REPORT ON THE ENERGY SITUATION IN SLOVENIA

2024

Agencija za energijo

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MAG. DUŠKA GODINA
DIRECTOR

INTRODUCTION

Every year, the Energy Agency prepares an overview of the energy situation for the previous year and reports it to the European Commission, the Government of the Republic of Slovenia and the National Assembly. The 2024 report also provides a comprehensive overview of key developments and changes in the supply of electricity, gas and heat, as well as information on progress in ensuring efficient energy use and protecting consumer rights.

In its Action Plan for Affordable Energy, the European Commission notes that a strongly integrated energy market has been established. Still, a genuine Energy Union has yet to be created, one that would truly ensure reliable, sustainable, competitive, and affordable energy for all Europeans. Energy costs in the EU remain relatively high, which, according to the Commission, exposes Europe to a real risk of deindustrialisation and threatens our economy. We must remain firmly committed to the green transition, as we have already taken significant steps together to promote energy efficiency, clean energy generation, and diversification of energy sources. Newly installed wind and solar capacity in the EU reached a record level of 78 GW in 2024, with renewable energy sources accounting for 48% of the EU's electricity generation (45% in 2023 and 41% in 2020). Gas prices have fallen significantly since the spring of 2023, and the Commission is continuing its efforts to phase out Russian energy imports completely.

Last year, Slovenia achieved its highest level of electricity generation from hydropower plants since 2014, which significantly contributed to the country's very high domestic generation coverage of 97%. Generation in solar power plants also increased by almost 25% compared to 2023. Last year, there were already 60,245 self-generation facilities in operation, representing a 35% increase from 2023, and the share of consumers who also produced electricity increased to 6.2%. Electricity consumption remained at approximately the same level, while gas consumption increased by almost 8%. In contrast, heat consumption was lower. In heat generation, we recorded a sound 18% reduction in coal consumption and a 20% share of renewable energy sources. The estimated total share of RES in gross final energy consumption for 2024 is 24.2% or 0.8 percentage points below the 2020 target.

Electricity prices were also regulated in 2024, so the supply for household consumers remained significantly cheaper than the EU average. The state covered a total of more than €210 million of the difference between the market and regulated prices from the budget, and price regulation also influenced the dynamics of supplier switching in the retail market. Suppliers structured their offers at the capped price level, with no promotional offers in 2024, and the potential savings from switching suppliers were minimal. In the last three years, we have recorded a record low number of energy supplier switches compared to years when the retail market operated under competitive conditions. Gas prices fell for all consumer groups last year, with the price of gas supplies for households 20% lower than the EU average.

Last year, we also recorded the highest level of investment in electricity distribution networks in terms of value. The increase in these costs is partly due to higher prices for materials and services, but according to the transmission system operator's development plans, achieving environmental targets and the associated increase in electrification of all consumption sectors, as well as increasingly dispersed and volatile energy sources, will require substantial investments in the electricity network, which is the backbone of the green transition. Both the European Commission, the European Court of Auditors, and ACER highlight that network costs will become the primary factor in the price of electricity supply and emphasise that managing their growth is crucial for the industry's competitiveness and ensuring affordability. Promoting the efficient use of networks is, therefore, the only sustainable way forward and is essential for reducing costs. Unstable electricity supply and increased demand are already leading to higher peaks, greater fluctuations and greater unpredictability in supply and consumption. Therefore, to reduce the need for expensive network capacity expansions, measures to ensure flexibility in demand response must be implemented urgently, and national regulatory authorities must ensure that network tariffs evolve in line with the energy system. The new network tariff, which has been in use since October 2024, is based on advanced metering and ensures a fairer distribution of costs, enables more flexible consumption, encourages peak reduction and contributes to better utilisation of existing capacity. By the end of 2024, 96.7% of all metering points were already equipped with advanced meters.

The energy transition must be socially just and inclusive. Support for vulnerable groups, energy advice, and incentives for energy efficiency have become integral to sustainable energy policy. This is not just a political commitment but also a fundamental value of the energy transition.

The data in the report are not just numbers – they are proof that Slovenia is also firmly on the path to transforming its energy sector towards greater energy independence, sustainable supply and climate responsibility.

With its rich content, the report on the state of the energy sector looks back while providing necessary assistance in tackling challenges and finding successful solutions to enable sustainable, reliable and affordable energy. Sincere thanks to all those who provided data for this comprehensive report and to all the staff at the Energy Agency for their dedicated, responsible and highly professional work.

