad \rightarrow \quad SR= Q_{pred}-Q_{prev}-\Delta LP$$

where:

Q_{pred}	energy delivered from the transmission system [kWh]
Q_{prev}	energy delivered to the transmission system [kWh]
ΔLP	change in total energy in the transmission system [kWh]
SR	system differences [kWh]

The calculation of system differences is thus directly dependent on the accuracy of the measurements at all five border entry/exit points and at all internal exit points of the gas transmission system (more than 300 active ones).

The measurement uncertainty of each measuring device depends on:

- the flow amount within the operating range of the measuring device (Q)
- the operating pressure (p)
- the operating temperature (T)
- the natural gas composition for volumetric conversions

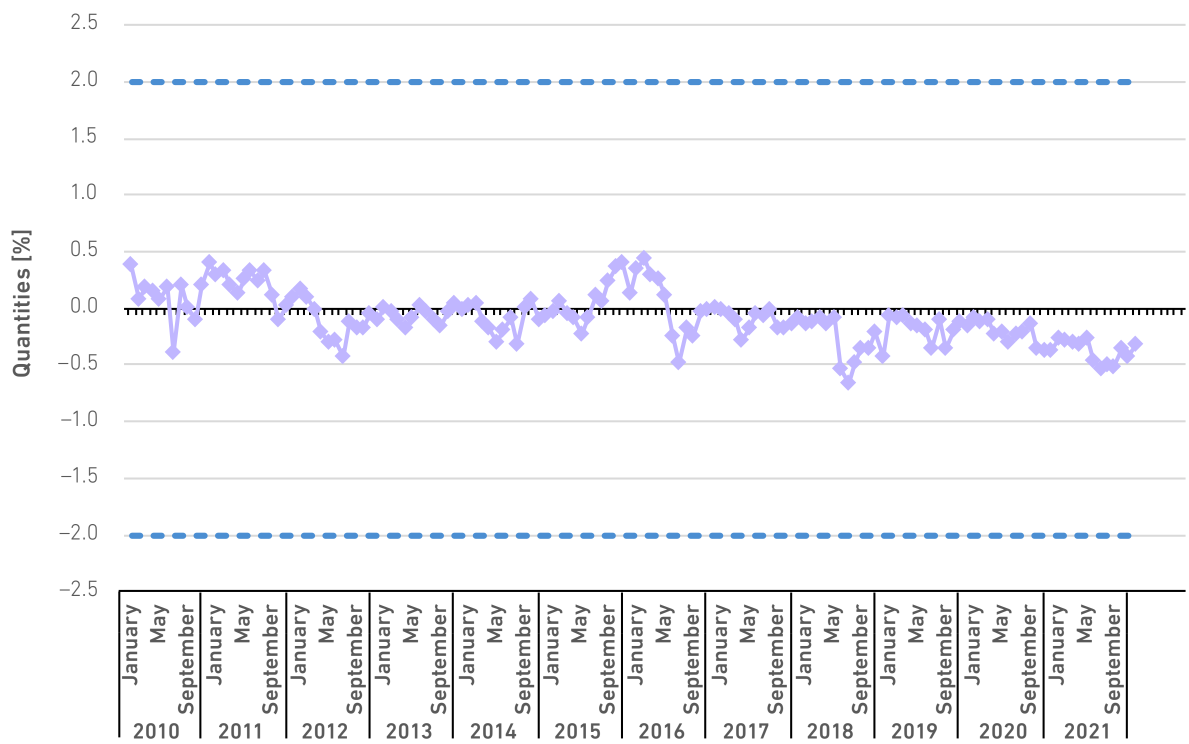
Depending on the type of measuring device (rotary or turbine gas meters), the characteristics of the measurement errors vary. In general, the measurement errors are greater when the flows are in the lower part of the range for which the measuring devices are declared. The transmission system operator cannot influence the directions of transmission and the magnitudes of the flows and other parameters (p, T, and gas composition) that affect the measurement uncertainty of the measuring devices.

In accordance with the System Operating Instructions for the natural gas transmission system, the TSO is responsible for the ongoing and investment maintenance of the transmission system in such a way that its functional competence and operational safety are maintained at all times. Thus, the TSO is also responsible for ensuring that all measuring devices are in good working order, properly serviced, calibrated, certified and sealed by accredited measuring calibration laboratories.

The measurement errors of the quantities of gas received and delivered to/from the transmission system are within the tolerance range in the Slovenian transmission system. In addition to measurement uncertainties, the magnitude of system differences is also affected by gas losses in the transmission system. Losses can arise from leaks at junctions in the transmission system, and from maintenance, repairs, damage to pipelines, and the connection of new pipelines. These include controlled releases of gas from pipelines (maintenance, repairs) and uncontrolled releases, such as leakages of gas due to possible damage to pipelines.

An analysis of the system or balance differences over the past 12 years shows that system differences have always been below 1% of the natural gas quantities transported through the transmission system (under the regulatory framework, the operation and maintenance costs of up to 2% of the natural gas volumes transported is the recognised cost of the TSO). Unlike in previous years, when system differences were positive in at least some months, system differences in 2021 were negative throughout the year. The TSO attributes the different dynamics of system differences to changed conditions in the transmission system, such as changed transit flows and reduced gas quantities at border entry and exit points.

FIGURE 145: RELATIVE VALUES OF SYSTEMIC DIFFERENCES IN THE 2010–2021 PERIOD



SOURCE: PLINOVODI

In the case of negative system differences, the TSO purchases gas in the same way as gas for its own use. The gas price is generally composed of the CEGHIX stock index and the supplier's margin. If the system differences are positive, they are attributed to the gas stocks in the transmission system or may be sold by the TSO on a trading platform or used to offset negative differences of the balance group leaders.

System differences received increased attention in 2021 due to rising natural gas prices and the consequent high cost included in the transmission system network charge. The following text shows the quantities and costs of system differences in recent years.

TABLE 35: OVERVIEW OF SYSTEM DIFFERENCES IN THE 2018–2021 PERIOD

	Year	Quantity [of transferred quantities]	Quantity [MWh]	Price [EUR/MWh]	Costs [EUR]
Balance differences	2018	0.27%	35,816	19.17	686,533
System differences	2019	0.16%	25,357	16.50	418,408
System differences	2020	0.21%	35,667	13.14	468,694
System differences	2021	0.36%	42,555	52.42	2,230,708

SOURCE: PLINOVODI

As shown in Table 35, the amount of system differences in 2021 increased compared to the previous year (to 0.36%), but is still below the permitted 2% of gas quantities transported. The very large increase in gas prices makes the costs associated with purchasing gas to cover system differences alarming, especially if the trend of negative system differences and high gas prices on the CEGH exchange continues.

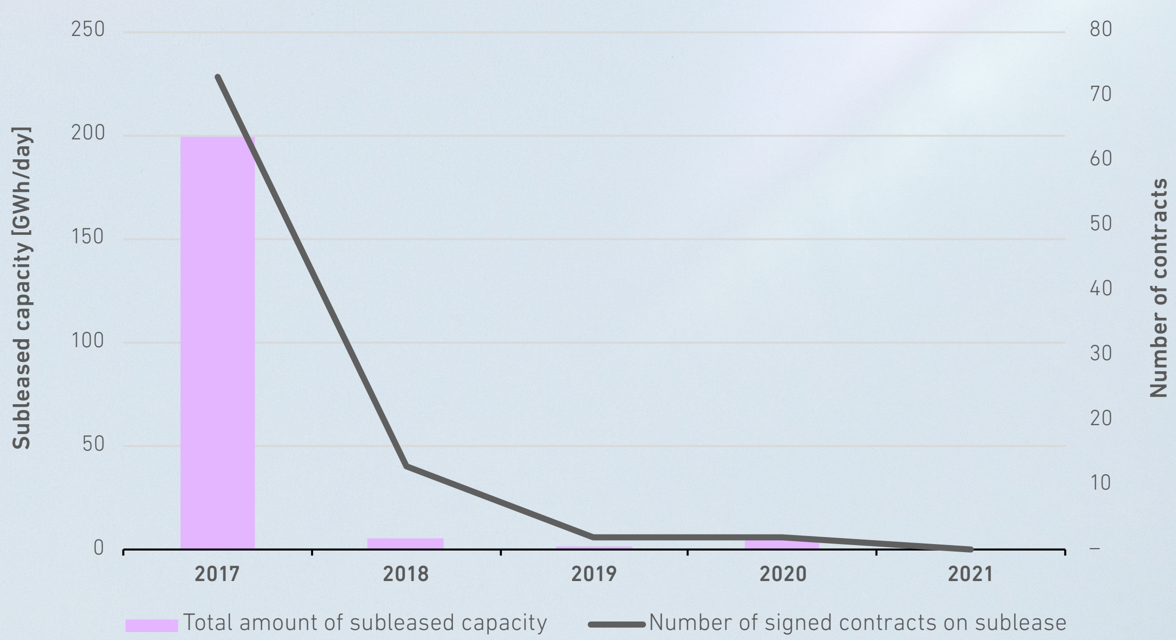
In addition to gas for system differences balancing, the TSO also purchases gas for its own use under an annual contract. High CEGHIX values also imply in this case higher costs for gas for own use, which may put further upward pressure on the network tariff rates for the transmission system.

Secondary Market for Transmission Capacity

After three years of very little trading of transmission capacity on the secondary market, trading on the secondary market came to a complete halt in 2021. No sublease agreements for transmission capacity were concluded.

The secondary market for transmission capacity has completely died away

FIGURE 146: TREND IN THE DEVELOPMENT OF THE SECONDARY CAPACITY MARKET IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

2017 was the turning year for trading on the secondary market for transmission capacity, with most of the long-term transmission contracts expiring. A sharp reduction in capacity booking at border points, a growing trend towards short-term capacity booking, and the better optimisation of capacity booking by transmission system users have also contributed to the declining role of the secondary market.

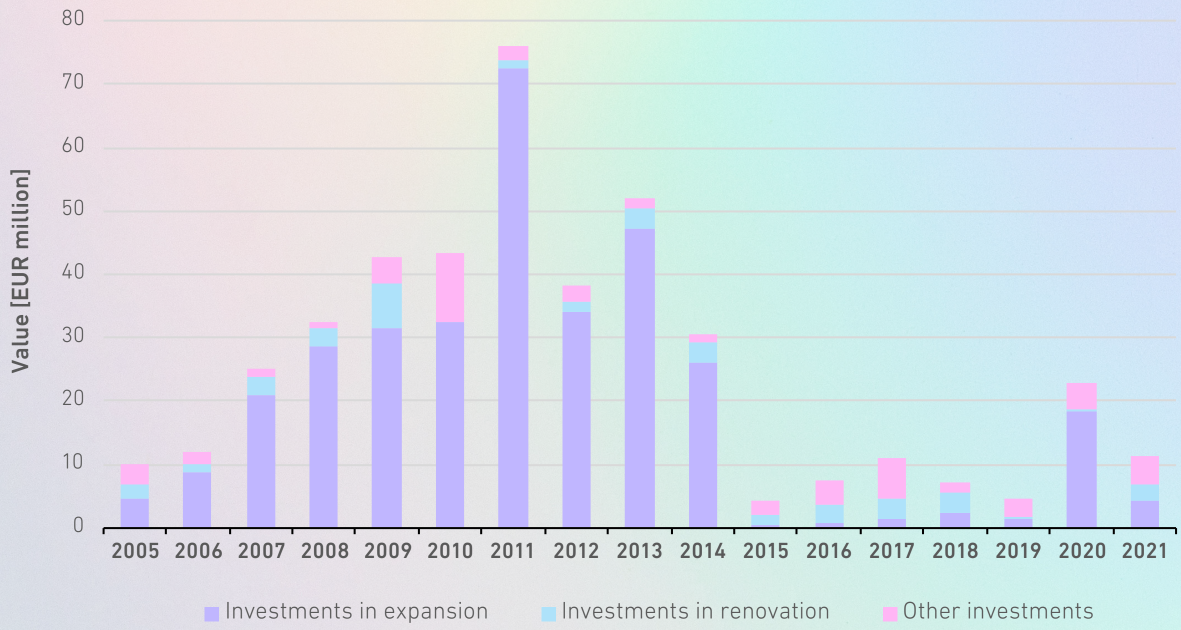
The Multi-Year Development of the Transmission Network

Investments in the Natural Gas Transmission System

The TSO allocated €11.44 million in investments in the transmission system, only half of the previous year's amount. Investments in the network expansion amounted to €4.32 million, investments in renovation €2.59 million, and other investments €4.53 million. All the investments were financed by the depreciation of fixed assets.

€11.44 million investments in the transmission system (half as much as the year before)

FIGURE 147: INVESTMENTS IN THE NATURAL GAS TRANSMISSION SYSTEM IN THE 2005-2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

In terms of investment, the year 2021 was marked by the successful completion of the construction of the transmission pipeline from Vodice to the TE-TOL site in Ljubljana and obtaining the utilisation permit. Several activities in the area of consumer connection were carried out, the construction of the Letališka MRS, MRP Tekstina, and Preska MRS projects were successfully completed, and the Regulation on the national spatial plan for the M1A/1 transmission pipeline - Rogatec interconnector was adopted.

In 2022, the TSO will continue the construction of the M6 Ajdovščina-Lucija pipeline. The construction of the section to Sežana is expected to be completed, the pipeline to Koper will be built in 2023, and the project is planned to be completed in 2025 with the construction of the Izola-Lucija section. The start of construction of the Control Centre has been slightly delayed and is now planned for 2024. The completion of the Dobrunje MRS and the continuation of the construction of the Sava MRS and the Koto MRS are also planned. Coordination between the Slovenian and Hungarian TSOs will also continue in preparation for the auctioning of long-term capacity at a potential new interconnection point between Slovenia and Hungary. The fifth list of projects of common interest also includes an investment to increase capacity at the Rogatec border interconnection point, which will allow for increased gas flows from Croatia to Slovenia. The implementation of this project depends to a large extent on increasing the capacity of the LNG terminal on the island of Krk in Croatia.

Investments in the Natural Gas Distribution System

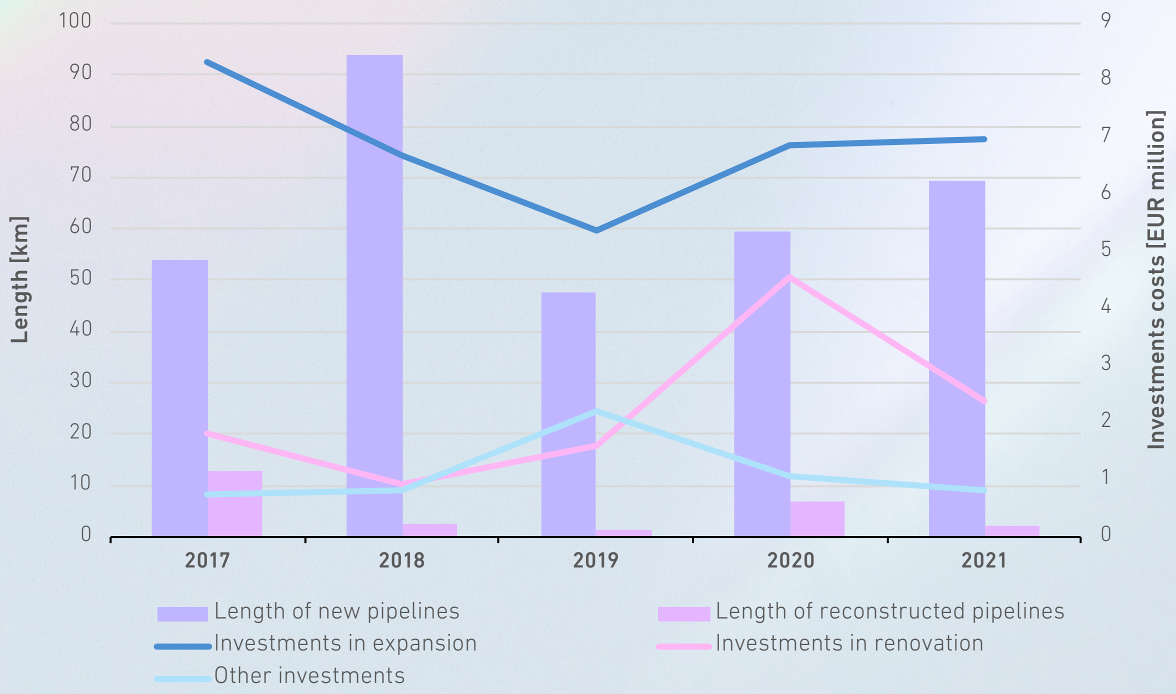
Distribution system operators built 69 kilometres of new gas pipelines, an increase of 17% compared to the previous year. Of these, 11.6 kilometres were built in the new Grosuplje distribution system. Only two kilometres of distribution pipelines were renovated, 70% less than in 2020.

69 km of new distribution pipelines, 17% more than the year before

2 km of distribution pipelines were renovated – 70% less than in 2020

The total value of investments in distribution systems amounted to €10.15 million, down 19% compared to the previous year. Investments in network expansion amounted to €6.98 million, investments in distribution system renovation to €2.36 million, and other investments not directly related to the construction or renovation of distribution systems to €0.81 million.

FIGURE 148: TREND OF BUILDING AND RENOVATING PIPELINES AND INVESTMENT COSTS IN THE 2017–2021 PERIOD

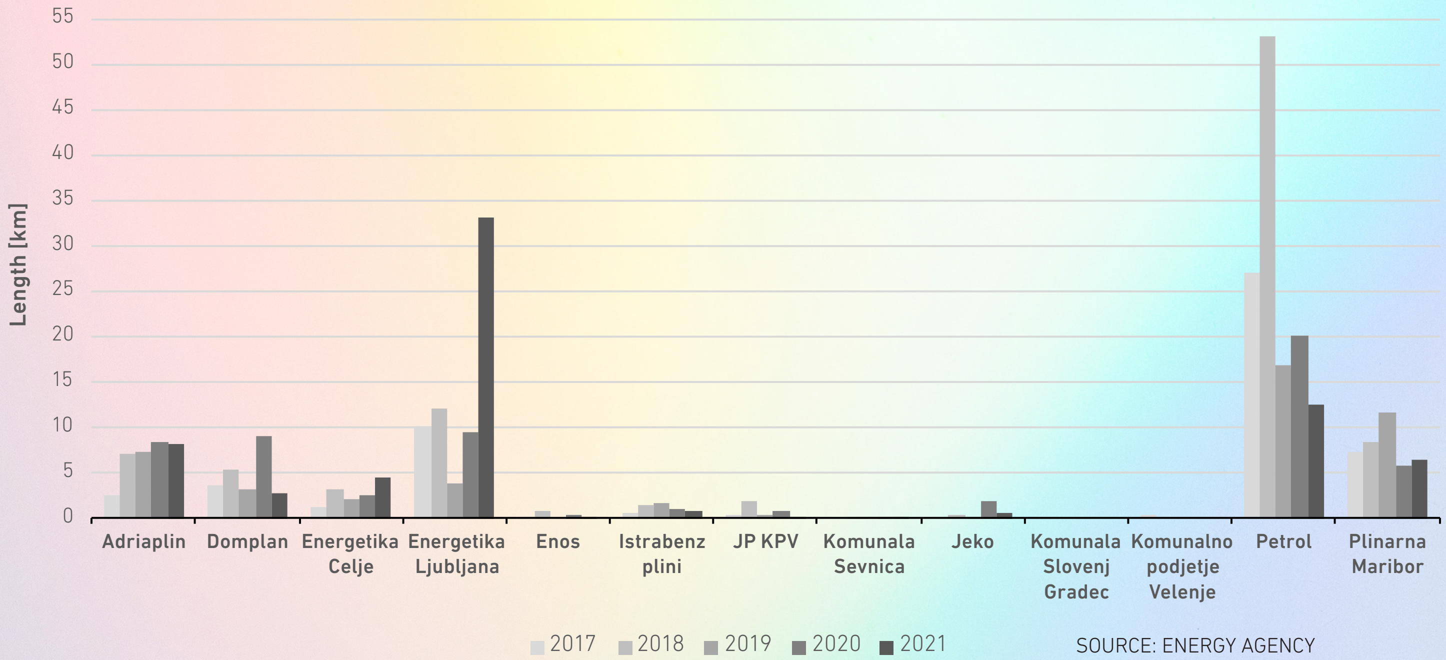


SOURCE: ENERGY AGENCY

Figure 149 shows the intensity of new pipeline construction by each DSO. Over the last five years, the five most active operators together have 91% of the new pipelines, while the remaining eight operators have hardly expanded their distribution systems, building only 9% of the new pipelines.

€10.1 million investments in distribution systems – 19% less than the year before

FIGURE 149: LENGTH OF THE NEW DISTRIBUTION NETWORKS IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

The Security and Reliability of Operation and the Quality of Supply

The TSO, DSOs and CSOs ensured the safe and reliable transport of natural gas through their networks, connected and performed all the necessary maintenance work on the networks.

The daily peak load on the transmission network was recorded in the winter period (12 January 2021) and amounted to 2,980 MWh/h. Capacity at the border entry/exit points was sufficient as no contractual or physical congestion occurred.

The TSO issued 13 connection consents, two fewer than the previous year. One new customer was connected to the transmission system. The overall connection process took 188 days.

In 2021, natural gas distribution system operators received 2251 applications for connection and issued 2,257 consents. The number of consents granted was down by just over 5% compared to the previous year. Operators connected 2,042 consumers in the year, almost 54% more than the previous year.

The average time taken to connect new consumers to the distribution system for the 10 operators was up to 20 working days after a complete connection application was submitted. For the other three, the overall connection process took on average 22, 30 and 31 working days respectively. Physical connection to the network took an average four working days for the 10 operators. For two operators, the average time taken to complete the physical connection was six days. For one operator, the average waiting time for physical connection was 27 working days.

54% more connections to the distribution systems

There were no new connections in the five CDSs areas in 2021.

Reliable and safe operation to ensure an uninterrupted supply to consumers was ensured by the TSO and DSOs through regular and emergency maintenance.

The TSO carried out 15 planned and 259 unplanned works on the transmission system. Due to the planned works, the natural gas supply was interrupted for 21 hours.

There were 2,275 planned works carried out in distribution systems. The number of works has increased again slightly in 2021, while the total duration of the works has been reduced by just over 11%. Planned work caused 1,223 hours of natural gas supply interruptions to consumers or 56% more than the previous year. In the distribution systems of three operators, the planned works were carried out without disruption or the interruption of supply; in the distribution systems of the other three, the total interruption time did not exceed two hours, and for the remaining seven, the total interruption time was recorded at between 12 and 966 hours. A total of 966 hours of interruptions were recorded by the operator with the most consumers. The duration of each interruption was a minimum of 50 minutes and a maximum of 150 hours. In this interruption, two of the 57,600 consumers had their supply interrupted in July. For six of the 10 operators with interruptions, the duration of each interruption did not exceed six hours. The shortest interruptions lasted less than an hour, and the average duration of all interruptions was 11 hours.

Unplanned interventions in distribution systems amounted to 777, an increase of more than 80% compared to the previous year. These interventions caused 123 supply interruptions. The total time of unplanned interruptions amounted to 522 hours, almost 17% less than the previous year. Five operators had no such interruptions, four operators had interruptions of up to 15 hours, and the remaining four had total unplanned interruptions of between 28 and 218 hours.

There were also 432 works carried out in distribution systems at the request and for the needs of third parties; the total time spent on these works amounted to 3,481 hours.

Maintenance work was carried out in the areas of all CDS operators but did not lead to any supply interruptions. The total duration of the planned work carried out was 2,525 hours, of which the full total time spent carrying out routine maintenance work was 1,045 hours, inspections 1,170 hours, tests 185 hours, and measurement checks 125 hours.

In 2021, two incidents were recorded as a result of natural gas leaks. In Celje, a gas leak at a house connection caused an explosion at a bus station on 8 January, causing minor injuries to three people and significant material damage to the bus station building. On 26 March, while excavating for waterproofing a residential house in Domžale, a gas pipeline was damaged, causing a natural gas leak. Professional firefighters and the network operator intervened at the scene. The area was secured and no one was injured thanks to the rapid action of the competent services and the responsible distribution system operator.

The activities of the TSO and DSOs related to the connection of system users and maintenance works on the system in the period 2019-2021 are shown in Table 36.

TABLE 36: PARAMETERS ON CONNECTION AND MAINTENANCE WORK IN THE 2019–2021 PERIOD

Gas operator	TSO			DSOs		
	2019	2020	2021	2019	2020	2021
CONNECTION-RELATED SERVICES						
Number of approvals issued	19	15	13	2,688	2,391	2,257
Average duration of the administrative procedure [days]	40	48	40	8	6	7
Maximum length of the administrative procedure [days]	-	-	-	15	15	15
Minimum length of the administrative procedure [days]	-	-	-	1	1	1
Number of connections performed	3	3	1	1,798	1,328	2,042
Average duration of the entire connection procedure [days]	204	468	188	16	14	15
Maximum length of the entire connection procedure [days]	-	-	-	61	40	31
Minimum length of the entire connection procedure [days]	-	-	-	2	2	2
MAINTENANCE WORK ON THE SYSTEM						
Number of planned works performed	28	19	15	1,984	2,083	2,275
Total duration of the planned work [hours]	102,600	109,032	108,560	121,088	120,909	107,372
Total duration of supply interruption due to planned work [hours]	56	13	21	803	784	1,223
Maximum duration of each scheduled interruption [hours]	12	13	11	52	148	150
Minimum duration of each schedule interruption [hours]	1	-	10	1	1	1
Number of unplanned interventions performed	217	198	259	527	430	777
Total duration of unplanned interventions [hours]	513	504	581	1,805	1,900	2,390
Number of supply interruptions due to unplanned work [hours]	-	1	-	107	134	123
Total duration of supply interruption due to unplanned interventions [hours]	-	0.25	-	402	627	522

SOURCE: ENERGY AGENCY

Network Charges for Gas Transmission and Distribution Systems

Setting the Network Charge

The Energy Agency regulates natural gas transmission and distribution activities on the basis of the regulated network charges method. It ensures that system operators can cover all the eligible costs of the regulatory period and any network charge deficit from previous years by setting network charges and other revenues, taking into account network charge surpluses from previous years. The eligible costs of a system operator shall be those costs that are necessary for the performance of the distribution or transmission of natural gas and that meet the criteria set out in the methodology for the establishment of the regulatory framework issued pursuant to Article 250 of EZ-1 (EA-1). Eligible costs consist of operation and maintenance costs, depreciation costs, regulated annual return on assets and incentives.

Incentives are based on the realised eligible costs, the assets taken over free of charge and the achievement of a 25% difference between the revenues and the costs of the TSO when purchasing additional capacity under the overbooking and buyback programme.

Through the regulatory framework, the Energy Agency promotes the cost-efficiency of system operators, ensures their sustainable and stable operations, a stable environment for investors or owners and stable and predictable conditions for system users.

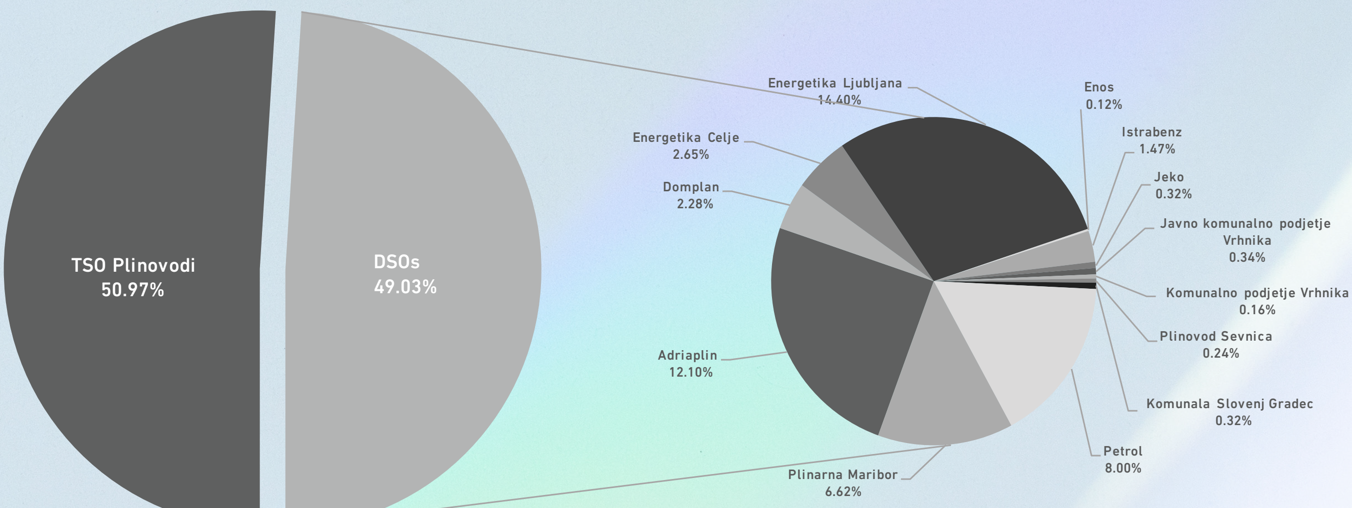
Before the start of the regulatory period, system operators shall, with the agreement of the Energy Agency, determine the planned eligible costs and the planned resources to cover the eligible costs on the basis of the methodology for setting the regulatory framework. At the same time, taking into account the methodology for the calculation of the network charge, they shall also determine the tariff rates for the regulatory period.

After the end of each year of the regulatory period, system operators shall identify deviations from the regulatory framework as the difference between the system operator's recognised eligible costs and the recognised resources to cover eligible costs, calculated on the basis of the criteria for their determination set out in the methodology for setting the regulatory framework. Deviations from the regulatory framework shall also be examined in the context of the identification of deviations from the regulatory framework. Deviations from the regulatory framework shall be reflected in a deficit or surplus of the network charge.

The Regulated Network Charge method also requires system operators to consider the network charge surplus as a dedicated resource to cover network charge deficits from previous years or eligible costs in subsequent years. At the same time, the Regulated Network Charge method gives the system operator the right to take the network charge deficit into account when setting the network charge in subsequent years.

The year 2021 was the last year of the 2019-2021 regulatory period. For 2021, the distribution system operators planned eligible costs of €52.1 million and the transmission system operator €54.2 million. Figure 150 shows the structure of the planned eligible costs in 2021 for the activities of the TSO and DSO.

FIGURE 150: THE STRUCTURE OF PLANNED ELIGIBLE COSTS FOR SYSTEM OPERATORS' ACTIVITIES IN 2021



SOURCE: ENERGY AGENCY

As of 1 January 2022, a new three-year regulatory period for system operators came into force, lasting until 31 December 2024. In 2021, the Energy Agency issued an Act amending the Legal Act on the Methodology for Determining the Regulatory Framework of the Natural Gas Transmission System Operator.

On the basis of that Act, in 2021, the system operators, with the prior consent of the Energy Agency, set the regulatory framework, the network tariffs, and the tariffs for other services for the 2022-2024 period.

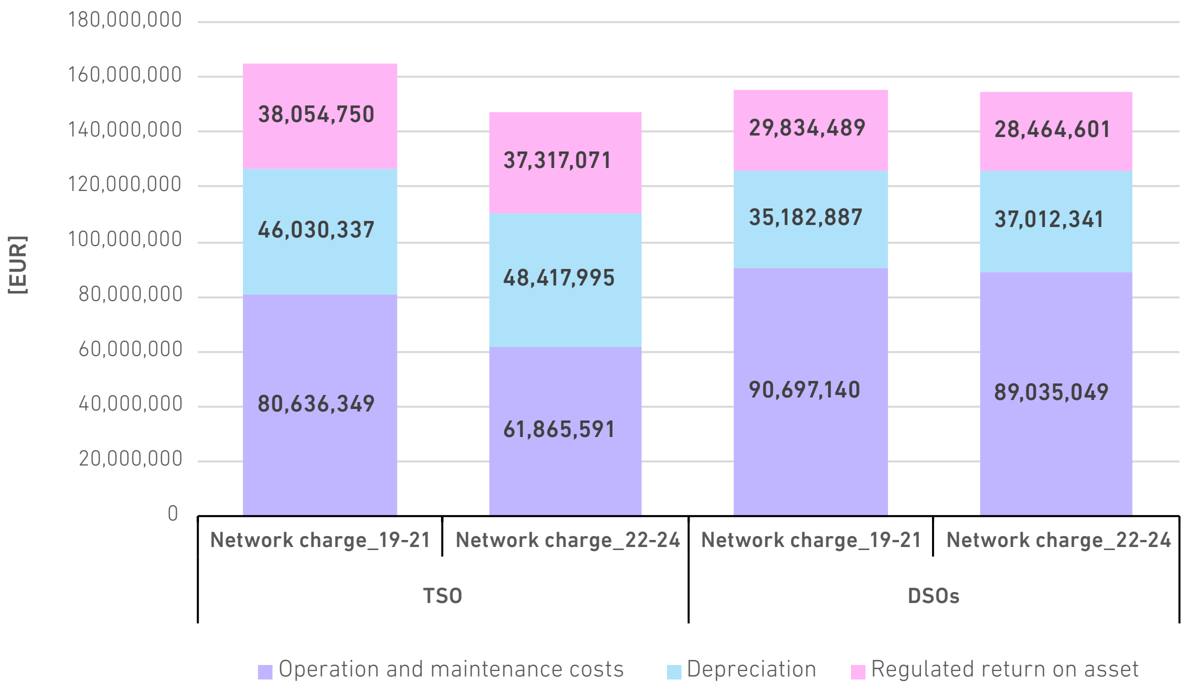
€154.5 million
for the operation of distribution systems in the 2022-2024 regulatory period

€147.6 million
for the operation of the transmission system in the 2022-2024 regulatory period

For this three-year period, the system operators have planned a total of €302.1 million of eligible costs, of which the transmission system operator has planned €147.6 million and the distribution system operators €154.5 million.

For the 2022-2024 regulatory period, the TSO has planned eligible costs that are 10% lower than those planned for the previous three-year regulatory period. Distribution system operators have planned eligible costs for the 2022-2024 regulatory period that are one percentage point lower than those planned in the previous three-year regulatory period.

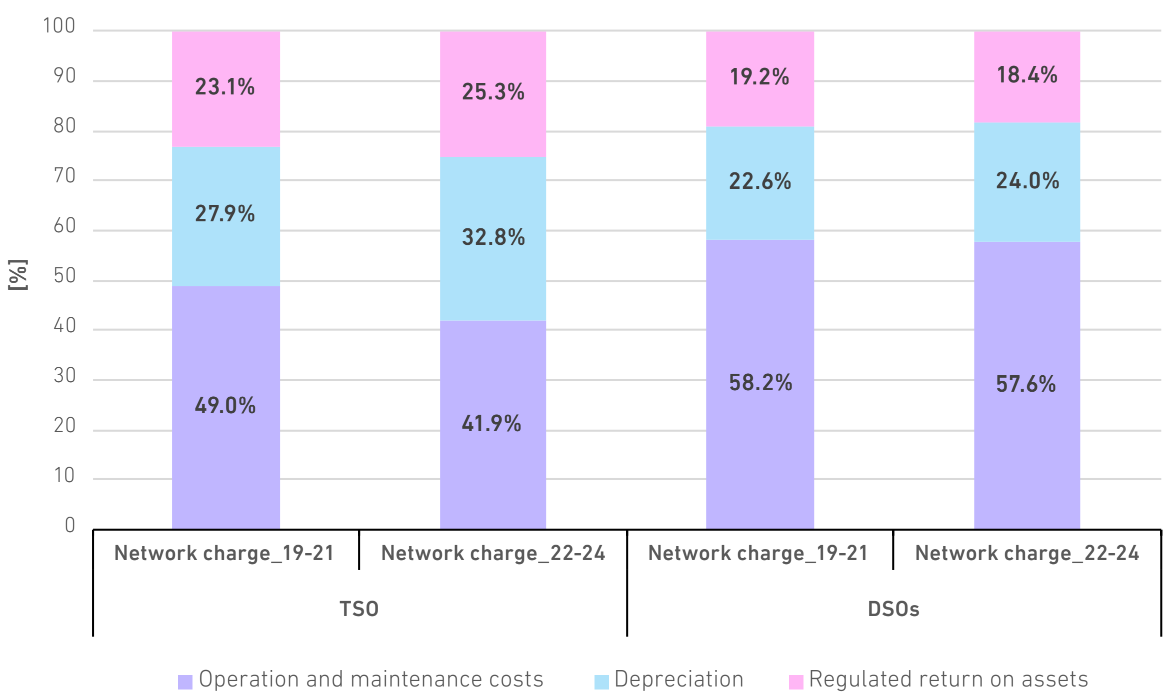
FIGURE 151: COMPARISON OF THE PLANNED ELIGIBLE COSTS IN THE 2019-2021 AND 2022-2024 REGULATORY PERIODS



SOURCE: ENERGY AGENCY

The comparison of the structures of the planned eligible costs by regulatory period in Figure 152 shows that for the 2022-2024 regulatory period, the TSO's planned cost of buying and selling natural gas for balancing has decreased. For DSOs, the planned O&M costs in the eligible cost structure did not change significantly compared to the 2019-2021 regulatory period, while the share of planned depreciation costs increased slightly in the 2022-2024 regulatory period, at the expense of a decrease in the share of the planned regulated return on assets.

FIGURE 152: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS IN THE 2019–2021 AND 2022–2024 PERIODS

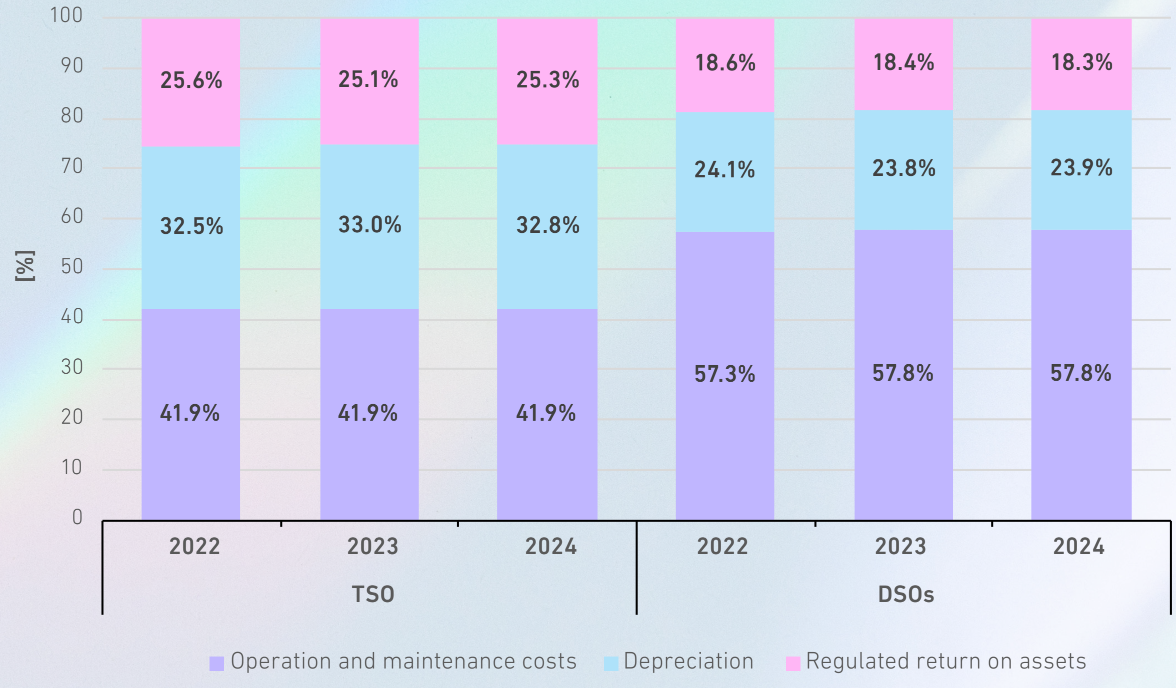


SOURCE: ENERGY AGENCY

Figure 153 shows the structure of eligible costs in the 2022-2024 regulatory period by year for transmission and distribution system operators. The largest share of the eligible cost structure for all operators is accounted for operation and maintenance costs. However, the structure of eligible costs itself does not change significantly between the years of the 2022-2024 regulatory period.

The largest share of the eligible costs of transmission system operators and distribution system operators are the operation and maintenance costs

FIGURE 153: STRUCTURE OF THE ELIGIBLE COSTS BY YEAR IN THE 2022-2024 REGULATORY PERIOD



SOURCE: ENERGY AGENCY

The Network Charge for the Natural Gas Transmission System

The network charge for the natural gas transmission system is levied on transmission system users and consists of:

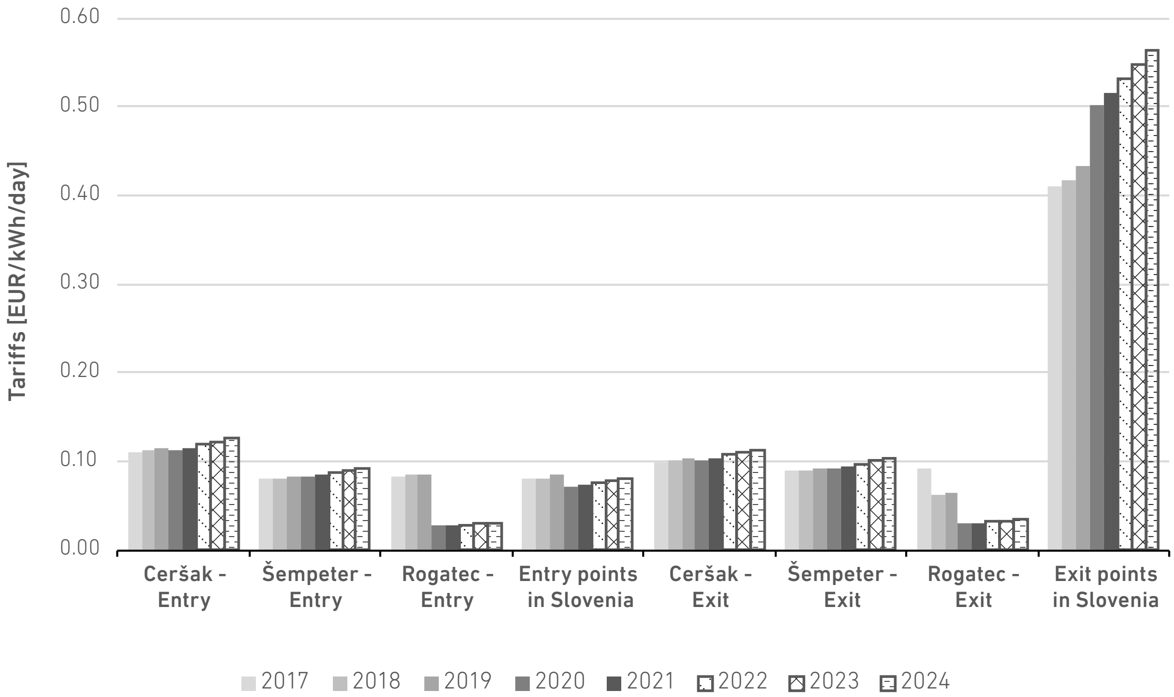
- network charge for the entry point,
- network charge for the exit point,
- network charge for own use; and
- network charge for measurement.

The network charge for each entry/exit point depends on the capacity product and booked capacity. Transmission system users book capacity of the entry/exit points that are interconnection points or border points via an online booking platform, as an annual, quarterly, monthly, daily or intraday standard capacity product.

System users leasing capacity within Slovenia may, however, lease annual, monthly or daily standard capacity product and day-ahead standard capacity product. For these users, the network charge for the intra-Slovenian exit point until 2024 will also be determined based on their classification into a consumption group according to the level of the capacity booked.

Transmission system users who book capacity are charged for the network charge for their own use and the network charge for measurements. The network charge for own use depends on the amount of natural gas transferred at each exit point, and the network charge for measurements depends on the size of the measuring device and the number of pressure reductions.

FIGURE 154: MOVEMENT OF THE NETWORK CHARGE TARIFFS FOR THE ENTRY AND EXIT POINTS OF THE TRANSMISSION SYSTEM DURING THE 2017–2024 PERIOD



SOURCE: ENERGY AGENCY

The network tariffs for each year of the regulatory period are set by the transmission system operator and approved by the Energy Agency. The 2021 network tariffs were already set in the framework of the 2020-2021 regulatory period in May 2019 on the basis of a matrix method that allocates the eligible costs of the individual parts of the transmission system to each entry/exit point of the transmission system.

Figure 154 also shows the network charge tariffs for the next regulatory period of 2022-2024. The network charge tariffs are increased by 2.9% each year in the 2021-2024 period. In 2021, the TSO launched a consultation procedure on the methodology on the setting of tariffs for the use of the natural gas transmission system in Slovenia on the basis of Article 26 of Commission Regulation (EU) 2017/460 establishing a network code on harmonised tariff structures for gas. The consultation procedure on the determination of reference prices ended in 2022 with a reasoned decision of the Energy Agency on the determination of the reference price methodology for the natural gas transmission system for 2022.

Network Charges for the Natural Gas Distribution Systems

The network charge for the natural gas distribution system consists of a distribution network charge and a network charge for measurements.

The network charge tariffs are determined uniformly by the distribution system operator for all areas where it distributes natural gas. Only in specific cases may network charge tariffs be different for different areas of service.

The network charge for distribution is paid by the users of the distribution system according to the quantity of natural gas distributed, which forms the variable part of the distribution tariff, and according to the booked capacity, which reflects the fixed part of the network charge. In the case of smaller consumers, this is calculated as a monthly flat-rate and for larger consumers as the amount of connected power or booked capacity.

The network charge for metering depends on the size and type of measuring device and the ownership or management of that device.

The 2021 network charge tariffs were set in 2018, when the consents to the 2019-2021 regulatory framework were issued. In 85 municipalities, 18 Acts setting the network charge tariffs for the distribution network were applied for the calculation of the network charge.

Distribution system operators are required to show separately on the distribution system user's bill the amount for the distribution of natural gas and the amount for metering.

The annual network charges paid by consumers with an estimated annual consumption of up to 50,000 kWh, which in numbers represent over 96% of all consumers in distribution systems, did not change significantly for the majority of consumers in 2020 compared to the previous year.

The annual amounts of network charges paid by consumers with an estimated annual consumption of up to 50,000 kWh, which is just under 96% of all consumers in distribution systems, have not changed significantly for most consumers in 2021 compared to 2020 and 2019.

The evolution of the network charge for distribution per megawatt-hour of natural gas consumed for typical household consumers and medium-sized industrial consumers in each year of the 2017-2021 period for the seven operators distributing natural gas in the 10 largest municipalities by number of consumers is shown in the following figures.

These operators are responsible for distribution in 70 other municipalities, which means that the network charges shown apply in 80 municipalities out of a total of 85 and to just under 97% of all consumers in the distribution networks.

In these areas, for typical small household consumers (group D1 with an annual consumption of 3,765 kWh) the network charge in 32 municipalities increased compared to the previous year, 47 municipalities has the same network charges as the previous year, and in Ljubljana the network charge decreased by 2%. For medium-sized household consumers (group D2 with an annual consumption of up to 10 MWh) and medium-sized household consumers (group D2 with an annual consumption of up to 32 MWh), the network charge also increased in 32 municipalities, in 47 municipalities it remained unchanged compared to 2020, and in Ljubljana it was 2% lower compared to the previous year. Also for the large household consumers group D3 with an

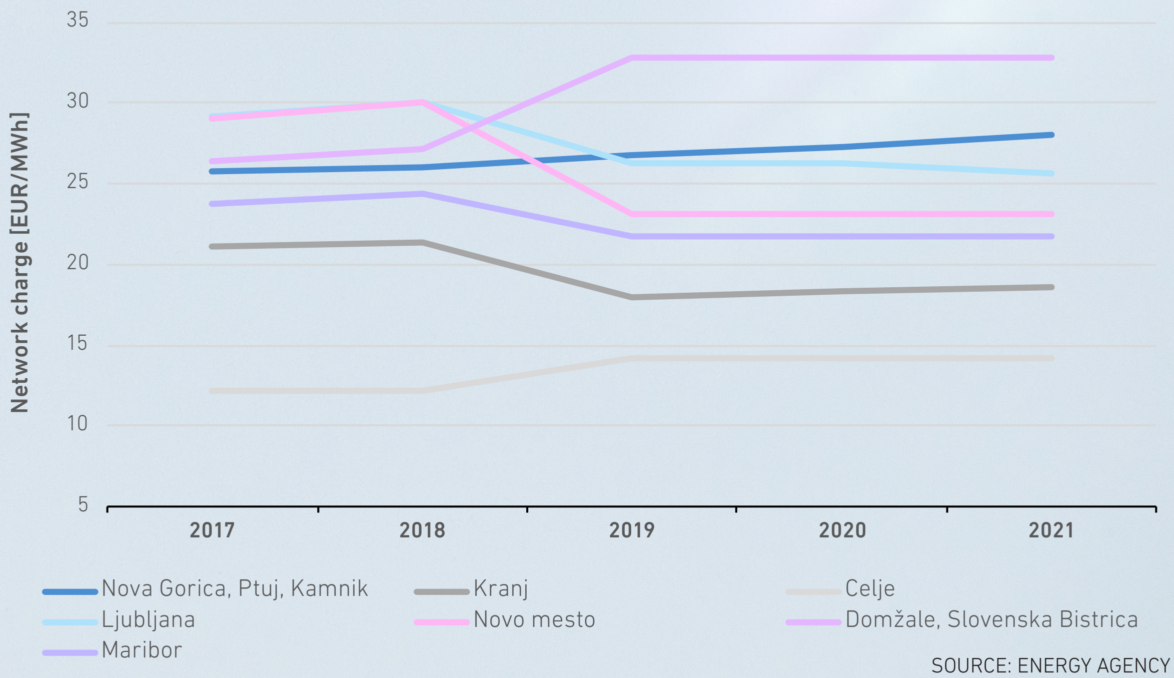
Distribution system network charges for consumers remain at the level of the previous two years

annual consumption of up to 215 MWh), the annual amount of the network charge in 2021 increased by up to 2% compared to the previous year in 32 municipalities, while in 47 municipalities the network charge remained unchanged. In Ljubljana, the network charge decreased by 2%.

The average changes of the annual network charges for a typical household consumer (group D1 with an annual consumption of up to 3,765 kWh) compared to 2020 range from -2 to +2.6%. For a medium-sized household consumer (group D2 with an annual consumption of up to 10 MWh) and a medium-sized household consumer (group D2 with an annual consumption of up to 32 MWh), the network charge varied annually between -2 and +2.1%. For large household consumers (group D3 with an annual consumption of up to 215 MWh), the annual network charges varied between -2 and +1.9%.

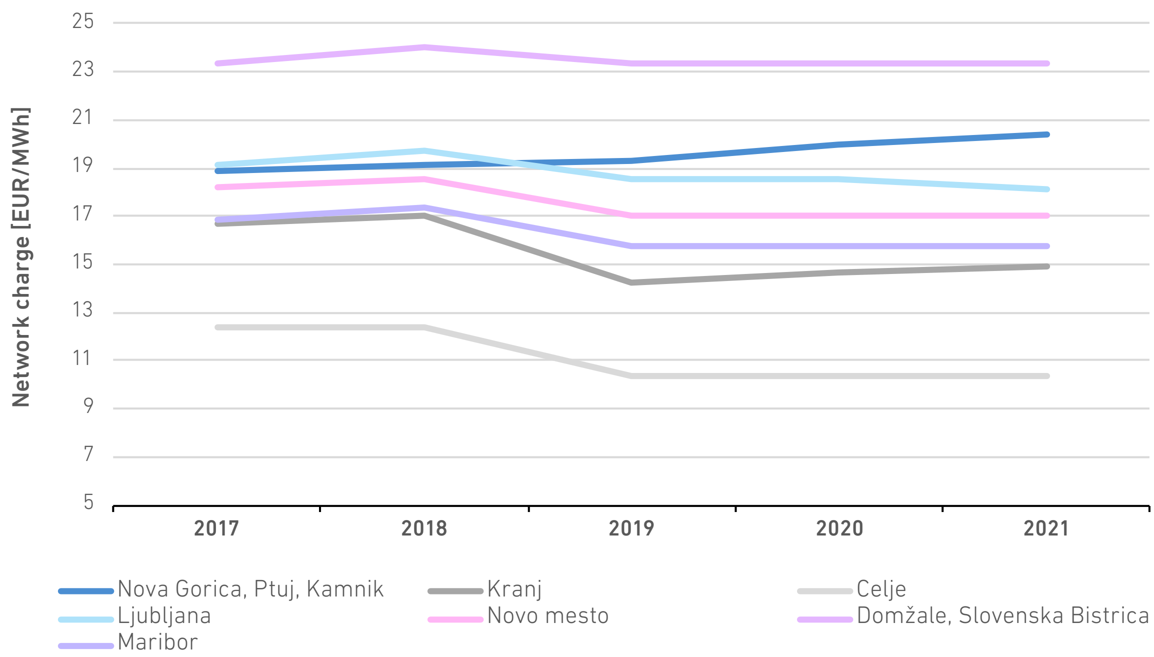
At individual DSOs, the annual network charge amounts were over 30% lower than five years ago. The highest increase in the network charge between 2017 and 2021 was recorded at the Petrol DSO, for smaller consumers with an average annual consumption of 3,765 kWh, at 24%. For these consumers, the maximum annual amount of the distribution network charge was €124. The evolution of network charges over the 2017-2021 period is shown in Figures 155 to 159.

FIGURE 155: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR SMALL HOUSEHOLD CONSUMERS - D1 (3,765 kWh) IN THE 2017–2021 PERIOD



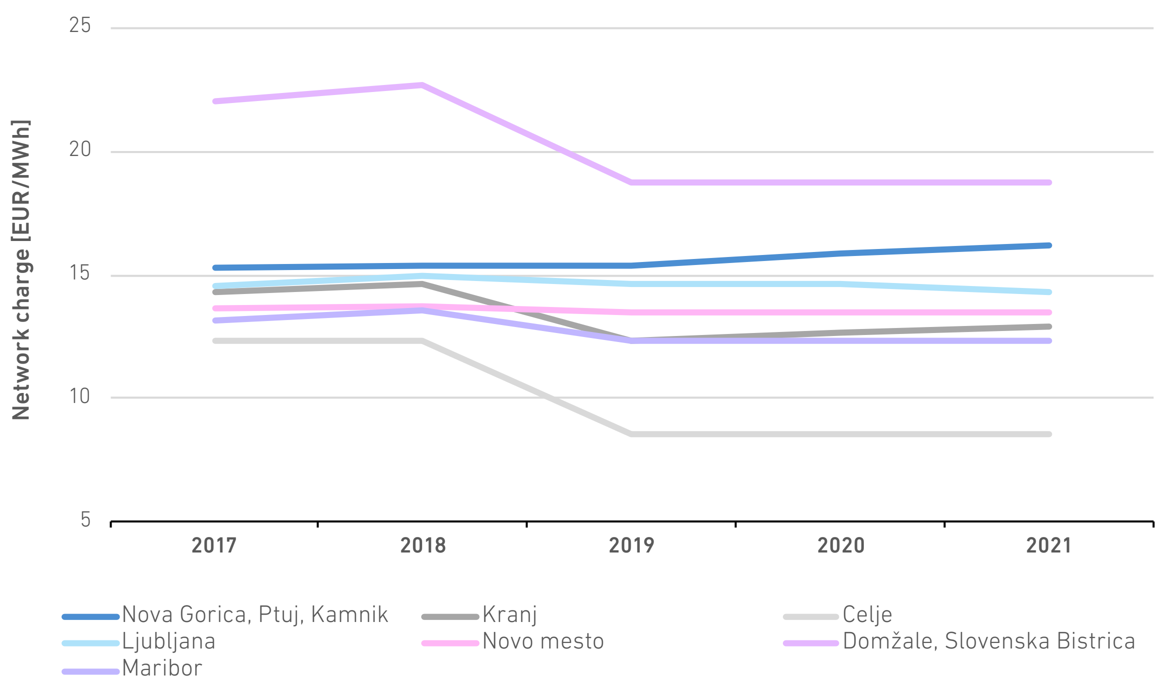
SOURCE: ENERGY AGENCY

FIGURE 156: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR MEDIUM-SIZED HOUSEHOLD CONSUMERS - D2 (10 MWh) IN THE 2017–2021 PERIOD



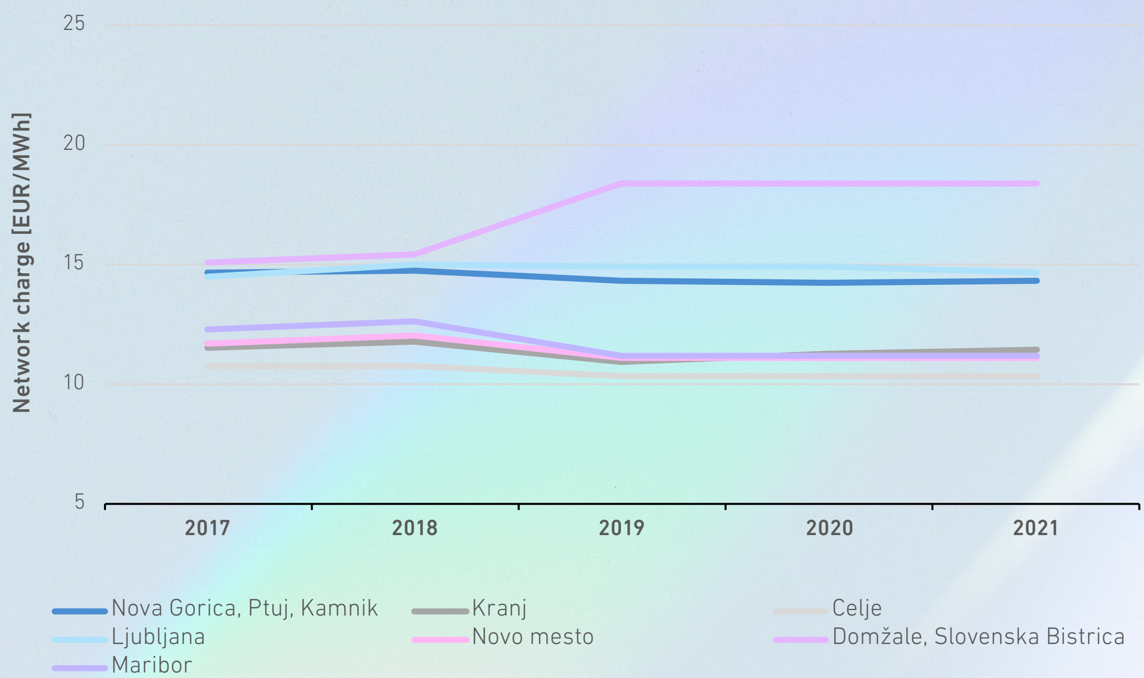
SOURCE: ENERGY AGENCY

FIGURE 157: DISTRIBUTION NETWORK CHARGE FOR MEDIUM-SIZED HOUSEHOLD CONSUMERS – D2 (32 MWh) IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

FIGURE 158: DISTRIBUTION NETWORK CHARGE FOR LARGE HOUSEHOLD CONSUMERS – D3 (215 MWh) IN THE 2017–2021 PERIOD



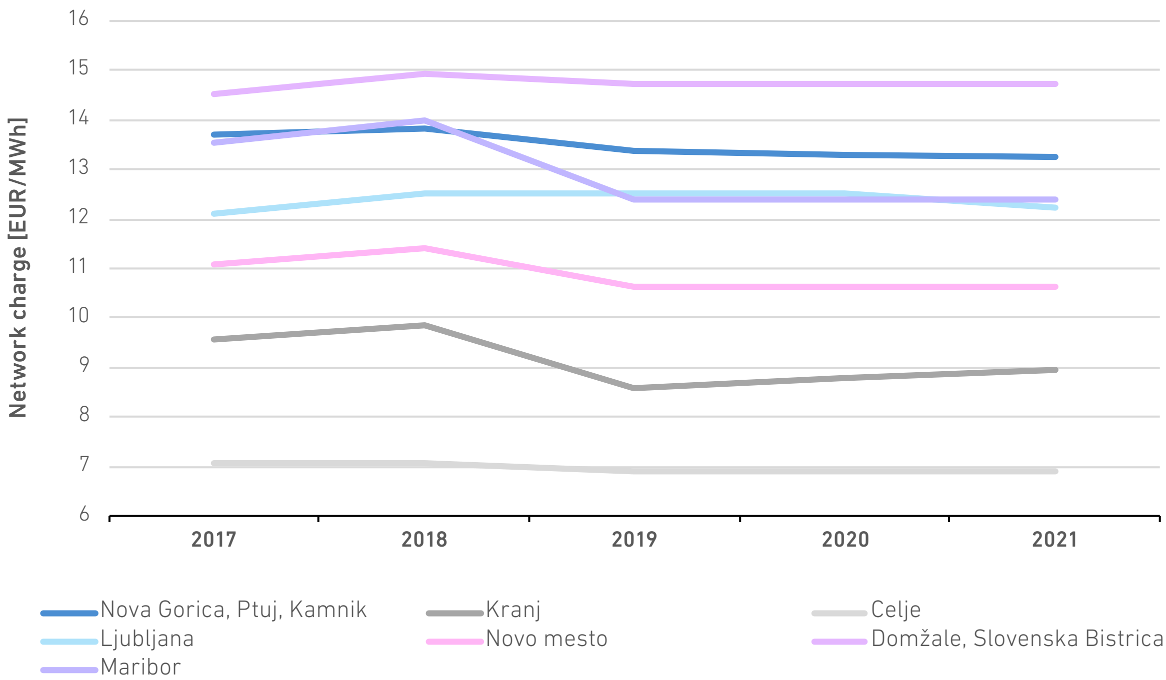
SOURCE: ENERGY AGENCY

For medium-sized industrial customers (customer group I3 with an annual consumption of 8,608 MWh), the average annual network charge decreased by up to 2% in 30 municipalities compared to the previous year, remained unchanged in 47 municipalities, and increased by 1.7% in three municipalities.

The average annual change in network charges for these consumers over the last five years varied between -1.7% and +0.3% depending on the operator. At two operators, consumers were paying lower network charges than five years ago. The differences in the annual network charge in individual municipalities reflect the different structures of consumers and their consumption, as well as the age and size of the distribution systems. The evolution of network charges for medium-sized industrial customers over the 2017-2021 period is shown in Figure 159.

Most medium-sized industrial consumers paid equal or lower network charges in 2021

FIGURE 159: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR MEDIUM-SIZED INDUSTRIAL CONSUMERS – I3 (8,608 MWh) IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

Capacity at Border Points

Capacities at border points were allocated on the basis of market-based methods through the online reservation platform PRISMA. Auctions of firm and interruptible capacities have been carried out. There were 63,924 auctions published, which is one per cent less than in the year before. Individual and bundled capacities were offered at auctions. The number of successful auctions of firm capacity was 960, which is 19% more than in the previous year. Of all the auctions, 74% were bundled capacity auctions. Interruptible capacity auctions were not successful and there were no auctions of incremental capacity in 2021.

TABLE 37: NUMBER OF SUCCESSFUL AUCTIONS OF FIRM CAPACITY

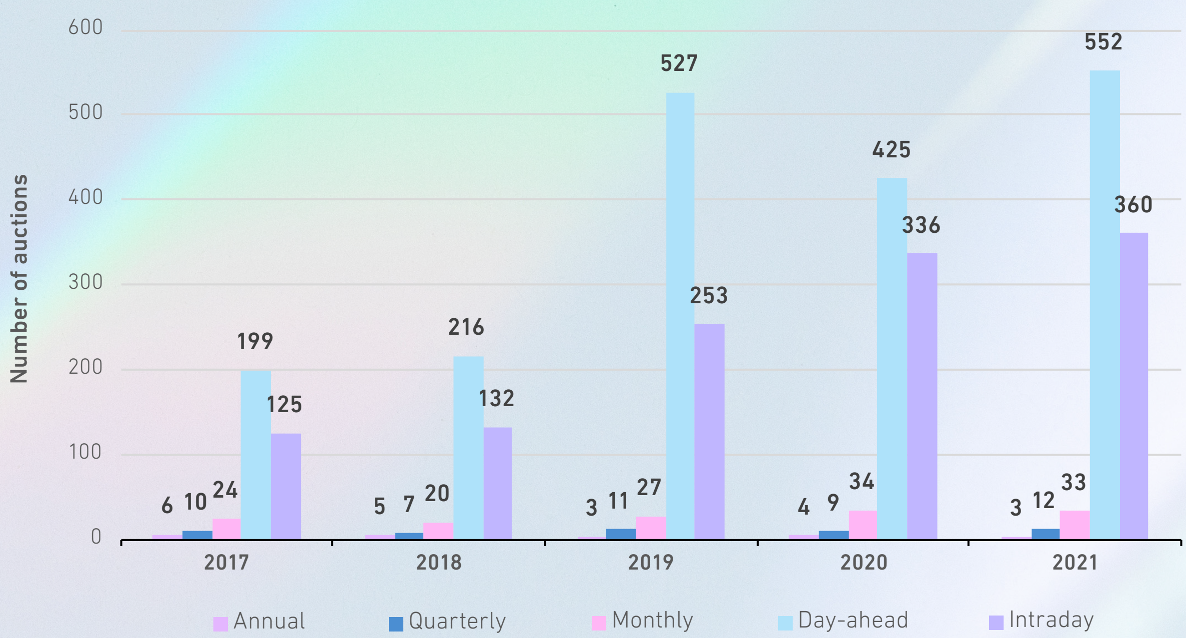
Auction type	Ceršak entry	Rogatec entry	Rogatec exit	Šempeter entry	Šempeter exit
Annual	2	0	1	0	0
Quarterly	7	2	3	0	0
Monthly	20	10	3	0	0
Day-ahead	467	21	54	1	9
Intraday	260	15	27	5	53
Bundled	506	48	88	6	62
Individual capacity	250	0	0	0	0

SOURCES: ENERGY AGENCIJA, PLINOVODI

Figure 160 shows the auctions of transmission capacity conducted over the last five years. The most striking feature is the marked increase in the number of successful auctions of short-term capacity over the last three years. For example, the number of capacity auctions auctioning day-ahead capacity increased by 30% in the last year, while the number of intraday capacity auctions increased by 7%. The trend in short-term capacity booking is the result of the expiration of long-term capacity booking contracts in 2017, the increasing optimisation of capacity booking, and the high level of unpredictability in the natural gas market.

30% more successful auctions of day-ahead capacity

FIGURE 160: SUCCESSFUL AUCTIONS OF FIRM CAPACITY IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

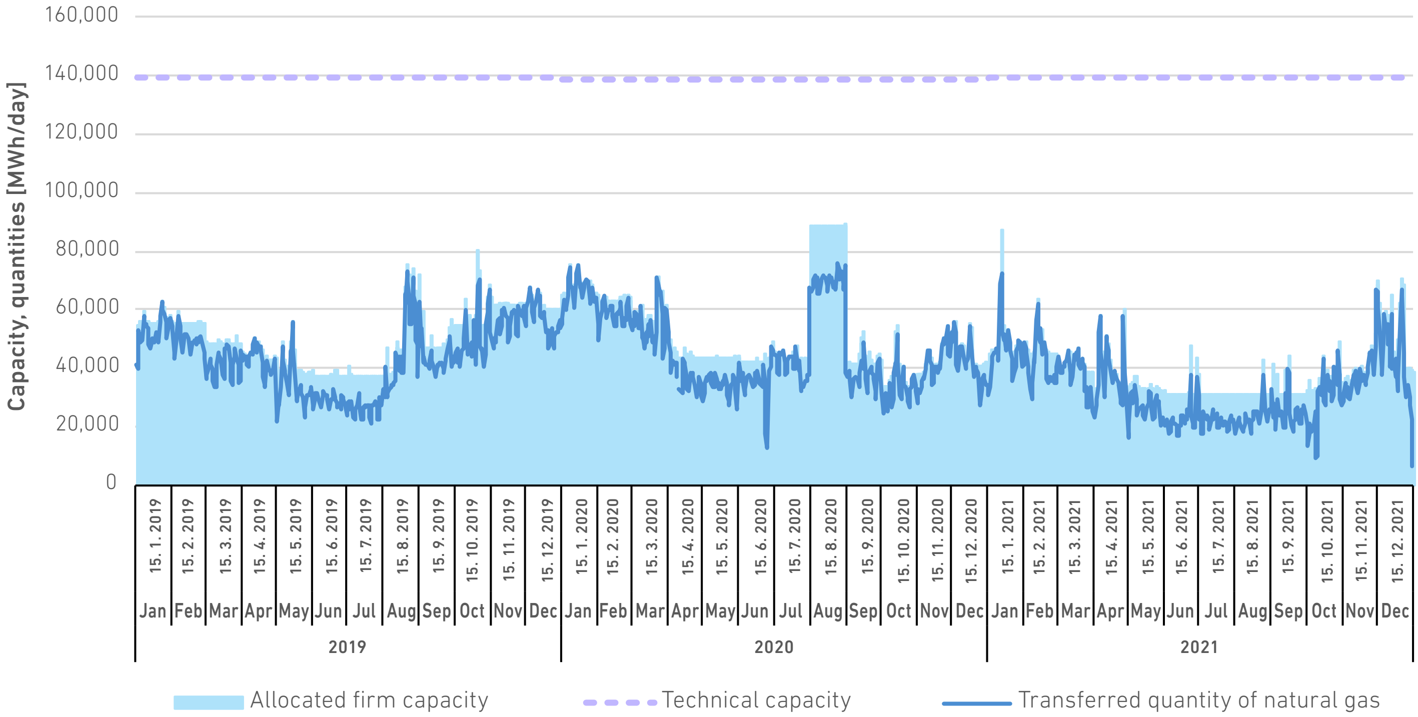
The TSO, in cooperation with the Hungarian TSO, prepared a cross-border cost allocation proposal (CBCA) for the Hungary–Slovenia–Italy gas corridor project. Together with the Hungarian regulator, the Energy Agency decided that each TSO would bear the costs of the construction of the pipeline on its own territory.

The TSO carried out a market demand assessment in cooperation with neighbouring TSOs. Two non-binding requests for capacity booking at the Ceršak entry point were received. The two requests were forwarded for capacity leasing between the gas years 2021/2022 and 2035/2036 in the range of 40,000 kWh/h to 54,000 kWh/h.

After an increase in capacity booking at Ceršak, Slovenia's largest border entry point, in 2019 and 2020, a quarter less capacity was booked last year than the year before. Compared to 2017, when Croatia was still largely supplied with gas via Slovenia, the decline in capacity booking is as much as 50%. In line with the capacity booking, the transferred quantities in 2021 were also 29% lower compared to the previous year, reaching 52% of the quantities transferred in 2017.

26% less booked capacity in Ceršak

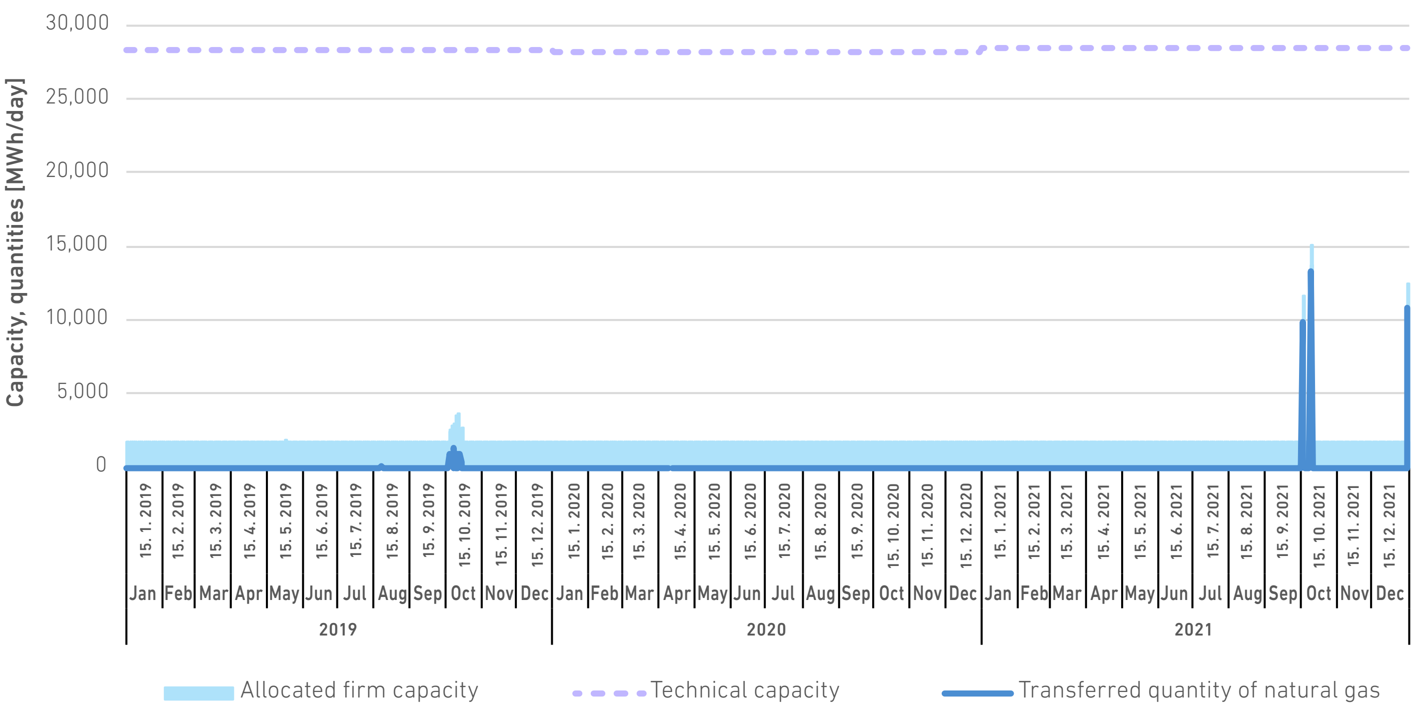
FIGURE 161: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE CERŠAK ENTRY POINT IN THE 2019–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

At the Šempeter entry point, daily capacity was booked for three days in October and one day in December. The average annual booking of technical capacity was therefore only 6.4%. The volume of natural gas transported from Italy to Slovenia through this entry point was 45,980 MWh.

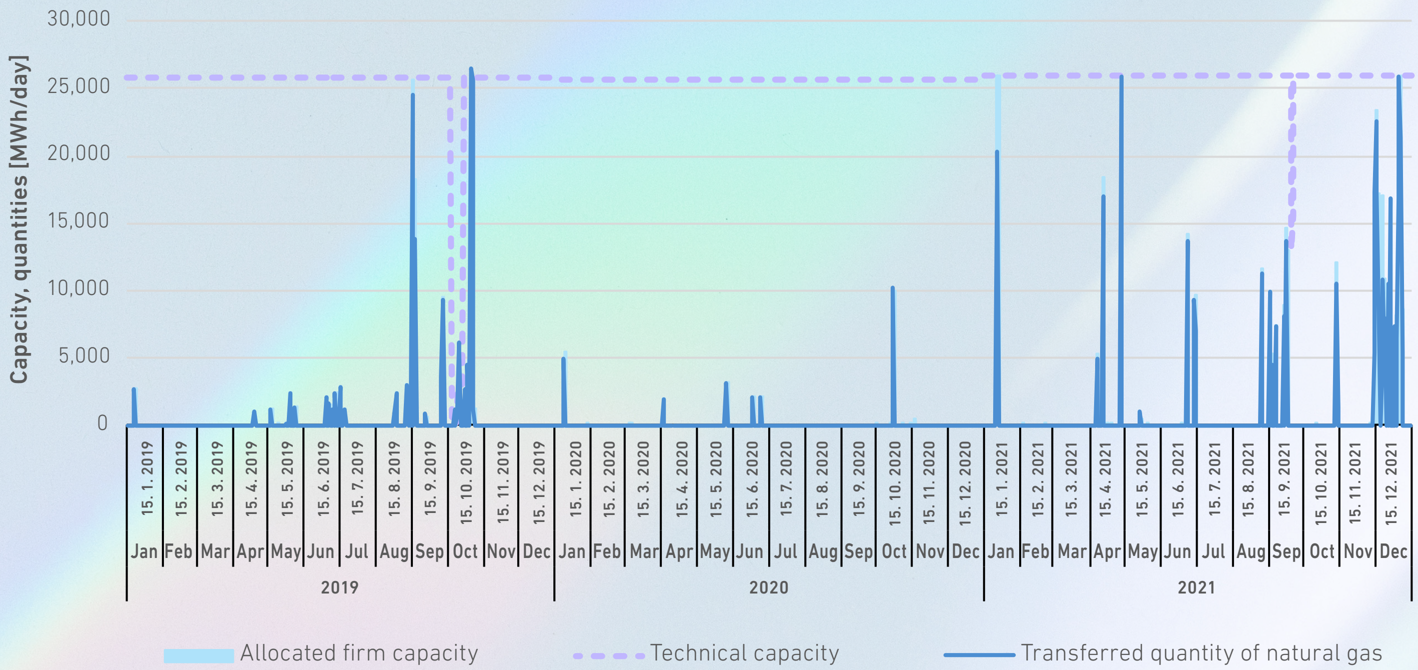
FIGURE 162: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE CERŠAK ENTRY POINT IN THE 2019–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

At the Šempeter exit point, where there is no long-term booked capacity, capacity was only booked on individual days, most of which were in December. The average annual technical capacity booked was only 4.8%. Almost nine times more natural gas was transferred to Italy than was imported from that country.

FIGURE 163: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ŠEMPETER EXIT POINT IN THE 2019–2021 PERIOD

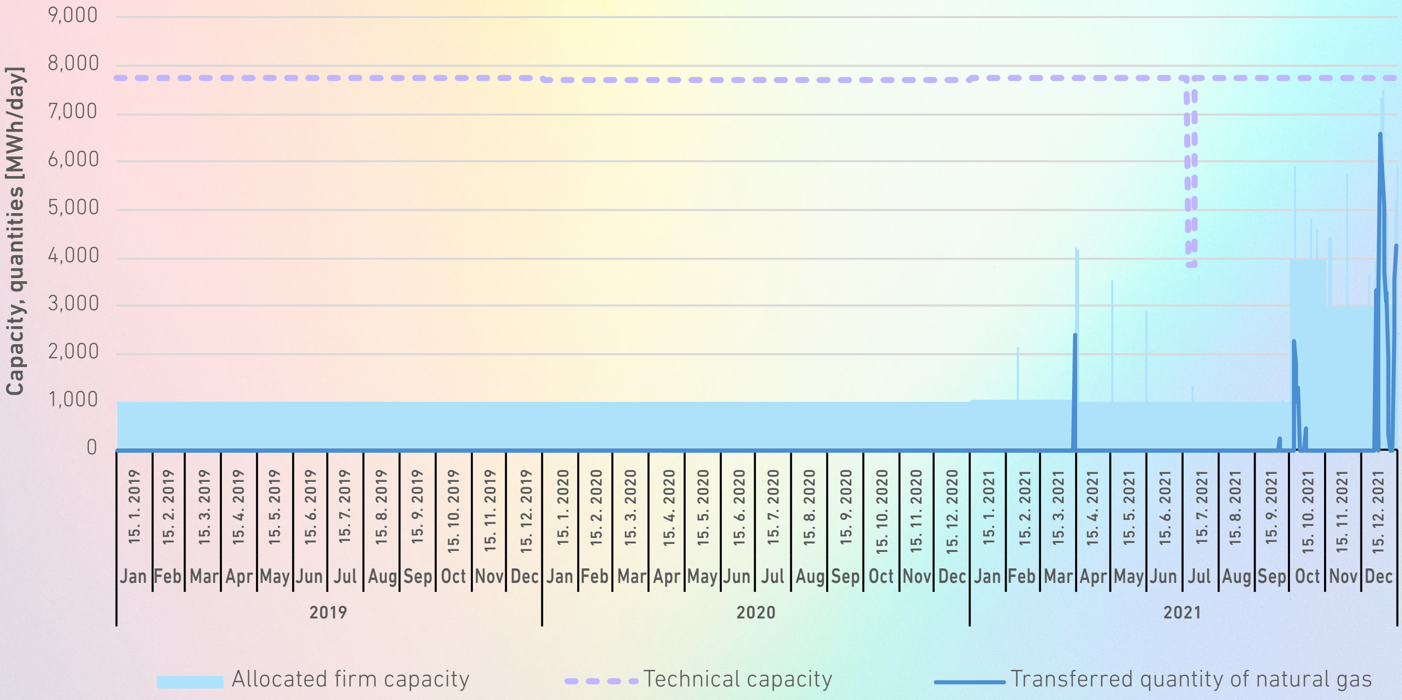


SOURCES: ENERGY AGENCY, PLINOVODI

At the Rogatec entry point, for the first time since the reverse flow capacity was put in place (January 2019), there was a physical flow of gas from Croatia to Slovenia. 62,564 MWh of natural gas were transferred, most of the volumes in the second half of December. The average booking of technical capacity on an annual basis was 23%, while only 2.2% of the technical capacity was transferred.

For the first time, natural gas was transferred from Croatia to Slovenia

FIGURE 164: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ROGATEC EXIT POINT IN THE 2019–2021 PERIOD

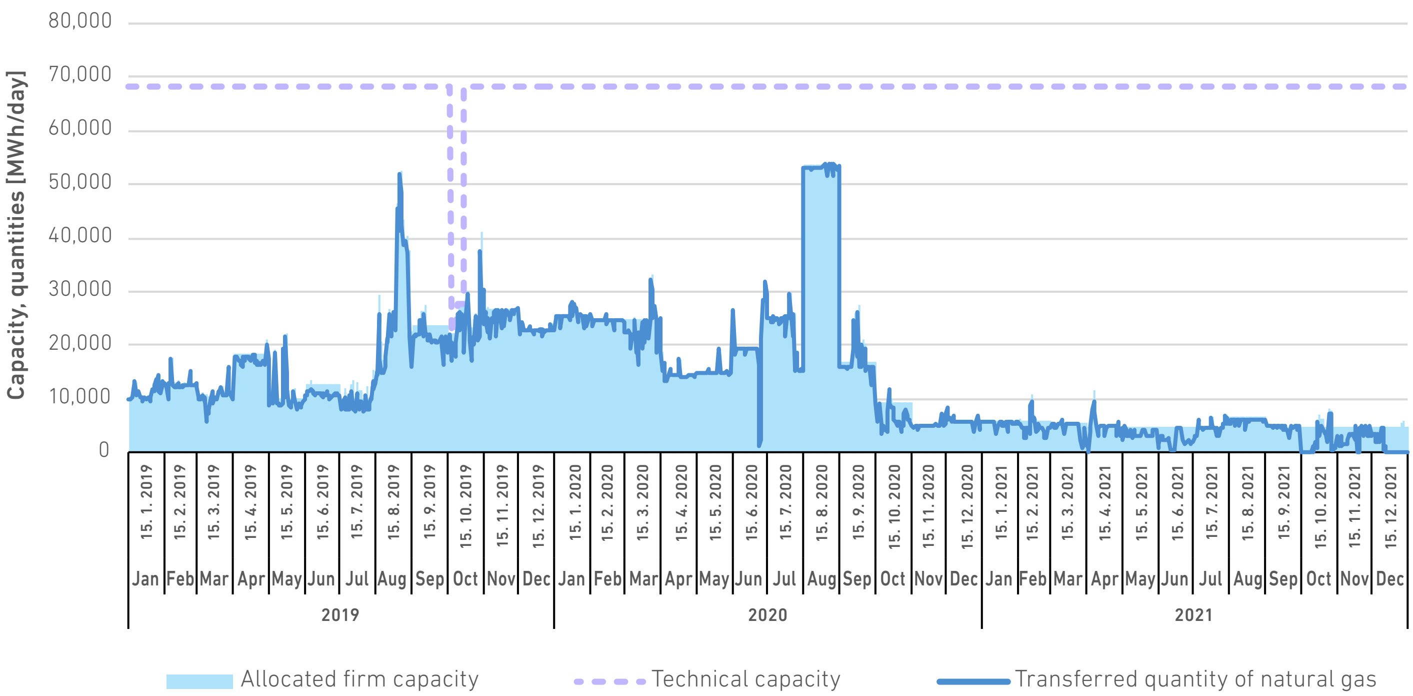


SOURCES: ENERGY AGENCY, PLINOVODI

Similarly to the Ceršak entry point, the largest exit point at Rogatec also experienced a significant decline in transmission capacity booking in 2021 after two years of increased capacity booking. Almost three quarters less capacity was booked compared to the previous year and 87% less compared to 2017. The decline in transported volumes is even more significant, down 80% compared to the year before and reached 11% of the value from 2017. The technical capacity was thus only 7.9% booked on average, while the volumes transported were only 5.9% of the volumes allowed by the technical capacity.

80% less natural gas transported from Slovenia to Croatia

FIGURE 165: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ROGATEC EXIT POINT IN THE 2019–2021 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

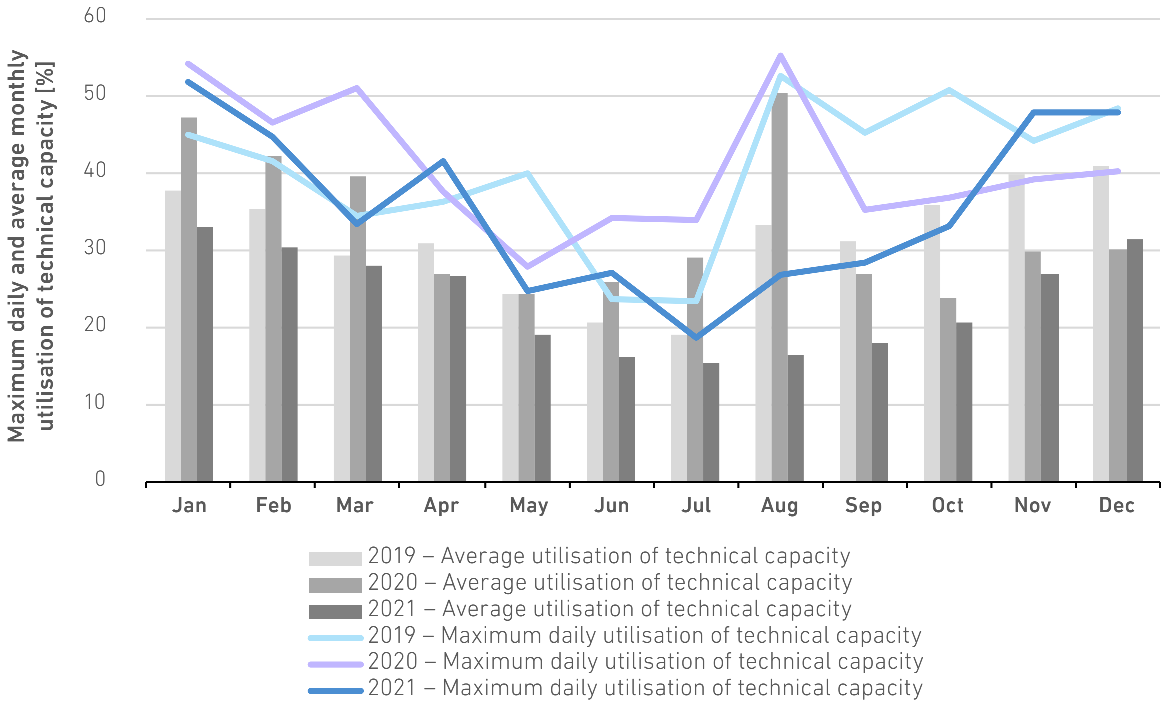
For the second year in a row, there was no booking of interruptible capacity. In previous years, interruptible capacity was also booked very infrequently and in small quantities.

With the exception of a few days of technical capacity reductions at the Rogatec entry point and the Šempeter exit point as a result of maintenance work, there were no changes to the technical capacity at the border crossing points.

There have been changes in the average monthly occupancy rate of the technical capacity at the Ceršak entry point, where the peak occupancy of the technical capacity has been shifted from the summer to the winter months. This is a consequence of the outage of natural gas transmission for filling the natural gas storage facilities in Croatia. The maximum daily technical capacity utilisation of 52% at the Ceršak entry point was thus reached in January.

The average monthly technical capacity utilisation rate at the Ceršak entry point was 23%, which is 10 percentage points lower than a year earlier.

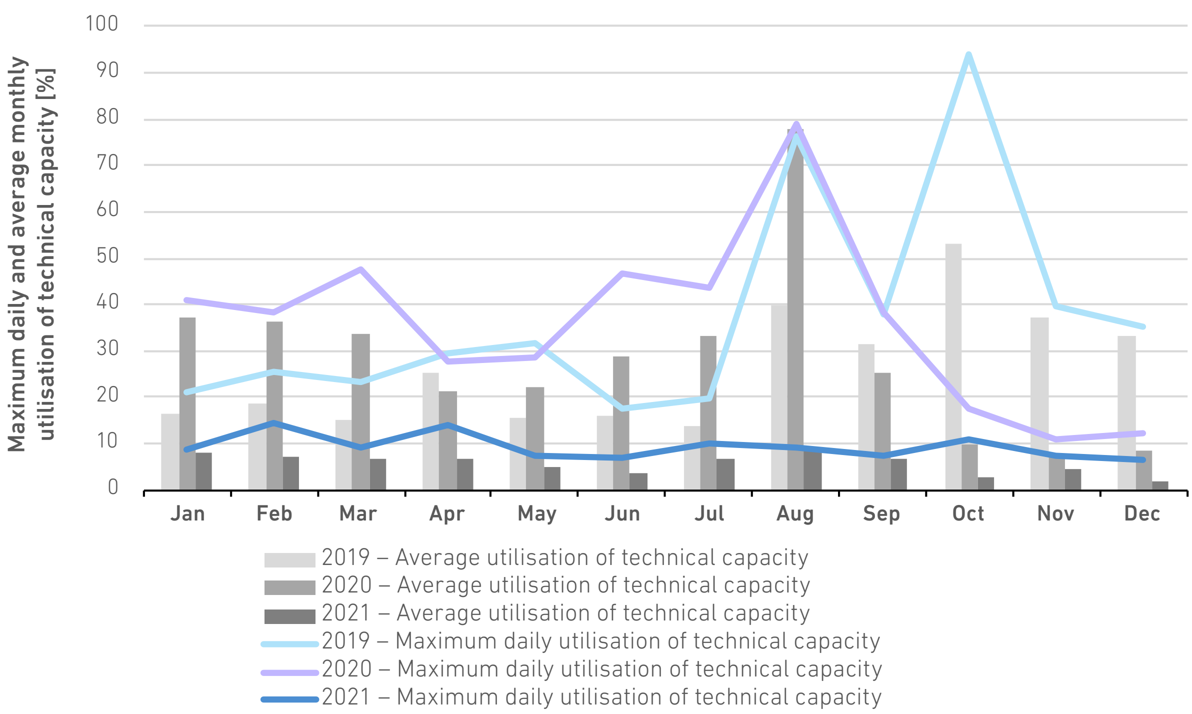
FIGURE 166: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE CERŠAK BORDER ENTRY POINT IN THE 2019–2021 PERIOD



SOURCE: ENERGY AGENCY, PLINOVODI

The maximum daily utilisation of the technical capacity of the Rogatec exit point was 14%, a decrease of 65 percentage points compared to the previous year. This was achieved in February. However, the average monthly occupancy rate at this exit point was 6%, 22 percentage points lower than the previous year.

FIGURE 167: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE ROGATEC EXIT POINT IN THE 2019–2021 PERIOD



SOURCES: ENERGY AGENCIJA, PLINOVODI

Promoting Competition

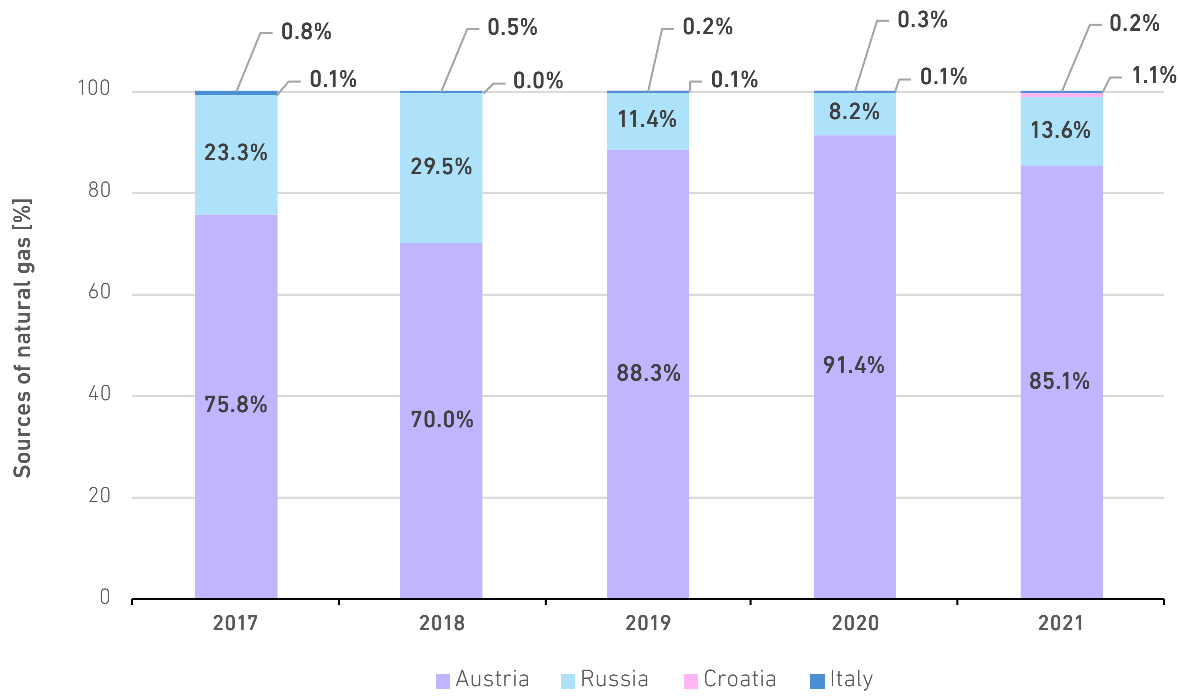
As part of its ongoing monitoring, the Energy Agency monitors developments in the field of pricing (impact factors on prices, price developments, the impact of liquidity on prices, etc.), transparency and integrity of the market (e.g. access to price information, implementation of the wholesale energy market integrity and transparency regulation) and market efficiency (openness and competition). Public publication of the results of market monitoring, in addition to other measures taken by the Energy Agency, contributes to strengthening the market and provides a high-quality energy supply service to natural gas end-customers at an optimal price. The key indicators used to assess the competitiveness, transparency and integrity of the markets concerned are highlighted below.

Wholesale Market

This chapter focuses on the assessment of market performance based on selected indicators that show the level of competition and the functioning of the natural gas market. The scope of the indicators is adapted to the size, structure and stage of development of the Slovenian natural gas market. Import dependency is certainly a specific feature, and therefore, in addition to the national market, it is also necessary to monitor the foreign markets from which the largest volumes of natural gas are supplied to Slovenia.

Slovenia does not have its own natural gas sources, natural gas storage facilities or LNG terminals, and the Slovenian wholesale market is therefore exclusively supplied by gas imported from neighbouring countries via the transmission systems of traders. The Slovenian wholesale market is supplied mainly with gas from Austria, Russia, Croatia and Italy. Figure 168 shows that Slovenian traders/suppliers still make the most use of the connection to Austria among the options described above, where they also purchase the largest volumes of gas at the Baumgarten hub and Austrian storage facilities. In 2021, 85.1% of the total natural gas imports came from Austria. The rest was imported from Russia, while the market with Italy, from where Algerian gas was also imported many years ago, has come to a complete standstill and imports from Croatia have increased to 1.1%.

FIGURE 168: SOURCES OF NATURAL GAS IN THE 2017-2021 PERIOD BY PLACE OF PURCHASE



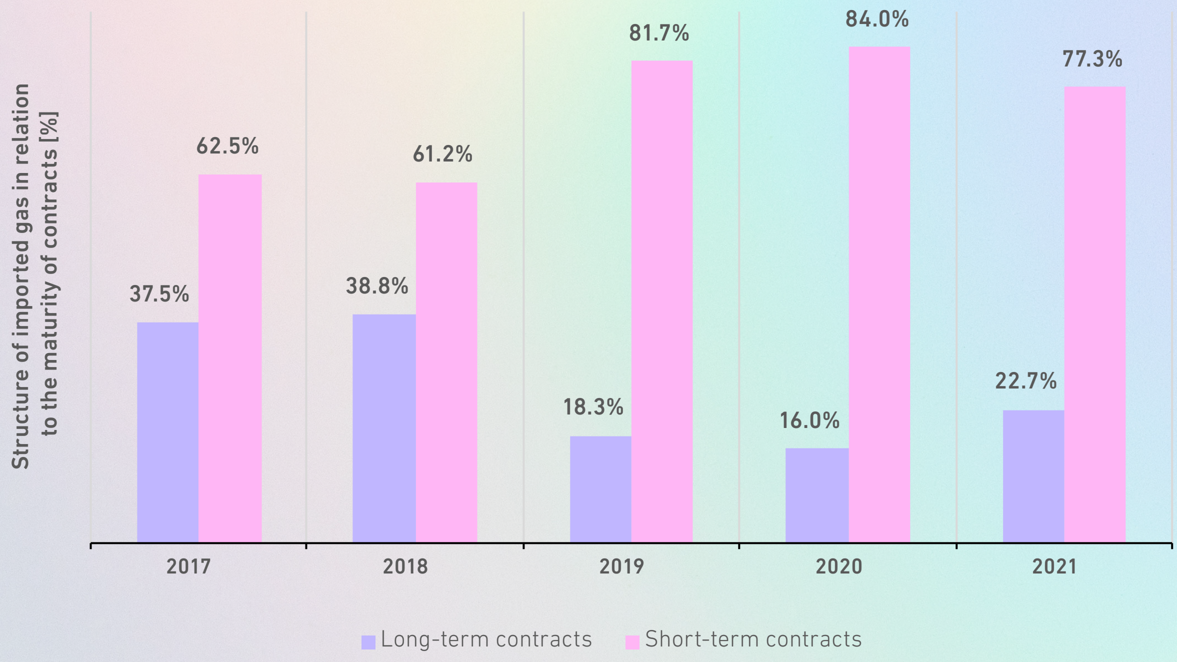
SOURCE: ENERGY AGENCY

Market liberalisation led to a decrease in the number of long-term contracts, which were typically concluded directly with natural gas producers in Russia, replaced by short-term contracts concluded at gas hubs, exchanges and other points within the EU. The dynamics of the increase in the conclusion of short-term contracts for the purchase of natural gas can be seen in Figure 169. In 2021, about 77% of this energy product was purchased through short-term contracts with a maturity of less than one year. This is a far cry from the ratio in 2016, when the ratio was almost 50%.

77.3% **of natural gas from short-term contracts**

The duration of contracts, or the ratio of short-term to long-term contracts, can have an impact on the security of supply, as in the event of a gas shortage, supply could be insufficient if all the necessary volumes cannot be purchased on the spot markets. However, the current developments on the gas markets and the war in Ukraine do not allow for any conclusions and forecasts for the future.