ELECTRICITY

TAKING INTO ACCOUNT THE TOTAL PRODUCTION IN NPP SLOVENIA IN 2024, NET ELECTRICITY EXPORTS

- 36.8% NUCLEAR FUEL
- 40.2% RES
- 23.0% FOSSIL FUELS

AGAIN ABOVE-AVERAGE PRODUCTION IN HPPs – THE HIGHEST SINCE 2014

AN ESTIMATED **24.2% SHARE OF RES** IN TOTAL GROSS FINAL ENERGY CONSUMPTION

97.1% OF ELECTRICITY CONSUMPTION COVERED BY DOMESTIC PRODUCTION

EUR 220 million INVESTED IN THE DISTRIBUTION SYSTEM – THE HIGHEST AMOUNT EVER, PARTLY DUE TO RISING PRICES OF MATERIALS AND SERVICES

12,694 GWh

TOTAL ELECTRICITY CONSUMPTION OF ALL FINAL CONSUMERS – REMAINS AT THE 2023 LEVEL

- 2% LOWER CONSUMPTION BY HOUSEHOLD CONSUMERS
- 0.9% HIGHER CONSUMPTION BY BUSINESS CONSUMERS

THE DATA DOES NOT INCLUDE ELECTRICITY PRODUCED AND CONSUMED BEHIND THE METER (SELF-SUPPLY).

GROWTH IN THE SHARE OF UNDERGROUND LINES IS SLOWING DOWN – ONLY 0.9 PERCENTAGE POINTS IN 2024 – AN INCREASING DEVIATION FROM THE NEPN TARGET VALUE

A cornerstone of modern lifestyle, technological development, and achieving climate neutrality

96.7% OF USERS ON THE DISTRIBUTION SYSTEM EQUIPPED WITH ADVANCED METERING DEVICES

ENISA CYBER EUROPE
– THE LARGEST CYBER EXERCISE FOCUSED ON THE ENERGY SECTOR IN THE EUROPEAN AREA

19,549
ELECTRIC VEHICLES

2,156
PUBLIC RECHARGING POINTS

6.2% SHARE
OF CONSUMERS WHO ARE ALSO PRODUCERS

8% INCREASE
IN PRODUCTION FROM RES – THE LARGEST SHARE FROM HYDROPOWER PLANTS

82.6% LESS SUPPORT PAID
FOR ELECTRICITY PRODUCTION FROM GAS COMPARED TO 2023

ALMOST 25% MORE PRODUCTION IN SOLAR POWER PLANTS THAN IN 2023

60,245
SELF-SUFFICIENCY DEVICES
- TOTAL CONNECTED CAPACITY 779 MW
- ESTIMATED PRODUCTION IN 2024 IS 674.2 GWh

SUPPORT PAID FOR ONLY 3.2% OF ALL ELECTRICITY PRODUCED IN 2024

2.2% INCREASE IN THE AVERAGE ANNUAL FINAL PRICE OF SUPPLY FOR A TYPICAL HOUSEHOLD CONSUMER

ABOUT **14%** DECREASE IN EXCHANGE PRICES

21.4% REDUCTION
IN FINAL ELECTRICITY SUPPLY PRICES FOR AVERAGE BUSINESS CONSUMPTION

DUE TO MEASURES TO MITIGATE THE ENERGY CRISIS, THE PRICE OF ENERGY SUPPLY TO HOUSEHOLD CONSUMERS REMAINED BELOW THE EU AVERAGE IN 2024

ELECTRICITY

Electricity Balance

Inputs and Outputs of Electricity in the System

15,101 GWh of electricity delivered into the electricity system, of which 40.2 from RES generation facilities

In 2024, 15,101 GWh of electricity was delivered into the electricity system from the generation units connected to the transmission or distribution system, which was 907 GWh more than in 2023. The electricity balance of inputs and outputs shown in Figure 1 also includes the withdrawal of 41 GWh battery storage in the context of generation in the distribution system and within closed distribution systems. The delivery from facilities using RES amounted to 6,046 GWh, which is 338 GWh more than the year before. Also the delivery from facilities using fossil fuels was 349 GWh higher than the year before and amounted to 3,470 GWh. The Krško Nuclear Power Plant (NPP) delivered 5,544 GWh of electricity or 221 GWh more than 2023. These quantities are taken from the balance sheets of the electricity system operators and are based on physical flows.