FIGURE 169: STRUCTURE OF IMPORTED GAS IN RELATION TO THE MATURITY OF CONTRACTS



SOURCE: ENERGY AGENCY

The quantities of natural gas traded on the Slovenian wholesale market only include those sold by suppliers to other traders or suppliers. They exclude quantities imported to supply customers on the retail market where the supplier on the retail market is also the importer of natural gas. This methodology can be used to determine the market shares and the Herfindahl-Hirschman Index (HHI) of the Slovenian wholesale market. The calculated values are presented in Table 38. The Geoplin company again had the largest market share in 2021, while Petrol retained the second largest market share. Taking retail market shares into account, it can be seen that the largest retail suppliers continue to source their natural gas independently on foreign markets, while smaller suppliers purchase from importers. Market concentration, as measured by the HHI, shows a very high degree of concentration in the Slovenian wholesale market. The value of the index still far exceeds the threshold that demarcates medium from high levels of concentration. The HHI was 5,866 in 2020 and 6,109 in 2021.

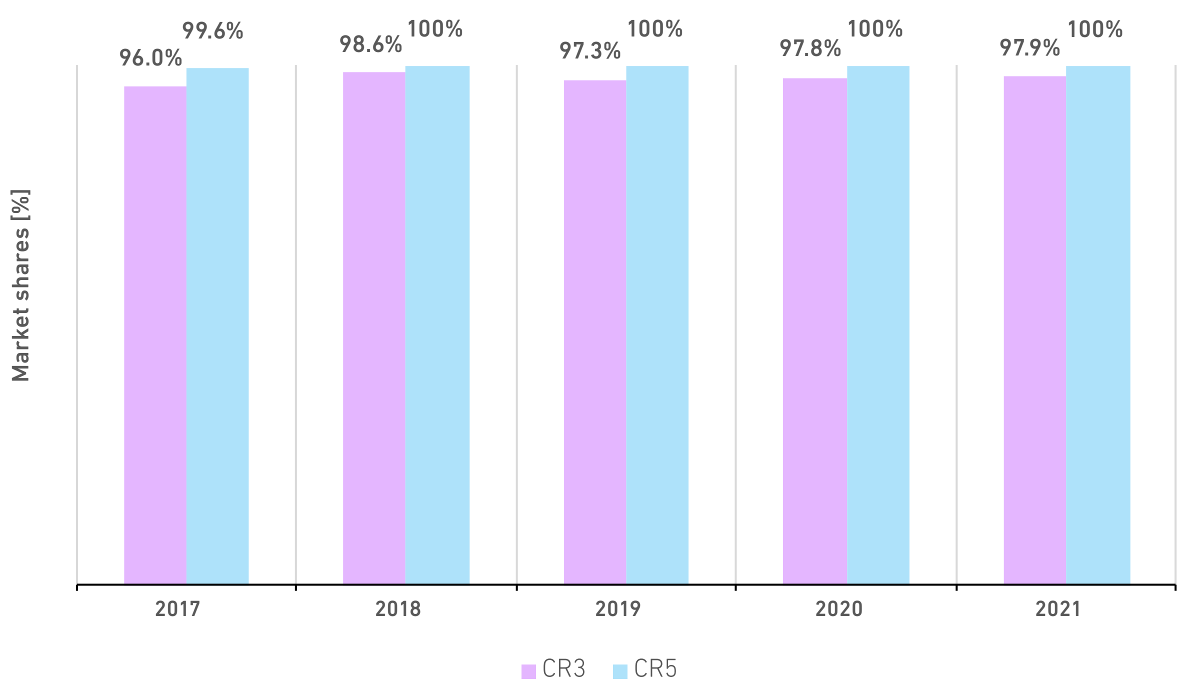
TABLE 38: MARKET SHARES AND THE HHI OF THE WHOLESALE NATURAL GAS MARKET

Company	Market share
Geoplin	75.70%
Petrol	19.09%
Energetika Ljubljana	3.14%
Plinarna Maribor	1.97%
Elektro energija	0.05%
PPD energija	0.03%
Adriaplin	0.02%
Total	**100%**
HHI of the wholesale market	**6,109**

SOURCE: ENERGY AGENCY

The high concentration level is also shown by the CR3 and CR5 indices shown in Figure 170. The CR3 index gives the three largest market shares and the CR5 index of the five largest suppliers. The three largest suppliers controlled 97.9% of the wholesale market in 2021, while the five largest suppliers controlled the entire Slovenian market. The concentration has remained virtually unchanged over the last five years.

FIGURE 170: WHOLESALE GAS MARKET CONCENTRATION



SOURCE: ENERGY AGENCY

Market Transparency

The REMIT regulation, Implementing Regulation 1348/2014, and the EA-1 provide a comprehensive legal framework to ensure price transparency on the natural gas and electricity wholesale market. This subject is addressed in more detail in the chapter about electricity market transparency.

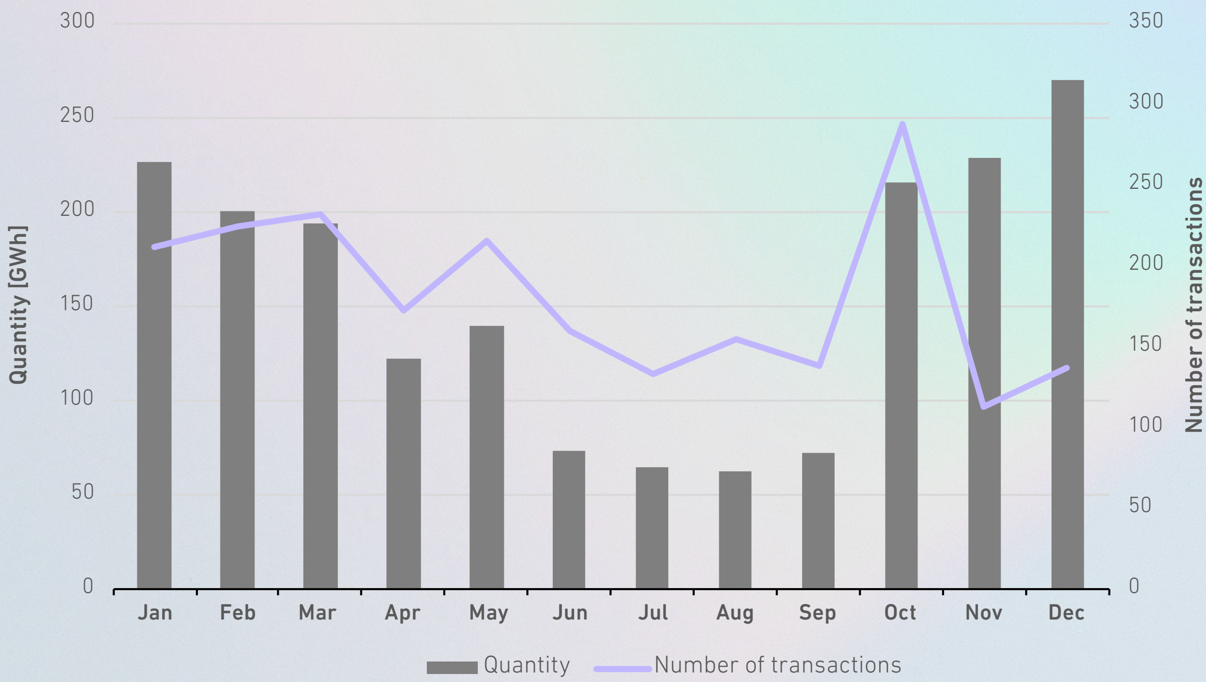
Market Effectiveness

As part of the market efficiency, the Energy Agency monitors the functioning of the virtual point managed by Plinovodi. The virtual point is used for the execution of natural gas transactions, the functioning of a trading platform for the imbalance settlement of balance group leaders, and the provision of bulletin board services.

A new record set on the free market, with
1,866.6 GWh
of natural gas exchanged

As can be seen from Figure 171, in 2021 the number of transactions on the OTC market was stable throughout the year, while the volume exchanged followed the usual seasonal fluctuations. OTC trading continues to be very popular among the market participants, with record trading volumes reported each year in recent years. 2021 was again no exception in this respect. In January 2020, the highest volume traded was 251.1 GWh on a monthly basis, while a new high of 269.5 GWh on a monthly basis was reached in December 2021. A new high was also reached on an annual basis. In 2021, the total volume exchanged was 1866.6 GWh, compared to 1694.4 GWh the year before, representing a 10.2% growth in volumes. Day-ahead trading remains the most popular, with 2,029 transactions made under the day-ahead product, 92 under the intraday product and the remaining 55 under the newly introduced monthly product. The weekly product, which was introduced together with the monthly product, did not have any transactions in 2021.

FIGURE 171: TRADING IN THE VIRTUAL POINT (FREE MARKET)



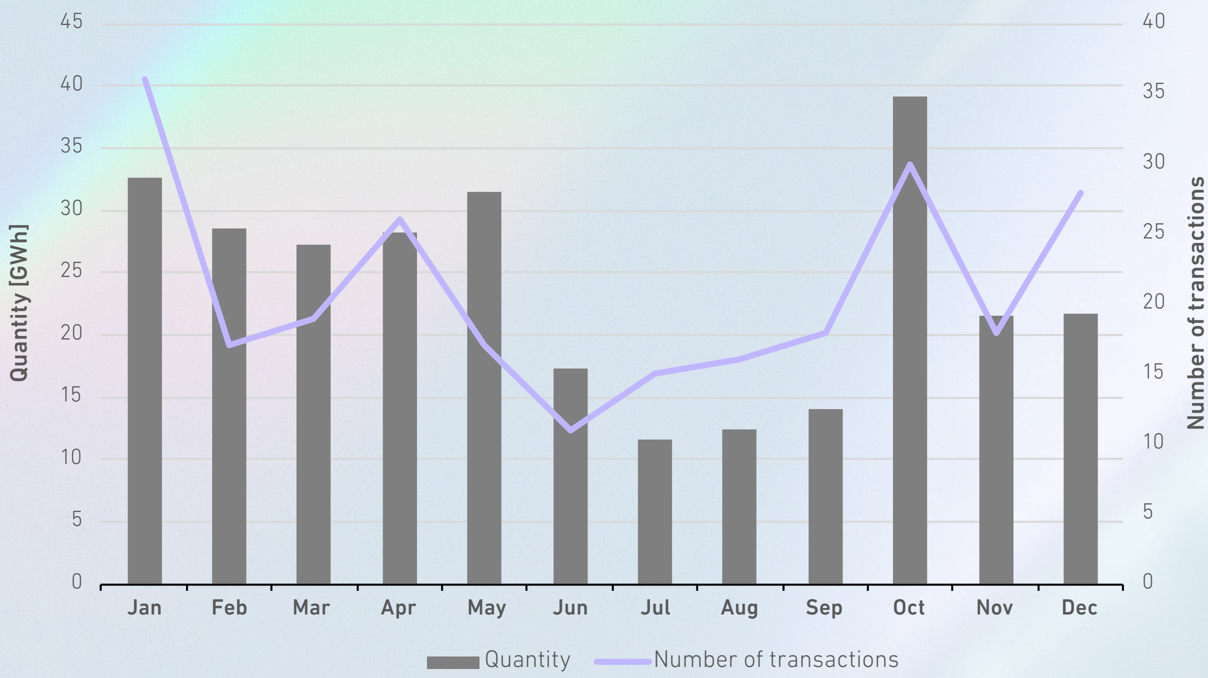
SOURCE: PLINOVODI

The virtual point also hosts a trading platform. This allows the balance group leaders to trade intraday and day-ahead natural gas volumes for balancing purposes. On the trading platform, the TSO trades natural gas volumes on an equal footing with other participants for the purpose of balancing the transmission system. If the operator cannot successfully balance the quantities in the transmission system by trading on the trading platform at the end of the billing day, it may use the system balancing service for balancing the transmission system based on an annual contract with the selected most favourable bidder.

On the basis of the trades executed, 286.2 GWh of natural gas was bought or sold on the trading platform. Compared to 2020, we saw a 14.9% decrease in volumes. The majority of these volumes, 286.1 GWh, were used by the operator to balance the transmission system, while only 150 MWh were exchanged between the balance group leaders. 286.2 GWh were exchanged on the basis of 251 trades, of which 225 trades were made on the basis of the short-term intraday standardised product and 26 on the basis of the short-term day-ahead standardised product. 225 trades were made on the basis of the short-term day-ahead standardised product.

The volumes of natural gas exchanged and the number of trades executed on the trading platform in 2021 by month are shown in figure 172.

FIGURE 172: TRADING ON A TRADING PLATFORM (BALANCING MARKET)



SOURCE: PLINOVODI

For each transaction executed on the trading platform, the price at which the natural gas was bought or sold is recorded. The index of the average price achieved on the trading platform is determined by balancing these prices with the quantities exchanged. The index is determined on a daily basis and is therefore comparable to the CEGHIX daily exchange index of the CEGH gas hub in Vienna. A comparison of the weighted average price and the CEGHIX is shown in Figure 173.

There is a strong correlation between the two indices as most of the natural gas is imported from Austria. On the trading platform, the liquidity level is lower, which is pronounced on non-trading days. The weighted average price is shown in Figure 173 together with the CEGHIX stock index.

The natural gas price on the trading platform remains correlated with the CEGHIX stock index

FIGURE 173: WEIGHTED AVERAGE PRICE ON THE TRADING PLATFORM (BALANCING MARKET) AND VALUES OF CEGHIX

SOURCES: PLINOVODI, CEGH

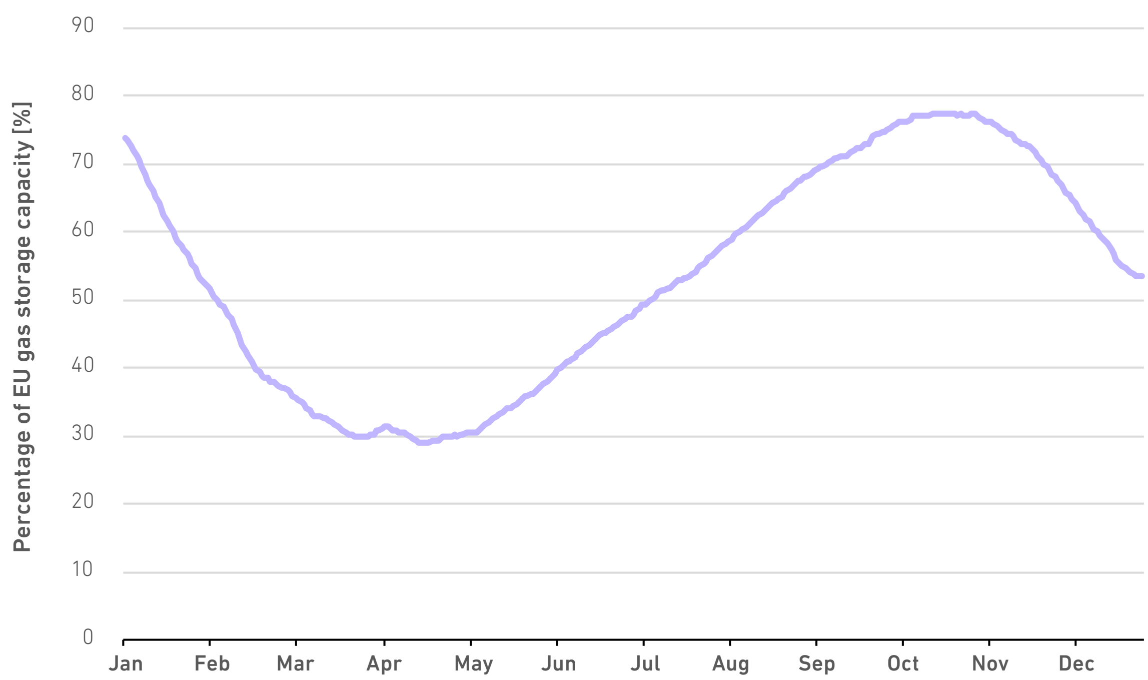
Wholesale natural gas prices have been rising for most of 2021. They started to rise in the first half of the year due to the EU's economic recovery, as supply did not adjust in time to the higher demand for natural gas for industry and electricity generation. One of the reasons for the price increase was higher prices on Asian exchanges, which affected the level of LNG imports into the EU. Wholesale natural gas prices were further pressured by the relatively empty gas storages in the EU in the second half of the year. In the second half of the year, Gazprom continued to supply natural gas to the EU under long-term forward contracts and did not opt for additional supplies under short-term forward contracts. On the other hand, EU LNG imports increased due to higher prices on European exchanges compared to Asian ones, but these imports failed to counteract the shortfall in Russian gas imports and the drawdown of stocks from natural gas storage. All this has led to concerns in the market about sufficient gas supply before the start of the new heating season.

In addition to the OTC trading and the trading platform, the virtual point includes a set of bulletin boards. This allows virtual point members to transparently post bids and asks for natural gas volumes in the Slovenian transmission system. In 2021, offers for sale were published on eight days of the year and the demand for gas purchases on a total of 18 days. The average advertised offer capacity was 187.5 kWh/h and the average demand capacity was 119,083 kWh/h.

CASE STUDY: THE IMPACT OF GAS STORAGE CAPACITIES IN THE EU ON WHOLESALE PRICES

The EU's gas storages significantly impact the evolution of wholesale natural gas prices. The total capacity of gas storages in the EU on 31 December 2021 was around 1,110 TWh[79]. As gas consumption varies seasonally and is temperature-dependent, gas storages are typically filled outside the heating season between 1 April and 1 October. On the other hand, gas is withdrawn from storages during increased temperature-dependent consumption, which occurs during the period of lower temperatures, between 1 October and 1 April. This trend is reflected in gas storage utilisation, as shown in Figure 174.

FIGURE 174: EU GAS STORAGE CAPACITY IN 2021



SOURCE: AGSI+

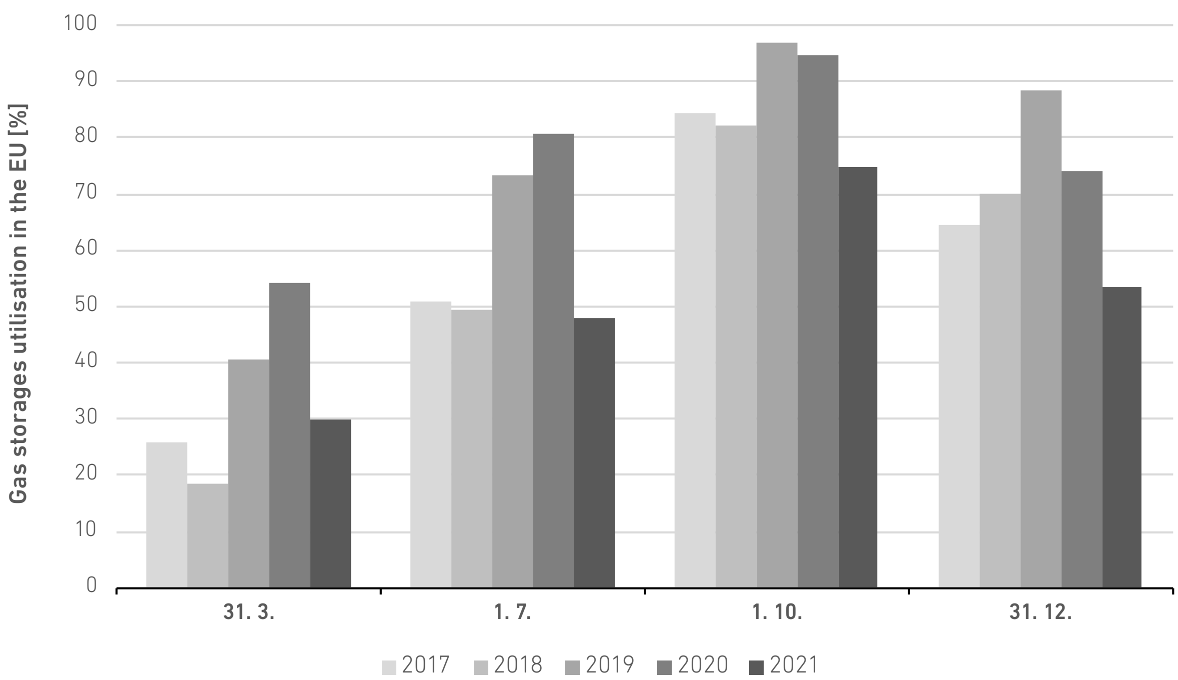
The state of gas storage capacities during the winter affects the need to import gas. If the gas storage facilities are relatively well-filled before the start of the heating season, i.e., on 1 October, this also has an impact on the wholesale price of natural gas, which is slightly lower as a result, as the well-filled gas storages cover the higher demand for this energy product during the possible prolonged period of colder weather. However, if the gas storages aren't full enough at the start of the heating season, this puts additional pressure on wholesale prices, as less gas in storage facilities may cause issues covering the total gas demand during the coldest days, especially towards the end of the heating season.

The demand for natural gas on wholesale markets outside the heating season, when temperature-dependent demand drops significantly, is also highly dependent on the state of gas storage utilisation. If the gas storages are not sufficiently full during this period, and if the demand for natural gas on the wholesale markets for the purpose of filling storage is higher, this also supports higher prices. If the situation is reversed, the pressure on the wholesale prices is reduced, as the demand for gas for the purpose of gas injection into the gas storage is also lower.

79 Aggregated Gas Storage Inventory, 2022

The EU gas storage occupancy rates on 31 March 2017, 1 July 2017, 1 October 2017, and 31 December in the 2017-2021 period are shown in Figure 175. Compared to 2020, the storage capacity utilisation at the end of the heating season on 31 March 2021 was lower by around 24 percentage points, mainly due to the higher consumption of temperature-dependent off-take due to lower temperatures. Compared to the average of the 2017-2020 period, storage utilisation in 2021 was about 4.6 percentage points lower. On 31 March 2021, the level of gas storage utilisation in the EU had already started to put additional pressure on wholesale gas prices due to the lag behind the multi-year average, indicating relatively empty storages. Halfway through the 2021 calendar year, storage utilisation was down by around 33 percentage points compared to 2020. Compared to the average for the 2017-2020 period, storage utilisation on 1 July 2021 was about 16 percentage points lower. One important reason for the relatively empty storages (after the end of the 2020/2021 heating season) was the rising natural gas prices on the wholesale markets. In addition to market concerns about a sufficient natural gas supply in the upcoming heating season and lower Russian gas imports compared to 2020 and 2019, the demand for natural gas for storage purposes was a further driver of the increase in wholesale prices. On the other hand, the relatively high natural gas prices on the wholesale markets have led to fewer injections into gas storages. The lower level of storage utilisation was also due to the filling of gas storage facilities in the EU operated by Gazprom. At the start of the 2021/2022 heating season, on 1 October, storage utilisation was down by around 20 percentage points compared to the previous year. Compared to the average for the period 2017-2020, storage utilisation was about 15 percentage points lower. At the mid-point of the heating season, at the end of the calendar year, EU gas storage utilisation in 2021 was about 21 percentage points worse than a year earlier. Compared to the 2017-2020 average, storage utilisation was also about 21 percentage points lower. Pressure on wholesale natural gas prices continued.

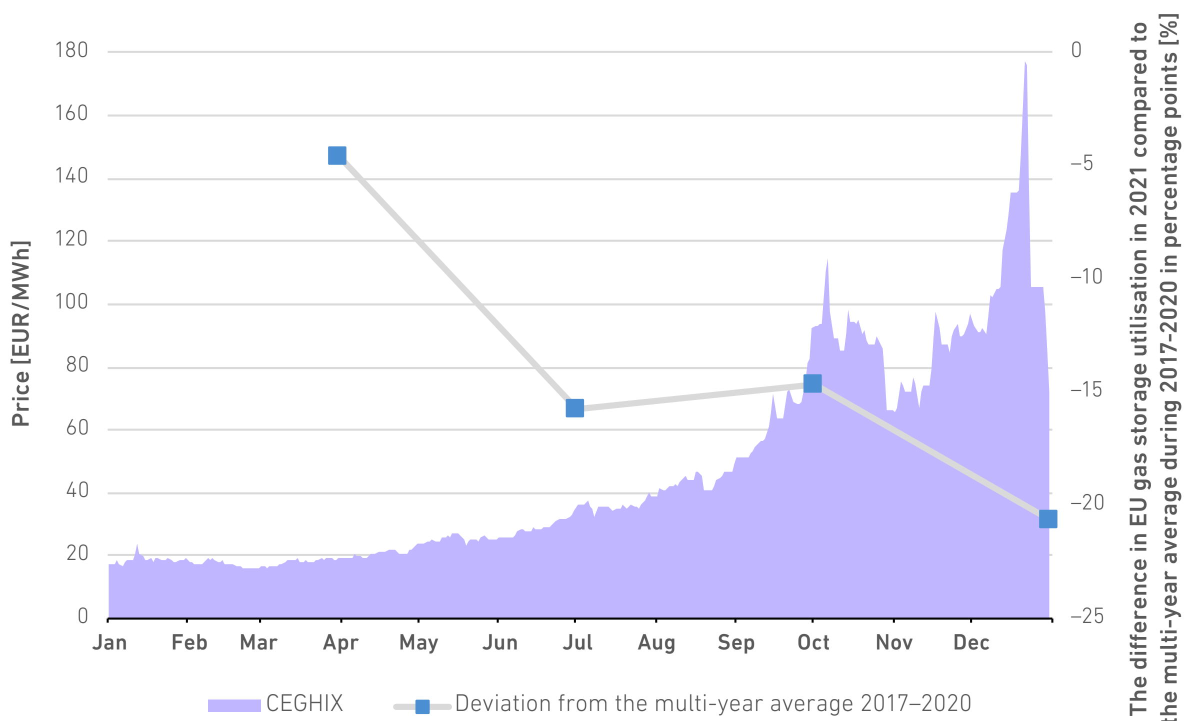
FIGURE 175: GAS STORAGE UTILISATION ON 31 MARCH, 1 JULY, 1 OCTOBER, AND 31 DECEMBER IN THE 2017–2021 PERIOD



SOURCE: AGSI+

The deviation of the EU gas storage utilisation in 2021 from the multi-year average over the 2017-2020 period is shown in percentage points in Figure 176, together with the evolution of the CEGHIX index on the Austrian CEGH exchange. A negative value indicates a lower utilisation, while a positive value indicates a higher utilisation. It can be concluded that the utilisation of gas storages in the EU in 2021 compared to the multi-year average in 2020 decreased inversely to the increase in prices on the wholesale markets for most of the year. The higher the natural gas prices on the wholesale markets, the more the level of utilisation of gas storage in the EU was lagging behind the multi-year average. With the increase in wholesale prices and the expectation that high gas prices are only a short-term transitory phenomenon, storage users have injected less gas into the storages in the off-peak period, as opposed to previous years, which resulted in a much lower storage utilisation at the start of the 2021/2022 heating season. The high gas prices were maintained or continued to rise during the heating season, so there was no additional injection of gas into the storages. Still, gas withdrawals from storages to meet gas demand increased during this period. On the other hand, the lower levels of gas storage utilisation at the start of the heating season introduced concerns in the wholesale markets about the sufficiency of natural gas demand, which put additional pressure on wholesale natural gas prices.

FIGURE 176: THE DIFFERENCE IN EU GAS STORAGE UTILISATION IN 2021 COMPARED TO THE MULTI-YEAR AVERAGE DURING 2017-2020 IN PERCENTAGE POINTS AND THE EVOLUTION OF THE CEGHIX INDEX



SOURCE: ENERGY AGENCY

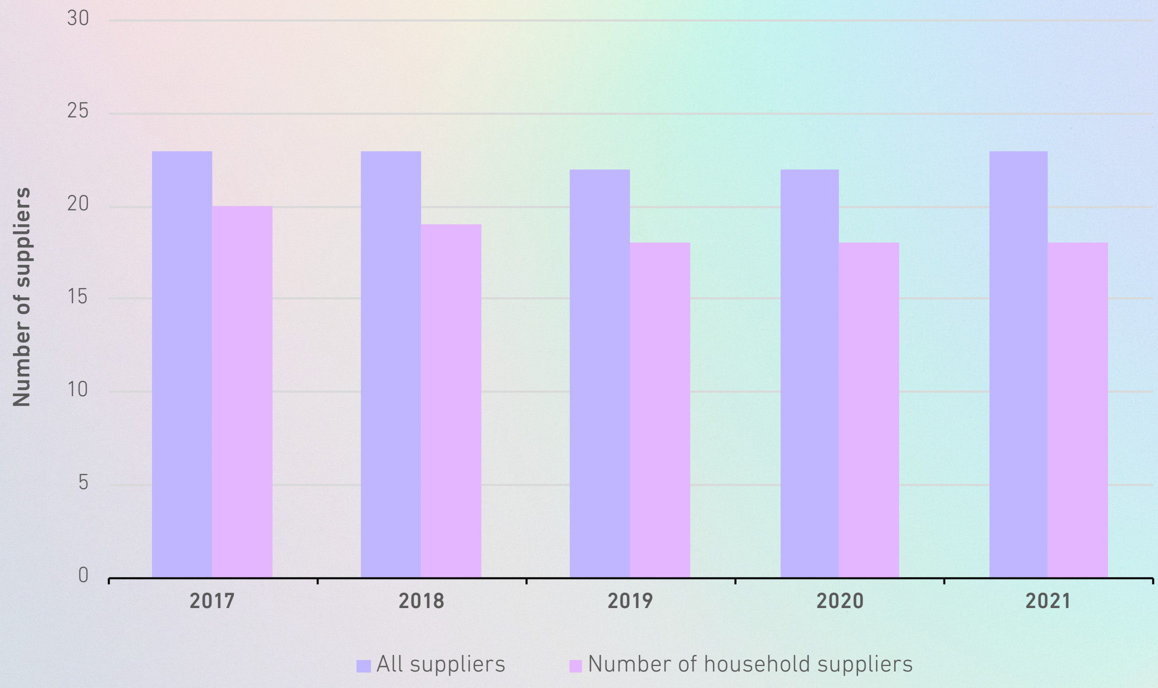
Retail Market

In 2021, 23[80] natural gas suppliers were active on the Slovenian retail market, supplying natural gas to household and business consumers connected to the distribution and transmission systems on the basis of concluded contracts. Compared to a year earlier, a new supplier, PPD Energija, entered the retail market and started supplying business customers in the second half of the year. There were no exits from the retail market in 2021. Of these 23 suppliers, 18 suppliers offered natural gas to household consumers. Consumers can choose among offers of supply companies offering natural gas in their local community. Individual natural gas suppliers, smaller in terms of the annual supply volume, supply natural gas to consumers only in local communities, where they also carry out natural gas distribution activities under the same company.

23 suppliers of natural gas on the retail market

Consumers pay for the natural gas delivered on a monthly basis according to the actual quantity measured by the relevant meters or, in the absence of an operator with measuring device reading, on the basis of the estimated consumption[81].

FIGURE 177: NUMBER OF SUPPLIERS ON THE RETAIL MARKET IN SLOVENIA IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY

In the five-year period, there were no significant changes in the number of suppliers on the market, as the number of active suppliers has consistently fluctuated between 22 and 23.

The variety and abundance of offers were low. At the end of 2021, more than two-thirds of suppliers supplying household consumers only offered natural gas on the basis of so-called regular offers[82], which do not require a time commitment for the supply period or other conditions to be met, and the customer can switch supplier at any time without paying a contractual penalty. Special or package offers, which may be limited to a specific consumer range, and which, as a general rule, contain contractual penalties if the consumer terminates the contract early, have occasionally been offered only by individual suppliers.

80 The Energy Agency considered as suppliers those companies that are members of the balance group or balance sub-group.
81 Calculated on the basis of the provisions of the Methodology for the prognosis of non-daily metered off-takes of users of the natural gas network.
82 After the termination of the regular price list definition under the EZ-1, these are offers that are accessible to all consumers and do not contain any requirements for meeting specific conditions (bindings, penalties, etc.).

Natural Gas Prices in the Retail Market

The Energy Agency actively monitors the prices in the retail market on the basis of public data and market data from household and small business consumers, which are obtained from suppliers in the framework of benchmarking services of the single contact point.

The gas prices in the supply offers depend mainly on the business decisions of each supplier and on the purchasing conditions provided by suppliers during trading. The level of the purchase price paid by the supplier is influenced by several factors. Thus, the natural gas prices depend on the characteristics of gas purchase contracts, developments in oil and petroleum prices, developments in foreign currency exchange rates, weather effects, international stock markets, and market competition.

Retail Price Index

As part of its monitoring of the relevant market, the Energy Agency determines the Retail Price Index (RPI). The RPI is based on the cheapest offer available on the market, accessible to all consumers, which allows consumers to switch supplier without contractual penalties for an unlimited period of time. It only reflects the price potential, not the realised price based on the contracts concluded.

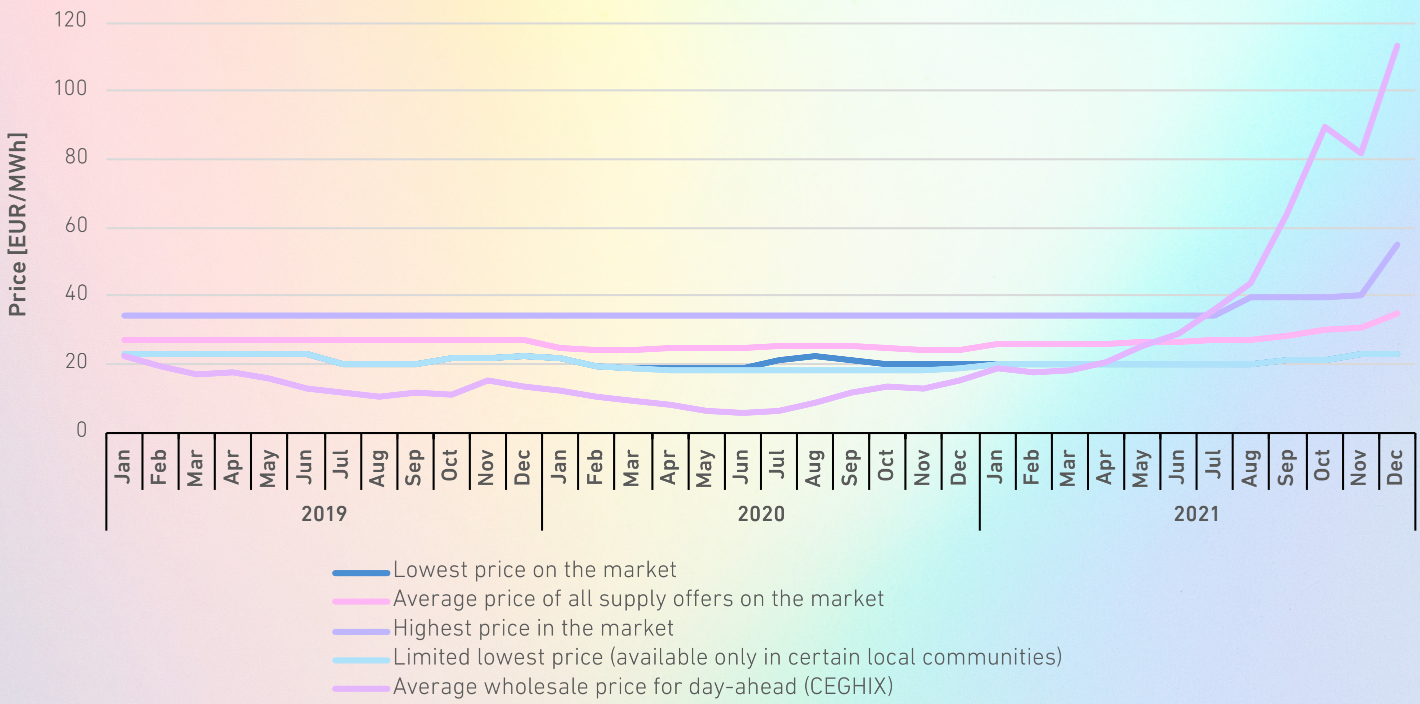
15% interim increase in the price of the best offer on the retail market

Figure 178 shows the trend in the following prices for a typical household consumer:

- limited lowest price (available only in certain local communities),
- the lowest price in the market,
- the average price of all offers in the market, and
- the highest price in the market.

In the first eight months of 2021, the minimum retail prices for natural gas remained almost unchanged. In September, the minimum price started to increase, followed by a further increase in the minimum price in November. At the end of the year, the lowest price offered was 15% higher than at the beginning of the year. Throughout the year, the lowest supply price in the market was available to a wider range of local authorities. The increase in retail prices was driven by the increase in wholesale prices in the wholesale natural gas markets in Europe. The latter started to accelerate in the second quarter, and the predominantly upward trend in price movements continued until the end of the year. At the beginning of 2021, at the end of the first trading day, the settlement price of natural gas on the day-ahead wholesale market at the Baumgarten gas hub in Austria was €17.039/MWh. These futures contracts ended the year with a settlement price of €72,345/MWh. On average, wholesale prices at the Baumgarten gas hub in Austria in 2021 for day-ahead futures contracts were around 367% higher than in 2020. Wholesale prices are usually passed on to the retail market with a lag of approximately six months, which to some extent reflects the evolution of the lowest price on the market. In the face of rising wholesale prices, suppliers had not been replacing expiring promotional offers with comparable offers, and a reduction in the number of promotional offers in the market had also been observed. The lowest retail price on the market at the end of 2021 ranged between €23 and €24 per MWh. These prices were very likely the result of individual suppliers' booking volumes for their consumers' expected consumption before the price increase in the wholesale markets.

FIGURE 178: RETAIL PRICE INDEX AND SOME TYPICAL NATURAL GAS PRICES WITHOUT THE NETWORK CHARGE, DUTIES, AND VAT IN THE 2019–2021 PERIOD



SOURCE: ENERGY AGENCY

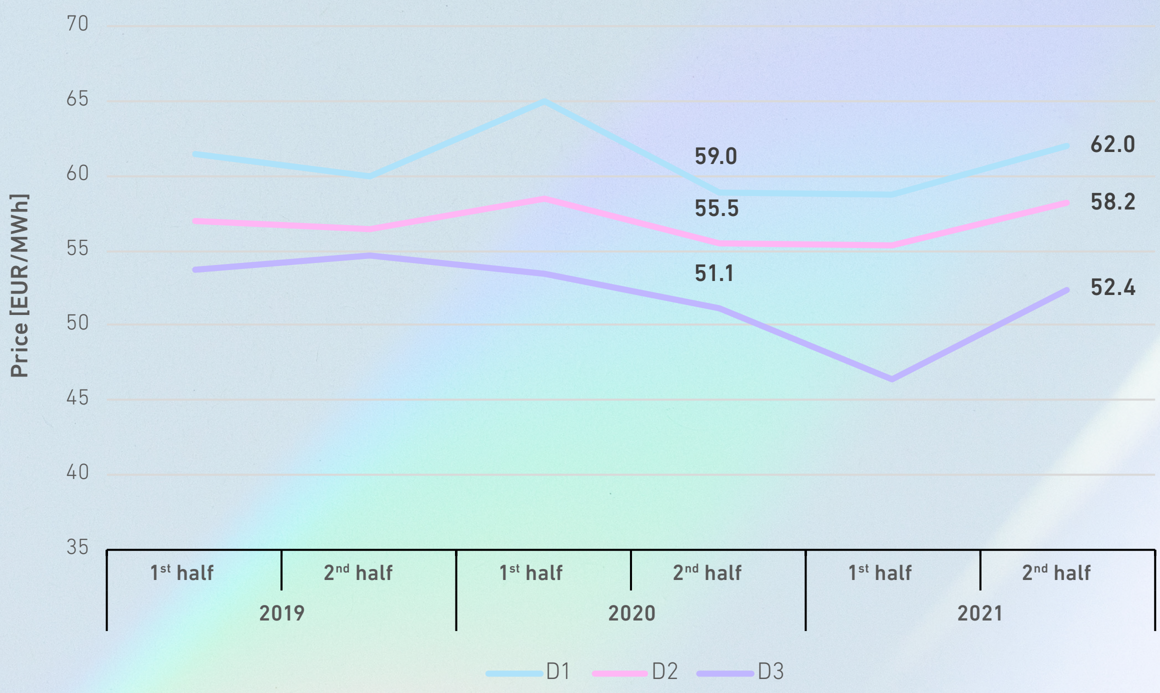
No significant price changes in the suppliers' offers could be detected until August. Adriaplin offered the lowest supply price available in all local communities during this period, Energetika Ljubljana offered the lowest price from September to November, and E.ON from November onwards. The dynamics of the transmission of rising natural gas prices from the wholesale market to the retail market is best seen in the evolution of the highest price in the market, which started to rise in July and continued to rise until the end of the year. The faster responsiveness in the case of peak price increases on the retail market may be mainly due to the composition of the portfolios of individual suppliers, which had shorter positions or a relatively high degree of portfolio openness and were, therefore, more exposed to changes in wholesale natural gas prices in the case of short-term forward contracts. The growth in retail prices itself is well reflected in the growth in the average price of all bids on the market, which recorded a 35% interim increase.

35% interim increase in the average price of natural gas

Final Prices of Natural Gas

Figure 179 shows the evolution of the price of natural gas, including all taxes and charges for household consumers in the 2019-2021 period. Compared to the second half of 2020, prices for all household consumer groups decreased in the first half of 2021. In the second half of 2021, however, final prices for all household consumer groups increased significantly compared to the first half of 2021. The most pronounced price increase occurred in the large household consumer group D3. In the second half of the year, prices for these consumers were 12.8% higher compared to the first half of the year.

FIGURE 179: FINAL NATURAL GAS PRICES FOR HOUSEHOLD CONSUMERS IN SLOVENIA WITH ALL TAXES AND DUTIES IN THE 2019-2021 PERIOD

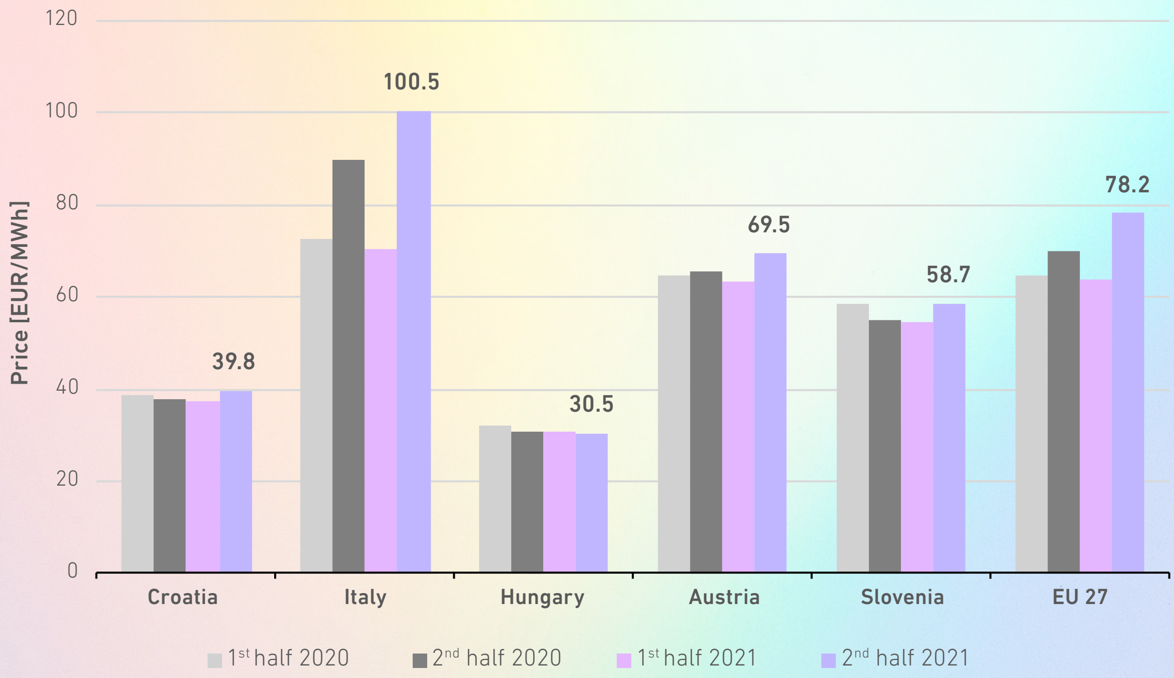


SOURCE: STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

Figure 180 shows the evolution of the final natural gas prices with all taxes and duties in 2020 and 2021 for a typical D2 household natural gas consumer in Slovenia and neighbouring countries. Final natural gas prices in Slovenia in 2021 remained comparable on an annual basis compared to the previous year, though a semi-annual view reveals that the decrease in the final price in the first half of the year was followed by an increase in the final price of natural gas in the second half of 2021. Final natural gas prices for typical household consumers in Slovenia continue to remain below the EU average. In all neighbouring countries, with the exception of Hungary, natural gas prices have increased on an annual basis. The largest price increase was recorded in Italy, where the price increased by more than 5% on an annual basis compared to 2020. Again, a semi-annual view reveals a decrease in the final price in the first half of the year, followed by an increase in the final price of natural gas in the second half of 2021. The above trend can also be seen in Figure 180 for the other countries except for Hungary and is the result of the pass-through of higher wholesale prices to the retail market.

The final price of natural gas for household consumers remains below the average EU-27 prices

FIGURE 180: FINAL PRICES OF NATURAL GAS FOR TYPICAL HOUSEHOLD CONSUMERS D2, INCLUDING TAXES AND LEVIES, IN SLOVENIA AND IN NEIGHBOURING COUNTRIES IN 2020 AND 2021

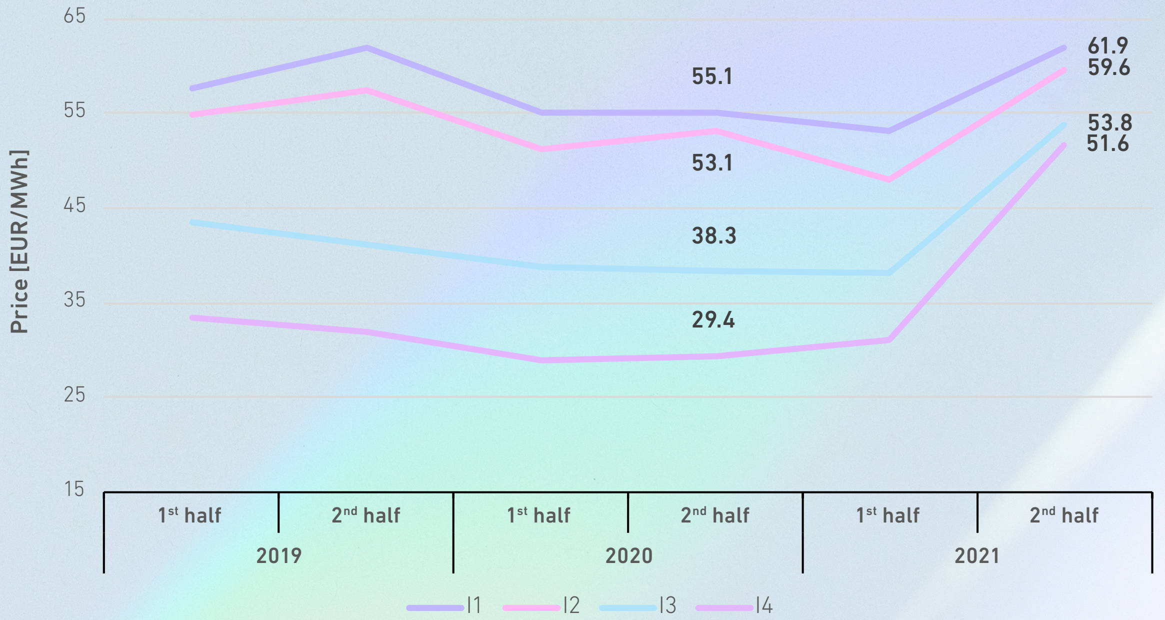


SOURCE: EUROSTAT

Figure 181 shows the evolution of the final price of natural gas including all taxes and charges for business consumers over the 2019-2021 period. Compared to the second half of 2020, prices in the first half of 2021 were lower for all consumer groups except for the largest group I4. In the second half of 2021, prices increased compared to the first half of 2021 for all consumer groups. The most pronounced half-yearly increase was recorded for group I4, at 65.7%. The interim increase in the final price of natural gas for this customer group was 41.9%. The data suggests that price fluctuations in the wholesale market are first and most significantly passed on to larger business consumers.

A 41.9% increase in the final price of natural gas for business consumer in consumption group I4

FIGURE 181: FINAL PRICES OF NATURAL GAS FOR BUSINESS CONSUMERS IN SLOVENIA, INCLUDING TAXES AND LEVIES, IN THE 2019–2021 PERIOD

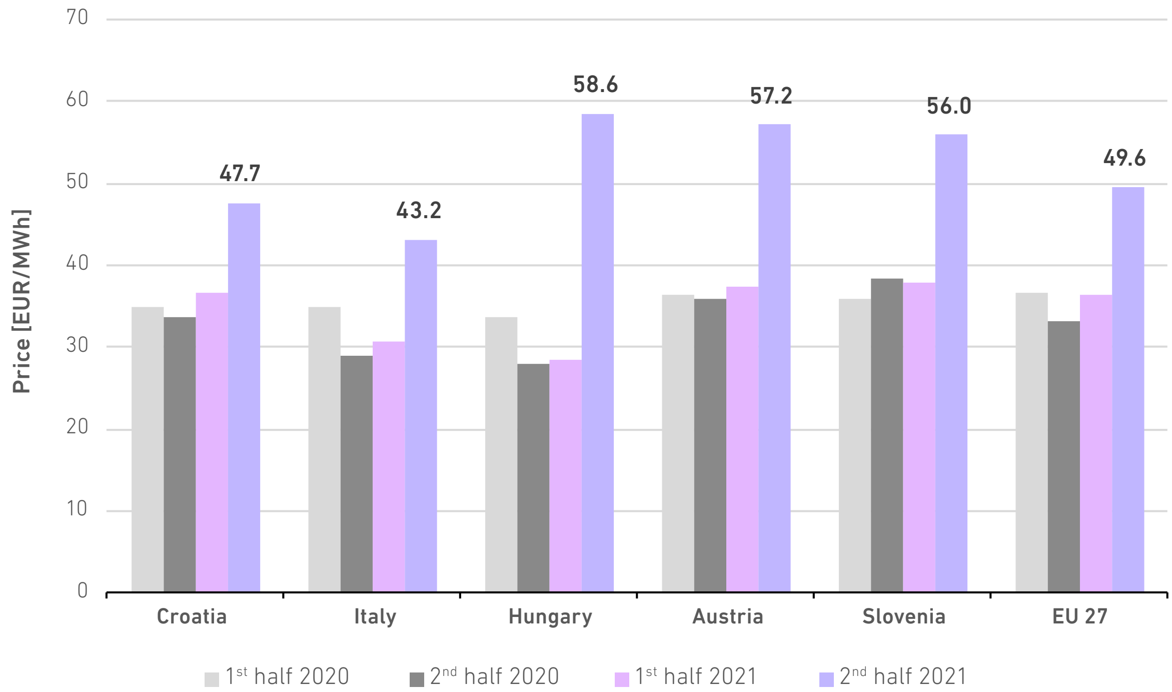


SOURCE: STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

Figure 182 shows the natural gas price trend with all taxes and levies in 2020 and 2021 for typical business consumers I3 in Slovenia and neighbouring countries. For these consumers, the final price of natural gas in Slovenia increased by more than 26% on an annual basis, while the interim increase in the second half of the year compared to the first half of the year amounted to 48.1%. The final price of natural gas for a typical business consumer was 8.9% above the EU average. Compared to a year earlier, the final prices were also higher in all neighbouring countries. On an annual basis, final natural gas prices increased the most in Hungary, by around 41%; the latter also experienced the highest interim increase, with the final prices rising by around 106% in the second half of the year compared to the first half. Business consumers in Italy experienced the smallest price increase.

The final gas price for business consumers was above the average EU-27 prices

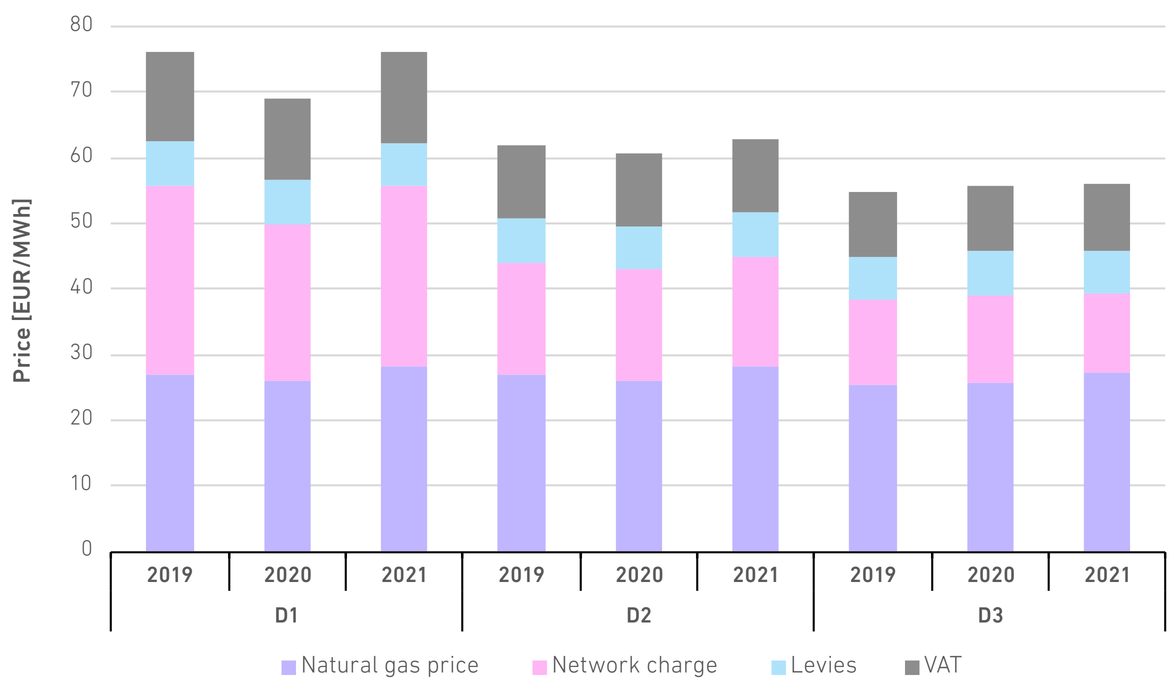
FIGURE 182: FINAL PRICES OF NATURAL GAS FOR TYPICAL BUSINESS CONSUMERS I3, INCLUDING TAXES AND LEVIES, IN SLOVENIA AND IN NEIGHBOURING COUNTRIES IN 2020 AND 2021



SOURCE: EUROSTAT

Figures 183 and 184 show the structure of the final price for typical residential and commercial consumers connected to the distribution systems in the 2019-2021 period.

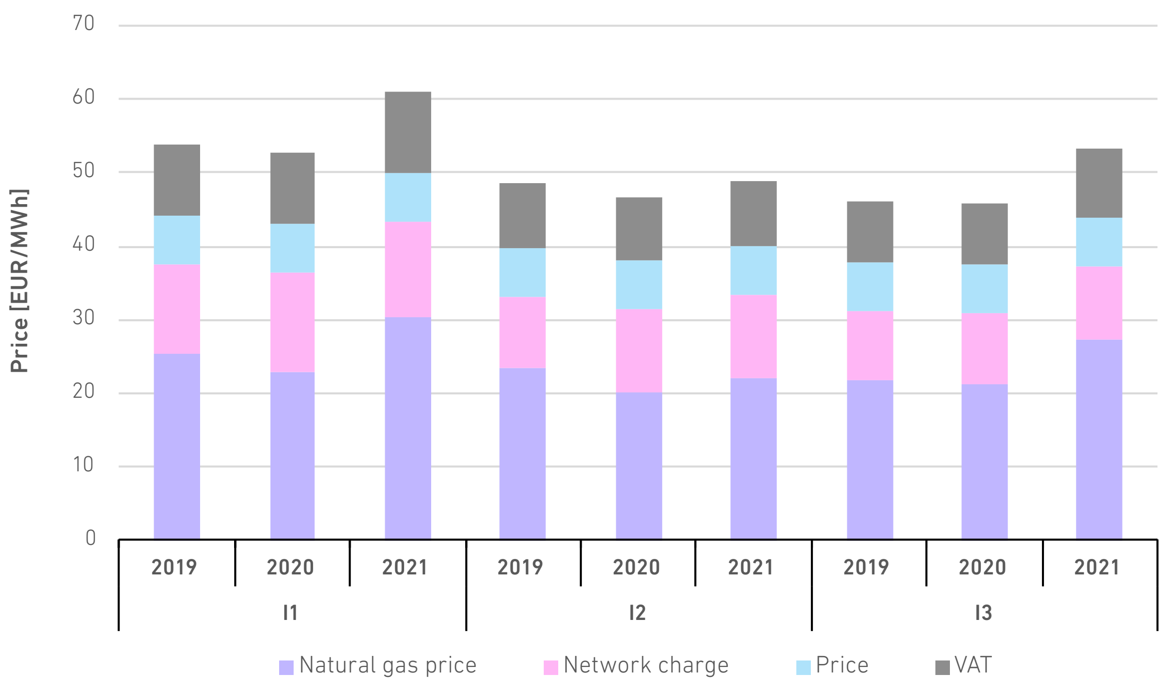
FIGURE 183: STRUCTURE OF THE FINAL NATURAL GAS PRICE FOR HOUSEHOLD CONSUMERS IN THE 2019–2021 PERIOD



SOURCES: SUPPLIERS

In the structure of the final price of natural gas for household customers in groups D2 and D3, the percentage of the energy price component increased in 2021 compared to the previous year. The increase in group D2 was 1.8 percentage points, while the increase in group D3 was 2.9 percentage points. The percentage of the network charge component of the final price decreased in both customer groups, by 1.3 percentage points in group D2 and by 2.9 percentage points in group D3. On the other hand, in the structure of the final price of natural gas for household consumers D1, the share of the energy price component in 2021 decreased by 0.8 percentage points compared to a year earlier, while the share of the network charge component increased by 1.7% point. In groups D1 and D2, a change in the share of the levy component in the final price was also observed. The share of charges in the final price of natural gas decreased by 0.9 percentage points for group D1, and by 0.4 percentage points for group D2.

FIGURE 184: STRUCTURE OF THE FINAL NATURAL GAS PRICE FOR HOUSEHOLD CONSUMERS IN THE 2019–2021 PERIOD



SOURCES: SUPPLIERS

In the structure of the final price of natural gas for business consumers, the percentage of the energy price component has increased in 2021 compared to the previous year for all consumer groups. The increase was 6.1 percentage points for group I1, 2.1 percentage points for group I2 and 4.7 percentage points for group I3. On the other hand, the share of network charges in the structure of the final price of natural gas for business consumers for all groups decreased compared to the previous year, with decreases of 4.3 percentage points for group I1, 1.4 percentage points for I2 and 2.7 percentage points for I3. The share of charges in the final price of natural gas for business consumers also decreased. The reductions were 1.8 percentage points for group I1, 0.6 percentage points for I2 and 2 percentage points for group I3.

CASE STUDY: DIFFICULTIES IN CONCLUDING NEW CONTRACTS FOR THE SUPPLY OF NATURAL GAS TO COLLECTIVE BOILER ROOMS

The first difficulties in concluding new natural gas supply contracts for the supply of collective boiler rooms were detected in the last third of 2021 when individual apartment block managers started to collect bids for the supply of natural gas for the next 12-month period for collective boiler rooms. Due to the increase in natural gas prices in the wholesale markets from the end of the 2020/2021 heating season onwards, the gas prices in the suppliers' bids in autumn were already significantly higher than the prices at which gas was supplied to individual household consumers during the same period. This led some managers or occupants of these dwellings to delay accepting new offers from suppliers in anticipation of falling prices. Still, market conditions continued to push up the gas prices offered by suppliers. In the past, managers generally entered into supply contracts with suppliers as business customers, and some also included in the contract several apartment blocks under management, as this allowed them to receive individual negotiations, which were generally able to lower the price of gas compared to the publicly published price lists for individual household consumers. The classification of collective boiler rooms between household and business consumption was not regulated by legislation, so different classifications were possible.

In the last quarter of 2021, suppliers were already offering significantly higher gas prices to managers and other large business consumers than the gas prices for household consumers in the publicly published price lists, which led to discussions in the media about the alleged inadequate treatment of household consumers in apartment blocks with a collective boiler room, which are treated as business consumers by suppliers. The managers of apartment blocks wanted the collective boiler rooms to be classified as household consumption, as they considered that this would mean buying gas at a lower price or the price of the publicly announced offers. At the same time, some suppliers urged the managers to conclude the contract for the following year as soon as possible in order to be able to purchase gas on the wholesale markets in time. The Energy Agency worked with the Ministry of Infrastructure to resolve this issue. Several solutions were proposed, which suggested that the classification of collective boiler rooms as household consumption could only be achieved through a change in legislation. At the same time, it was recognised that the changing gas market conditions did not guarantee a low gas price for anyone.

The efforts of the managers of apartment blocks to classify the consumption points of these dwellings as household consumption have not been fully resolved even with the adoption of the Act Determining Emergency Measures to Mitigate the Consequences of the Impact of High Energy Commodity Prices (Official Gazette of the Republic of Slovenia, No 29/22), as this Act has raised new issues related to the supply of collective boiler rooms. At the end of 2021, the situation for individual household consumers started to change as well, as suppliers with lower gas prices could no longer accept new customers and offer them cheaper supplies; new offers with much higher prices started to appear for new customers. For example, the highest gas price offered to new household consumers in early 2022 was already €125/MWh, which is 4.6 times the lowest price at which gas was supplied to household consumers on the basis of the lowest-priced offer during the same period. The supply price for existing individual household consumers had also reached €122/MWh for the most expensive supplier at the beginning of the new year.

The rest of 2022 will show whether the large price differentials are just a transitional period until the supply prices offered are likely to be much more equal and at the same time higher than we have been used to. High natural gas prices may have a longer-term impact on future gas use, as more and more consumers may decide to switch permanently to another energy source before the end of the year.

Market Transparency

The Financial Transparency of Suppliers and the Transparency of Bills

As part of its market monitoring, the Energy Agency analyses suppliers' annual reports and sample bills, and prepares relevant internal reports for decision-making purposes. The transparency of bills is systemically regulated on the basis of the legislation in force. The bill for natural gas supplied thus shows separately the amounts for natural gas consumed, the network charge (distribution and metering), the energy efficiency contribution, the RES and CHP contribution, the environmental levy (CO_2 tax), the excise duty and the VAT.

Based on its analysis of the situation, the Energy Agency considers that the legislation in force ensures a high level of transparency in the calculation of the cost of supply.

The Obligation to Publish Supply Offers

Suppliers must provide household and small business consumers with transparent information on their offers for the supply of natural gas and the related applicable price lists, as well as the general contract terms and conditions for the supply service.

The Energy Agency's Activities for Providing Transparency

The Energy Agency regularly monitors the functioning of the natural gas retail market, including the number and characteristics of published offers, focusing on prompt action in the event of identified controversial practices. Data on current offers and any changes in the characteristics of these offers are provided by the obliged parties to the Energy Agency on a monthly basis and used by the Energy Agency for electronic services in the framework of the single contact point, in accordance with the ZOEE. With the aim of ensuring transparency in the natural gas retail market, the Energy Agency's website provides users with comparative e-services, among which is the online application for the comparison of natural gas supply costs (cost comparator). The application allows the calculation and comparison of the natural gas supply amount for each consumption profile based on the offers entered in the web application by suppliers. The Energy Agency also provides an e-Invoice Check service, which allows users to check the correctness of the bill for the gas supplied according to the selected offer and consumption profile. The monthly calculation is displayed separately by the billing component. Users of the comparison services had access to all the price lists or basic information on all suppliers' offers. Users of the cost comparator have the possibility, among other things, of quickly accessing individual price lists and the general contract terms and conditions of suppliers.

The analysis of the use of benchmarking services in the field of natural gas supply is set out in the chapter Ensuring the Transparency of the Retail Electricity Market. The analysis of the number of comparisons and bill checks carried out confirmed the increased interest of consumers, with a 20% increase in the number of comparisons carried out compared to 2020, and a 73% increase in the number of consumers carrying out comparisons.

Increased consumer interest in using comparative natural gas supply cost services

Market Effectiveness

The Energy Agency monitors the efficiency and competitiveness of the retail natural gas market based on the continuous collection of data submitted by reporting entities (suppliers).

Market Shares and HHI of the Natural Gas Retail Market

Supply of Natural Gas to end consumers

Table 39 shows the market shares of suppliers to all end consumers on the natural gas retail market in Slovenia.

TABLE 39: MARKET SHARES AND HHI OF SUPPLIERS TO ALL END CONSUMERS IN THE NATURAL GAS RETAIL MARKET

Supplier	Delivered energy (GWh)	Market share
Geoplin	4,348	43.4%
GEN-I	1,186	11.8%
Energetika Ljubljana	1,086	10.8%
Petrol	930	9.3%
Adriaplin	892	8.9%
Plinarna Maribor	665	6.6%
Goodyear Slovenija	157	1.6%
ECE	145	1.4%
Energetika Celje	143	1.4%
Enos	108	1.1%
Energija plus	95	1.0%
Other small suppliers	269	2.7%
Total	**10,023**[83]	**100.0%**
HHI of the retail market		**2,364**

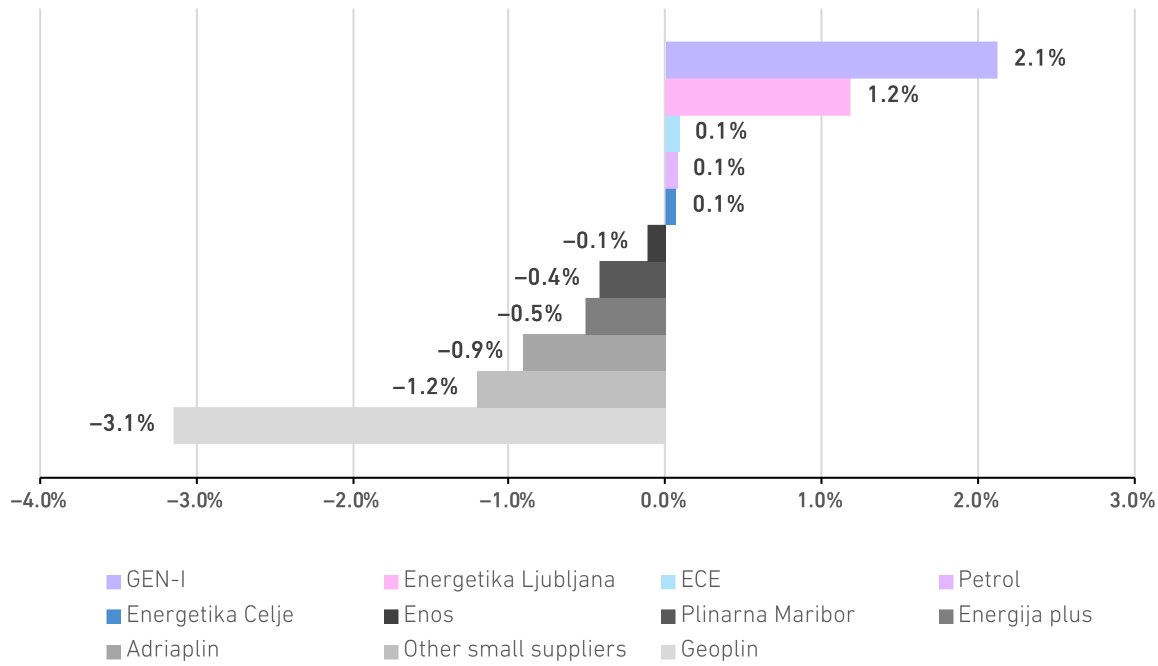
SOURCE: ENERGY AGENCY

The HHI value shows that the retail market is highly concentrated (the HHI is more than 1800). Compared to 2020, the HHI value decreased by 227, indicating a slightly more competitive market. Among all suppliers, only five managed to increase their market share in 2021, of which GEN-I and Energetika Ljubljana increased their market share by more than 0.1%, which had the effect of reducing the market share of the still largest supplier, Geoplin. Year-on-year changes in the suppliers' market shares are shown in Figure 185.

The natural gas retail market remains highly concentrated

83 The difference between the total and the individual supplier totals is due to rounding to one decimal place.

FIGURE 185: CHANGES IN MARKET SHARES IN THE END CONSUMERS MARKET IN 2021 IN COMPARISON TO 2020



SOURCE: ENERGY AGENCY

The Supply of Natural Gas to Business Consumers

Market shares of natural gas suppliers in the retail market for business consumers in 2021 are presented in Table 40.

TABLE 40: MARKET SHARES AND HHI OF SUPPLIERS TO ALL BUSINESS CONSUMERS IN THE NATURAL GAS RETAIL MARKET

Supplier	Delivered energy (GWh)	Market share
Geoplin	4,348	49.9%
GEN-I	913	10.5%
Petrol	777	8.9%
Adriaplin	760	8.7%
Energetika Ljubljana	726	8.3%
Plinarna Maribor	486	5.6%
Goodyear Slovenija	157	1.8%
ECE	123	1.4%
Enos	104	1.2%
Energetika Celje	89	1.0%
Other small suppliers	226	2.6%
Total	**8,709**	**100.0%**[84]
HHI of the retail market		**2,872**

SOURCE: ENERGY AGENCY

84 The difference between the total and the individual supplier totals is due to rounding to one decimal place.

The HHI shows that the retail market is highly concentrated (the HHI is more than 1,800). In the business retail market, the HHI in 2021 also decreased, namely by 238, and the HHI reached a lower value than the one reached, for example, at the end of 2019, when it was 2,944. GEN-I and Energetika Ljubljana gained the largest share in the market for supplies to business consumers. In addition to these two suppliers, only Energetika Celje managed to increase its market share. Geoplin, the largest supplier, lost the largest part of its market share. In addition to the above-mentioned supplier, Plinarna Maribor and Adriaplin also suffered a major loss of market share.

The Supply of Natural Gas to Household Consumers

The market shares of natural gas suppliers in the retail market for household consumers in 2021 are presented in Table 41.

TABLE 41: MARKET SHARES AND HHI OF SUPPLIERS TO ALL HOUSEHOLD CONSUMERS IN THE NATURAL GAS RETAIL MARKET

Supplier	Delivered energy (GWh)	Market share
Energetika Ljubljana	360	27.4%
GEN-I	273	20.7%
Plinarna Maribor	179	13.6%
Petrol	153	11.6%
Adriaplin	132	10.0%
Energetika Celje	54	4.1%
Domplan	45	3.5%
Istrabenz plini	24	1.8%
ECE	22	1.7%
Energija plus	16	1.2%
Other small suppliers	56	4.3%
Total	**1,314**	**100%**
HHI of the retail market		**1,657**

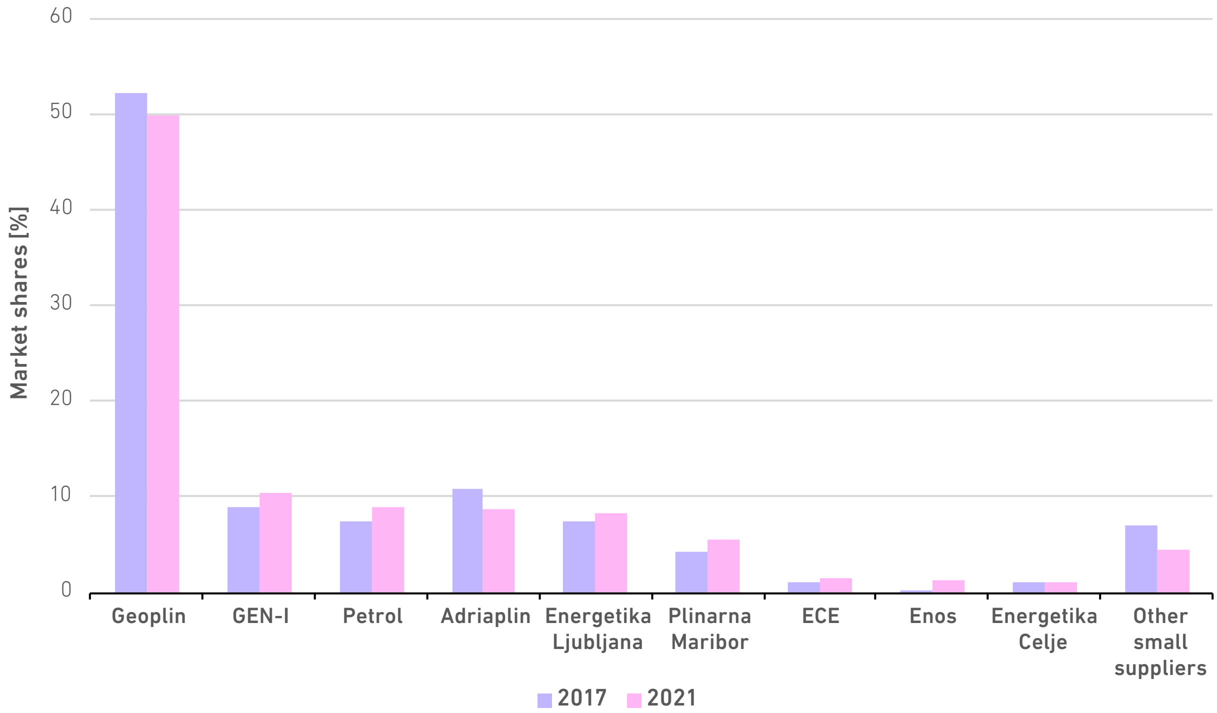
SOURCE: ENERGY AGENCY

The HHI value indicates that the retail market is moderately concentrated (the HHI is between 1,000 and 1,800). Compared to 2019 and 2020, when the HHI was 1,744 and 1,689 respectively, the downward trend of the HHI continued in 2021. The market share of the top three suppliers (CR3) was just over 61.8%, with Plinarna Maribor replacing Petrol among the top three suppliers. The remaining suppliers with a supply share above one percent of the total volumes supplied to household customers remain the same as in 2020.

In 2021, Plinarna Maribor managed to increase its market share by more than 1% compared to the previous year, with an increase of 4%. On the other hand, GEN-I suffered the largest market share decrease in the household segment. It was the only supplier to lose more than 1% of its market share, with a market share decrease of 2%.

The changes in the market shares of suppliers to business consumers over the 2017-2021 period are shown in Figure 186. The largest increases in market shares were observed for GEN-I (1.7%), Petrol (1.5%), Plinarna Maribor (1.4%) and Enos (1%), while decreases were observed for Geoplin, Adriaplin and a group of smaller suppliers.

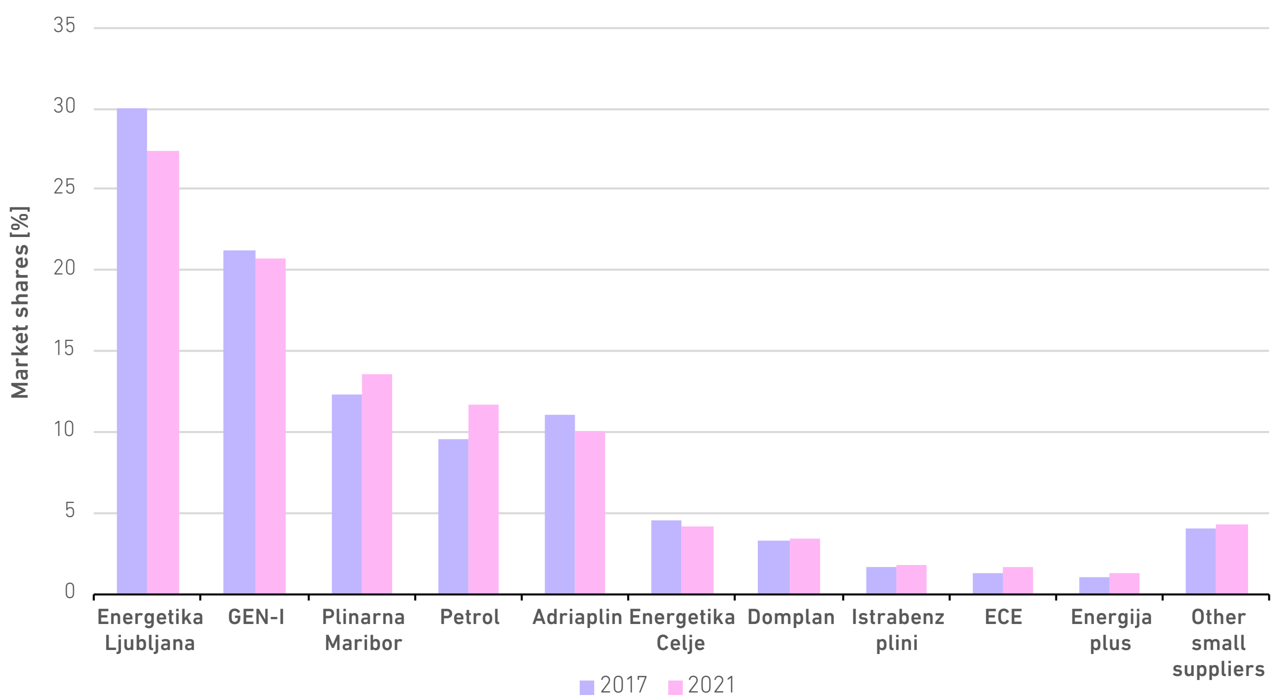
FIGURE 186: COMPARISON OF SUPPLIERS' MARKET SHARES TO BUSINESS CONSUMERS IN 2017 AND 2021



SOURCE: ENERGY AGENCY

The changes in the market shares of suppliers to household consumers between 2017 and 2021 are shown in Figure 187. Petrol increased its market share the most (2.1%), followed by Plinarna Maribor (1.3%). On the other hand, Energetika Ljubljana and Adriaplin lost the largest market share over the period.

FIGURE 187: MARKET SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS IN 2017 AND 2021

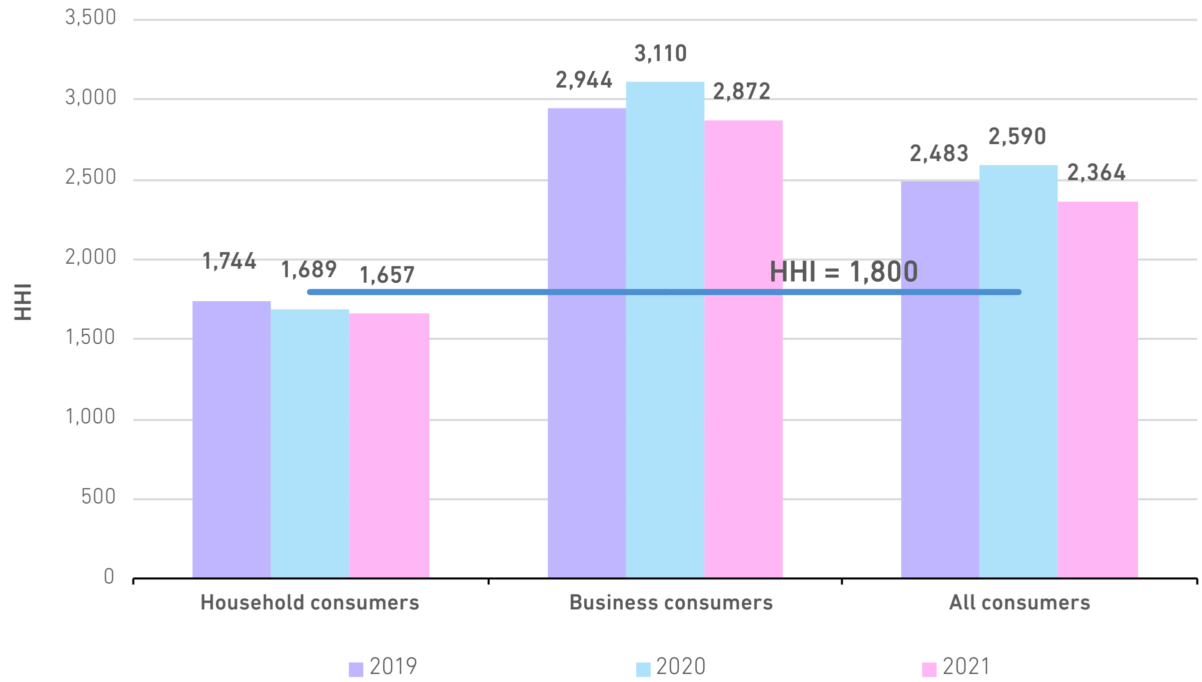


SOURCE: ENERGY AGENCY

Comparison of Concentrations on the Relevant Markets

The HHI decreased in all supply segments of the retail market in 2021. A slight decrease in the HHI was recorded for the fourth year in a row in the household consumers segment, which is also the only observed market with moderate concentration. The business consumers market is a highly concentrated market in terms of HHI.

FIGURE 188: MOVEMENT OF HHI IN THE RETAIL MARKET IN THE 2019–2021 PERIOD

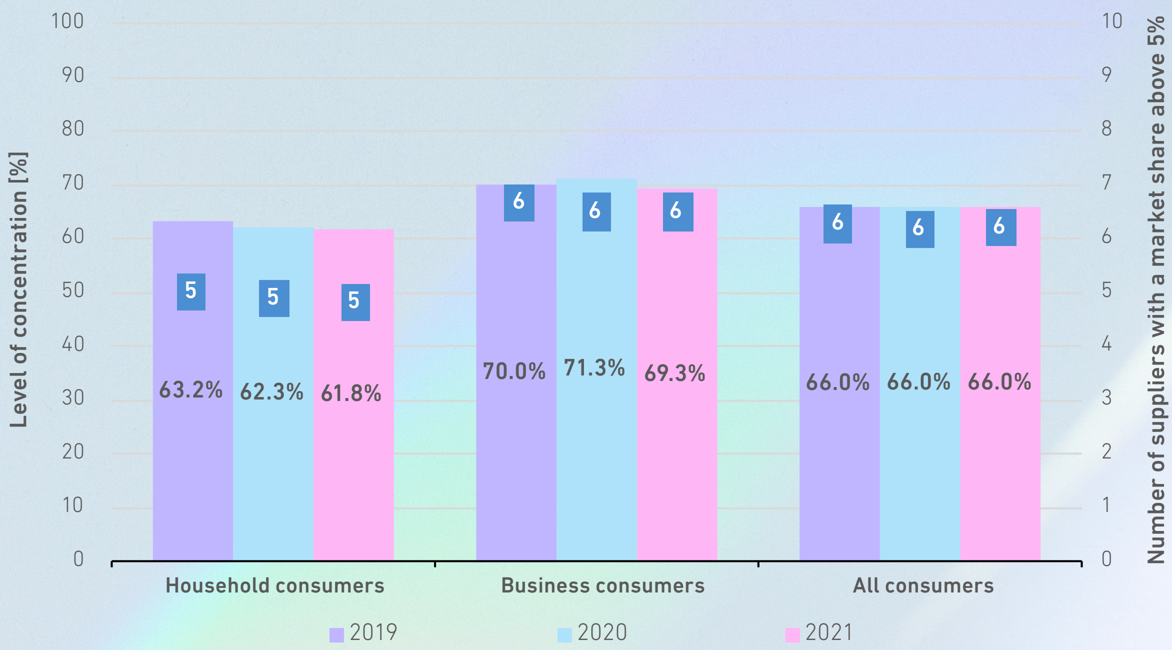


SOURCES: SUPPLIERS

Figure 189 shows an index in the degree of concentration of the three CR3s in each market segment over the last three years. The CR3[85] values of the supply to business consumers are at or just below the high concentration threshold (70%). A positive downward trend in the concentration level can be observed in 2021 compared to the previous year, in the supply to both household and business consumers.

85 Total market share of the three largest suppliers on the market

FIGURE 189: LEVEL OF CONCENTRATION OF CR3 AND THE NUMBER OF SUPPLIERS WITH A MARKET SHARE ABOVE 5% IN THE 2019–2021 PERIOD



SOURCES: SUPPLIERS

Switching Supplier

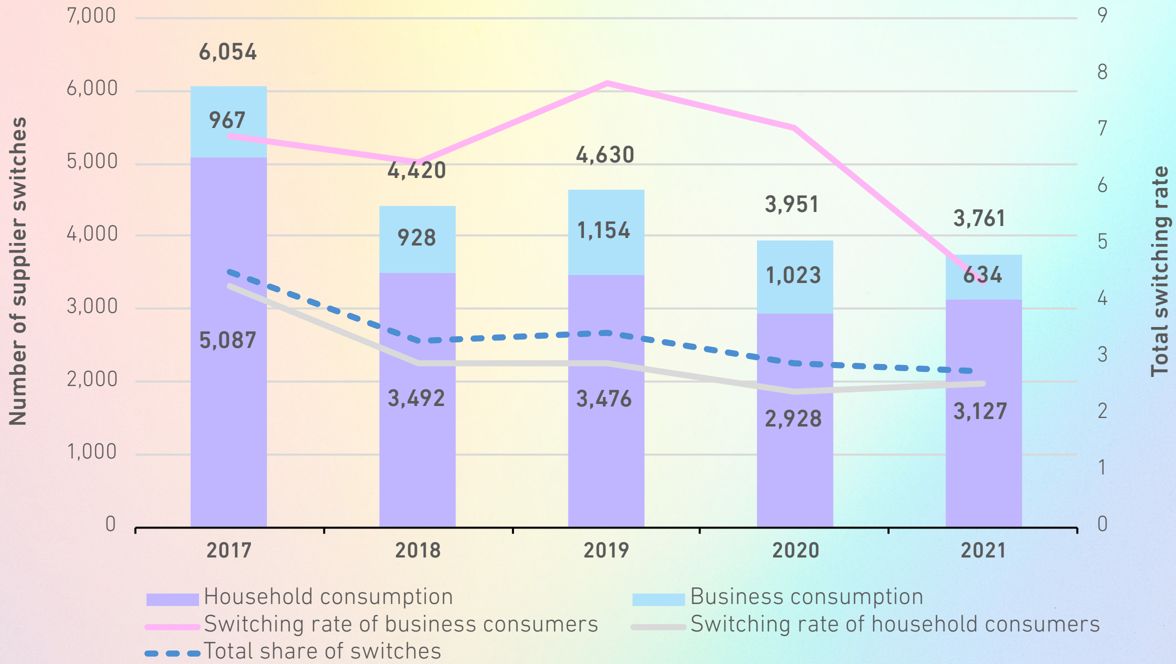
The number of switches is one of the key indicators of a well-functioning retail market. In Slovenia, we would like to see more diversified and attractive supplier offers, and in particular more active consumers, many of whom, it can be assumed, are not even aware of the possibility of switching, and most of whom have never switched since the opening of the market.

A more than 7% increase in switching for hosueholds and a 38% decrease in switching for natural gas business consumers

In 2021, 3,761 consumers connected to the distribution network switched their natural gas supplier, namely 3,127 household and 634 business consumers. The average number of monthly switches was 260 for household and 53 for business consumers. Compared to 2020, the total number of switches decreased by almost 5% (an almost 7% increase for households and 38% decrease for businesses). The downward trend in switching from previous years continued in the first four months of 2021. However, from May onwards, the number of switches started to increase, which may be due to the passivity of suppliers in preparing new promotional offers due to the rising wholesale prices of natural gas.

Figure 190 shows the trend in the total number of switches and the share of switches by type of customer over the 2017-2021 period.

FIGURE 190: NUMBER OF SUPPLIER SWITCHES IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

The switching rate for household consumers in 2021 is 2.6%, which is a higher value compared to the previous year. Compared to the previous year, the switching rate of household consumers increased by 0.2 percentage points. For business consumers, the switching rate has decreased by 2.7 percentage points compared to 2020. In previous years, Belgium had the highest share of switching[86] in the EU on a metering point basis, at 24.6%. The latter was the only country to exceed 20% on an annual basis. The average annual switching rate for household customers was 3% over the last five-year period. For business consumers, the annual switching rate has decreased significantly compared to previous years. In 2021, 4.3% of business consumers switched supplier, compared to an average of 6.5% over the last five-year period.

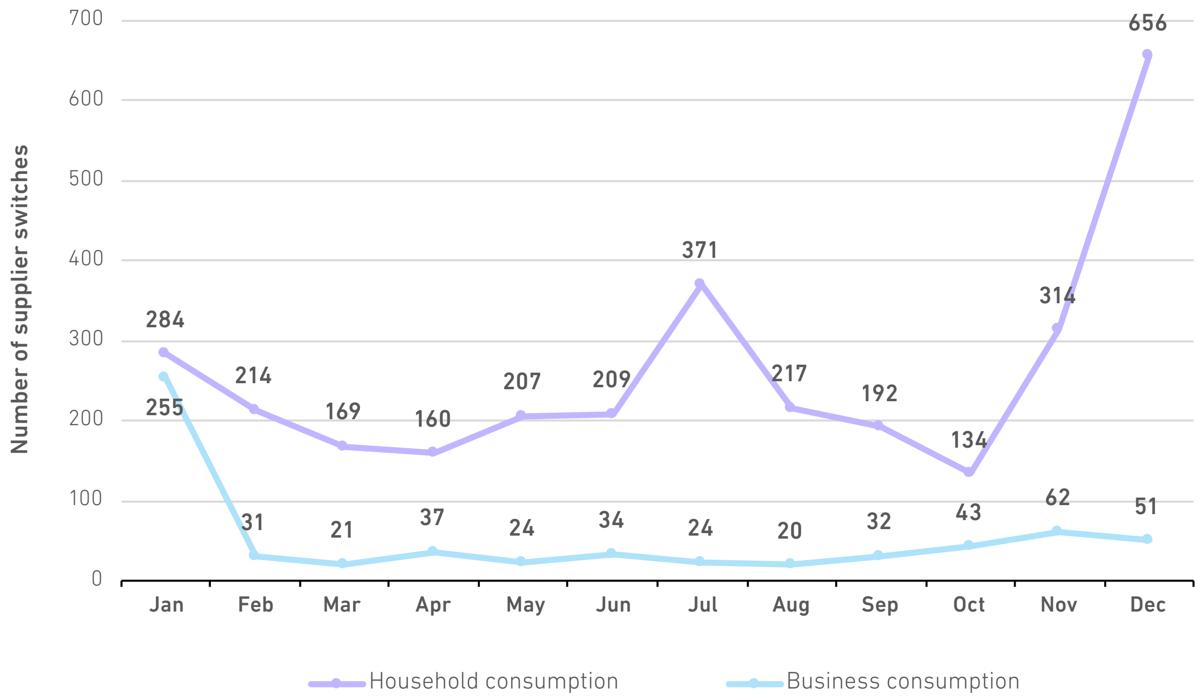
Increased responsiveness of household natural gas consumers to the changing market conditions

Atypical trend in supplier switching compared to previous years

In 2021, similar to previous years, there was an increase in the number switching at the beginning of the year, which is due to the peak heating season and, thus, increased consumers activity in search of potential savings. In Figure 191, we can see that the number of switches by household consumers started to increase again in the middle of the year, while on the other hand, the number of switches was lowest at the beginning of the heating season, in October. This is a rather atypical trend compared to previous years, but may be due to a faster reaction of active customers to the announced increases in the retail market. At the end of the year, there is a sharp increase in switching by household consumers, mainly due to the higher retail prices, higher natural gas consumption due to the heating season and providing better information to customers on the increase in energy prices.

86 ACER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2020 – Energy Retail Markets and Consumer Protection Volume, november 2020, figure 22

FIGURE 191: DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES DEPENDING ON THE TYPE OF CONSUMPTION

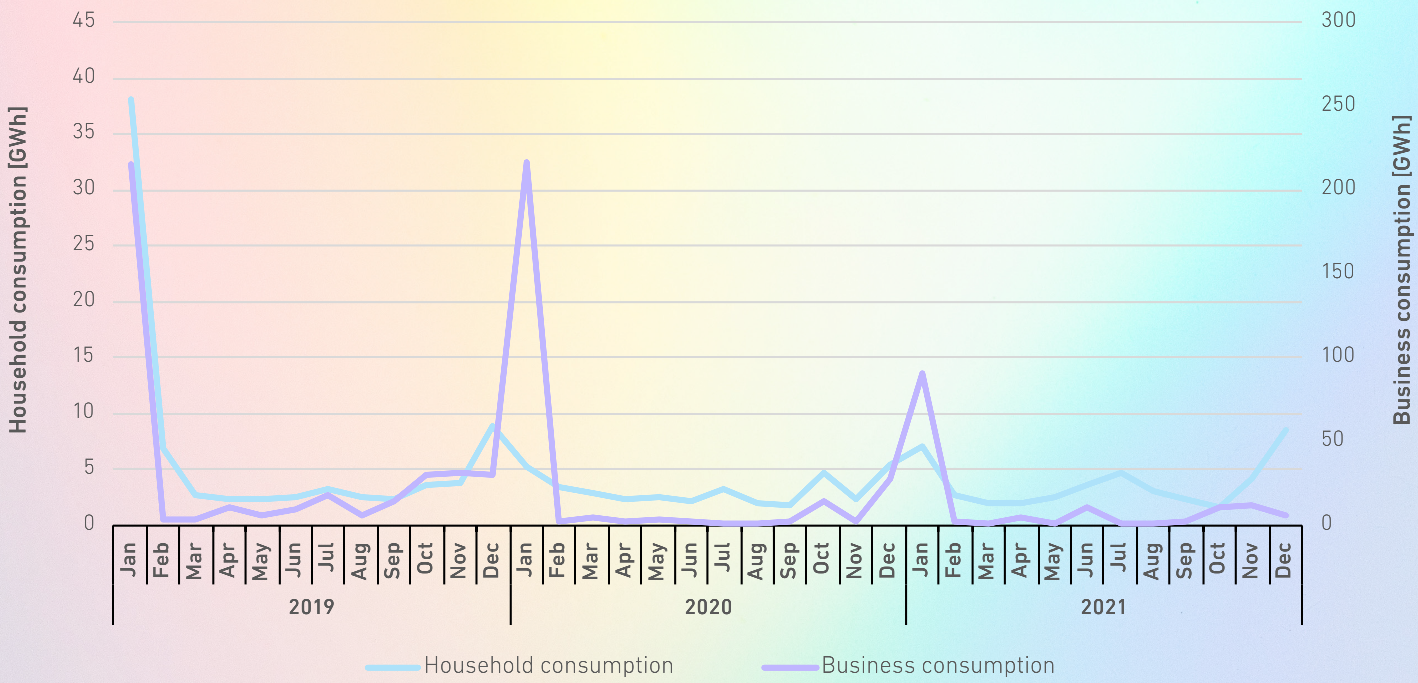


SOURCE: ENERGY AGENCY

Business consumers made more than 40% of all switches in January, which is a normal pattern of behaviour for these customers, as a comparable proportion of switches were made in previous years in January or from December to January. This is usually the time when the existing supply contracts expire. The switching rate for commercial customers in 2021 was 1.7%. The amount of energy exchanged is the estimated annual consumption of natural gas by consumers who switched supplier. Similar to the number of switches, the amount of energy switched by business consumers shows a significant decrease. The amount of energy switched by business consumers is thus down by around 49% compared to the previous year. In view of the higher retail prices for natural gas and the faster pass-through of wholesale prices to the retail market, it can be concluded that many business consumers have managed to secure a better deal from their current supplier than they would have received on the market. This conclusion is also supported by the fact that certain suppliers did not take on any new customers at all in the second half of 2021.

Figure 192 shows the trend in the quantities of natural gas exchanged over the period from January 2019 to December 2021.

FIGURE 192: QUANTITIES OF EXCHANGED GAS WITH RESPECT TO THE TYPE OF CONSUMPTION



SOURCE: ENERGY AGENCY

As can be seen in Figure 192, the quantities of gas exchanged in the segment of household consumption was the highest in January, July, and December, indicating an atypical seasonal pattern of supplier switching intensity during the heating season.

In the business segment, the volume of natural gas switched was highest in January, June, and at the start of the heating season in October and November. The change in the pattern is mainly due to the increase in retail prices.

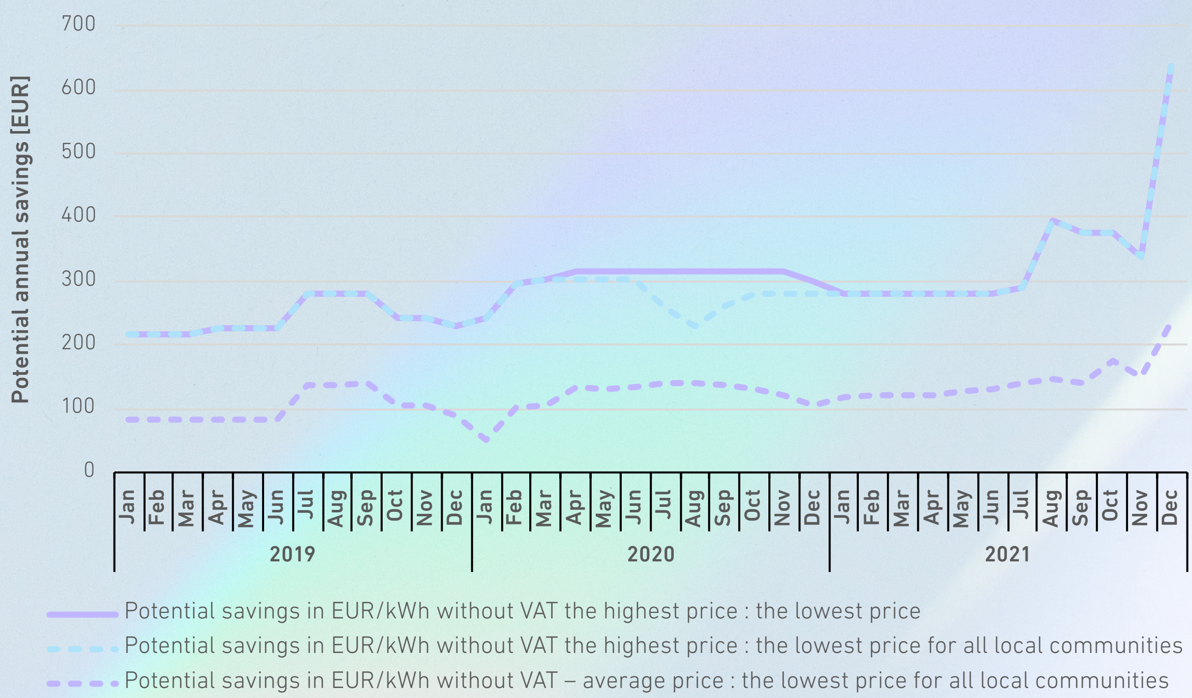
Estimating the Potential Benefits of Switching Supplier

By switching supplier, any household or legal entity can reduce its annual cost of natural gas supply, influence the payment terms and other provisions of its contractual relationship with the supplier, or obtain additional benefits linked to a particular offer. As natural gas consumption is highly correlated with the heating season, consumers can make significant savings in the colder months, when consumption is typically at its peak, by being supplied on the basis of the most affordable offers.

Figure 193 shows the trend in potential savings for a typical household customer with an annual consumption of 20,000 kWh.

127% higher potential savings in December 2021 compared to the same period a year earlier

FIGURE 193: POTENTIAL SAVINGS IN CASE OF SWITCHING NATURAL GAS SUPPLIER FOR A TYPICAL HOUSEHOLD CONSUMER IN THE PERIOD 2019–2021



SOURCE: ENERGY AGENCY

The potential savings when switching from the supplier with the highest supply price to the supplier with the lowest supply price available in all local authorities ranged between €280 and €637 in 2021, assuming a 12-month supply period under the same conditions. Due to the rising prices on the retail market, the potential savings for existing consumers increased for some suppliers towards the end of the year as a result of the widening gap between the highest and lowest price offers: for example, in December 2021 it was 127% higher compared to December 2020. Even otherwise, consumers had the potential to achieve higher savings in 2021 compared to 2020. By switching from the average price offer to the lowest price offer, savings of between €119 and €237 were possible. For a well-functioning and competitive retail market, it is important that final customers are sufficiently active in monitoring the offers and supply conditions of individual suppliers, identifying savings opportunities and switching suppliers, as this will help them pay less for their supply and encourage suppliers to compete more and offer more competitive services.

Measures to Promote Competition

The Energy Agency monitors the natural gas retail market and cooperates with the regulatory and supervisory authorities at the national level, such as the Market Inspectorate of the Republic of Slovenia, the Slovenian Competition Protection Agency and, where appropriate, with independent and non-profit consumer organisations. The Energy Agency's actions are diverse and result from internal analyses of the Energy Agency, bilateral activities and the results of public consultations. Within the framework of the single contact point, the Energy Agency keeps up-to-date relevant information on market development.

The price of natural gas as an energy product is not regulated and is determined freely in line with supply and demand on the wholesale and retail markets.

The labelling of key data entities in electronic data interchange in the field of natural gas distribution systems is still not in line with the normative framework and open standards

In the natural gas market, the Energy Agency carries out activities to harmonise the most important data exchange processes at the national and regional levels. The Act on the Identification of Entities in Electronic Data Exchange Between Electricity and Natural Gas Market Participants obliges market participants to use standardised identifiers of key data entities in the electronic exchange of data on the market. The implementation of data exchange processes in the natural gas market is not yet largely based on open standards. The harmonisation of data exchange processes in the natural gas market is very slow. No significant progress has been made since autumn 2018, when the Economic Interest Association for the Distribution of Natural Gas decided to use the GS1 standard for the harmonised labelling of metering points in all the natural gas distribution networks in Slovenia. The uniform and standardised identification of measuring sites across Slovenia is important for reducing the costs of implementing IT systems by market participants (entry costs for new entrants), for improving the efficiency of the supplier change process and for the effective deployment of data and other services in the relevant market. Standardisation in the area of data exchange is becoming even more important due to the requirements for cross-sectoral integration. According to the information available, some activities to move towards standardised labelling are expected to take place, but the labelling of metering points based on standardised identifiers has not yet been implemented even by the end of 2021.

In the natural gas market, the same rules apply as for other types of goods as regards the prevention of restrictions of competition and abuses of dominant positions. According to publicly available data, the Slovenian Competition Agency did not identify any restrictive practices or potential dominant positions on the natural gas market by undertakings active on the market in 2021. In the context of the merger review, the Slovenian Competition Agency issued a decision on the merger review of the acquisition of control of ISTRABENZ PLINI, d.o.o. in 2021, over GTG plin d.o.o. and ARDOKS, d.o.o., did not oppose the concentration and declared that it is in line with the competition rules.

The Security of the Natural Gas Supply

In 2021, the security of the gas supply was ensured and supply was uninterrupted despite the implementation of protective preventive measures and service restrictions due to the Covid-19 epidemic in Slovenia and other EU Member States.

The legislation dictates that special care is given to protected customers. Protected customers are customers who must be assured of a gas supply by their suppliers and other stakeholders, even in the event of a potentially severe situation, including a shortage of gas on the market, as long as this is possible. Protected customers include household consumers and basic social services other than education and public services. In addition, heat distributors for district heating are protected customers to the extent that they supply heat to household customers and social services other than educational and public services.

In 2021, protected customers consumed a total of 1,950,701 MWh of gas, which is around 19.2% of the consumption of all consumers in Slovenia. Of this, 319,376 MWh of gas was consumed by heat distributors in the part where there are protected customers.

In accordance with the Preventive Action Plan, suppliers have complied with the supply standard, which requires suppliers to provide gas for the supply of protected customers in three cases.

19.2% of gas consumed by protected consumers in 2021

For the coldest seven-day period, all the suppliers combined nationwide are required to provide an average of 14,711 MWh per day for seven consecutive days. For the 30-day period with particularly high demand, suppliers must provide a total of 275,631 MWh or an average of 9,188 MWh per day for 30 consecutive days. For a 30-day period with a supply outage affecting the largest infrastructure, suppliers must supply an average of 10,515 MWh per day for 30 consecutive days. In addition, suppliers have demonstrated that they can provide the necessary transmission capacity for these quantities and the required dispersion of supply sources and transmission paths. In securing the necessary quantities, the suppliers have followed, up to and including 2021, their established way of working and demonstrating the above-mentioned quantities.

CASE STUDY: THE SECURITY OF THE GAS SUPPLY TO SLOVENIA AND PREPARING FOR EMERGENCY SITUATIONS

Slovenia is entirely dependent on natural gas for its gas supply, as other gases, e.g., biogas, are not yet produced in large enough quantities to be transported through the networks. Even the natural gas entering the transmission system and thus the market is not produced in Slovenia.

In 2021, as in recent years, Slovenian suppliers purchased a small part of their gas directly from Russia and the vast majority from Austria, but this gas is also predominantly of Russian origin. Slovenia has very limited options to cope with the consequences of a possible interruption of gas supplies, as it has neither storage facilities nor its own LNG terminal. This makes Slovenia one of the Member States exposed to higher risks and consequences in the event of a complete and permanent interruption of gas supplies from Russia. Suppliers participating in the Austrian and Italian markets have access to storage facilities there but have historically only used storage for small volumes of gas.

In December 2021, the European Commission (EC) proposed amendments to Regulation (EU) 2017/1938 on reliable gas supply, intending to ensure that storage capacities are filled with gas before the start of the heating season in all EU member states, even if this would not be of market interest. In March 2022, the EC, in a new proposal to amend Regulation (EU) 2017/1938[87], more precisely determined the obligations of the member states regarding gas storage. The required filling at the EU level will be at least 80% for 2022 and at least 90% for subsequent years on 1 November. Member States without storage would have to store at least 15% of the gas used in the previous season under this proposal. All the mentioned requirements can be changed in the legislative process at the EU level during the negotiations.

On 18 May 2022, the EC published the REPowerEU[88] Roadmap (hereafter referred to as the EC Roadmap), which represents a concerted effort by the EU Member States to end their dependence on Russian fossil fuels and to accelerate the green transition[89] strongly. This is to be done at several levels simultaneously, with very ambitious targets at each of them. The binding target for energy use measures is being raised to 13%, which, together with other energy-saving measures, could reduce gas consumption by an estimated 13 billion cubic metres per year. Demand pooling and aggregated procurement should allow transparent gas procurement through a common platform, which strengthens the role of consumers by aggregating consumption, and allows for the optimal and coordinated use of infrastructure. The diversification of production sources and transmission routes further reduces dependence on Russian fossil fuels but will require investments in LNG regasification infrastructure and pipelines. An important focus is on accelerating and increasing the transition from fossil to RES in electricity generation, buildings, industry and transport.

An important milestone is 2030, when 45% of all energy consumption in the EU should already be from renewable sources, with the target of 55% lower net greenhouse gas emissions unchanged. By that year, all the infrastructure to produce, import, and transport up to 20 million tonnes of hydrogen should be in place, of which the EU is expected to produce half. By then, all the necessary infrastructure should also be in place to produce and transport biomethane, of which 35 billion cubic metres is expected to be produced this year. The EC Roadmap also contains other commitments and incentives for renewables and their financing.

In terms of the security of the gas supply, the Plan requires the Member States to be prepared to reduce Russian gas supplies. It calls on the Member States to launch a campaign to reduce gas consumption, draw up plans to curb consumption and commit transmission system operators to invest in systems that will allow more gas flow eastwards. It also calls for the missing solidarity aid agreements between neighbouring Member States to ensure gas supplies to protected customers in case of severe gas shortages.

87 COM(2022) 135 final
88 COM(2022) 230 final
89 The European Commission's package of legislative proposals, collectively entitled »Ready for 55«.

The replacement of Russian natural gas with gas from other sources envisaged in the EC plan is constrained on the one hand by the sources and on the other by the capacity of the infrastructure in the EU, which would have to transport gas from the new sources to consumers. These constraints relate to LNG terminals, pipelines mainly in the west-east direction, and storage facilities. Even if they are full before the start of the season under the proposed Regulation, storage facilities can store gas for about a quarter of the EU's total normal consumption during the heating season. However, storage capacities are distributed quite unevenly between Member States, and there are technical constraints on using gas from storage in one Member State for use in another Member State. In addition, without Russian pipeline gas, the projected EU-wide storage filling levels cannot be achieved due to technical constraints in different parts of the pipelines and other infrastructure in the EU.

Slovenia only has access to storage facilities and other gas sources without physical constraints in Austria and to the rest within the technical limits of the pipelines. Gas supplies from Italy and Croatia together, with the 2021 annual consumption, would be roughly sufficient to supply gas to all consumers, except perhaps on the coldest winter days. The increased use of storage and gas from other sources, particularly LNG, is also expected to be reflected in higher gas prices.

Slovenia would quickly suffer the consequences of any permanent substantial reduction or complete interruption of Russian gas supplies. The first to feel the impact would be industrial consumers, for whom the switch to other energy sources usually requires technological changes, which would take a longer period of time.

Since March, the EC has regularly convened a Gas Coordination Group to coordinate and exchange information, assess preparedness for different scenarios of the interruption of gas supplies from Russia, including a complete cut-off, and make recommendations. To cope with the consequences of a possible gas shortage, Slovenia will need to apply a combination of measures from the EC REPowerEU plan mentioned above. Suppliers will have to find gas from other sources, and the transmission system operator will have to allow for a slight increase in throughput capacity at the Šempeter–Gorica interconnection point. Participation in joint gas procurement using a common platform will also enable Slovenian suppliers to purchase gas under transparent and, depending on the situation, realistic conditions. Before the start of the winter season, some consumers are likely to switch to other energy sources and thus reduce their overall gas consumption. Gas saving will also be necessary, as every contribution counts. If the situation requires it and gas is no longer available in sufficient quantities, measures to reduce consumption will also be put in place.

Consumer protection - the right to quality, reliable, and affordable energy

541

FINAL CONSUMERS ON LAST RESORT SUPPLY IN DECEMBER 2021, AND IN JANUARY 2022 ALREADY MORE THAN 1500

NO EMERGENCY CARE BENEFICIARIES IN 2021

54.6% OF ALL

DISCONNECTIONS OF ELECTRICITY CUSTOMERS WERE DUE TO THE TERMINATION OF A SUPPLY CONTRACT FOR NON-PAYMENT

THE MAJORITY OF COMPLAINTS FROM HOUSEHOLD CONSUMERS, 75% IN THE FIELD OF NATURAL GAS

99.7%
OF ALL

DISCONNECTIONS OF HOUSEHOLD CONSUMERS WERE CARRIED OUT AT THEIR REQUEST

MORE THAN 100 COMPLAINTS DUE TO NON-ISSUANCE OF CONSENT FOR THE CONNECTION OF THE SELF-SUPPLY INSTALLATIONS

CONSUMER PROTECTION

Promoting effective competition and thus a well-functioning electricity and natural gas market benefits all consumers. In 2021, even more attention was paid to the protection of consumer rights, as developments and record price movements in the wholesale markets for electricity, natural gas and emission allowances, especially in the second half of the year, have already started to have an impact on the retail markets. Particular protection was given to household consumers, as they are less active and, for the most part, less aware of their rights in relation to energy supply.

In the context of the protection of consumers' rights, energy legislation specifically highlights:

- the right to be informed,
- the right to emergency supply,
- the right to last resort supply,
- the right to complain to suppliers and to out-of-court dispute resolution,
- the right to the protection of rights in the administrative procedure,
- the right to the safe and reliable operation of the system and to a quality supply of electricity or natural gas at a reasonable price.

The Right to be Informed

The Energy Agency is responsible for informing consumers about their rights, the applicable rules and general acts for the exercise of public powers, and the methods for handling complaints concerning the supply of electricity and natural gas, and publishes all the necessary information for consumers on its website through the single contact point. The website also provides access to a comparator of all offers on the electricity and natural gas market, which is managed by the Energy Agency. In the context of the news, the website keeps customers up-to-date on topical issues, including the Energy Agency's ongoing response to developments on the retail markets in 2021, and informs consumers whose energy supply contracts have been terminated of their rights and options and of the further procedures related to the choice and switching of supplier.

Household and small business consumers of natural gas and household consumers of electricity must be informed about any changes to the General Terms and Conditions of Supply relating to the performance of the contract, including changes to the price that may entail an increase in the supply payment, at least one month before they come into force, and other electricity consumers at least two weeks before they come into force, in accordance with the ZOEE. As a consequence of a change in the general terms and conditions of supply, household or small business customers may withdraw from the supply contract within one month of the entry into force of the general terms and conditions, without notice or penalty, and must be specifically informed of this right by the supplier in the notice of the change in the general terms and conditions. The notice must be sent free of charge to the household consumers in the manner specified in the supply contract.

Before connecting to the system, electricity and natural gas distribution system operators must inform customers that they can choose their supplier freely on the market. To facilitate the choice of supplier, the Energy Agency's website offers a tool for the comparison of supply costs, which contains information on package and promotional offers from electricity and natural gas suppliers, price lists, and allows for the comparison and calculation of the cost of supply on a monthly or annual basis. The comparator is aimed at household and small business customers and allows them to check their monthly billing for electricity or natural gas supplied and to calculate the cost of using the network.

The provision of all the required information is monitored by the Energy Agency, which in 2021 mainly checked:

- whether suppliers publish energy prices for household and small business customers on their websites;
- the timeliness of the granting of consents for the connection of self-supply facilities;
- the correctness and legality of the electricity distribution system operator's disconnection procedures;
- whether the electricity distribution system operator ensures permanent and direct access to data;
- membership of the balancing group and appropriate inclusion in the balancing scheme;
- whether customers are informed before connection of their rights and obligations in relation to the choice of supplier and emergency and last resort supply.

During the year, the Energy Agency also continued its monitoring procedures on the regulation of the so-called »grey« closed distribution systems, either ex officio or at the request of the electricity distribution system operator. In particular, these controls have had a positive impact on the management and takeover of networks in these systems, ensuring that the electricity distribution system operator has constant and direct access to information and that system users are effectively informed of their rights.

Effective and prompt monitoring prevented the unjustified disconnections of electricity customers when the supplier terminated their supply contract in an illegal manner.

The Right to Last Resort and Emergency Supply

Right to Last Resort for Electricity Consumers

Last resort supply of electricity is provided by the electricity DSO when the supply contract of household or small business customers is terminated as a result of measures resulting from the insolvency or illiquidity of the supplier, or at the explicit request of household and small business customers of electricity, of which they shall be duly informed. With the adoption of the ZOEE, the electricity distribution system operator shall also ensure an emergency supply to final customers if the supplier loses its status as a member of the balancing scheme in accordance with the regulation governing the operation of the electricity market. The price of electricity for last resort supply is regulated on the basis of the provisions of the EA-1, determined by the electricity DSO and publicly announced. The price must be higher than the market price for supply to a comparable customer, as this encourages the quickest possible choice of an alternative supplier and ensures the separation of regulated activities from market activities, but the price of the last resort supply must not exceed market prices by more than 25%. If the electricity DSO does not set a price or sets it contrary to the rules, the price is set by the Energy Agency.

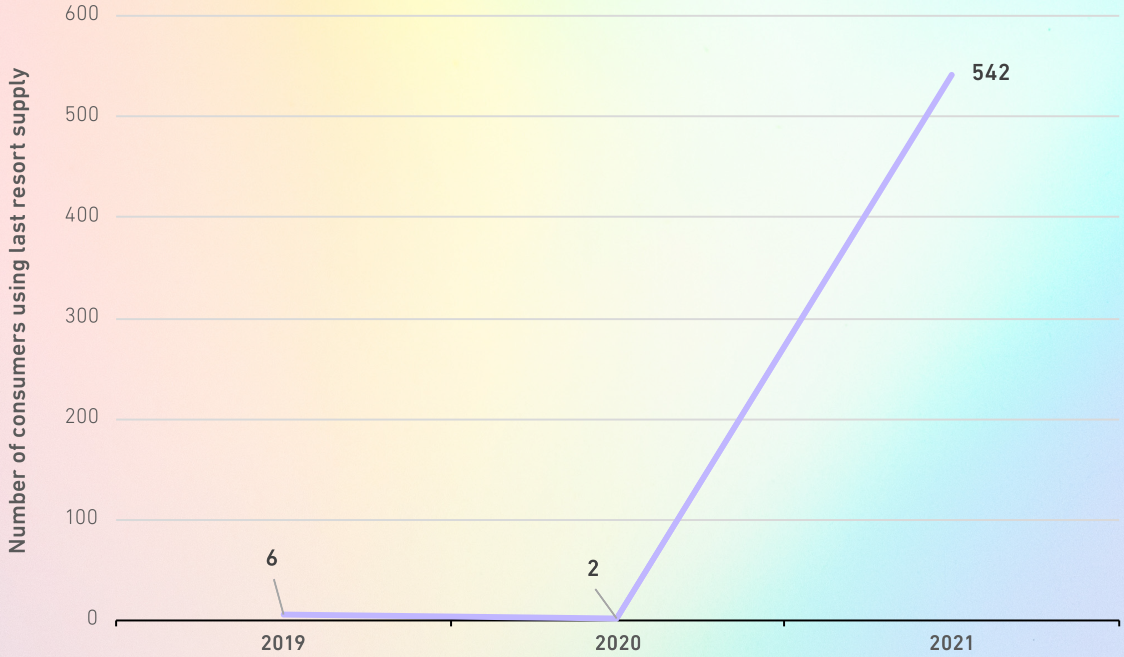
In September 2021, the electricity DSO supplied one household customer under last resort supply conditions, while in December, 541 final customers were supplied under last resort supply conditions.

There were 541 final customers on last resort supply in December 2021, and in January 2022 more than 1500

The significant increase in the number of final customers on last resort supply is due to the developments and record price increases of energy products on the wholesale markets, which led to two suppliers ceasing their electricity supply activities at the end of the year. Due to the exclusion of the supplier Involta d.o.o. from the electricity market, 541 final customers were provided with last resort supply in December 2021, according to the data of the electricity distribution system operator. With the termination of Telekom Slovenije's supply activities as of 1 January 2022, a total of 1571 end-users were provided with emergency supply in January 2022, which is a significant departure from previous years.

The dynamics of the last resort supply over the last three years can be seen in the Figure 194.

FIGURE 194: LAST RESORT SUPPLY BY YEAR



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

The Right to Emergency Supply

Emergency supply is a measure that delays the disconnection of electricity or natural gas if certain conditions are met, and is intended only for extreme cases where the life and health of the household consumer or persons living with him/her are endangered, given the circumstances (time of year, temperature, place of residence, state of health and other similar circumstances).

Vulnerable electricity consumers are defined in the ZOEE and vulnerable natural gas consumers are defined in the Gas Supply Act (ZOP). They are defined as a special category of household consumer who, due to their financial situation, the share of their energy expenditure out of their disposable income and other social circumstances, are unable to provide themselves with an alternative source of energy for household use or heating, which would cause them to incur the same or lower costs for essential household use or the heating of their dwelling. The household consumer can prove his/her vulnerable consumer status and thus eligibility for emergency supply with a certified statement from the Centre for Social Work (CSD), which must show that the household consumer has submitted an application for regular social assistance before receiving notification from the electricity or natural gas distribution system operator of the intended disconnection and that the decision procedure has not yet been completed with the CSD.

All DSOs must inform household customers of their right to emergency supply, the conditions under which it is possible and the deadlines for submitting evidence before disconnection (usually by means of a notice of intended disconnection).

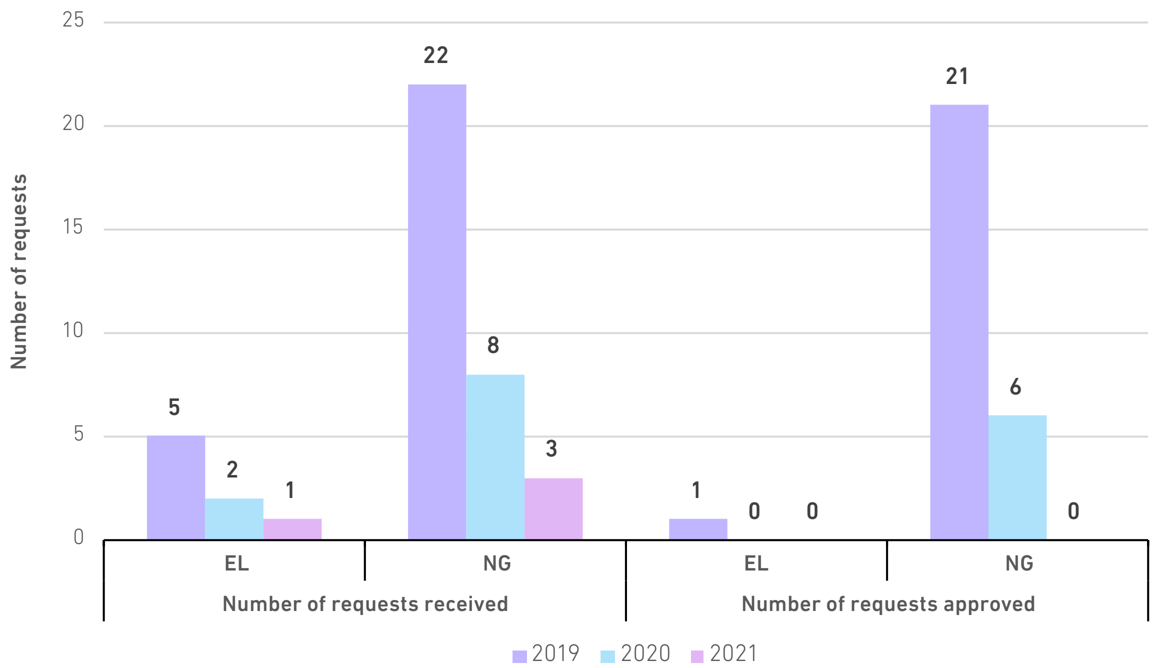
In 2021, there were no claimants for emergency supply

The costs of an emergency supply of electricity to vulnerable customers are eligible costs of the electricity DSO, while in the case of the supply of natural gas, the costs of the emergency supply are borne by the natural gas DSO until they are paid by the vulnerable consumer.

Eligibility for emergency supply is assessed by the electricity and natural gas distribution system operators and implemented in accordance with the procedure laid down in the System Operating Instructions and, in the case of electricity, in accordance with the rules and criteria laid down by the Energy Agency in the Legal Act on the Criteria and Rules for Providing an Emergency Supply of Electricity.

The number of applications for emergency supply is down compared to the previous year. In 2021, the electricity DSO received only one request for emergency supply (which was not granted), while the two natural gas DSOs received a total of three requests, again without any postponement of the disconnection of customers. Figure 195 shows the decline in requests and entitlements to emergency supply over the last three years.

FIGURE 195: COMPARISON OF THE NEED FOR EMERGENCY SUPPLY



SOURCES: ENERGY AGENCY, OPERATORS

If the application for emergency supply is not approved and the customer fails to pay the energy bill, disconnection follows. Given that the cost of the emergency supply is paid by all other electricity consumers through the network charge, the eligibility criteria for emergency supply are very strict. This is in line with the guidance in the European legislation that Member States should ensure that measures to protect vulnerable consumers are primarily provided through general social policy measures and other measures that do not merely involve the deferral payment or the non-payment of electricity bills.

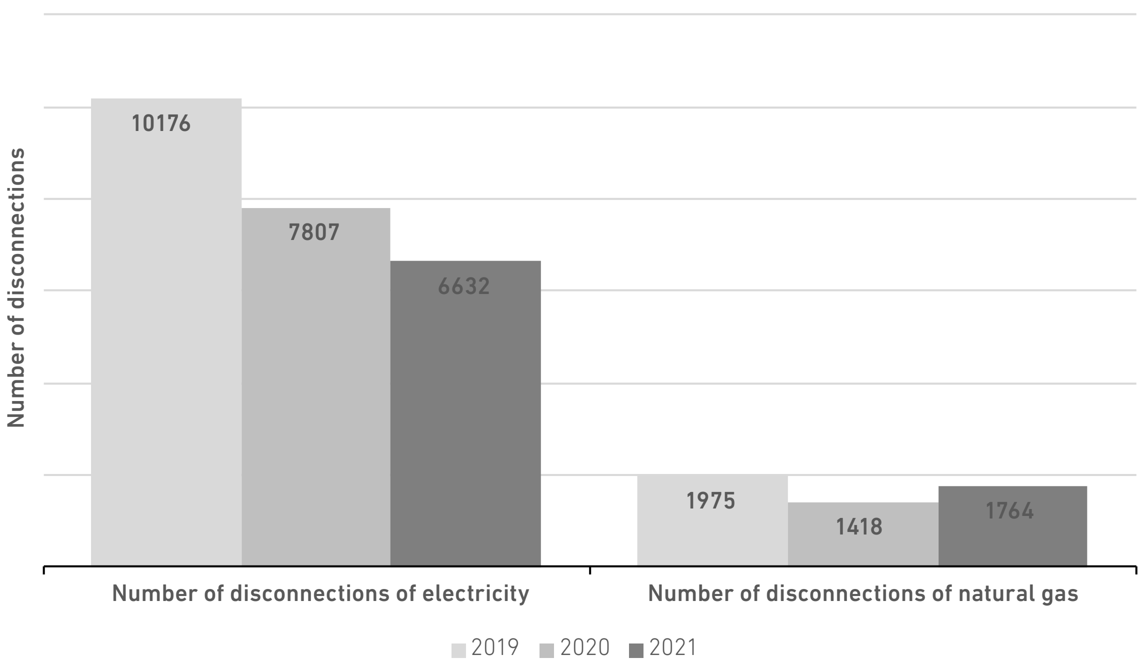
Customer Disconnections

Disconnecting the customer is one of the most extreme ways to correct infringements caused by the customer's behaviour. The electricity or natural gas distribution system operator may disconnect a customer for the termination of a supply contract by the energy supplier (most often for non-payment) or for other reasons (infringements), which are listed in the ZOEE for final electricity customers and in the ZOP for final natural gas customers. Depending on the type of violation, the disconnection procedure is carried out with prior notice, without prior notice or at the request of the system user.

In September 2021, one of the suppliers (Elektro prodaja E.U.) terminated the supply contract due to changed circumstances and gave the customers a three-day deadline to change supplier, otherwise they would be disconnected, which was contrary to the provisions of the Obligations Code. Most of the household customers switched within three days for fear of disconnection, but some household customers remained passive and did not switch. These customers were threatened with disconnection. As the supply contract can only be terminated in court due to changed circumstances under the provisions of the Obligations Code and as the specific supplier had terminated the contract illegally, the Energy Agency prevented the disconnection of the customers by immediately informing the public and by issuing a declaratory decision in the monitoring procedure. It also prevented the possible repetition of such unacceptable practices by other suppliers, as one of the suppliers immediately revoked the termination of its supply contracts after the Energy Agency's action due to changed circumstances. As a result, not a single household customer was disconnected due to the unlawful termination of a supply contract.

The number of disconnections of final customers from the electricity system has been decreasing over the period under review. Compared to 2020, the number of disconnections of electricity final customers in 2021 decreased by 15%. The opposite is true for natural gas, where the number of disconnections increased by 24.4% compared to 2020. Figure 196 shows the number of disconnections over the last three years.

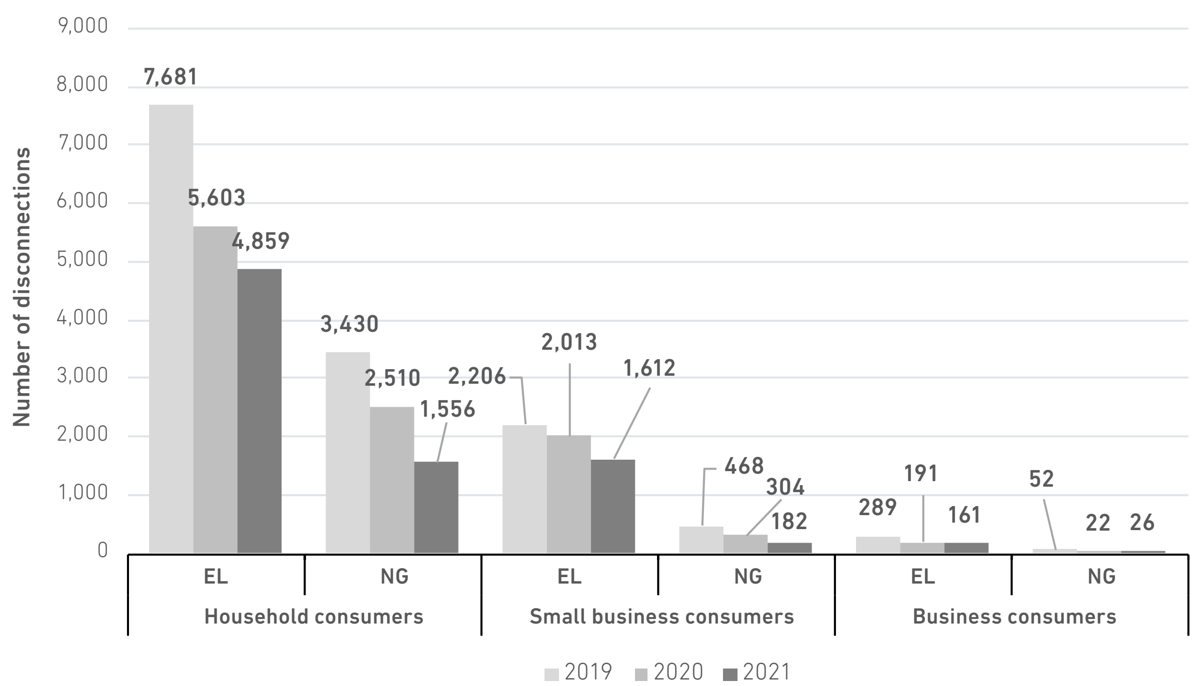
FIGURE 196: COMPARISON OF THE NUMBER OF DISCONNECTIONS OF FINAL CUSTOMERS



SOURCE: ENERGY AGENCY, OPERATORS

One of the reasons for disconnection is the non-payment of network charges. This is a disconnection following a prior notification by the electricity or natural gas distribution system operator to the consumer after the energy supplier has informed the consumer of the cancellation of the supply contract due to unpaid obligations. 73% of all disconnections in the electricity sector involved disconnections of household consumer (4,859), an increase compared to the previous year, while the share in the natural gas sector was the same as in the previous year, i.e. 88% (1,556 disconnections of natural gas household consumers).

FIGURE 197: COMPARISON OF THE NUMBER OF DISCONNECTIONS BY END CONSUMER GROUP



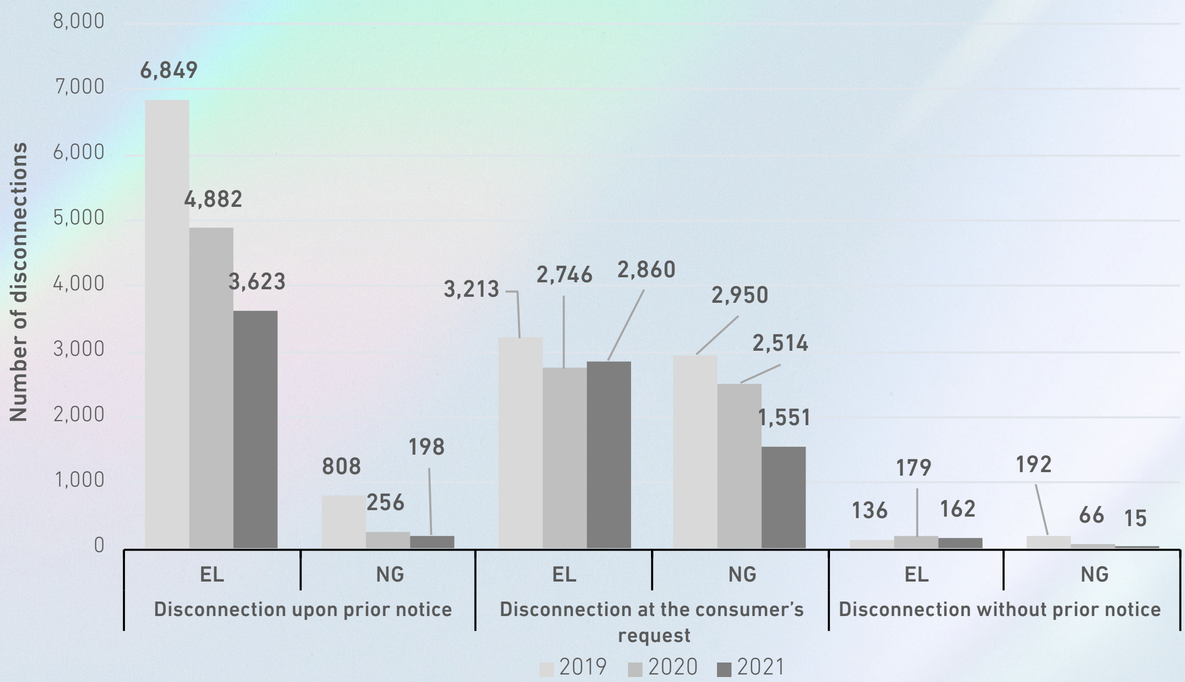
SOURCES: ENERGY AGENCY, OPERATORS

A comparison of the reasons for disconnection shows that the most common reason for the disconnection of an electricity customer is non-payment and thus the termination of the supply contract (disconnection after prior notice), while in natural gas most disconnections are made at the request of the final customer. As in previous years, the lowest number of disconnections of electricity and natural gas customers was without prior notice. Of the 1,764 disconnections of natural gas final customers, 1,551 were at the request of the natural gas final customer.

88% **of all disconnections of natural gas customers were carried out at the customer's request**

54.6% **of all disconnections of electricity customers were due to the termination of a supply contract for non-payment**

FIGURE 198: DISCONNECTIONS ACCORDING TO THE DISCONNECTION PROCEDURE



SOURCES: ENERGY AGENCY, OPERATORS

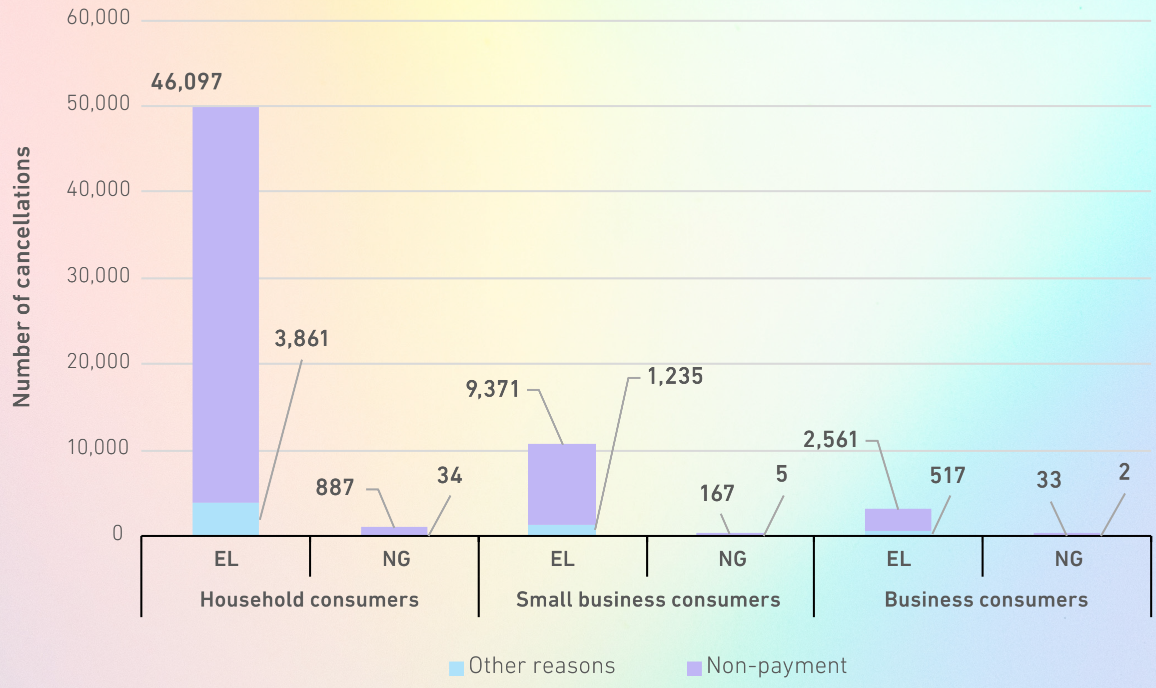
Under the Electricity Supply Act and the Gas Supply Act, electricity and natural gas distribution system operators are required to give at least 10 days' notice to household customers and at least eight days' notice to business customers of the intended disconnection. During this period, customers may remedy the reasons for which they are threatened with disconnection and household customers may exercise any right to emergency supply. In this case, household and small business electricity customers may also request the electricity distribution system operator to provide them with a last resort supply.

Cancellation of the Supply Contract

Electricity suppliers most often cancel the supply contract of household customers for non-payment. In 2021, the total number of cancellations of supply contracts for household customers was 49,958, of which 46,097 were for non-payment. This number does not include the cancellation of supply contracts by the supplier Elektro prodaja E.U., which cancelled supply contracts illegally.

In 2021, natural gas suppliers cancelled 921 contracts for household customers, of which 887 were cancelled for non-payment. Compared to 2020, there is a decrease of 61.8% in contract cancellations.

FIGURE 199: CANCELLATION OF SUPPLY CONTRACTS BY SUPPLIERS



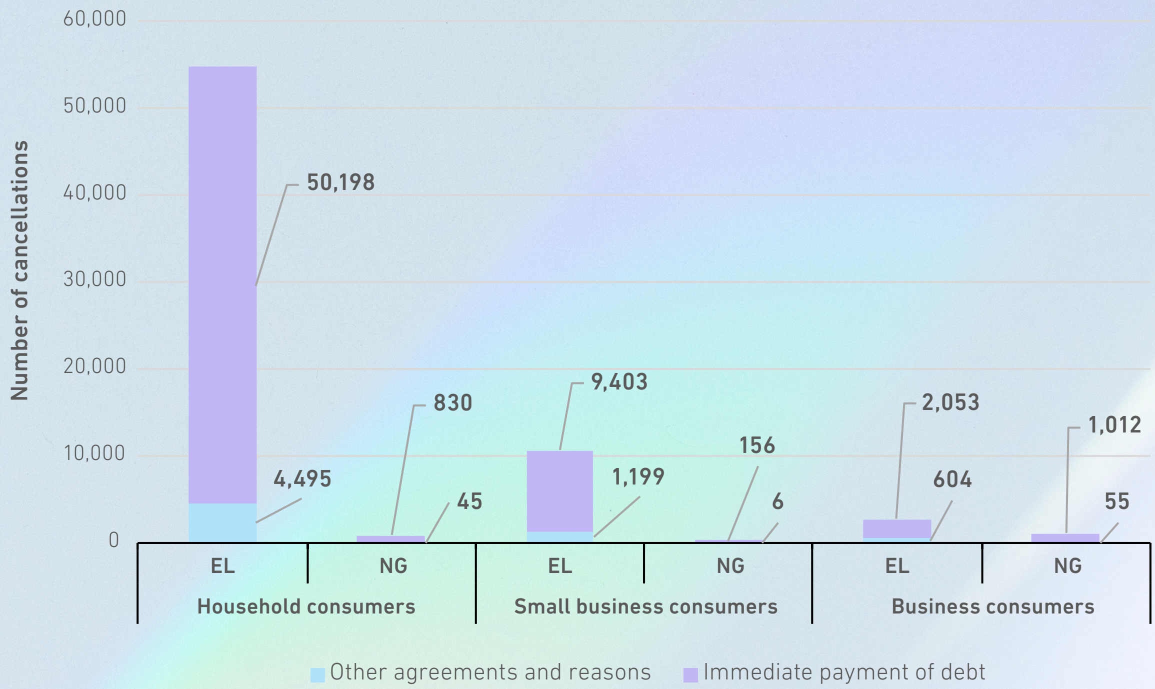
SOURCES: ENERGY AGENCY, SUPPLIERS

As shown in Figure 200, electricity suppliers to household customers cancelled the given terminations of the supply contract 54,693 times in 2021, of which 50,198 times were due to the immediate payment of the debt. In the natural gas sector, the number of cancellations of supply contract terminations for household customers decreased again in the past year, with 875 cancellations of supply contract terminations for household customers (compared to 2,230 in 2020), of which 830 were due to debt repayment and 45 due to other agreements or reasons.

95% **of all cancellations of natural gas supply contracts to household customers were cancelled due to the immediate payment of the debt**

92% **of all cancellations of electricity supply contracts to household customers were cancelled due to the immediate payment of the debt**

FIGURE 200: CANCELLATION OF THE TERMINATION OF SUPPLY CONTRACT BY SUPPLIERS



SOURCES: ENERGY AGENCY, SUPPLIERS

Out of 860,776 household electricity customers, 46,097 supply contracts were cancelled by electricity suppliers due to non-payment, representing 5.36% of all household customers. According to the electricity distribution system operator, only 4,859 household electricity customers were actually disconnected in 2021, representing only 0.6% of all household customers.

Of the 122,404 household natural gas customers, 887 supply contracts were cancelled by natural gas suppliers due to non-payment, representing 0.7% of all household customers. According to the data of the natural gas distribution system operators, 1,556 household natural gas customers were actually disconnected in 2021, which is almost 1.3% of all household customers. However, almost all actual disconnections of household natural gas customers are made at the request of the final customers (1,551 disconnection requests by final customers in 2021).

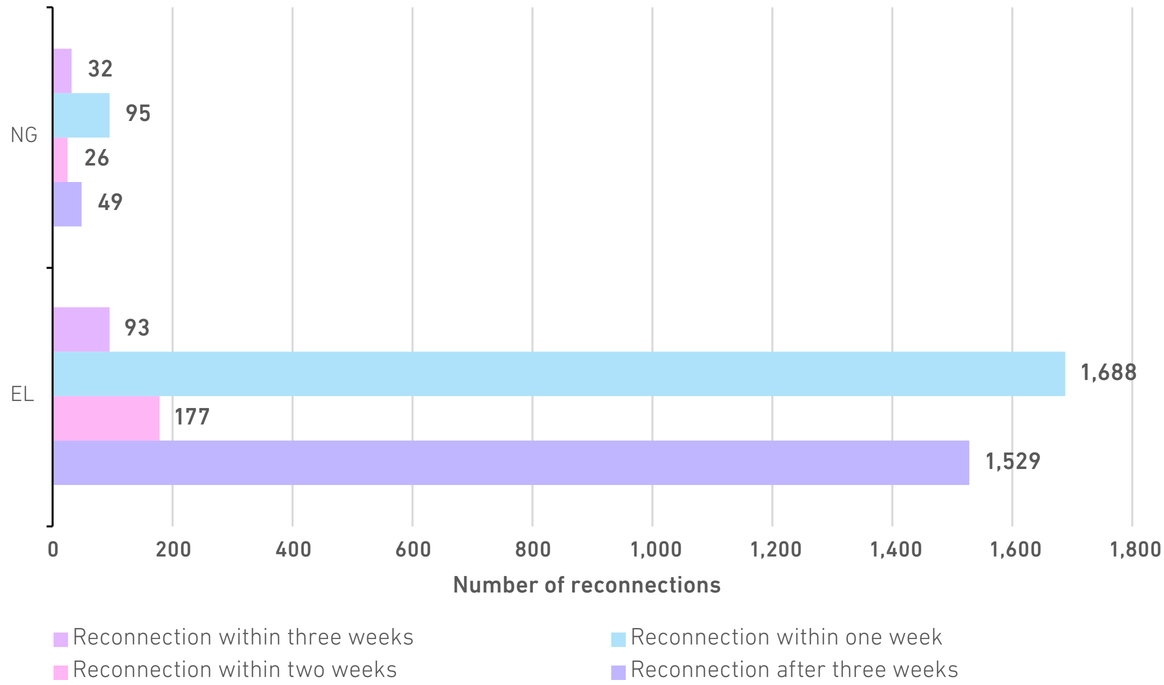
99.7% of all disconnections of natural gas household customers were carried out at the request of the customers

Reconnections

Of the total of 4,859 household electricity customers disconnected, 71.8% (48.4%) were reconnected. Most reconnections were made within one week of disconnection (1688) and after three weeks of disconnection (43.8%).

Of the total of 1,556 household natural gas customers disconnected, only 13% of all disconnected customers were reconnected (202). Most reconnections took place in the first week after disconnection (47%).

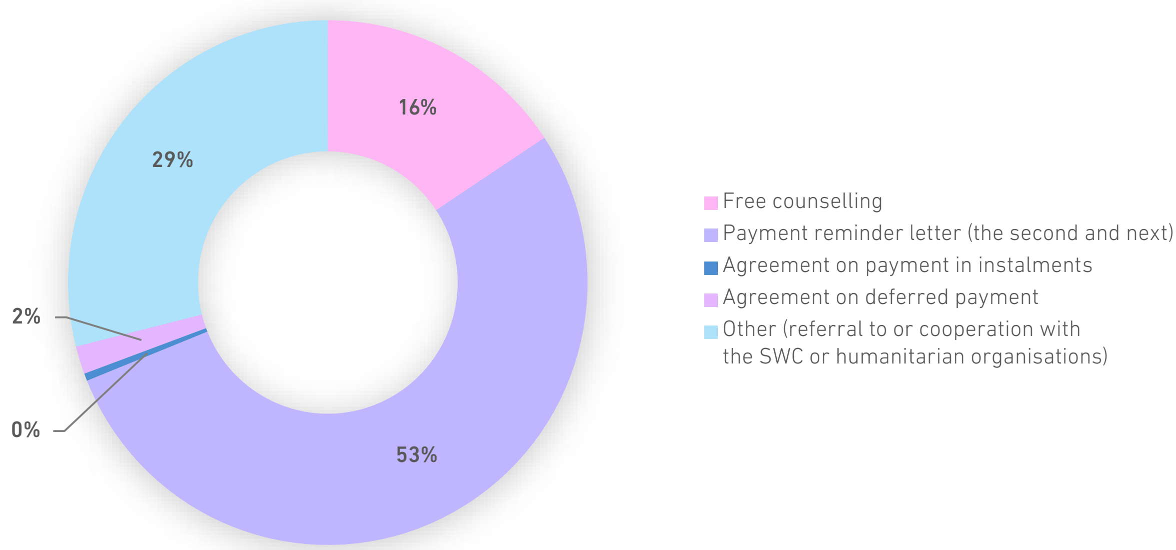
FIGURE 201: RECONNECTIONS AFTER DISCONNECTION PROCEDURES



SOURCES: ENERGY AGENCY, OPERATORS

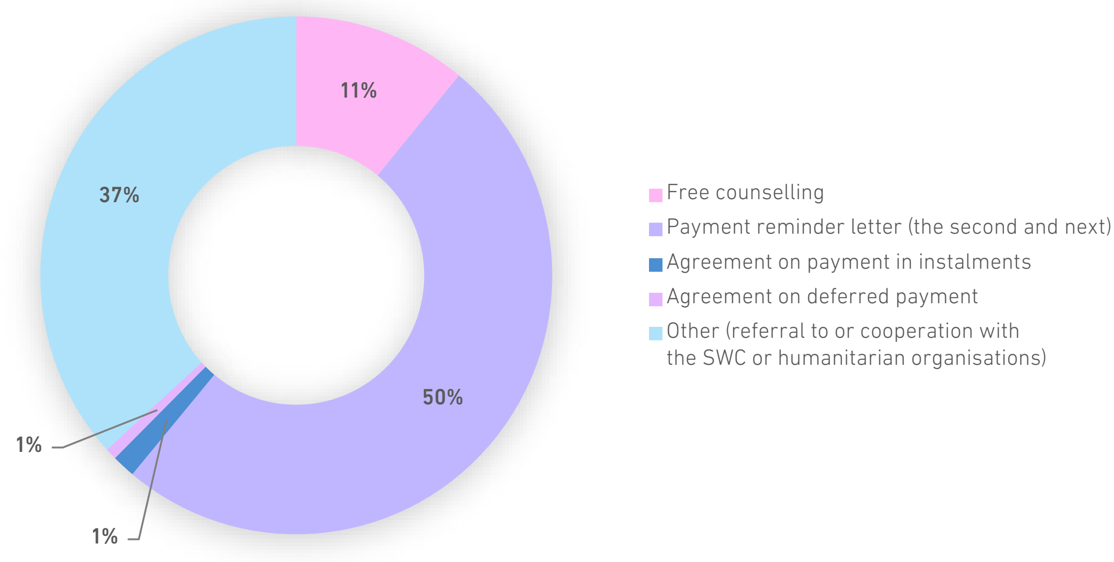
The reason for reconnection is most often the payment of a debt. Most electricity and natural gas suppliers also offer free counselling to household customers who are at risk of disconnection, make arrangements with them to pay their debts, refer them to the SWC or humanitarian organisations, or inform them about emergency supply.

FIGURE 202: AID MEASURES IN THE FIELD OF ELECTRICITY



SOURCES: ENERGY AGENCY, ELECTRICITY SUPPLIERS

FIGURE 203: AID MEASURES IN THE FIELD OF NATURAL GAS

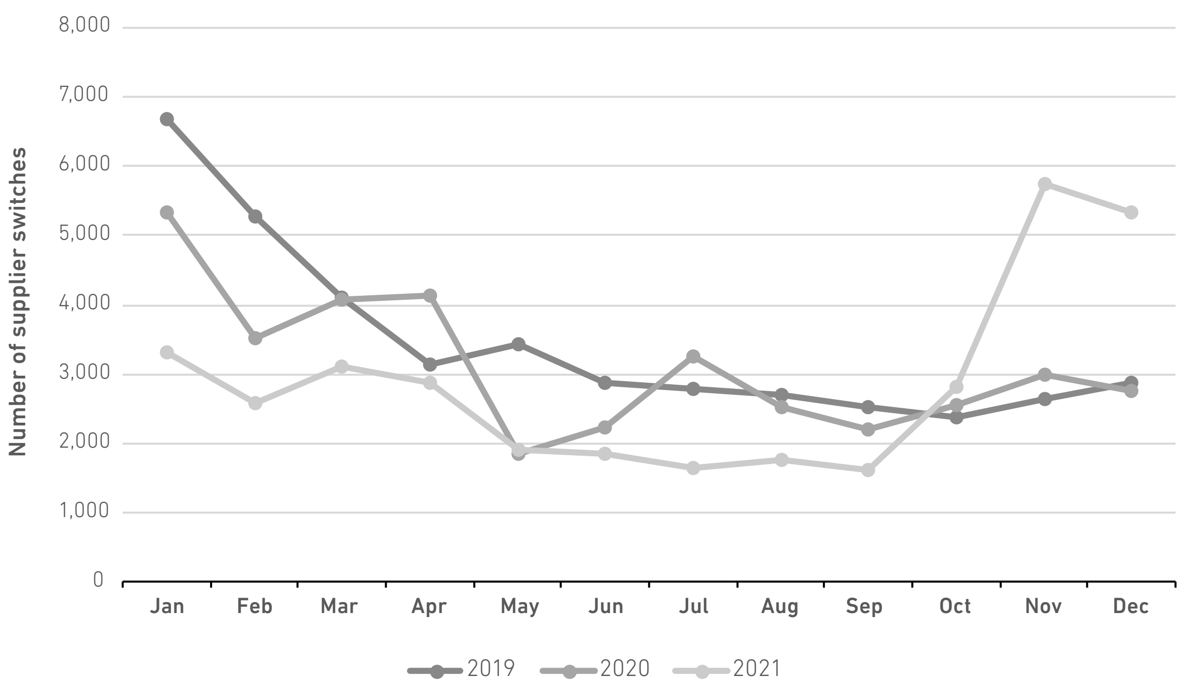


SOURCES: ENERGY AGENCY, NATURAL GAS SUPPLIERS

CASE STUDY: LEGAL GROUNDS IN THE CASE OF UNEXPECTED EVENTS IN THE RETAIL MARKET AND PROPOSALS FOR THE SETTLEMENT OF THE SITUATION

The record growth in the prices of energy products and emission coupons on the wholesale markets, which in the second half of 2021 also began to be reflected in the retail markets in Slovenia, set major challenges for the suppliers of final customers related to the management of price risks. As a result, suppliers responded differently, with some gradually raising prices, two suppliers cancelled supply contracts with a large part of their customers, and two suppliers even withdrew from the market and ceased their activities. The situation led to an increased number of supplier switches in the last three months of 2021 and an increased number of customers supplied under last resort supply conditions at the end of the year. Thus, 14,937 customers had to switch supplier during the period, which is a significant difference from what was happening in previous years.

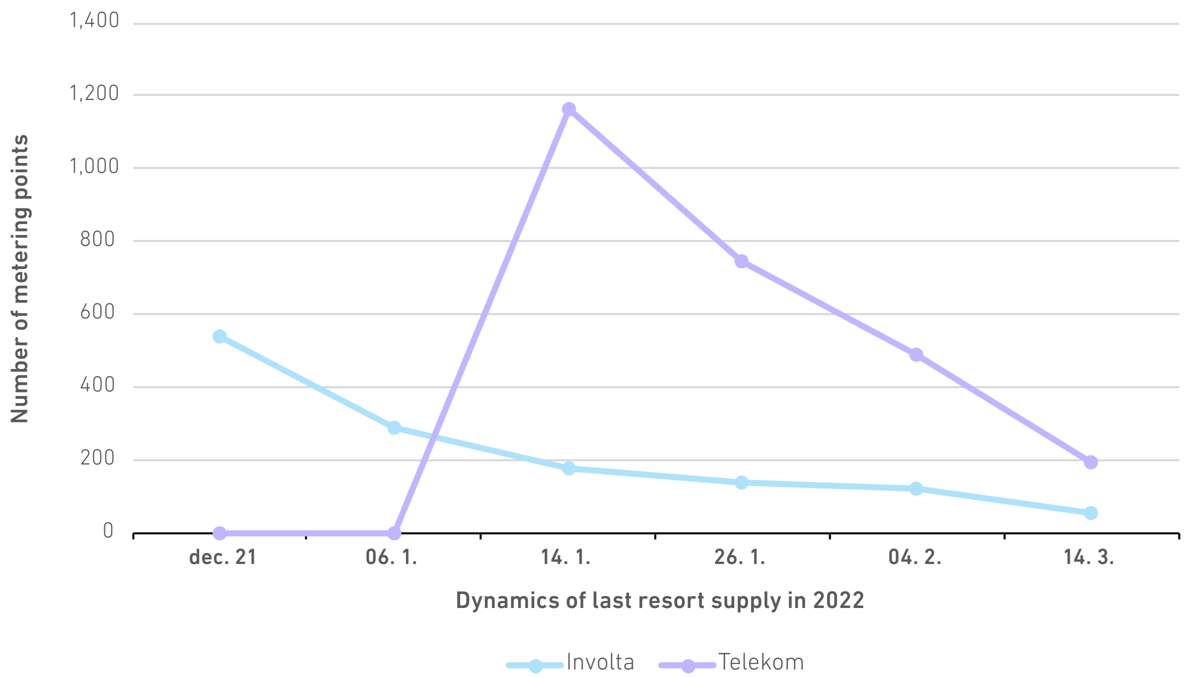
FIGURE 204: DYNAMICS OF THE NUMBER OF HOUSEHOLD CONSUMER SUPPLIER SWITCHES IN THE 2019–2021 PERIOD



SOURCES: ENERGY AGENCY, SODO

At the end of the year, 541 customers were on last resort supply, which is significantly more than in previous years, and in January 2022, the number of customers on last resort supply increased further to 1,571, as some customers did not switch supplier in time after Telekom Slovenije withdrew from the Balance Scheme.

FIGURE 205: YNAMICS OF LAST RESORT SUPPLY AT THE METERING POINTS OF TWO SUPPLIERS IN THE BEGINNING OF 2022



SOURCES: ENERGY AGENCY, SODO

For the first time in Slovenia, however, we were confronted with a situation where some customers who were left without a supplier found themselves in difficulties, as some suppliers refused to enter into supply contracts with new (mainly larger) end-users, and some took the decision not to accept new customers in general, which they also announced on their websites.

The Energy Agency has closely monitored market developments and raised awareness of customers' rights in relation to the applicable legal bases, and in so doing found that certain situations are not regulated by the legislation adequately or at all.

Cancellation of a Contract due to Changed Market Circumstances

Suppliers may change the general contractual conditions or the electricity price on the basis of the applicable legislation, but they must inform household customers of the intended changes in a transparent and comprehensible manner at least one month before they come into effect. They shall also inform them in that notice that the changes to the general terms and conditions or the price shall give them the right to withdraw from the contract within one month of the changes coming into force. This allows the household customer to withdraw from the supply contract free of charge if they do not agree with the new price or the new general terms and conditions. The same applies to small business customers, except that under the ZOEE, 14 days' notice is now sufficient. Suppliers therefore have enough time to adapt their business to market conditions, while customers have enough time to find a new supplier with a more suitable offer and to switch in time.

Under the Obligations Code, suppliers have the possibility to request the cancellation of an existing contract before a court on the grounds of changed circumstances, it being for the court to decide whether there are grounds for cancellation and when the cancellation of the contract actually takes place. The supplier cannot, in fact, terminate the supply contract arbitrarily for this reason.

Notice of Termination of Long-Term Debtor Relationship

In the case of permanent contractual relationships, i.e. contractual relationships that do not have a fixed duration, the Obligations Code provides for the termination (cancellation) of the contractual relationship. The relationship may be terminated at any time by unilateral declaration, but not at an inopportune time. The law does not specify what exactly constitutes an inopportune time. However, according to legal theory, an inopportune time for termination means the existence of circumstances that would cause unjustified damage to the other party to the contract. The legal consequences of termination do not begin upon receipt of the termination notice, but rather they are delayed into the future, i.e. the notice period, which is intended to allow the parties to prepare for the termination of the relationship and to adjust their business or, in the case of electricity supply, to find a new supplier. The length of the notice period is at the discretion of the customers and may be set by law. Given that suppliers, as the stronger party, draw up the general terms and conditions of the contract, the length of the notice period should be fixed by law.

Termination of a Supply Contract due to the Insolvency, Illiquidity or Withdrawal of a Supplier from the Market

In the event of the termination of a supply contract due to the insolvency or illiquidity of a supplier, or if suppliers lose their status as a member of a balance scheme for any other reason, customers automatically switch to the last resort supply of the distribution system operator (DSO) until they find a new supplier.

Suppliers may lose their status as a member of a balance scheme, inter alia, either by withdrawing from the market or by having their balance contract terminated and their membership ceasing as a result[90]. Loss of status as a member of a balance scheme is regulated in the legislation, but not adequately, in particular with regard to the time limits set for withdrawal or exclusion from the balance scheme.

Obligation to Contract with Final Customers

Under the Consumer Protection Act, which applies only to household customers, an undertaking must sell goods or provide services to all consumers on equal terms. The above, on the basis of the Commentary on the Obligations Code[91], constitutes a contracting obligation on the part of suppliers, i.e. an obligation to enter into a contract. This obligation is established irrespective of whether the supplier has shown an express intention to conclude a supply contract, but the mere publication of a price list is sufficient, which is not the case for business customers.

Summary of Developments in 2021 and Shortcomings of the Current Regime

Eight of the 23 suppliers at the time changed their prices and informed customers in a timely manner. Twelve suppliers did not change their prices and four suppliers applied different business practices. The suppliers Elektro prodaja E.U. and Sonce energija terminated customers' contracts with three days' notice due to changed circumstances. The supplier Involta wanted to leave the balance scheme but was later excluded, and the supplier Telekom Slovenije announced at the end of November 2021 that it would leave the balance scheme as of 1 January 2022 and informed customers that they had 30 days to find another supplier.

The termination of the contracts due to the changed circumstances of the supplier Elektro prodaja E.U. and Sonce energija was illegal as the supplier would have had to request the termination of the contracts before a court.

Consequently, the envisaged disconnections of customers who did not switch supplier within the set three-day period would not have been lawful either, since until the court's judgment terminating the contract, the contract is valid and each party is obliged to fulfil its obligations under the contract. In view of the above, the Energy Agency immediately published on its website and in the media information on the market irregularities, informed customers of their rights and, by decision, prohibited the DSO from disconnecting customers. With that, the Energy Agency provided a general preventive measure, as the supplier Sonce energija immediately withdrew from the already announced cancellations and no new illegal cancellations of supply contracts have been detected to date due to changed market circumstances.

While the behaviour of the other two suppliers (Telekom Slovenije and Involta) was not a violation of the legislation, this event has clearly highlighted legal gaps that will need to be urgently filled in order to adequately protect consumers and other market participants. The current regulations do not set minimum time limits that suppliers should respect when making decisions to withdraw from the market, to cease supply activities or to exit from the balance scheme. Telekom Slovenije has therefore not violated the regulations; however, the 30-day time limit is not sufficient to ensure the effective protection of customers' rights and to ensure the timely switching of suppliers. If customers do not switch supplier within this period, they are supplied under the rules of last resort supply, which is much more expensive. Another problem arises

90 The difference between an exit from a balancing scheme and an exclusion from a balancing scheme is that the supplier exiting the balancing scheme has no active customers, as they switch supplier before the exit. If these suppliers do not switch within a set period of time, the conditions for the last resort supply are triggered. However, when a supplier is excluded from the balancing scheme, the last resort supply conditions start immediately.

91 N. Plavšak, M. Juhart, D. Jadek Pensa, V. Kranjc, P. Grilc, A. Polajnar Pavčnik, M. Dolenc, M. Pavčnik: Obligacijski zakonik s komentarjem (splošni del), 1st Book, p. 216

when the burden of providing electricity to these customers is shifted to the electricity distribution system operator, which does not have the adapted processes to carry out the commercial activities of supplying electricity in large volumes or to take over a massive number of metering points, while being placed in the role of supplier, which is contrary to the rules on unbundling.

The termination of the supplier's activities also terminates all the obligations it had as a supplier, including the important right of customers to the free out-of-court settlement of disputes arising from the time when the supplier was still active in the supply business (e.g. disputes over self-supply billing).

Proposals for Changes at the Legislative Level

To improve consumer protection, the Energy Agency together with the market operator, DSO and the Ministry of Infrastructure started setting individual executive acts. Amendments to the Rules on the operation of the electricity market were adopted immediately at the beginning of 2022, specifying the mechanisms for the termination of membership, extending the deadlines for renewing the existing legal bases for membership of the balance scheme, and adding more flexibility in determining margins without changing the level of nominal base and variation margins.

Certain shortcomings can only be changed by amending the law, which will take more time. The Energy Agency considers that it is necessary to provide for:

- minimum notice periods for the termination of a supply contract by the supplier without fault on the part of the customer;
- a reasonable period of time for the supplier to publish information or notify its customers of the termination of the supply activity or of the withdrawal from the balance scheme. From the point of view of customers and other stakeholders who have to prepare themselves to receive new customers, it is necessary to ensure that the termination of the supply activity is announced three months before the withdrawal from the market or the balance scheme at the latest;
- the responsibilities and obligations of the supplier even after the termination of the supply activity (e.g. ensuring the out-of-court settlement of consumer disputes arising from the period when the supplier was still active in the supply activity);
- reintroducing licences or at least minimum conditions for the exercise of electricity supply activities.

Given the state and regulation of last resort supply in Slovenia, it is also necessary to consider a reform of such supply in the electricity sector, where, following the example of most Member States and in line with the rules on the unbundling of network activities from commercial activities, last resort supply should be provided by one or more suppliers.

Market developments in the past year, when consumers could not find a new supplier and consequently opted for last resort supply, which is much more expensive and, due to the unbundling of activities, should only be provided temporarily by the DSO, have shown that a universal supply service should be ensured, e.g. through the introduction of a 'general price list'. This area is very well regulated in Austria, for example, where the 'free market' means that both the consumer and the supplier have the right to choose, but where all suppliers of household consumers are obliged by law[92] to publish a 'general tariff' ('Grundversorgung') for the basic supply of household consumers, according to which they must supply energy to household and small business consumers on request, and cannot refuse to supply the consumer in this case. In doing so, rules are also laid down for the setting of the general tariff, which may not be higher than the tariff at which the largest number of household consumers of each supplier are supplied. This form of supply protects, in particular, consumers who have been threatened with disconnection for non-payment against the payment of a security deposit, which may not exceed the monthly energy cost. The security is refunded to the consumer after a period of six months in the event of the regular payment of the obligation.

The arrangement in question could be extended in Slovenia to the area where a household or small business consumer cannot find a supplier for whatever reason, as already reported by consumers in autumn 2021. Thus, it is necessary to amend the current legislation in such a way that suppliers are required to publish a general or regular price list and general supply conditions, which would apply without restriction to all household and possibly small business consumers. In such cases, the supplier should not refuse to enter into a contract with those consumers, regardless of whether this is in the interest of the supplier or not. Electricity is so essential a commodity that we need to ensure that no one is left without a basic supply at a reasonable price.

92 Elektrizitätswirtschafts und organisationsgesetz - ElWOG

The Right of Complaint and the Out-of-Court Settlement of Consumer Disputes with Suppliers and the Right of Complaint with Operators

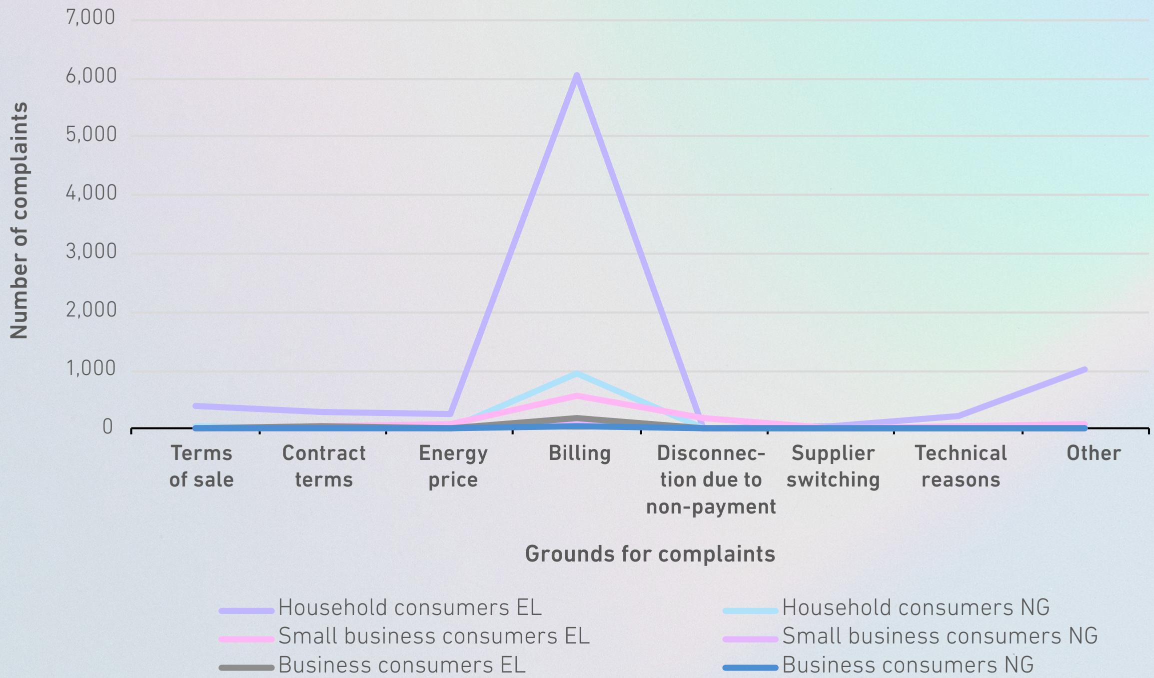
Complaints and Out-of-Court Consumers' Dispute Settlements with Energy Suppliers

All consumers have the right to complain to their energy supplier. Disputes between small or large business consumers on the one hand and energy suppliers on the other hand are settled first with the individual supplier and then before the competent court. For household consumers, the legislation also provides for out-of-court dispute resolution with energy suppliers.

The number of complaints by household electricity and natural gas consumers decreased compared to the previous year, by 11% for electricity with 8,358 complaints, and by 21% for natural gas, with a total of 1,210 complaints.

Figure 206 shows the number of complaints by electricity and natural gas customers against energy suppliers in 2021 by reason. The majority of all the consumers' complaints related to the content of the energy supplier's invoice. It should be added that complaints about the invoice also partly include complaints relating to the measured quantities of energy consumed or electricity delivered, on the basis of which the billing is carried out and for which the operators of the electricity and natural gas distribution systems respectively are responsible and that communicate this information to the energy suppliers (the result of disagreement with the measured quantities of energy is reflected in the number of complaints against the invoice). The majority of complaints were filed by household consumers, with the number of complaints filed in the electricity sector being significantly higher than in the natural gas sector.

FIGURE 206: CONSUMERS' COMPLAINTS AGAINST SUPPLIERS BY REASONS

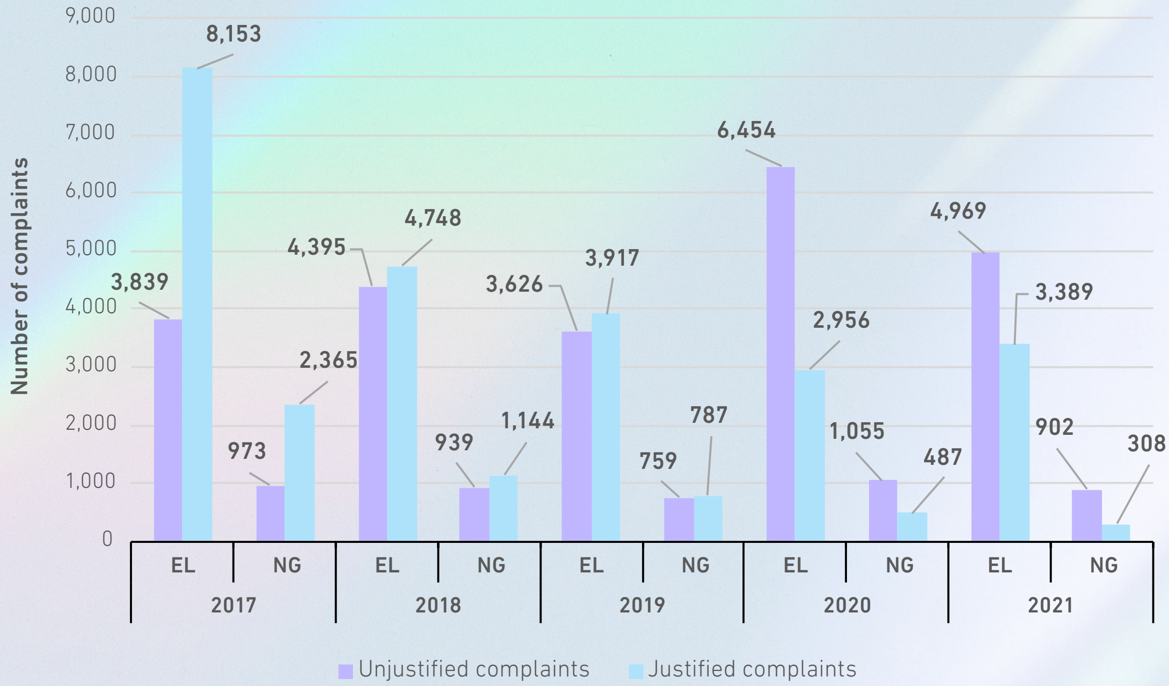


SOURCES: ENERGY AGENCY, SUPPLIERS

While in previous years the majority of complaints were upheld by suppliers, this trend was reversed in 2020 and continued in 2021. In the electricity sector, 60% of all complaints received were unjustified, while in the natural gas sector 75% of such complaints were unjustified. Figure 207 shows the decisions taken by energy suppliers on complaints from household electricity and natural gas consumers, according to the justification of the complaint.

The majority of complaints from household consumers, 75% in the field of natural gas, were unjustified.

FIGURE 207: SUPPLIERS' DECISIONS ON THE ELIGIBILITY OF COMPLAINTS BY HOUSEHOLD CONSUMERS IN THE 2017–2021 PERIOD



SOURCES: ENERGY AGENCY, SUPPLIERS

Only one household electricity consumer whose complaint was rejected by the supplier as unjustified continued with the out-of-court consumer dispute resolution provider, while in the field of natural gas, there were no requests for an out-of-court consumer dispute resolution provider in 2021. Although electricity and natural gas consumers are aware of this dispute resolution option, they do not use it.

Potential breaches of the general consumer protection rules in Slovenia are also monitored and sanctioned by the Market Inspectorate of the Republic of Slovenia, but with the amendment in 2019 and later with the adoption of the ZOEE and the ZOP, the competencies with regard to the monitoring of unfair commercial practices relating to:

- false or misleading representation of the company, which the person addressing the end consumer represents, or in the name and on behalf of which he acts;
- misrepresentation of the supplier's offer to final consumers;
- giving untrue reasons for visiting final consumers;
- false or misleading claims relating to contract,

were transferred from the Market Inspectorate of the Republic of Slovenia to the Energy Agency. In 2021, the Energy Agency, thus, initiated four control procedures concerning unfair commercial practices.

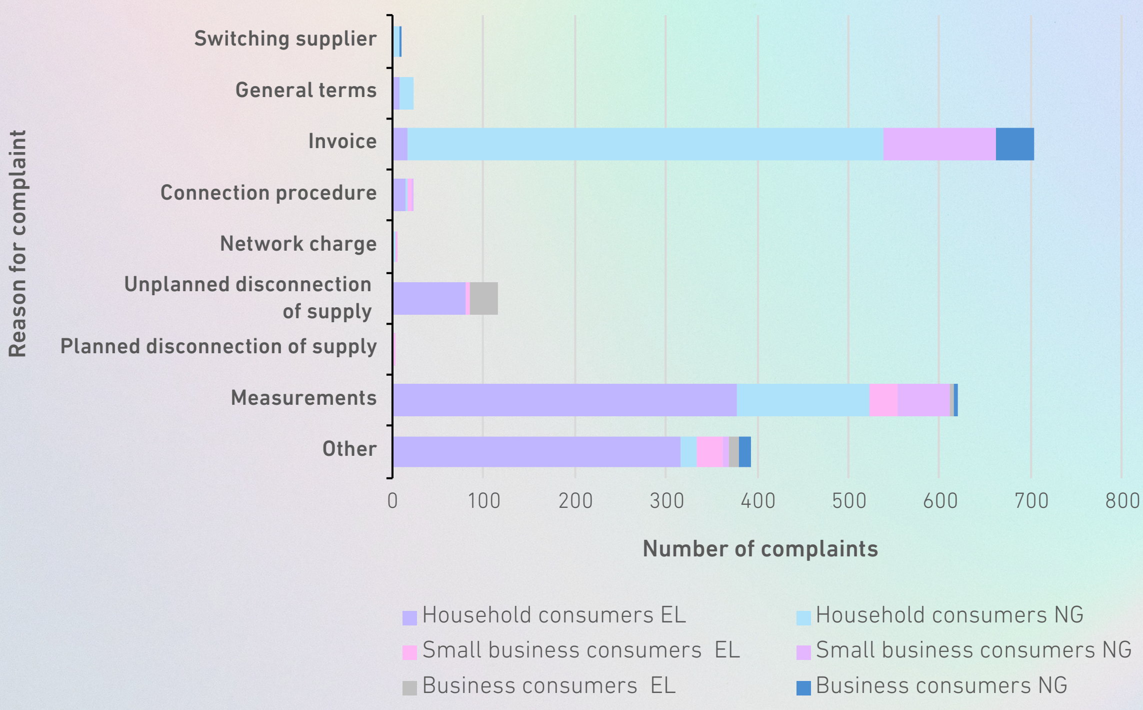
Consumer Complaints to Electricity and Natural Gas Distribution System Operators

In the event of disagreement with the operator regarding billing, metering, network charges, interruptions, etc., consumers also have the right to submit a complaint directly to the electricity or natural gas distribution system operator. If consumers fail to resolve their complaints directly with the electricity or natural gas distribution system operators, the Energy Agency shall settle disputes in accordance with the procedures described in more detail in the following chapter.

53% fewer complaints from electricity consumers

In 2021, a total of 930 complaints from electricity consumers were filed directly with the electricity distribution system operator (1,040 fewer than in the previous year) and 962 complaints were filed with natural gas distribution system operators (32 fewer than in the previous year). The majority of complaints to electricity and natural gas DSOs were from household consumers (813 electricity and 715 natural gas), with the majority of complaints relating to metering in electricity and billing in natural gas.

FIGURE 208: NUMBER OF CONSUMER COMPLAINTS TO OPERATORS BY REASON

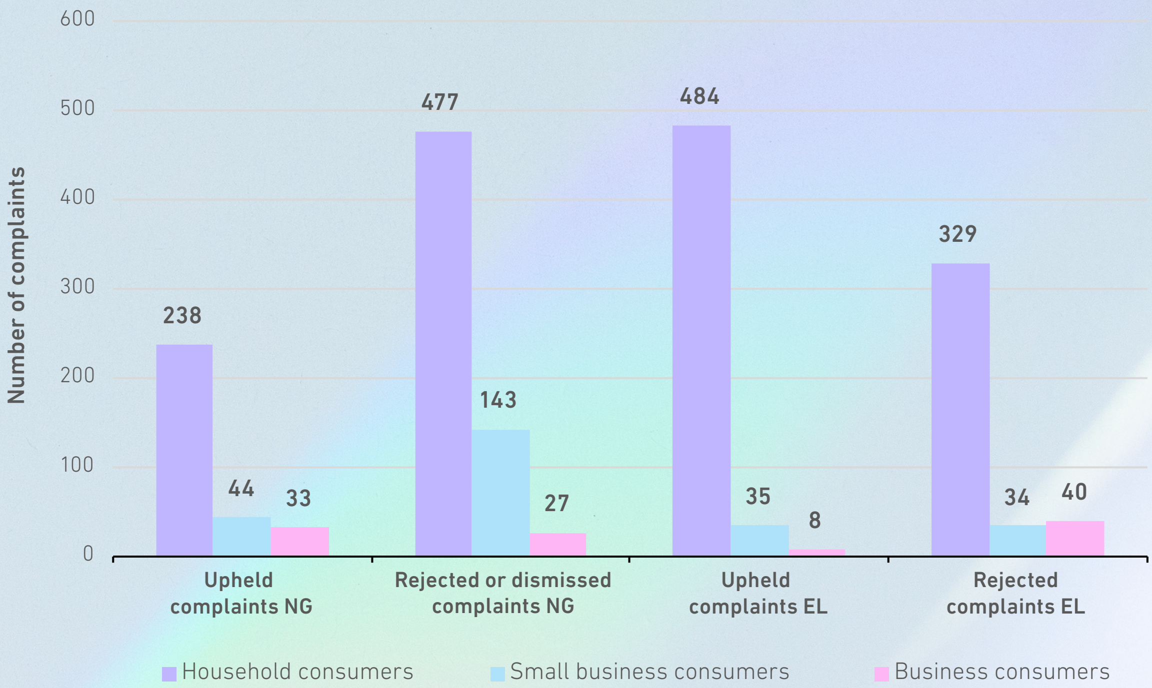


SOURCES: ENERGY AGENCY, OPERATORS

Figure 209 shows the number of approved and rejected complaints against electricity and natural gas distribution system operators.

Out of a total of 930 complaints filed by all electricity consumers, 57% or 527 were upheld and the rest were rejected (403). In the field of natural gas, the trend is reversed, with the majority of complaints being rejected, with operators upholding only 33% of the complaints filed, or 315, and the rest being rejected or dismissed (647).

FIGURE 209: NUMBER OF COMPLAINTS DEALT WITH BY OPERATORS



SOURCES: ENERGY AGENCY, OPERATORS

The Right to the Protection of Rights in Administrative Procedures

In addition to electricity or natural gas consumers, suppliers of electricity or natural gas may also submit a request for dispute settlement before the Energy Agency. These are disputes that these eligible entities bring before the Energy Agency in relation to electricity and natural gas transmission system operators, electricity and natural gas distribution system operators, or the electricity market operator, whereby they must first follow the procedure set out in the EZ-1 before submitting a request for a decision to the Agency.

The disputes falling within the competence of the Energy Agency are disputes relating to access to the system, the amount charged for the use of the system, breaches of the system operating instructions and established deviations, and disputes relating to breaches of the Decree on the self-supply of electricity from renewable energy sources.

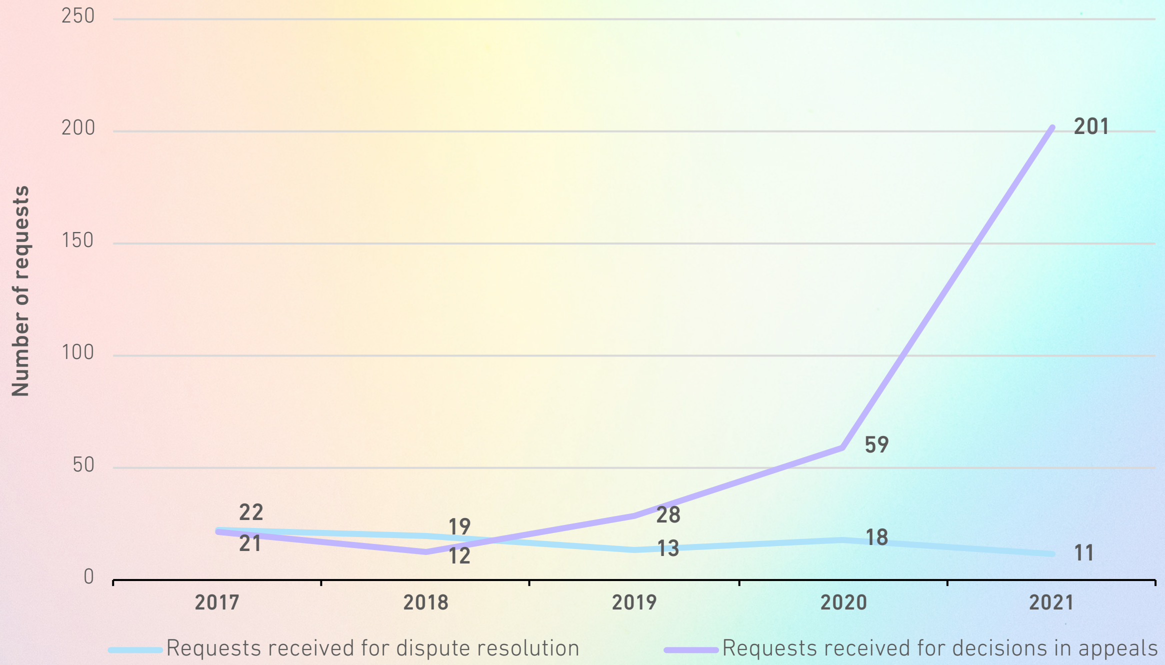
Administrative procedures before the Energy Agency are fast and free of charge. A decision on a dispute settlement request is taken within two to four months.

In 2021, the Energy Agency dealt with 222 individual cases, 14 first instance requests (three cases carried over from the previous period) and 208 second instance cases - complaints relating to the consent for connection to the system (seven cases carried over from the previous period). 123 second instance complaints out of the total of 208 related to the first instance authority's silence in failing to grant consents for the connection of self-supply installations.

Figure 210 shows the share of requests received and decided on by the Agency in the first and second instance over the last five years.

Requests for decision-making in disputes and complaints only in the field of electricity

FIGURE 210: ENERGY AGENCY DECISIONS IN DISPUTES AND APPEALS IN THE 2017–2021 PERIOD



SOURCE: ENERGY AGENCY

Four requests for a decision in the dispute did not meet the conditions for initiating proceedings before the Energy Agency and, in these cases, applicants were referred to the preliminary procedure. Of the remaining six requests examined, two were discontinued (due to settlement or the withdrawal of the request for adjudication), one was rejected (due to failure to conduct preliminary proceedings) and the remaining three requests were granted for one and rejected for two. However, four requests submitted in 2021 have not yet been decided on.

The Energy Agency received more than 100 complaints about the non-issuance of connection consents for self-supply installations

The Energy Agency also protects the rights of consumers by resolving complaints filed by consumers against decisions of electricity and natural gas distribution system operators relating to the granting of a connection consent. In 2021, the Energy Agency received more than 100 complaints about the first instance authority's silence or failure to issue connection consents for self-supply installations - all concerning Elektro Maribor - which did not issue connection consents for individual self-supply installations within the time limits set by the applicable legislation. On the basis of an in-depth analysis of the situation and a comparison of the conduct of the procedures for all distribution companies, the Energy Agency concluded that the reasons for the long delays were unjustified, as the average time taken to resolve the application for granting the said consent consistently deviated from other comparable distribution companies, the average number of consents for the connection of self-supply installations per employee for the area was half that of other comparable distribution companies, even though all the companies have recognised eligible costs on the same methodological basis and have sufficient resources to ensure that the consents are issued smoothly. Following the Energy Agency's action, the number of decisions increased significantly in the last months of the previous year (e.g. in November alone, five times as many applications were resolved on a weekly basis as in each week of the previous months). Nevertheless, at the end of the year, the number of pending applications for connection consent was still 1,998. A similar trend continues in 2022 as a consequence of the state of the network, which will not be able to withstand the connection and the safe and reliable operation of new generating installations without additional reinforcements and extensions. The loss of revenues for distribution companies due to the Intervention Act in 2022 will only worsen this situation.

In deciding on appeals against the connection consent, the Energy Agency resolved 34 appeals (29 were upheld and returned to the first instance authority for retrial, four were rejected and one was dismissed) and 34 were referred to the first instance authority. The Energy Agency ruled on procedural irregularities (infringement of the rules of administrative procedure) in most of the requests.

TABLE 42: ENERGY AGENCY DECISIONS IN DISPUTES AND APPEALS

	2021	
	Disputes	Appeals
First instance authority's silence	0	123
Dismissed	1	1
Discontinued	2	0
Passed on to a competent authority	0	34
Rejected	2	4
Granted	1	29

SOURCE: ENERGY AGENCY

The Right to the Safe and Reliable Operation of the System and the Quality of Supply

All consumers have the right to the safe and reliable operation of the system and to a quality supply of electricity and natural gas provided by the electricity and natural gas system operators in accordance with the system operating instructions to which the Energy Agency gives its consent.

At the system level, the quality of supply regulation seeks to improve or maintain the level already achieved at the optimum cost. Various activities are carried out to address the quality of the electricity supply, such as monitoring, reporting and data analysis of the following observed dimensions: continuity of supply, commercial quality and voltage quality. In addition to the above, the Energy Agency also regulates the quality of supply by publishing data and analyses, which are made public in the Quality of the Electricity Supply Report. For more information, see the section on voltage quality in the electricity sector.

In 2021, natural gas system operators continued to ensure reliable and safe operations for a smooth and quality supply by carrying out regular and emergency maintenance.

More details are provided in the chapter on the quality of the electricity supply and in the chapter on safe and secure operation and the quality of the natural gas supply.

Efficient use of energy - lower costs, less pollution, better security of energy supply

262 GWh

OF ENERGY SAVINGS, 4.8% MORE THAN THE TARGET SAVINGS

74,491 TONNES

OF CO_2 EMISSIONS LESS, MOST SAVINGS IN INDUSTRY

5,401 GWh

POTENTIAL SAVINGS FROM ENERGY AUDITS OVER THE NEXT FOUR YEARS

54%

OF ALL SAVINGS GENERATED IN INDUSTRY

95%

OF LARGE COMPANIES COMPLY WITH ENERGY AUDITS

ENERGY EFFICIENCY

Energy efficiency is one of the most cost-effective measures to achieve the objectives of a sustainable energy policy. Energy efficiency means introducing modern technologies and measures that reduce energy use and thus greenhouse gas emissions while increasing the share of RES in final energy consumption.

Slovenia has committed in the NEPN to get primary energy consumption below 73.9 TWh by 2030 and to increase energy efficiency by at least 35% compared to the 2007 baseline scenario, although the EU target is 32.5%.

The energy efficiency policy objectives are being implemented in Slovenia through measures to promote energy efficiency in all end-use sectors, as well as in the energy conversion, distribution and transmission sectors, including efficient district heating and cooling networks.

Most of the energy savings in Slovenia to meet its energy efficiency targets are achieved by implementing measures under the mandatory energy savings scheme, which binds energy suppliers to end-users, and the alternative energy efficiency measures programme implemented by the Eco Fund.

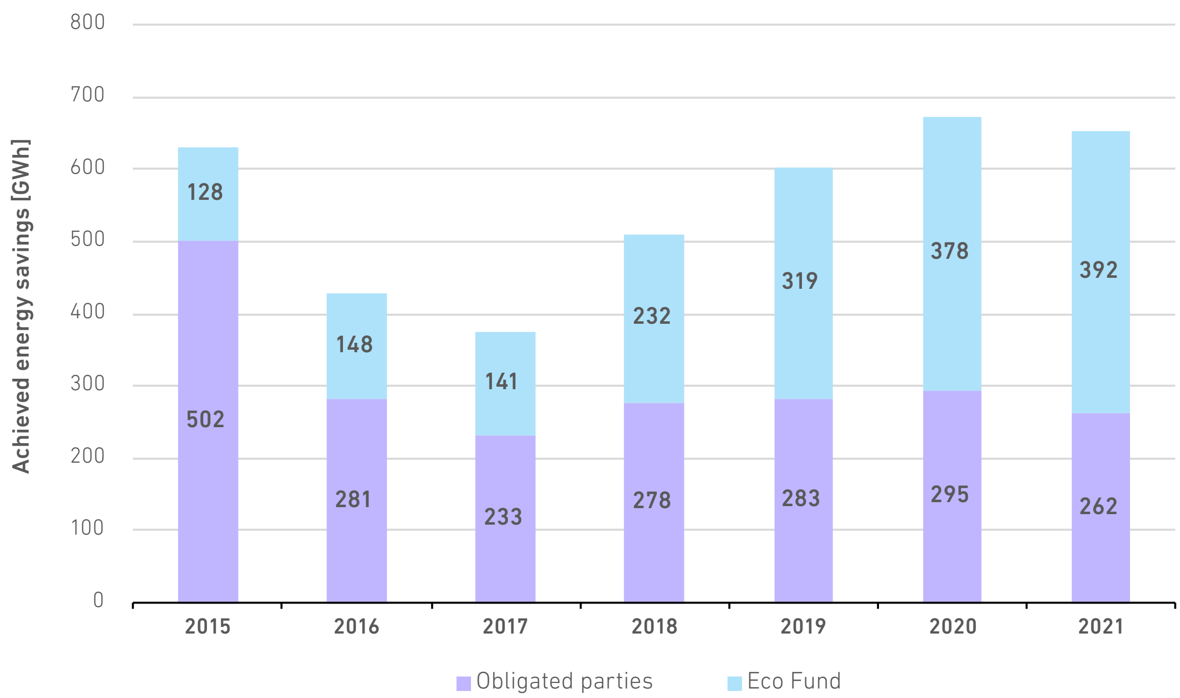
The Energy Savings Obligation Scheme and Alternative Measures

Under the mandatory energy savings target, Slovenia must achieve 0.8% annual savings in final energy consumption. In doing so, the country has taken advantage of the transitional period to allow liquid fuel suppliers to gradually increase their annual savings until 2026, when they will also be required to achieve annual final energy consumption savings of 0.8% on the previous year's sales volumes, while in 2021 they were required to achieve 0.3% on the volumes of energy sold in 2020.

Energy savings are also generated through an alternative measure implemented under the EcoFund Energy Efficiency Programme. The programme is financed through funds collected from final energy consumers as part of the energy efficiency contribution.

These two measures together generate 654 GWh of savings in Slovenia in 2021, which is 20 GWh less than the savings achieved in 2020. It is worth noting that the Eco Fund's savings in 2021 exceeded those in 2020 by 14 GWh and in 2019 by 73 GWh.

FIGURE 211: ACHIEVED ENERGY SAVINGS IN THE 2015-2021 PERIOD



SOURCES: ENERGY AGENCY, ECO FUND

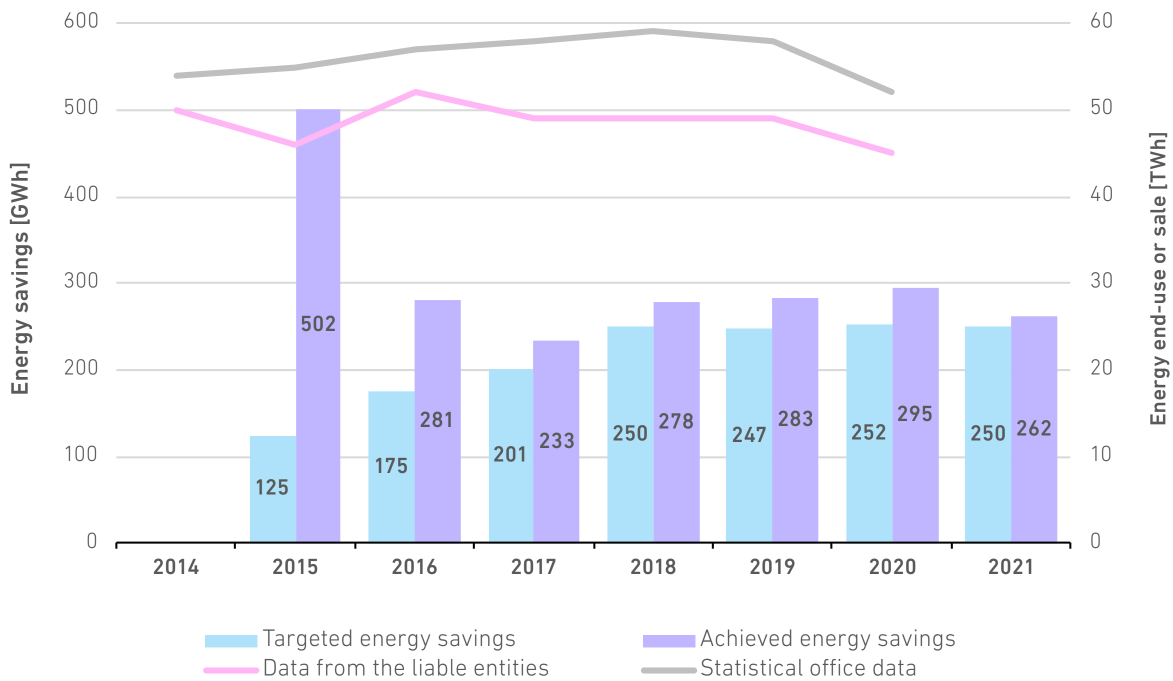
Target Energy Savings of the Obligated Parties

The energy savings obligation is imposed on suppliers of electricity, heat, natural gas and liquid and solid fuels to final customers, who were required to contribute to the implementation of energy efficiency measures in 2021 by delivering annual energy savings of 0.8% of the energy sold to final customers in 2020. This obligation is exempted for suppliers of liquid fuels, who were required to deliver annual savings of 0.3% of petrol and diesel sold in 2021. However, suppliers of solid fuels to final customers who supply less than 100 MWh of energy per year are exempted from the mandatory savings scheme from 2020.

Energy suppliers sold 44,912 GWh of energy to final customers in 2020, according to reported data. Of this, 21,906 GWh of petrol and diesel were sold. The 0.3% savings target for 2021 from the sale of liquid fuels was therefore 66 GWh. The 0.8% savings target for 2020 from the sale of electricity, heat, natural gas and liquid and solid fuels to final customers (23,006 GWh) was set at 184 GWh for 2021. The total savings target for 2021 was therefore 250 GWh, which is only 2 GWh or 0.8% less than the 2020 savings target, although energy suppliers sold 4440 GWh or 9% less energy products in 2020 than in 2019, according to the reported data. This is mainly due to the increase in the share of the savings target for liquid fuels from 0.25% in 2020 to 0.3% in 2021.

Figure 212 shows the volume of energy sold to final customers and a comparison with STAT data on final energy consumption, as well as the targeted and achieved energy savings in the 2015-2021 period.

FIGURE 212: COMPARISON OF THE FINAL ENERGY CONSUMPTION AND SOLD ENERGY DATA FROM THE LIABLE ENTITIES AND STAT IN THE 2014-2019 PERIOD AND THE TARGETED AND ACHIEVED SAVINGS IN THE 2015-2021 PERIOD



SOURCES: ENERGY AGENCY, STAT

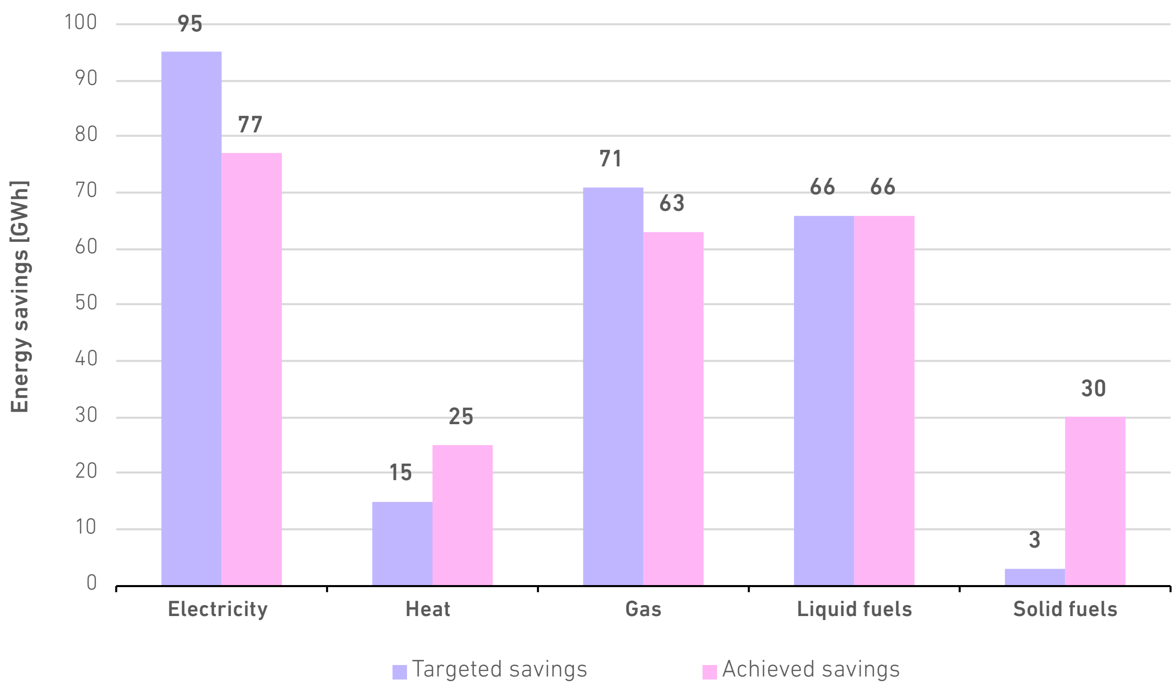
By contributing to the implementation of energy efficiency measures, suppliers achieved 262 GWh of energy savings in 2021, 4.8% more than the target, exceeding the annual savings target in this year, as well as in the 2016-2020 period.

Activities of Suppliers to Achieve Target Energy Savings

In 2021, most energy suppliers have contributed (by co-implementing measures, contributing to the implementation of measures, etc.) to ensuring that the 2021 savings target is exceeded. Suppliers who fail to achieve the target energy savings through their contribution to the implementation of energy efficiency measures may fulfil their obligation to pay financial compensation to the Eco Fund for each megawatt-hour of energy savings not achieved.

Figure 213 shows that electricity suppliers generated the highest savings, with 77 GWh of savings, and liquid fuel suppliers with 66 GWh of savings. This is followed by gas suppliers with 63 GWh, solid fuel suppliers with 30 GWh and heat suppliers with 25 GWh of energy savings. Both electricity and gas suppliers generated savings in 2021 that do not exceed the 2021 savings target for this energy commodity, based on reported energy sales data. However, suppliers of heat, liquid and solid fuels met or exceeded the 2021 savings target for this year.

FIGURE 213: TARGET AND ACHIEVED ENERGY SAVINGS BY THE TYPE OF ENERGY SUPPLIER



SOURCE: ENERGY AGENCY

Energy Savings Achieved by Individual Measures

Suppliers have achieved energy savings by contributing to the implementation of individual energy efficiency measures in industry, the service and public sectors, residential buildings and, in addition, in the energy conversion, distribution and transmission sector. For the set of measures for which suppliers can demonstrate savings, the savings achieved are calculated in accordance with the measure-specific savings calculation methodologies set out in the Rules on the methods for determining energy savings, except for measures where savings must be demonstrated by an energy audit, in which case the savings achieved for each measure are measured.

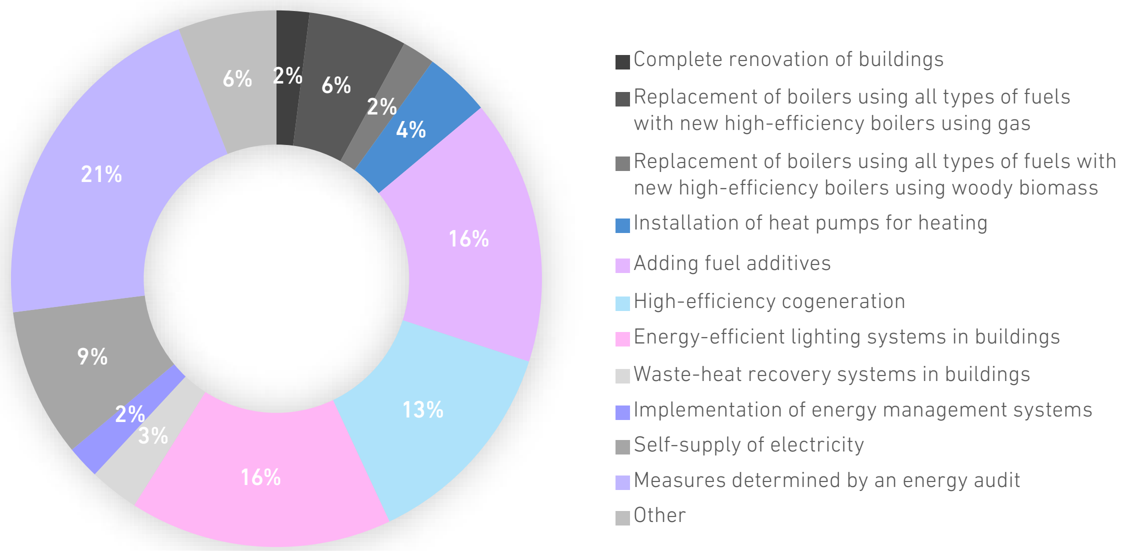
TABLE 43: ENERGY SAVINGS BY INDIVIDUAL MEASURES IN THE 2015–2021 PERIOD

Measure	2015 (GWh)	2016 (GWh)	2017 (GWh)	2018 (GWh)	2019 (GWh)	2020 (GWh)	2021 (GWh)
Complete renovation of buildings	0.0	0.6	0.1	15.9	7.0	7.7	4.0
Replacement of boilers using all types of fuels with new high-efficiency boilers using gas	7.6	13.6	22.8	14.8	13.5	15.6	16.8
Replacement of boilers using all types of fuels with new high-efficiency boilers using woody biomass	1.6	2.4	0.8	1.5	2.9	20.5	5.6
Replacement of electric heating systems with central heating with new high-efficiency gas boilers	0.0	0.0	0.0	1.5	0.0	0.0	0.0
Installation of heat pumps for heating	2.7	0.3	1.7	3.5	6.1	2.8	9.7
Comprehensive renovation of heat stations	73.5	3.1	0.8	1.7	0.5	1.9	2.7
Connecting buildings to the district heating system	2.3	4.7	5.8	2.6	2.2	2.3	1.3
Renovation of the distribution network for district heating	3.9	4.4	2.9	4.5	3.8	1.6	3.0
Systems for the recovery of waste heat in buildings	0.0	9.2	2.0	0.6	0.0	0.9	7.9
Optimisation of technological processes, which is based on implemented energy audits in small and medium-sized enterprises	15.3	9.7	3.9	4.8	12.1	2.4	6.0
Adding fuel additives	195.5	99.1	45.2	54.4	33.4	27.8	41.9
High-efficiency cogeneration	37.7	9.8	11.9	66.2	78.9	62.2	34.0
Energy-efficient lighting systems in buildings	14.5	15.5	24.1	42.5	57.8	55.0	40.2
Renovation of outdoor lighting systems	0.1	0.0	2.7	2.2	0.3	5.2	0.2
Energy-efficient household appliances	0.0	0.1	0.1	0.9	0.1	1.1	1.2
Energy-efficient electric motors	0.2	0.1	1.6	1.6	0.1	0.0	0.5
Use of frequency converters	1.1	0.4	5.6	3.8	1.2	1.9	2.1
Implementation of energy management systems	98.3	92.9	103.8	9.7	29.8	3.4	5.4
Use of excess heat in industry and service sectors		0.0	6.0	22.6	0.3	0.0	0.6
Self-supply of electricity	0.0	0.0	0.0	0.0	5.0	4.6	23.5
Measures determined by energy audits	44.9	12.3	7.5	27.1	27.6	75.4	48.0
Other	2.2	3.7	2.3	1.9	3.4	2.8	7.4

SOURCE: ENERGY AGENCY

The data in Table 43 and Figure 214 show that in 2021, most of the energy savings (21%) were achieved through measures where savings are demonstrated through energy audits, mainly in the industry sector, followed by transport through an additive to motor fuels, and the service sector through the measure of implementing energy efficient lighting in buildings.

FIGURE 214: SHARES OF ENERGY SAVINGS ACHIEVED THROUGH INDIVIDUAL MEASURES



SOURCE: ENERGY AGENCY

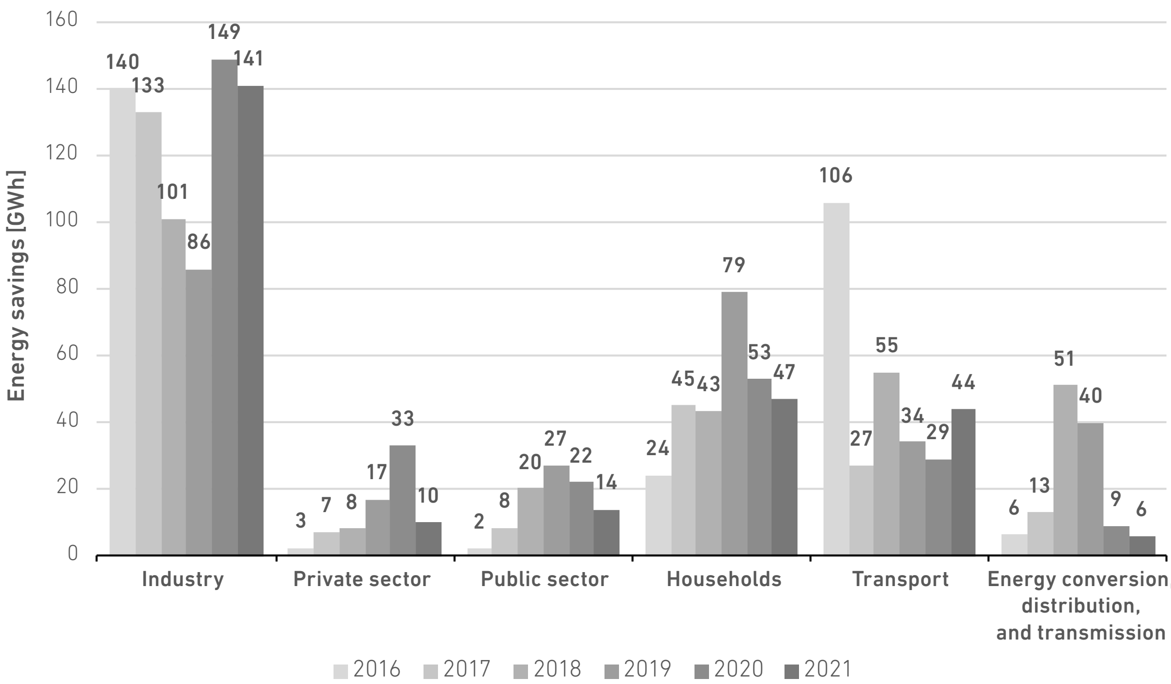
Based on the methodologically determined CO_2 emission reduction calculations for each type of measure, the Energy Efficiency Obligation measures reduced the annual CO_2 emissions by 74,491 tonnes, with the highest reductions in industry, which also achieved the highest savings by sector.

Energy Savings by Sector

In 2021, the largest savings were generated in the industry sector, with 141 GWh, representing 54% of the total energy savings achieved, and 8 GWh less than in the previous year. Transport achieved more savings than in the previous year, with 44 GWh.

Over the entire 2016-2021 savings reporting period, the greatest savings were achieved in industry, while the lowest savings were achieved in the private and public sectors. However, savings in the private and public sectors, households and the energy conversion, distribution and transmission sectors were also decreasing this year.

FIGURE 215: ENERGY SAVINGS BY SECTOR IN THE 2016–2020 PERIOD



SOURCE: ENERGY AGENCY

Energy Savings Achieved Under the Alternative Measure

An alternative measure under the combined scheme to achieve the target share of final energy savings is implemented by the Eco Fund under the Energy Efficiency Improvement Programme.

The Eco Fund achieves energy savings through three systems, as shown in Table 44, namely by crediting investments in efficiency measures, by awarding grants for the implementation of efficiency measures and by providing energy advice to citizens through a network of advisory offices called ENSVET. In this context, most savings are achieved through measures implemented with the help of financial incentives - grants awarded under Eco Fund calls for tenders. In 2021, they achieved a total of 323 GWh of energy savings, and together with EcoFund measures, 392 GWh of savings were achieved in 2021.

TABLE 44: ACHIEVED ENERGY SAVINGS IN THE ECO FUND PROGRAMME FOR IMPROVING ENERGY EFFICIENCY IN THE 2015–2021 PERIOD

	2015	2016	2017	2018	2019	2020	2021
Credited investments (GWh)	5	8	11	24	23	39	44
Non-refundable grants (GWh)	123	127	117	190	272	314	323
Energy advisory for public (GWh)	0	14	14	18	23	25	25

SOURCES: ECO FUND ANNUAL REPORTS

Most of the savings achieved by the Eco Fund are achieved through measures implemented by individual investors in households and businesses, partly financed by grants awarded through Eco Fund calls for tenders. In 2021, two measures, namely the installation of heat pumps (99 GWh) and self-supply (58 GWh), achieved the highest savings. Together, 323 GWh of savings were achieved from the grants in 2021, which is equivalent to 82% of the Eco Fund's total savings. Compared to previous years, the savings in 2021 are significantly higher for the implementation of the Self-supply - Net metering measure.

TABLE 45: ENERGY SAVINGS BY MEASURES FOR THE 2018–2021 PERIOD, PARTLY FINANCED BY ECO FUND GRANTS

	2018 (GWh)	2019 (GWh)	2020 (GWh)	2021 (GWh)
Biomass boilers	18.3	30.6	27.2	26.5
Heat pumps	63.1	102.7	103.8	99.0
Self-supply – net metering	10.0	16.3	30.9	58.0
Installation of joinery	2.9	3.3	4.1	3.6
Facade thermal insulation	49.9	55.0	48.9	43.2
Roof thermal insulation	18.0	15.2	13.6	13.5
Heat recovery ventilation	0.0	2.1	4.2	4.0
Natural gas condensing boilers	10.9	31.7	39.4	33.2
sNES Public buildings (almost zero energy building)	3.7	1.9	1.3	4.8
Energy audits	3.3	1.3	4.1	0.4
Environmentally friendly passenger cars	3.2	2.5	3.8	5.0
Replacement of lighting	0.0	1.6	4.9	8.9
Excess heat recovery	0.0	0.1	3.8	2.9
Energy optimisation	0.0	2.0	11.1	8.0
Tyres	0.0	0.0	7.9	7.8
Other measures	6.8	6.1	5.0	4.2

SOURCES: ECO FUNDS ANNUAL REPORTS

Energy Audits

Another well-established national energy efficiency measure is the mandatory energy audits of large companies, which must carry out an energy audit every four years and report to the Energy Agency. An energy audit is a systematic review and analysis of energy consumption in all segments of a company's operations, including energy consumption for buildings, processes, transport and human activities, in order to identify energy flows and opportunities for improving energy efficiency. The minimum requirement of an energy audit is a detailed review of the energy use of buildings, technological processes or industrial plants, transport and a set of possible measures to improve energy efficiency. The energy audit shall be based on actual, measured, verifiable and operational data on energy consumption for all energy sources.

Large companies are those companies that exceed two of the following criteria in the last two financial years at the balance sheet cut-off date:

- employ on average more than 250 workers,
- have assets in excess of €20 million and
- net operating income exceeds €40 million.

95% of all large companies comply with the energy audits obligation

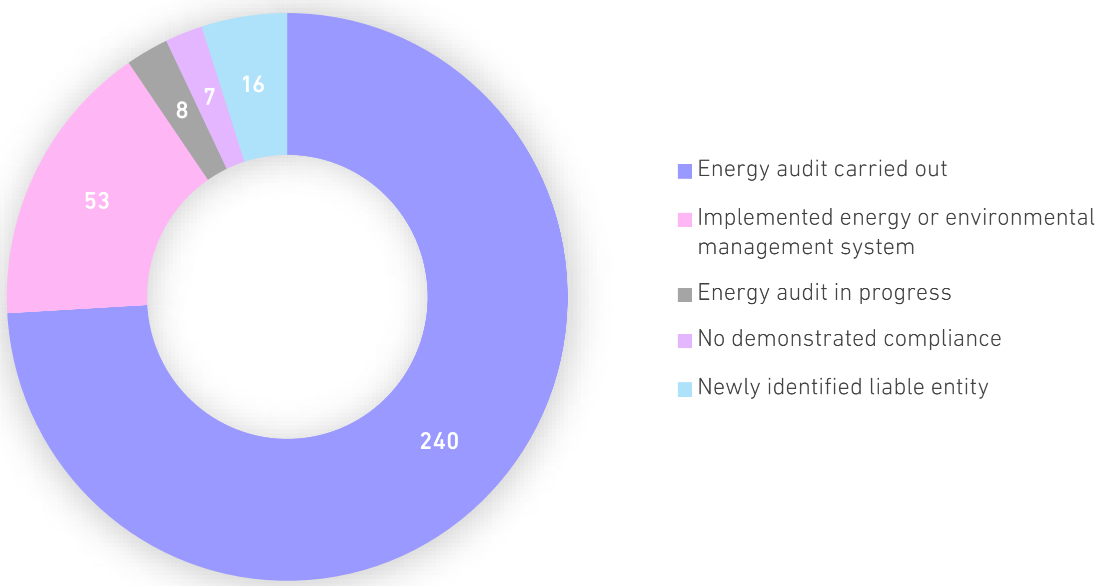
The Energy Agency has identified 324 large companies registered in Slovenia in the register of large companies for 2021, based on data from the Business Register of Slovenia. Nine companies were removed from the register and 16 companies were newly included in the register, compared to the situation at the end of 2020.

Large companies can comply with the obligation to carry out an energy audit:

- by carrying out an energy audit in accordance with SIST ISO 50002 or the SIST EN 16 247 series of standards (SIST EN 16 247-1, SIST EN 16 247-2, SIST EN 16 247-3 and SIST EN 16 247-4);
- with an energy management certificate in accordance with SIST EN ISO 50001 or an environmental management system in accordance with SIST EN ISO 14001, which shall also be subject to a minimum inspection in accordance with Annex A, point A.3 of SIST ISO 50002, to be carried out every four years. The Energy Agency has confirmed the fulfilment of the energy audit obligation by three companies in 2021, based on the submission of a certificate at the request of a large company.

At the end of 2021, 293 out of a total of 324 large companies had complied with the energy audit obligation, 43 more than in 2020. Of these, 240 companies had carried out an energy audit and 53 companies have a certified energy or environmental management system in place in accordance with European or international standards and have been recognised as having complied with the obligation by a decision confirming that they have complied with the energy audit obligation. Eight companies are undergoing energy audits and 16 companies have reached the criteria to be classified as large companies in 2021 and are required to carry out energy audits within one year.

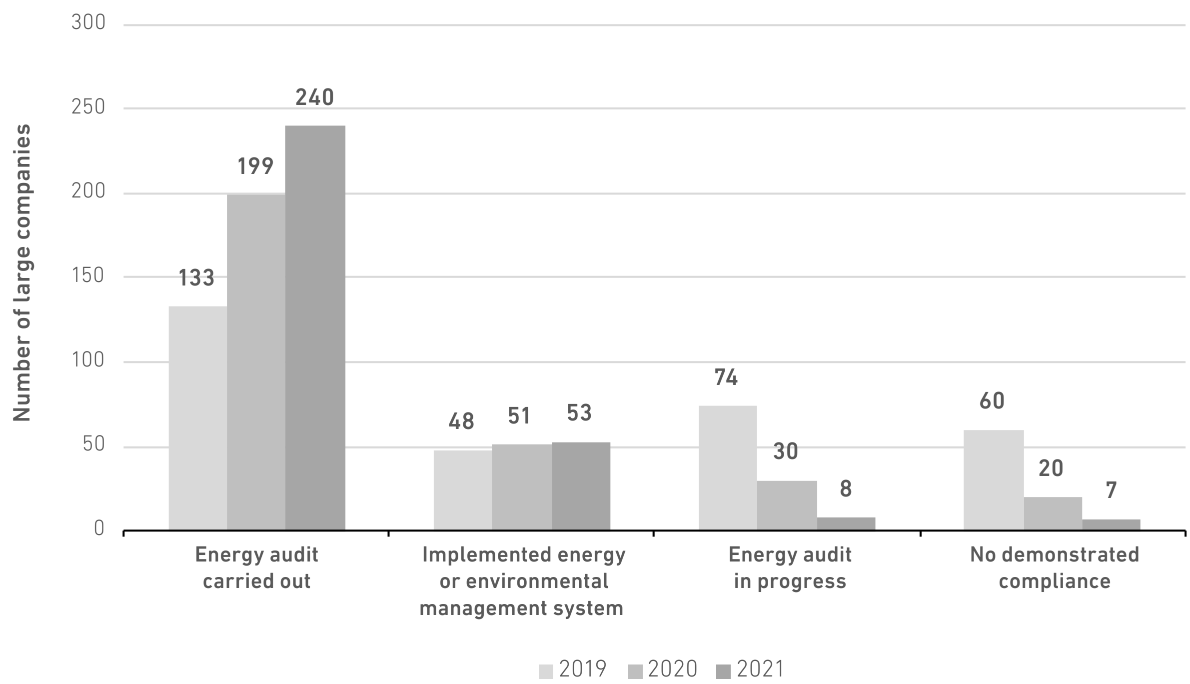
FIGURE 216: ENERGY AUDITS OF LARGE COMPANIES



SOURCE: ENERGY AGENCY

Figure 217 shows that significant progress has been made over the last two years in the implementation of energy audits in large companies. While 181 large companies or 57% of all large companies complied with the energy audit obligation in 2019, 293 large companies or 95% complied with the obligation in 2021, assuming that the 16 companies included in the register of large companies in 2021 have to comply with the energy audit obligation in 2022.

FIGURE 217: COMPARISON OF LARGE COMPANIES' COMPLIANCE BETWEEN 2019 AND 2021



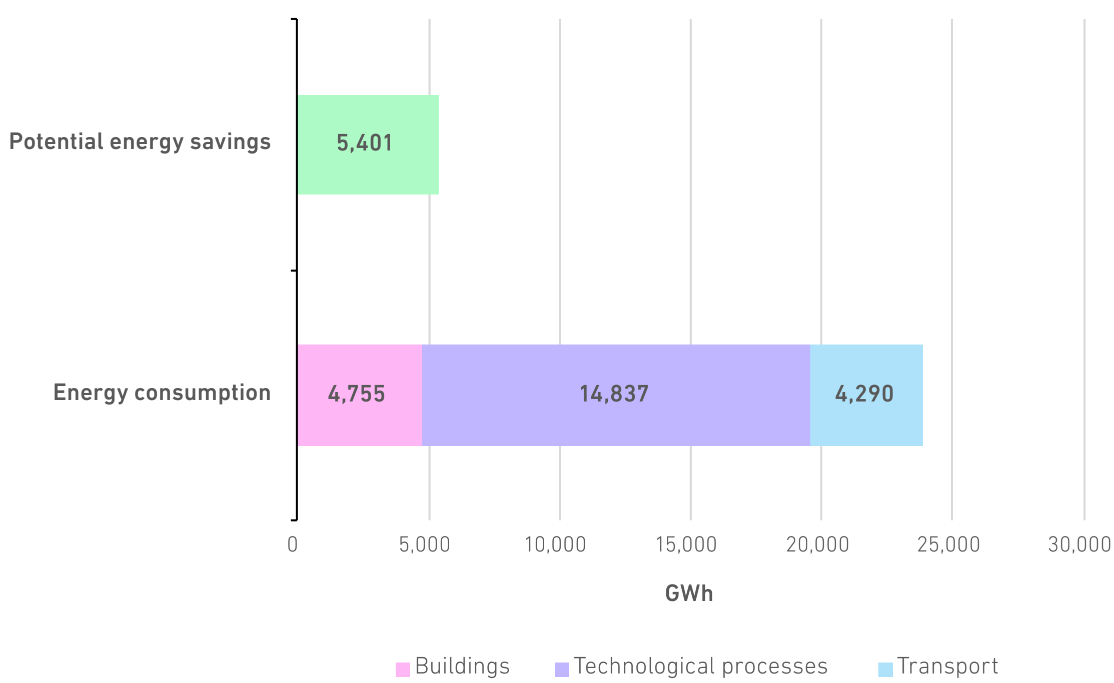
SOURCE: ENERGY AGENCY

Savings Achieved

The submitted energy audit reports (240) show that the companies consumed a total of around 24 TWh of energy per year. As much as 14,837 GWh or 62% of the total energy was consumed in technological processes, 4,755 GWh or 20% of the energy was consumed in buildings and 4,290 GWh or 18% was consumed in transport.

The companies' reports also show that the measures (optimisation of energy consumption in production, renovation of internal lighting, installation of cooling and heating, introduction of a computerised energy management system, renovation of a boiler room, renovation of the thermal envelope and of the building furniture) identified in the energy audits could save a total of 5,401 GWh of energy over the next four-year period.

FIGURE 218: ENERGY CONSUMPTION BY ACTIVITY AND SAVINGS POTENTIAL FROM ENERGY AUDITS



SOURCE: ENERGY AGENCY, COMPANIES

12.3% INCREASE IN HEAT CONSUMPTION

12% HIGHER AVERAGE RETAIL PRICE OF HEAT FOR HOUSEHOLD CONSUMERS

Heat - energy in the form of warm water, hot water, steam or cold

61.5% OF DISTRIBUTION SYSTEMS ENERGY EFFICIENT

20.4% OF HEAT PRODUCED FROM RENEWABLE SOURCES

74.8% OF DISTRIBUTED HEAT PRODUCED IN CHP

3.8% LESS NATURAL GAS FOR HEAT PRODUCTION

1.6% HIGHER SHARE OF COAL IN HEAT PRODUCTION

HEAT

12.3% higher consumption of heat

Supply of Heat

In 2021, 54 heat suppliers provided heat from district heating. Distribution was carried out in 69 municipalities using 112 distribution systems.

Heat distributors supplied 2448.4 GWh of heat for the heating of buildings, domestic hot water, and industrial steam processes, and delivered 2080.6 GWh of heat to 109,792 consumers. The difference is losses amounting to 367.8 GWh of heat. Heat consumption for the supply of consumers on registered distribution systems was 12.3% higher compared to the year before, and higher by 10.4% compared to 2019, despite the larger share of thermal insulation of single- and multi-apartment buildings. This is mainly due to a larger annual temperature deficit compared to the temperature deficits of the last three years and an increase in the number of supplied household and business consumers.

The number of heat consumers is 2.8% higher than in the previous year.

FIGURE 219: BASIC DATA ON PRODUCED AND DISTRIBUTED HEAT FOR CONSUMERS OF HEAT CONNECTED TO THE DISTRIBUTION SYSTEMS

SOURCE: ENERGY AGENCY

In 2021, two larger district cooling distribution systems with a total installed capacity of 3.88 MW of refrigeration units were in operation, primarily supplying business consumers in Velenje and industrial consumers in Kranj.

Heat distributors with own production and heat producers supplying distribution systems have produced 2617.6 GWh of useful heat for heating, the preparation of sanitary hot water, the supply of industrial processes, and their own needs. At the same time, 855.4 GWh of electricity or 758.8 GWh of electricity were produced at the threshold of cogeneration processes. The heat produced in cogeneration accounted for 72.4% of all useful heat produced (for own use and distribution systems).

1.6 percentage points
higher share of coal

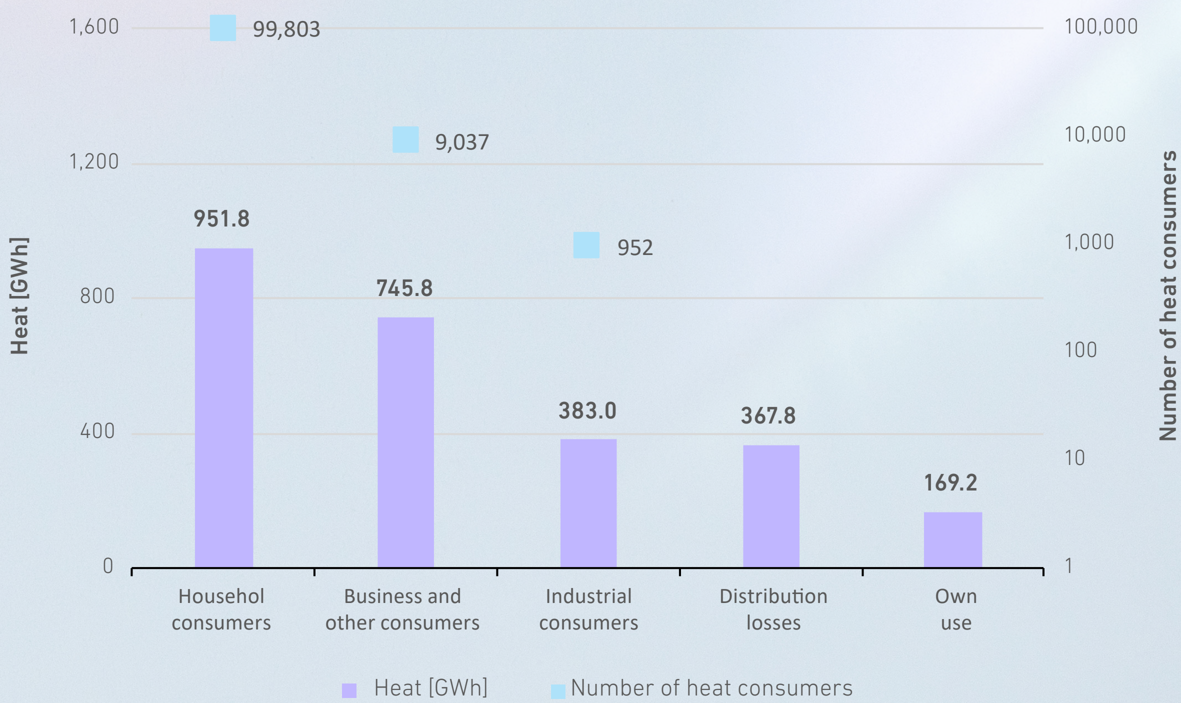
3.8 percentage points
less natural gas for heat production

74.8%
of distributed heat produced in cogeneration units

The remaining 27.6% was produced in other technological processes (woody biomass boilers, natural gas, liquefied petroleum gas, heat recovery processes from geothermal wells, waste heat from industrial processes, incineration plants, etc.). In the share of heat supplied by distribution systems, heat from cogeneration sources covered 74.8%. The highest share of total useful heat produced, i.e. 36.4%, was delivered to 99,803 household consumers, 28.5% to 9,037 business consumers, and 14.6% to 952 industrial consumers. Heat producers or distributors used 6.5% of the heat for their own needs (own use for industrial processes, heating and domestic hot water) and the remaining 14% are the total annual distribution losses[93].

The heat consumption by type of consumers and their number is shown in Figure 220.

FIGURE 220: HEAT CONSUMPTION BY THE TYPE OF CONSUMERS AND THEIR NUMBER



SOURCE: ENERGY AGENCY

93 Total distribution losses also include the distribution losses of the internal distribution systems of the heat producers.

In 2021, 15.5 TJ of primary energy was used to supply the distribution systems. Due to the increased demand for heat and electricity, their consumption increased slightly by around 2.4% compared to the previous year.

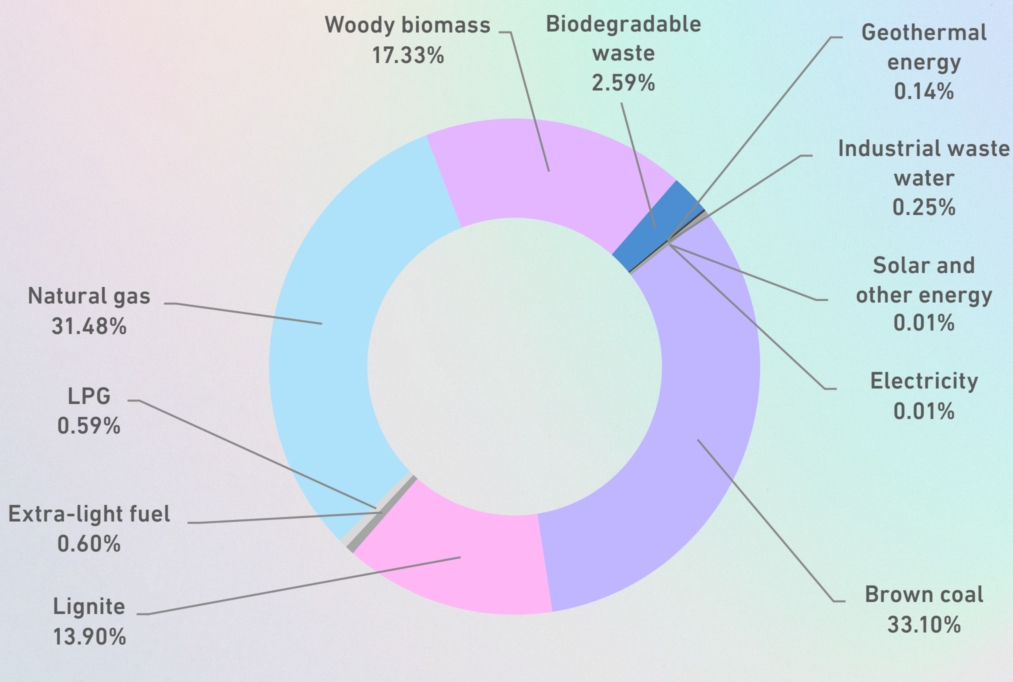
Coal remains the main primary energy for heat generation to supply distribution systems, with a share of 47%, followed by natural gas with 31.48% and other primary energies with 21.52%. The share of natural gas decreased by around 8.71% compared to 2020 as a result of the sharp increase in natural gas prices on the wholesale market in the second half of 2021.

Oil and petroleum products accounted for 1.19% of the primary energy mix, renewable sources (wood biomass, geothermal energy and biodegradable waste) for 20.06%, industrial waste heat for 0.25% and electricity to power heat pumps for 0.01%. Biodegradable waste heat was only produced in the municipal waste incineration plant of the Municipality of Celje, while industrial process heat was produced in the area of the Ravne Ironworks (SIJ Metal Ravne) and in the Lek Ljubljana plant. With primary energy becoming more and more expensive, the use of excess heat from production processes for the supply of heat distribution systems is becoming an increasingly important factor in the affordable supply of heat to consumers.

47% share of coal in the primary sources of heat production

The structure of primary energy products for heat production is presented in Figure 221.

FIGURE 221: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS FOR HEAT GENERATION



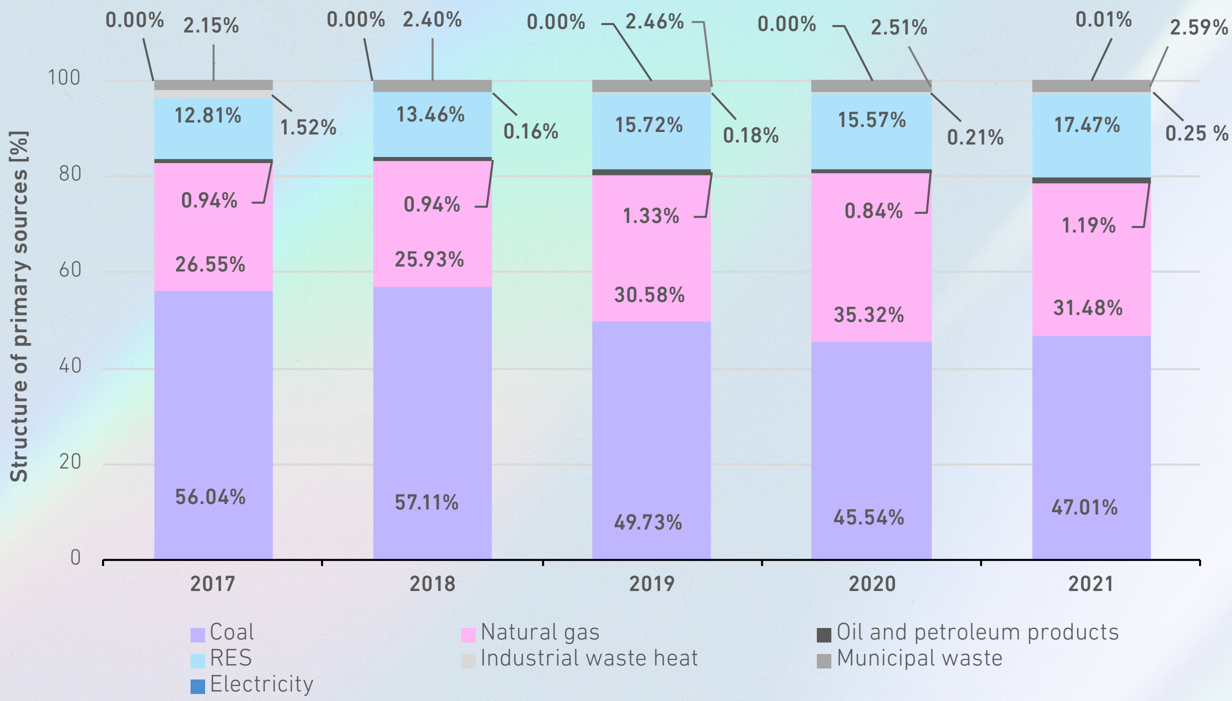
SOURCE: ENERGY AGENCY

The shares of coal and natural gas changed the most in the structure of primary energy sources (Figure 222).

The above-mentioned lower consumption of natural gas and the increase in coal consumption are mainly due to the almost 85% lower consumption of natural gas in heat production at the second largest heat producer for the heat distribution system, Termoelektrarna Šoštanj. The aforementioned increase in natural gas prices on the wholesale market in the second half of 2021, which is reflected in a partial increase in the consumption of petroleum products, also has a partial impact on the decrease of natural gas consumption in the energy mix. Indeed, at the end of the year, oil products as an alternative fuel to natural gas in certain production processes were more affordable and consequently more acceptable than natural gas.

In 2021, in addition to rising prices for natural gas and petroleum products, high prices for CO_2 emission allowances on the exchange markets have also contributed significantly to the increase in heat prices for district heating systems. Their average monthly offer price has thus reached a record average monthly price of €80/tonne CO_2 in December 2021 from €39.3/tonne CO_2 in January, according to data from the European Energy Exchange portal.

FIGURE 222: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS IN THE 2017–2021 PERIOD

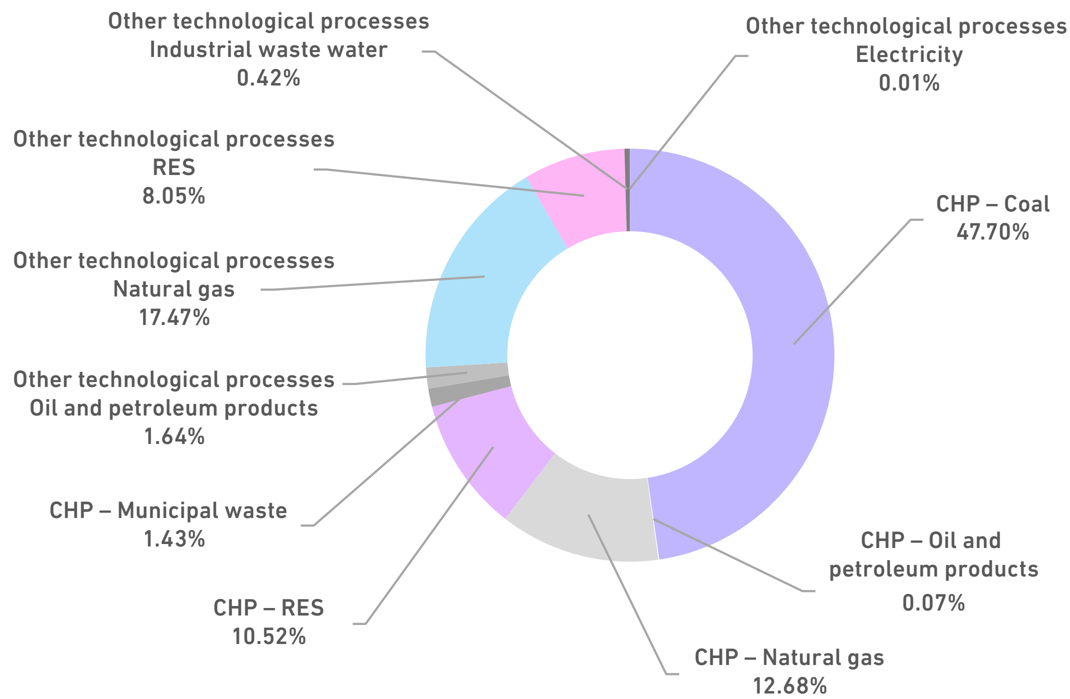


SOURCE: ENERGY AGENCY

Coal as a primary source was only used in cogeneration processes, with 450.3 GWh of gross electricity and 1,248 GWh of heat produced in cogeneration. Natural gas was used to a greater extent in the rest of cogeneration and other technological processes (405.1 GWh of gross electricity and 1368.1 GWh of heat produced). 113.7 GWh of gross electricity and 534.2 GWh of heat were produced from RES. The structural share of primary energy consumed in relation to the method of heat generation for the supply of distribution systems is shown in Figure 223.

20.4% of heat is produced from RES

FIGURE 223: STRUCTURE OF PRIMARY ENERGY SOURCES FOR HEAT PRODUCTION FOR DISTRIBUTION SYSTEMS[94]

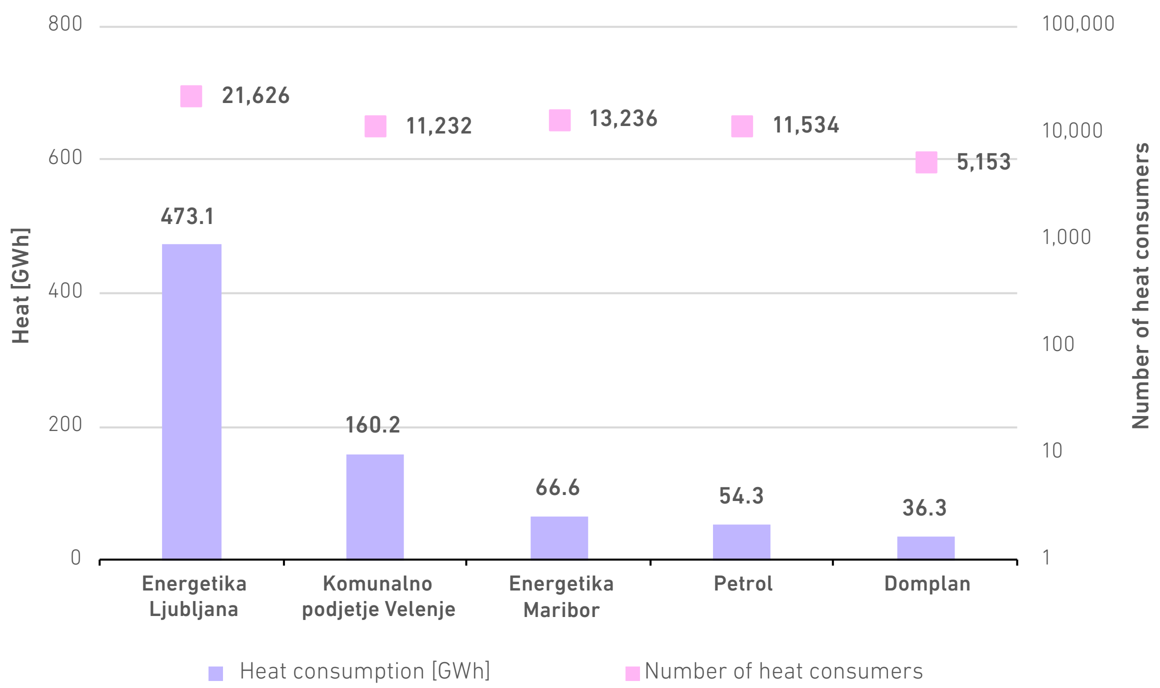


SOURCE: ENERGY AGENCY

In 2021, the five largest heat distributors according to volumes of distributed heat delivered to final consumers had supplied as much as 85.6% of all delivered heat from 24 heat distribution systems. The five largest distributors to household consumers supplied 62.9% of these consumers and delivered 83% of heat to them from 37 distribution systems. In 2021, heat for space heating and domestic hot water was distributed from 110 distribution systems. In this context, 85 distribution systems in 59 Slovenian municipalities supplied household consumers. This is shown in Figure 224.

94 Rounding of percentages to two decimal places may result in discrepancies in the totals.

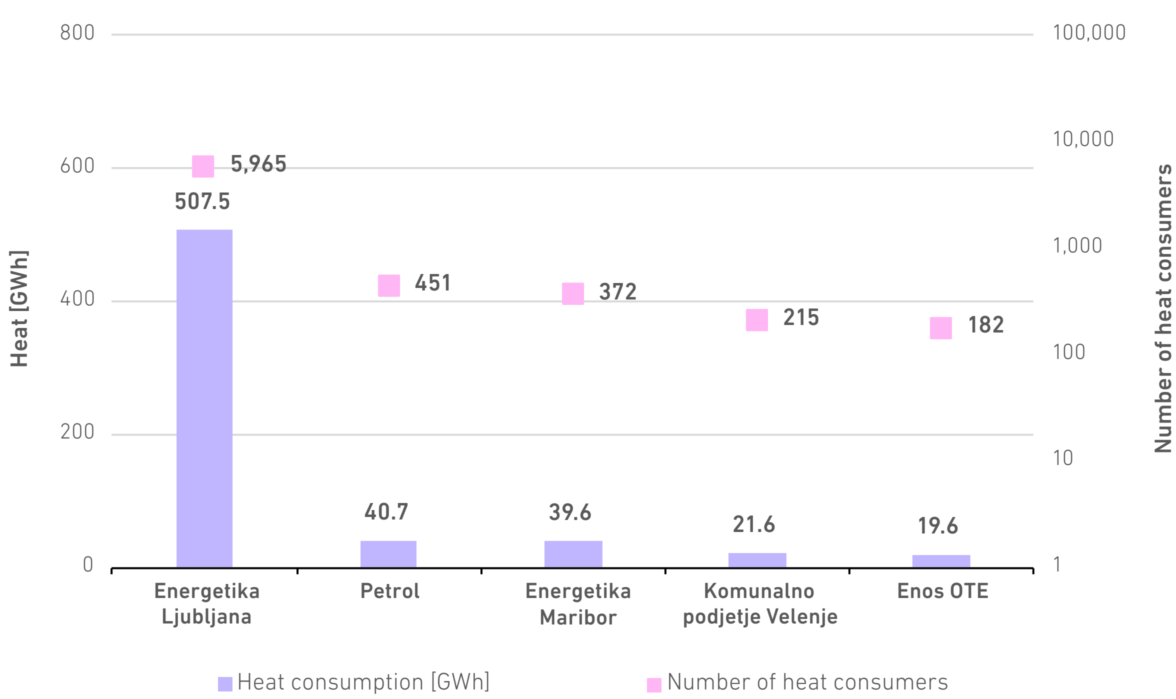
FIGURE 224: HEAT CONSUMPTION AND THE NUMBER OF HOUSEHOLD CONSUMERS AT THE FIVE LARGEST HEAT DISTRIBUTORS



SOURCE: ENERGY AGENCY

The five largest heat distributors, which supply heat for space heating and domestic hot water from 24 distribution systems to commercial and other heat consumers, supplied 79.6% of these customers and 84.5% of all heat (Figure 225). In 2021, business and other heat consumers were supplied from 81 distribution systems in 62 Slovenian municipalities.

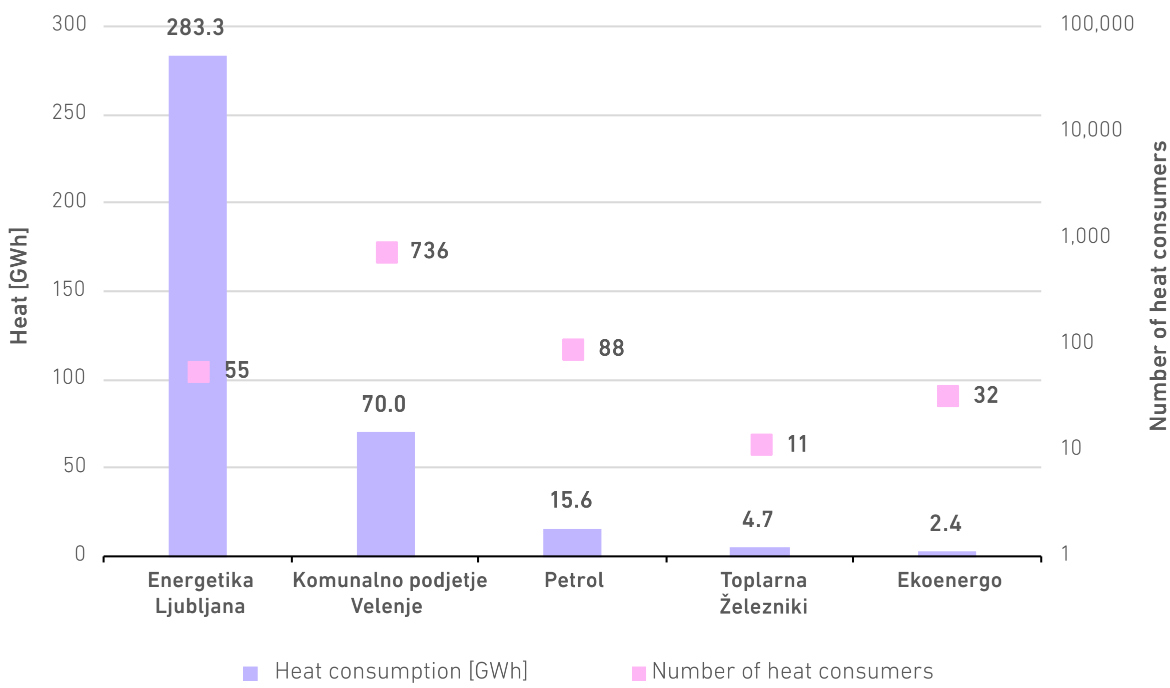
FIGURE 225: HEAT CONSUMPTION AND THE NUMBER OF BUSINESS AND OTHER CONSUMERS AT THE LARGEST HEAT DISTRIBUTORS TO THESE CONSUMERS



SOURCE: ENERGY AGENCY

In 2021, the first five largest heat distributors supplying heat for industrial processes and heating to industrial consumers supplied 96.8% of these consumers from 13 distribution systems and delivered 98.2% of the heat for industrial customers (Figure 226). In 2021, industrial consumers were supplied from 81 distribution systems in 21 Slovenian municipalities.

FIGURE 226: HEAT CONSUMPTION AND THE NUMBER OF INDUSTRIAL CONSUMERS AT THE FIVE LARGEST DISTRIBUTORS



SOURCE: ENERGY AGENCY

Heat Distribution Systems

According to the Energy Agency's records, the heat supply from heat distribution systems[95] in 2021 was carried out from 112 distribution systems (63 as a service of general economic interest, 14 commercial distributions, and 35 private distribution systems) in 69 Slovenian municipalities. The total length of the distribution systems was 924.1 km. As an optional local service of general economic interest, heat supply was carried out by 63 distribution systems operated by 36 distributors in 52 Slovenian municipalities. In 10 municipalities, the supply was carried out as a market activity, and in 19 municipalities, the heat supply was carried out by private distribution systems. Private distribution systems in the area of the municipalities of Kranj, Koper, Maribor and Žalec are large distribution systems for the supply of household and business consumers, as they supplied as many as 10,052 consumers, including 9,931 households.

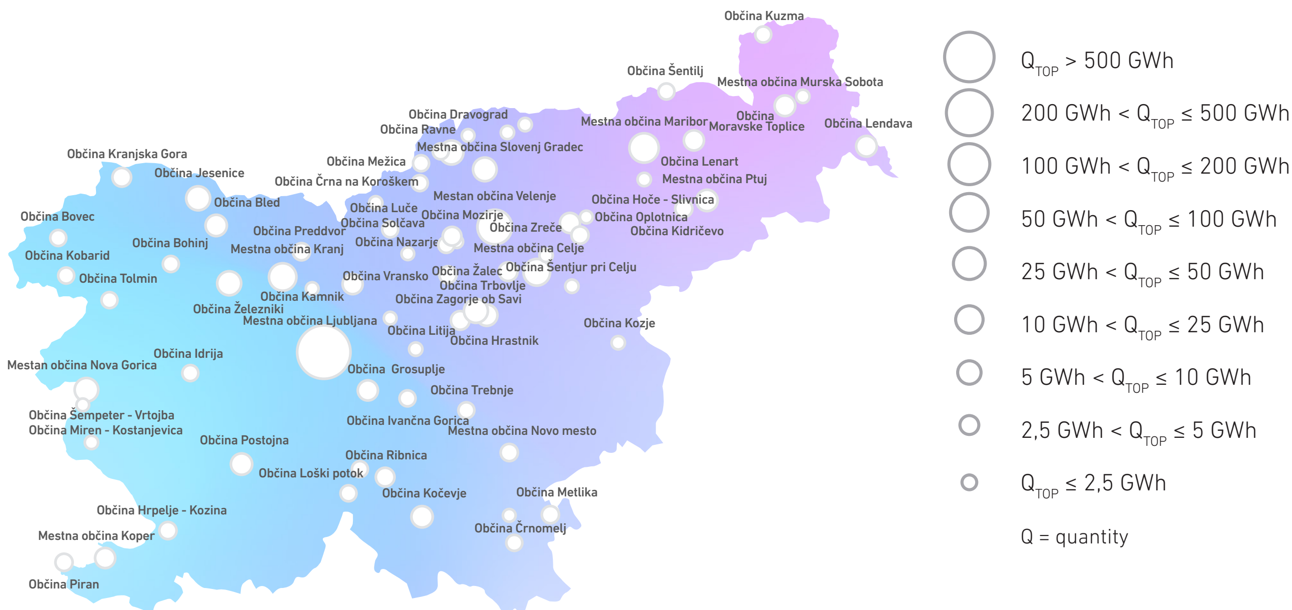
The distribution systems where the activity of distributing heat is carried out as an optional local service provided heat to 87.7% heat consumers, and their share of the delivered heat was 93.8% of all the delivered heat from these systems.

Large district cooling systems are only located in the municipalities of Velenje and Kranj, with a total of 1.5 kilometres.

Municipalities with distribution systems and quantities of distributed heat are shown in Figure 227.

95 Distribution systems do not include the internal distribution systems of heat producers.

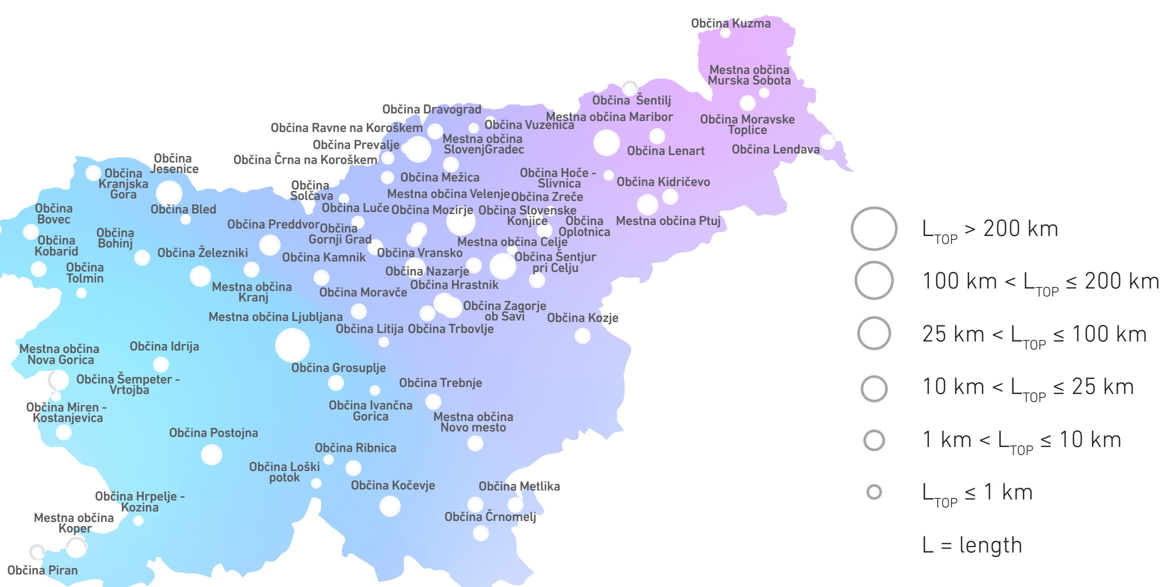
FIGURE 227: QUANTITIES OF DISTRIBUTED HEAT BY SLOVENIAN MUNICIPALITIES



SOURCE: ENERGY AGENCY

With respect to the temperature regime of the operations of the individual systems, the systems are divided into warm-water systems, hot-water systems, steam distribution systems, and district cooling systems. The length of the warm-water and hot-water distribution systems accounts for 98.8% of the entire length of the distribution systems, steam distribution systems 1%, and district cooling systems slightly less than 0.2% of the total length of the distribution systems. The longest distribution systems are still in Ljubljana (a 280.3-km-long warm-water distribution system) and Velenje with Šoštanj (a 180.5-km-long warm-water distribution system). The average length of the heat distribution systems was 8.2 kilometres and the distribution systems recorded average annual heat distribution losses of 15% of the total heat distributed.

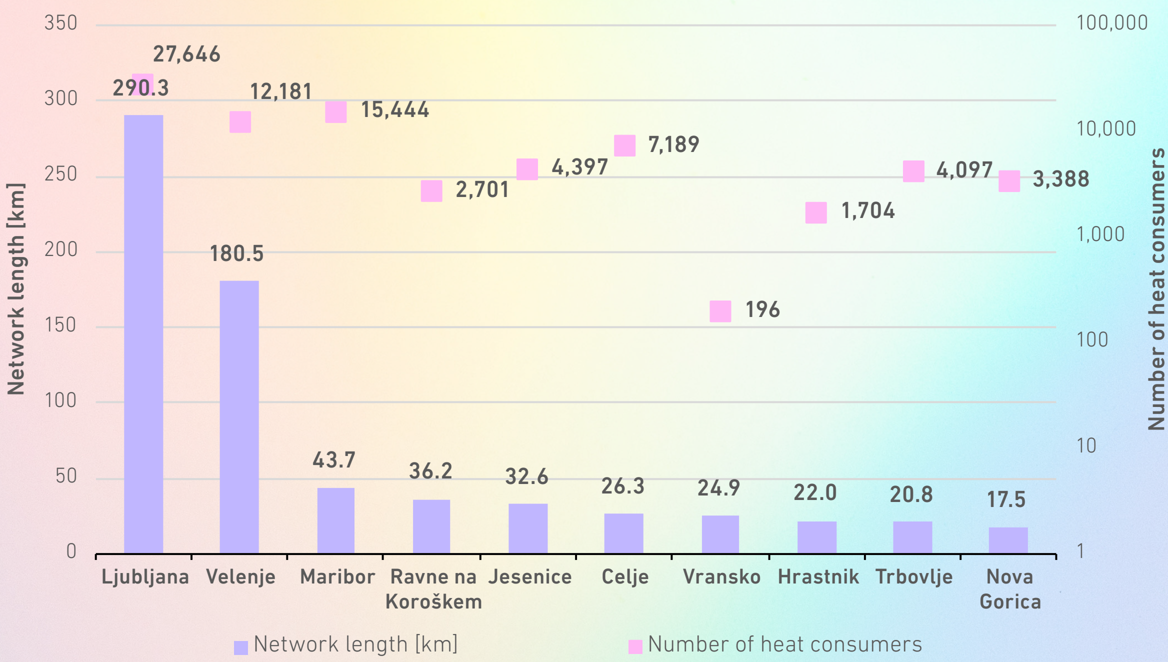
FIGURE 228: LENGTH OF THE HEAT DISTRIBUTION SYSTEMS IN SLOVENIAN MUNICIPALITIES



SOURCE: ENERGY AGENCY

The length of the ten largest heat distribution systems and the number of consumers in 2021 are shown in Figure 229.

FIGURE 229: LENGTH OF THE HEAT DISTRIBUTION SYSTEMS AND NUMBER OF CONNECTED CONSUMERS IN INDIVIDUAL MUNICIPALITIES



SOURCE: ENERGY AGENCY

Energy-Efficient District Heating Systems

District heating and cooling systems are energy efficient if the heat distributor ensures an annual level of heat by using at least one of the following sources:

- at least 50% of the heat produced directly or indirectly from renewable energy sources (RES);
- at least 75% of heat from cogeneration; or
- at least 50% of waste heat;
- at least 50% of a combination of the heat referred to in the above two indents.

61.5%
energy-efficient distribution systems

Every year, the Energy Agency monitors which heat distribution systems meet the criteria and publishes a list of energy-efficient heat distribution systems on its website (seznam energetsko učinkovitih distribucijskih sistemov toplote).

According to these criteria, in 2021, out of 112 registered heat distribution systems where heat distribution is carried out as a service of general economic interest or market activity or from a private distribution system, 67 were energy efficient (i.e. they met at least one of the criteria, some of them more). The largest number of distribution systems, 53, met the energy efficiency criterion of at least 50% of the distributed heat being produced directly or indirectly from RES. Eleven distribution systems met the energy efficiency criterion of at least 75% of the distributed heat being produced from cogeneration (four systems less than in the previous year). 11 distribution systems met the energy efficiency criterion of at least 75% of the distributed heat being produced from cogeneration. However, no distribution system met the criterion that at least 50% of the distributed heat is produced from waste heat.

A heat distribution system can also be energy efficient if the heat produced is a combination of production from RES, waste heat or cogeneration. This criterion was met by 12 distribution systems.

The Price of Heat

The average retail price of heat in nine selected Slovenian municipalities with heat distribution systems is calculated as the average monthly retail price of heat for residential heating and sanitary hot water on the basis of publicly announced price lists of heat distributors for 2020 for a typical household heat consumer in a multi-dwelling residential building with an annual capacity of 7 kW and average annual consumption of 6.21 MWh.

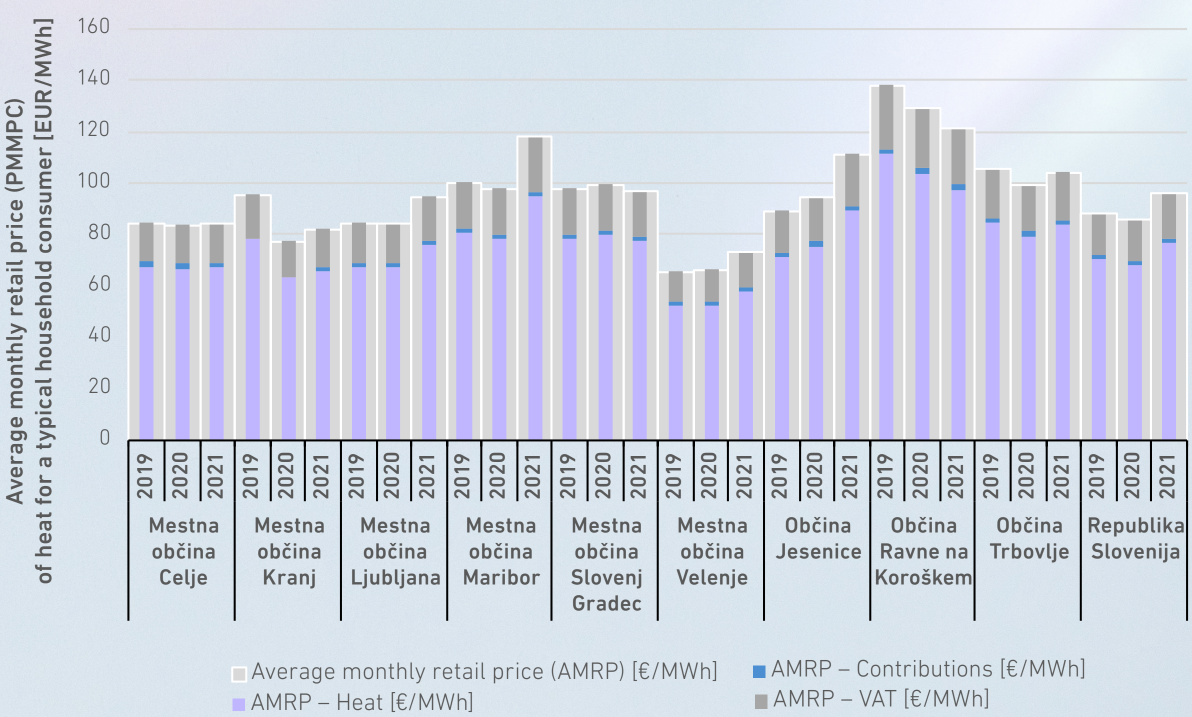
12% higher
average retail price

In 2021, distribution systems in selected Slovenian municipalities supplied 69.8% of all household consumers supplied in Slovenia, while their acquired heat was 86.6% of all the heat delivered to these consumers.

The average retail heat prices in the selected Slovenian municipalities are shown in Figure 230. They are calculated as the weighted average monthly retail prices for a typical household heat consumer living in a multi-dwelling residential building in each selected municipality, and the average monthly retail price of heat for the entire territory of Slovenia, weighted by the number of household consumers supplied is also shown. The average monthly retail price of heat for household consumers increased on average by 12% in all of the mentioned municipalities in comparison with the previous year, and was €95.8/MWh in 2021.

The largest jump in heat prices occurred at the beginning of the 2021/2022 heating season due to a sharp increase in the prices of primary energy products, mainly natural gas. The highest increases in heat prices for household consumers were in the municipality of Maribor, €118.1/MWh (20.7%), and in the municipality of Jesenice, €111.6/MWh (17.88%). Despite a relative decrease of 6% in the average annual heat price in the municipality of Ravne na Koroškem (€121.35/MWh), it was the highest among the selected Slovenian municipalities.

FIGURE 230: AVERAGE RETAIL PRICE OF HEAT FOR HOUSEHOLD CONSUMERS IN INDIVIDUAL SLOVENIAN MUNICIPALITIES FOR THE 2019–2021 PERIOD



SOURCE: ENERGY AGENCY

CASE STUDY: HEAT PRICE CHANGES from April 2021 to March 2022

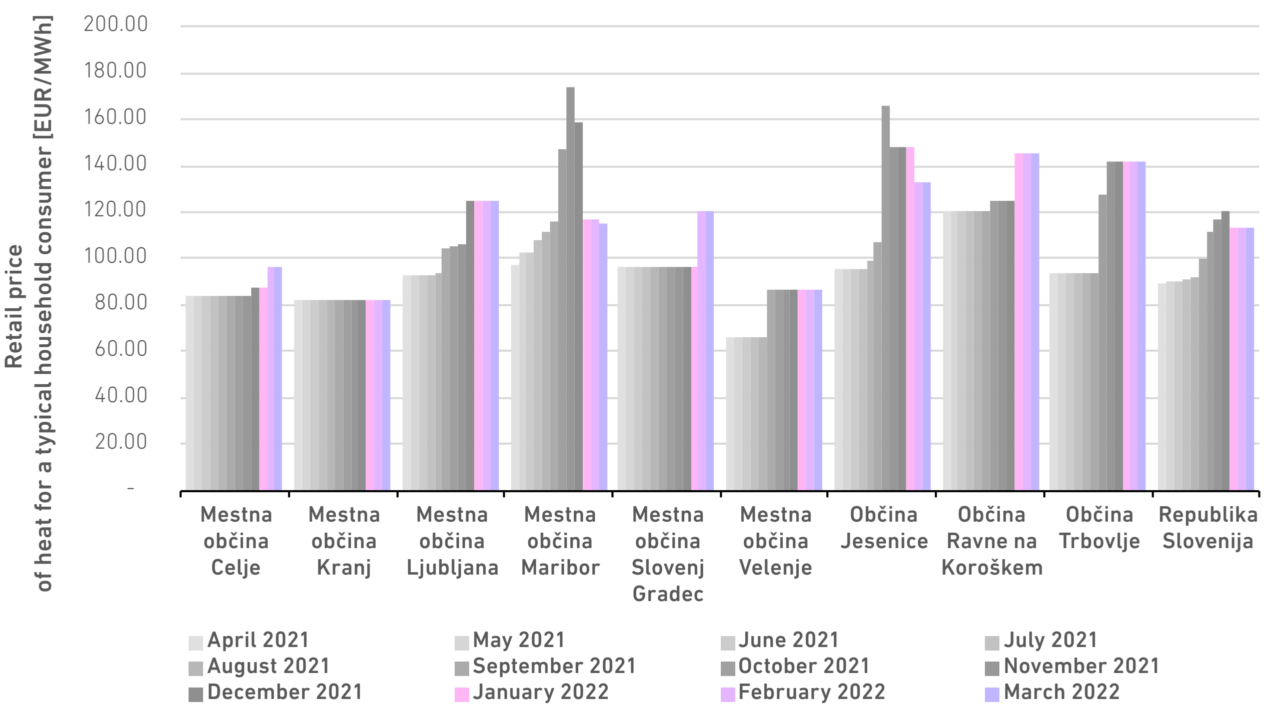
Rising energy, energy products and CO_2 emission allowance prices on wholesale markets were reflected in a sharp increase in retail heat prices on some heat distribution systems at the end of 2021.

The heat price increases in the 2021/2022 heating season were most felt by heat consumers of distribution systems using natural gas as the primary fuel for heat production, the prices of which depend on rising gas prices on the wholesale markets. For heat distributors using coal as the primary production source, the increase in the heat price was influenced by the increase in the price of emission allowances.

The following text shows the impact of the increase in primary energy prices and emission allowances on the monthly retail price of heat in nine selected Slovenian municipalities, where district heating systems supply almost 70% of all household heat consumers connected to distribution systems in Slovenia.

For the comparative calculation of the monthly variation of the retail heat prices among different distribution systems in the selected Slovenian municipalities in the period April 2021-March 2022, a so-called typical household heat consumer in a multi-apartment building with a billing power of 7 kW and an average annual consumption of 6.21 MWh was used.

FIGURE 231: MONTHLY TREND OF RETAIL PRICES OF HEAT FOR HOUSEHOLD CUSTOMERS IN SELECTED SLOVENIAN MUNICIPALITIES IN THE PERIOD APRIL 2021-MARCH 2022



SOURCE: ENERGY AGENCY

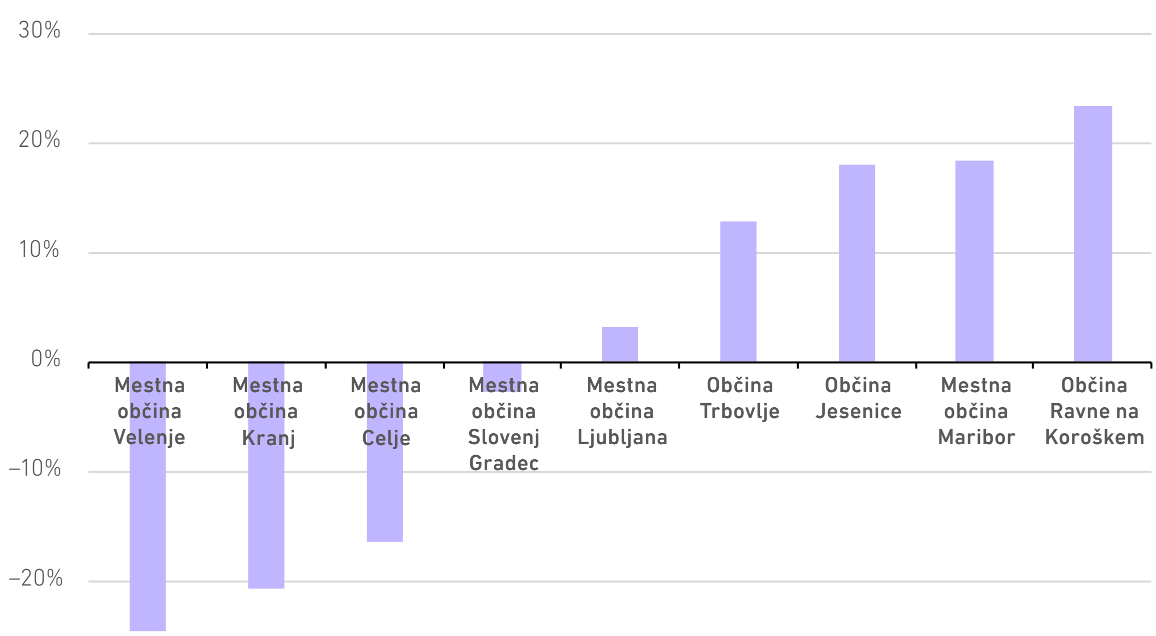
Figure 231 shows the monthly movement of retail heat prices, showing a marked change in heat prices in October 2021, especially in municipalities where natural gas is the primary source of heat generation. The largest jump in retail is observed in the municipality of Jesenice (54.8%), followed by Trbovlje (36.09%) and Maribor (27.69%). The highest retail price in October was in the municipality of Jesenice at €166.18/MWh, followed by Maribor at €147.63/MWh and Trbovlje at €127.23/MWh, while at the national level, the weighted retail price reached €111.97/MWh. The latter was 16.9% higher than the annual average retail of €95.8/MWh.

In November, the highest monthly retail price among the selected municipalities was reached in the municipality of Maribor at €173.54/MWh, while the weighted monthly retail price in Slovenia was €116.70/MWh. In December, the retail prices peaked in most of the municipalities observed, with only the municipality of Maribor experiencing a decrease in the retail prices; the weighted monthly retail price in Slovenia stood at €120.15/MWh, which is also the highest retail price in Slovenia for the period observed.

In December, the retail prices reached the peak in most of the municipalities; only in Maribor retail price decreased; the weighted monthly retail price in Slovenia stood at €120.15/MWh, which is also the highest retail price in Slovenia for the period observed. Over the whole period under consideration, from April 2021 to March 2022, the highest average monthly retail price for heat was reached in the municipality of Ravne na Koroškem, i.e. €127.57/MWh, followed by Maribor €122.29/MWh, Jesenice €121.93/MWh, Trbovlje €116.58/MWh and Ljubljana €106,68/MWh. The average monthly retail prices in the above-mentioned municipalities were above the weighted average monthly retail price in Slovenia, which for the whole period under consideration, amounted to €103.35/MWh.

Below the weighted average monthly retail price in Slovenia, heat prices in Slovenj Gradec, Celje, Kranj and Velenje were €100.58/MWh, €86.43/MWh, €82.05/MWh and €77.91/MWh. The deviations of the average heat retail price from the weighted average heat prices in the selected Slovenian municipalities in the period April 2021-March 2022 are shown in Figure 232.

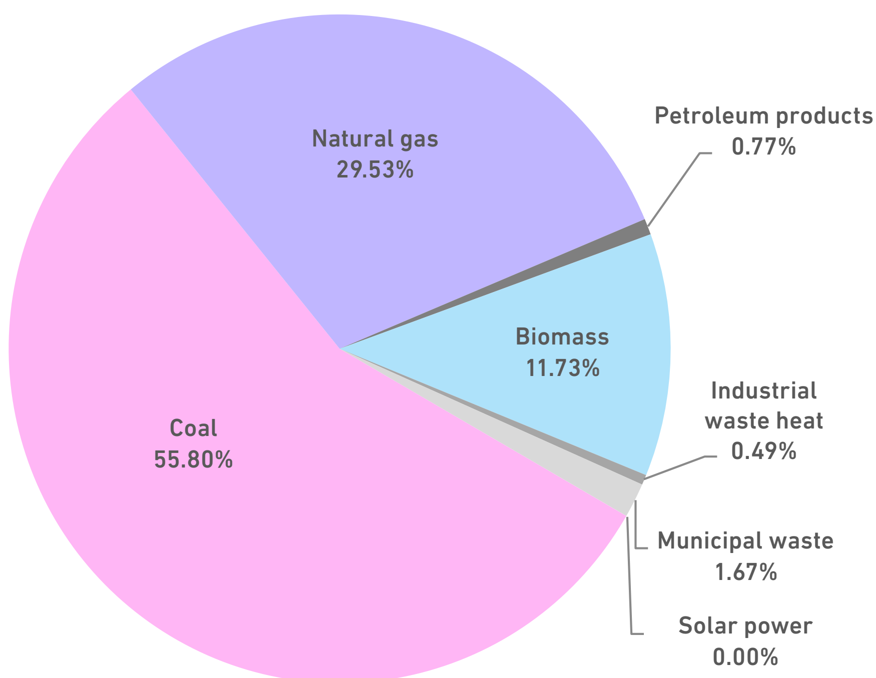
FIGURE 232: DEVIATIONS OF THE AVERAGE RETAIL PRICES OF HEAT FROM THE WEIGHTED AVERAGE RETAIL PRICE OF HEAT IN SELECTED SLOVENIAN MUNICIPALITIES IN THE APRIL 2021-MARCH 2022 PERIOD



SOURCE: ENERGY AGENCY

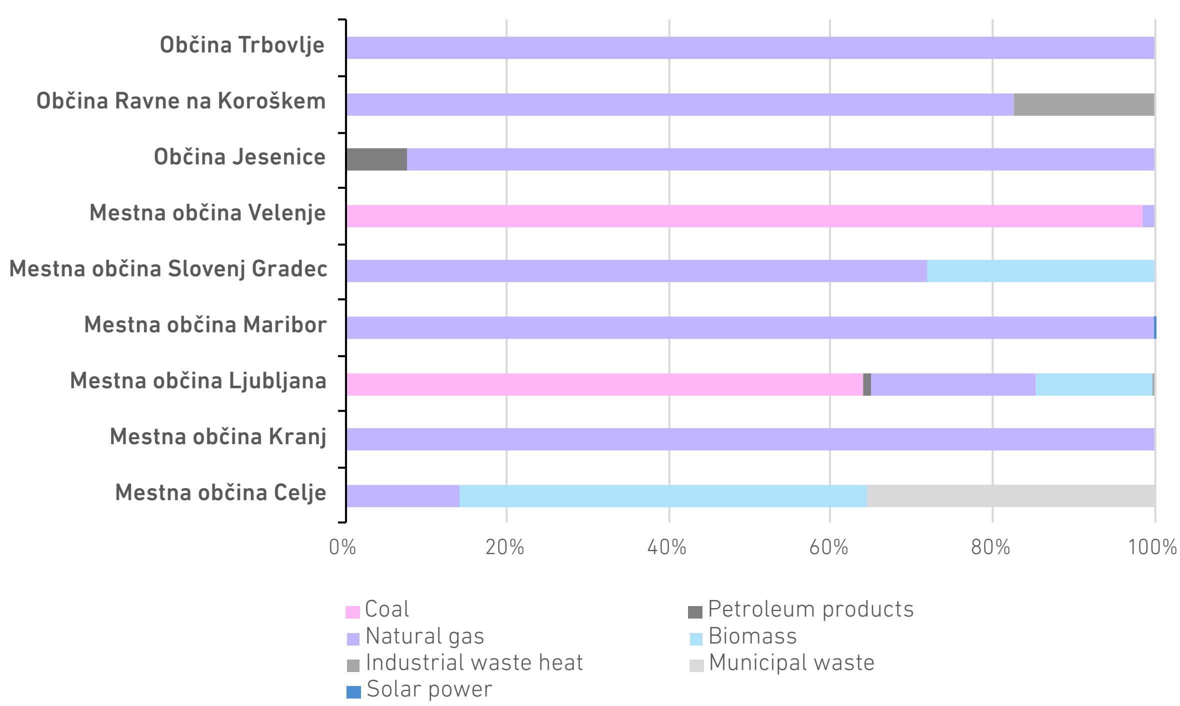
Figure 233 shows the average structure of the primary energy sources used for heat production in the distribution systems in selected municipalities in 2021, while Figure 234 shows the average structure of primary energy sources for heat production in the distribution systems by individual selected municipalities in 2021.

FIGURE 233: AVERAGE COMPOSITION OF THE PRIMARY ENERGY SOURCES FOR HEAT PRODUCTION IN HEAT DISTRIBUTION SYSTEMS IN SELECTED MUNICIPALITIES IN 2021



SOURCE: ENERGY AGENCY

FIGURE 234: AVERAGE STRUCTURE OF THE PRIMARY ENERGY PRODUCTS FOR HEAT PRODUCTION IN THE HEAT DISTRIBUTION SYSTEM IN SELECTED MUNICIPALITIES IN 2021



SOURCE: ENERGY AGENCY

Based on the results shown for the monthly retail prices of heat in the selected municipalities, and given the structure of their primary energy sources for heat production and the increasing prices of energy, energy products and CO_2 emission allowances on the wholesale markets, which are expected to continue in the first quarter of 2022, the retail prices of heat for the supply of final customers connected to the heat distribution systems are expected to continue to increase further in the first quarter of 2022. Providing acceptable retail prices to heat consumers from district heating systems will require heat producers and distributors to switch to new, cheaper and more environmentally acceptable primary sources for heat production (e.g. woody biomass, industrial waste heat, heat recovery from municipal waste incineration, heat from geothermal boreholes, etc.) and will be a long-term process requiring investments in heat production. In addition to the price situation, the necessary transition towards a climate-neutral society will also encourage the switch to other energy sources.

Regulating the Price of Heat for District Heating

The Energy Agency implements the regulation of the price of heat for district heating on the basis of the current Act on Heat Supply Pricing Methodology. Persons subject to regulation are heat distributors performing an optional service of general economic interest and producers of heat that supply to distributors of heat more than 30% of the intended distributed heat or have ownership links with them. Persons subject to economic regulation must obtain the Energy Agency's agreement on the starting price of heat for each distribution system for the supply of heat. They form the base price according to the criteria and baselines set out in the Act.

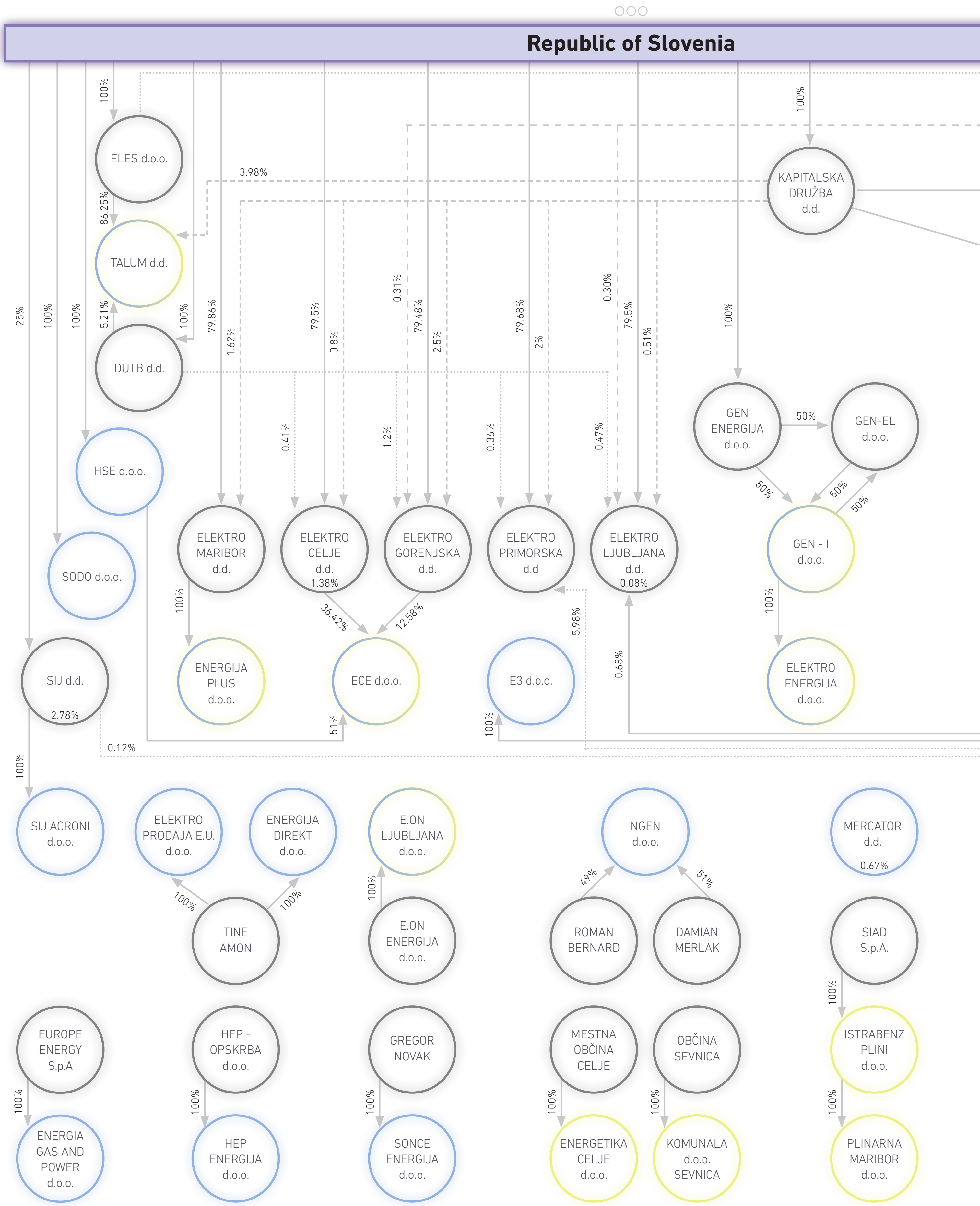
The Energy Agency dealt with the demands for granting consent to the starting price of heat from persons who did not yet have a valid starting price, and the requirements it received due to the fulfilment of criteria for the new requirements of the Act on Heat Supply Pricing Methodology. These criteria relate to major technological changes, changes in the tariff system, changes in the planned quantities of distributed heat of more than 20% or changes in consumers' planned accounting power of more than 10%, a substantial change or suspension of an undertaking's activities and a lower actual cost-plus price than the last applicable average price. In 2021, the Energy Agency did not receive any request for issuing consent due to the notification of the new distribution system.

Monitoring and analysing the notifications received on changes to the starting prices of heat are important factors in assessing the appropriateness of the proposed starting and average price in the request for consent to the baseline heat price. In 2021, the Energy Agency received 127 notifications for adjustments to the variable part of the starting heat price and 10 notifications for adjustments to the fixed part of the starting price. The changes to the starting heat price related mainly to a change in the price of the energy used to produce the heat. The Energy Agency monitored and analysed the changes in the base heat prices due to changes in eligible costs and also monitored the way heat is charged and the publication of heat tariff rates.

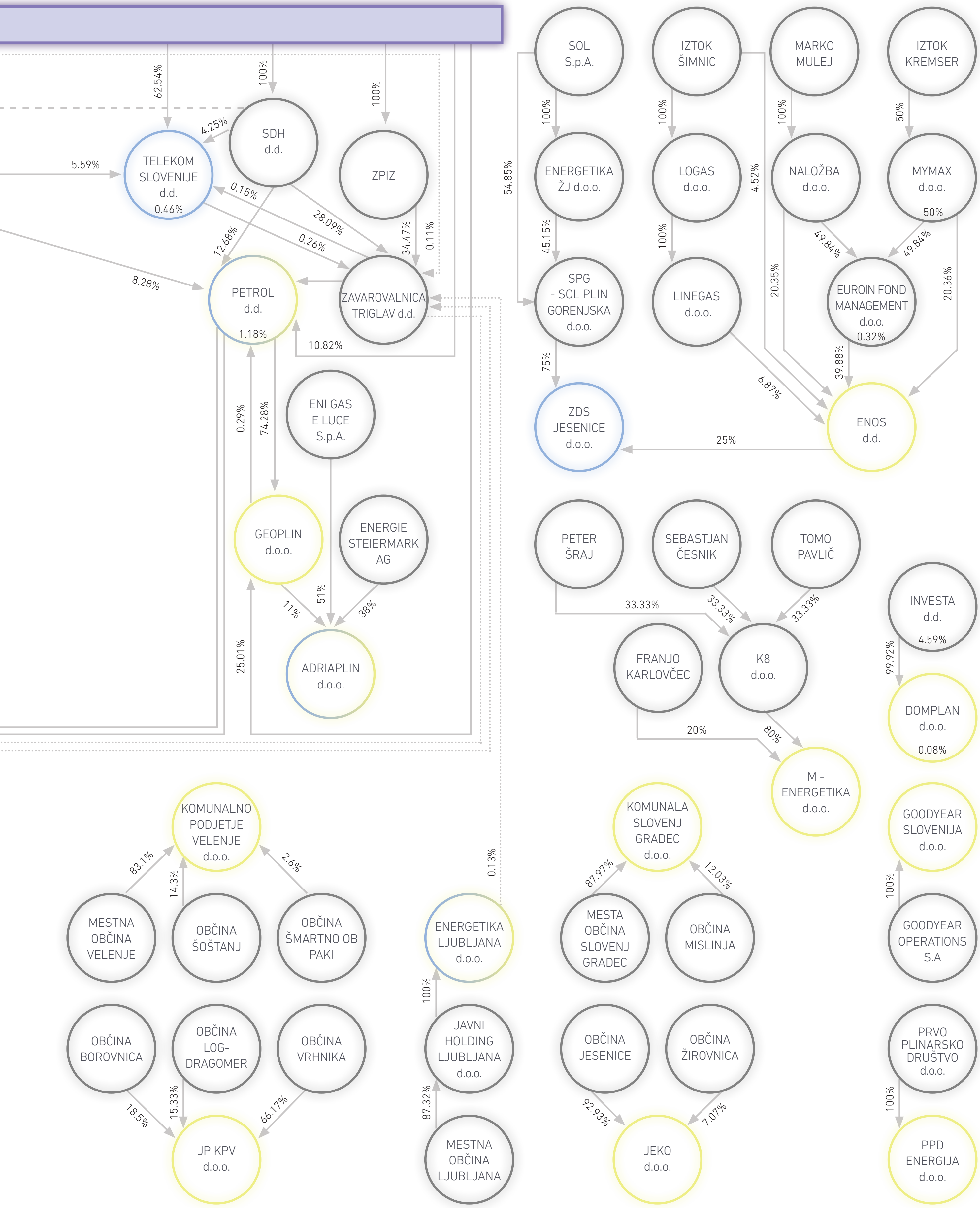
Unbundling

Distributors performing services of general economic interest and carrying out activities other than heat distribution should keep separate accounts in accordance with accounting standards and disclose separate accounts in the notes on the financial statements for heat distribution, heat production and other activities. To this end, they should define in their internal acts the criteria for allocating assets and liabilities, costs and expenditure, and revenues, which they take into account in the management of accounts and the preparation of separate accounts. They must also be disclosed in full in the notes on the financial statements. The adequacy and correctness of the application of judgments should be audited annually by the auditor, who must produce a special report.

FIGURE 235: OWNERSHIP STRUCTURE OF ELECTRICITY AND NATURAL GAS SUPPLIERS – ON 31 DECEMBER 2021

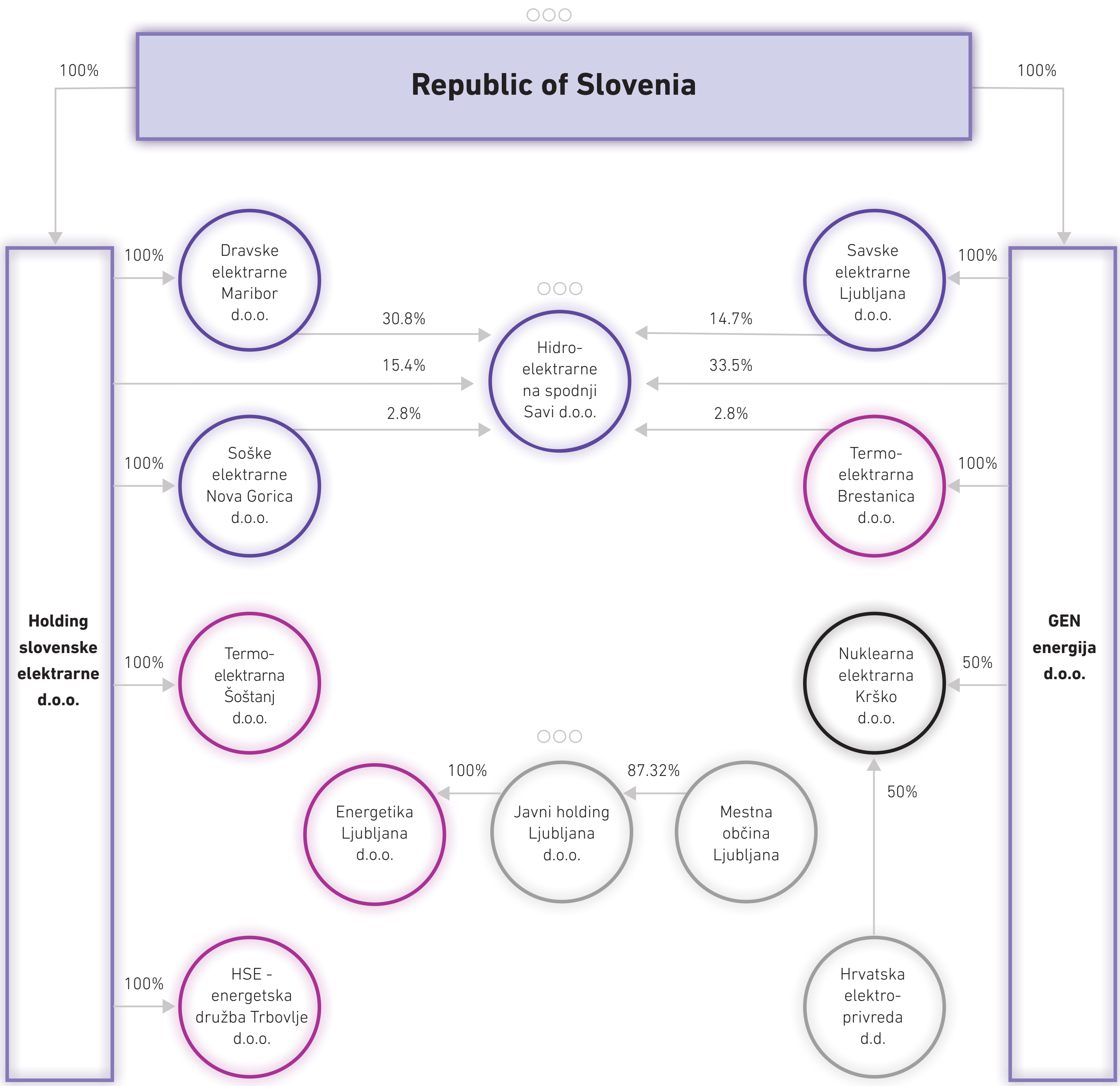


Electricity supplier
Natural gas supplier
Electricity and natural gas supplier



SOURCE: GVIN.COM

FIGURE 236: OWNERSHIP STRUCTURE OF ELECTRICITY PRODUCERS WITH INSTALLED CAPACITY MORE THAN 10 MW – ON 31 DECEMBER 2021



SOURCE: GVIN.COM

LIST OF ABBREVIATIONS AND ACRONYMS

ACER	Agency for the Cooperation of Energy Regulators Agency za energijoEnergy Agency
AIB	Association of Issuing Bodies
AJPES	Agency of the Republic of Slovenia for Public Legal Records and Related Services
AMS++	Advanced Metering System
AN-OVE	National Renewable Energy Action Plan 2010-2020
AM	Amortisation
AN-URE 2020	National Energy Efficiency Action Plan 2017-2020
AREDOP	Active Regulation of Energy Activities and Networks of the Future
Borzen	Borzen, Power Market Operator
BS	Balance Group
BSP, Southpool	BSP, Regional Energy Exchange, Southpool
B2B	Business to Business
B2C	Business to Consumer
BEV ++	Battery Electric Vehicle
CBCA	Cross-Border Cost Allocation
C_{neg} and C_{poz}	Basic Imbalance Prices
CDS	Closed Distribution System
CEP	Clean Energy Package
CEEPS	Central Electricity Portal of Slovenia
CEER	Council of European Energy Regulators
CEER CS WS	CEER Cyber Security Workstream
CEGH	Central European Gas Hub AG Vienna; (stock index)
CEP	Clean Energy Package
CHP	Combined Heat and Power
CIM	Common Information Model (IEC 61970-3XX)
CNG	Compressed Natural Gas
CONE	Cost of New Entry
CRIDA	Complementary Regional Intraday Auctions proposal
CROPEX	Croatian Power Exchange
CSDMP	Central system for access to metering data
CZC	Cross-zonal capacity

DEM	Dravske elektrarne Maribor d.o.o. (Dravske elektrarne HPP)
DG ENER	Directorate-General for Energy of the European Commission
DSO	Distribution System Operator
DTO	Distribution-Transformer Station
E	Electricity
ebIX	European forum for energy Business Information eXchange
EDC	Electricity Distribution Companies
EEX	European Energy Exchange AG, Leipzig
ENISA	The European Union Agency for Cybersecurity
ENTSO-E	European Network of Transmission System Operators for Electricity
EPOS-G2	E-reporting of energy service providers' data
ESMIG	European Smart Energy Solution Providers
EXAA	Energy Exchange Austria
EZ-1	Energy Act, Official Gazette of the RS. no. 60/19 – official consolidated text and 65/20
EU	European Union
EXAA	Energy Exchange Austria
GDP	Gross Domestic Product
GIAC	Global Information Assurance Certification
GIZ	Economic Interest Grouping
GJS	Service of general economic interest
GME	Gestore Mercati Energetici, Italian Power Exchange
GO	Guarantee of Origin
GS1	Global Business Languages ((http://www.gs1.org)
HEP	Hrvatska elektroprivreda d.d.
HESS	Hidroelektrarne na Spodnji Savi, d.o.o. (Hidroelektrarne na Spodnji Savi HPP)
HHI	Herfindahl-Hirschman index
HOPS	Hrvatski operator prijenosnog sustava d.o.o
HPP	Hydroelectric Power Plant
HSE	Holding Slovenske elektrarne, d.o.o.
HUPX	Hungarian Power Exchange
HV	High Voltage

I	Incentives
ICT	Information and communication technology
IEGSA	Interoperable pan-European Grid Service Architecture
IPET	Energy Market Data Exchange (IPET Section)
JAO	Joint Allocation Office
JPEL	Javno podjetje Energetika Ljubljana
KORRR	Key Organisational Requirements, Roles and Responsibilities
LNG	Liquefied Natural Gas
LT	Low Tariff
LV	Low Voltage
MAIFI	Momentary Average Interruption Frequency Index
MRS	Metering-regulation Station
MV	Medium Voltage
NBIoT	Narrow Band Internet of Things (Ozkopasovni internet stvari)
NEMO	Nominated Electricity Market Operator)
NG	National Gas
NNP	Nuclear Power Plant
NREAP	National Renewable Energy Action Plan
P	Power
PCI	Projects of Common Interest
PHEV	Plug-in hybrid electric vehicles
PL	Power Line
PSHPP	Pumped-Storage Hydroelectric Power Plant
PT	Peak Tariff
RDS	Regulated return on assets
REMIT	Regulation (EU) No 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency
RES	Renewable Energy Sources
R&I	Research and Innovations
RF	Regulatory Framework
RPI	Retail Price Index
RRM	Registered Reporting Mechanism
SAIDI	System Average Interruption Duration Index

SAIFI	System Average Interruption Frequency Index
SANS	SysAdmin, Audit, Network, and Security (Escal Institute of Advanced Technologies)
SCT	Single Contact Point
SDV	Operating and maintenance costs
SEE	South-East Europe
SEL	Savske elektrarne Ljubljana d.o.o. (Savske elektrarne HPP)
SEEI	Costs of electrical power system losses
SEDMP	System for Uniform Access to Measurement Data
SENG	Soške elektrarne Nova Gorica d.o.o.
SEVF	Slovenian Energy Security Forum
SGTF-EG2	Smart Grid Task Force Expert Group 2
SHB	Slovenia, Croatia, Bosnia in Herzegovina (block SHB)
SIDC	Single IntraDay Coupling
SIPX	Slovenian Price Index
SODO	Slovenian Distribution System Operator
SONDSEE	System operating instructions for the electricity distribution system
STAT	Statistical Office of the Republic of Slovenia
SWC	Social Work Centre
T	Annual operating hours
TEB	Termoelektrarna Brestanica d.o.o. (Brestanica TPP)
TEŠ	Termoelektrarna Šoštanj d.o.o. (Šoštanj TPP)
TS	Transformer station
URSIV	Information Security Administration
TPP	Thermoelectric Power Plant
TS	Transformer Station
TSO	Transmission System Operator
VAT	Value-Added Tax
VOLL	Value of Lost Load
ZGD-1	Companies Act, Official Gazette of the RS, Nos. 65/09 – official consolidated text, 33/11, 91/11, 32/12, 57/12, 44/13 – dec. CC, 82/13, 55/15, 15/17 and 22/19 – ZPosS
ZOEE	Zakon o oskrbi z električno energijo – Electricity Supply Act, Official Gazette of the Republic of Slovenia, No. 172/21
ZOP	Zakon o oskrbi s plinom – Gas Supply Act, Official Gazette of the Republic of Slovenia, No. 204/21

LIST OF TABLES

LIST OF FIGURES