The quantity of electricity delivered into the electricity system produced by facilities connected to the distribution system, which includes closed distribution systems (CDS), increased by 40 GWh compared to 2023 to a total of 1,244 GWh, or 1,284 GWh if including the electricity drawn from battery storage. In internal consumers' networks with connected generation facilities in installed generation units, an additional 708 GWh of electricity was produced and consumed, which is 55% of all electricity delivered into the distribution system from facilities connected to the distribution system and closed distribution systems. The estimated generation from renewable self-consumption systems amounted to 674 GWh[1], while system operators' reports state that 558 GWh were delivered into the distribution system at the metering points of consumer's with the annual calculation of electricity, while 581 GWh of electricity were delivered from the distribution system.

1 The report drafted in accordance with Article 20 of the Decree on the self-supply of electricity from renewable energy sources (Official Gazette of the Republic of Slovenia, no. 43/22).

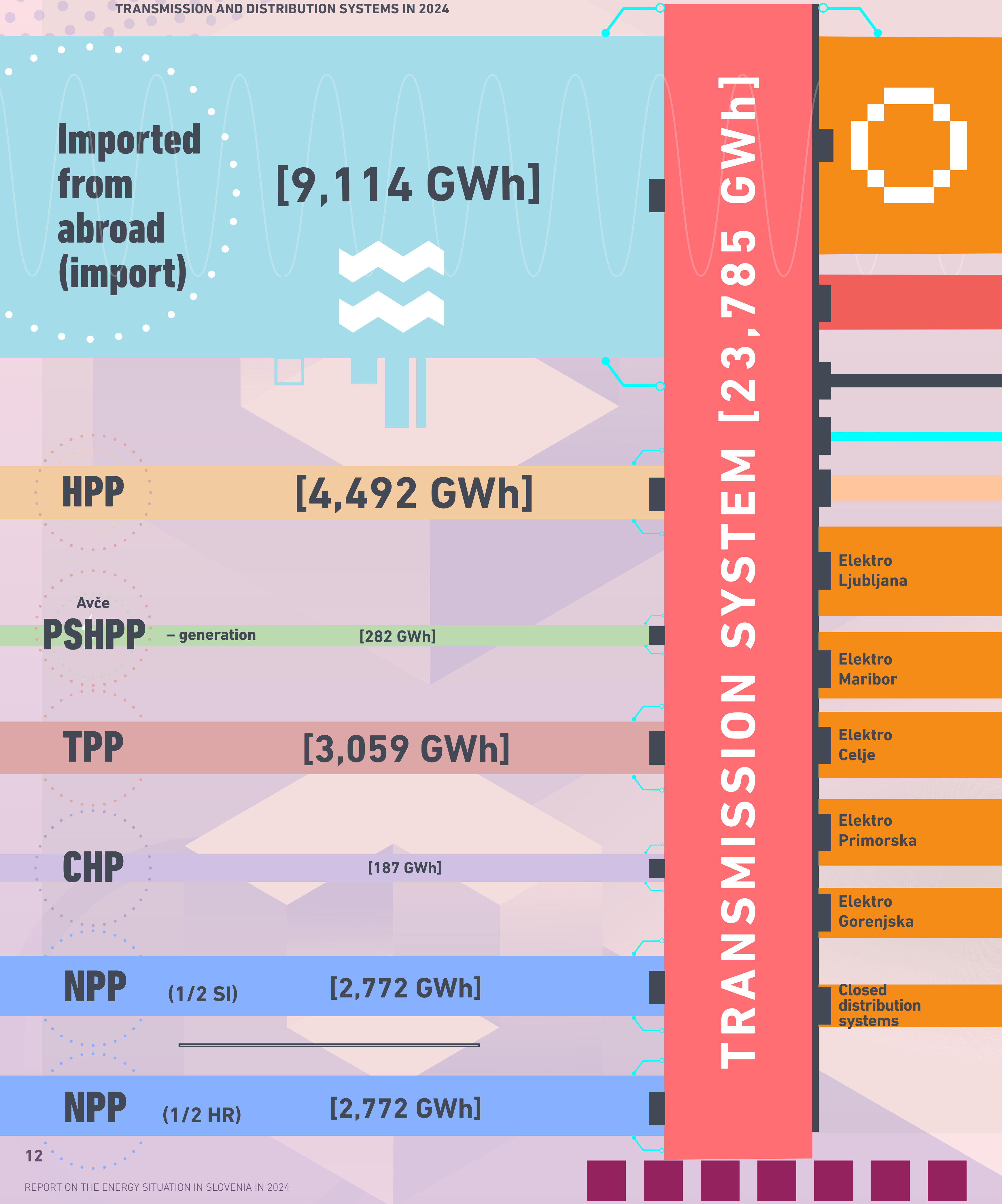
TABLE 1: ELECTRICITY DELIVERED TO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2022–2024 V PERIOD, IN GWh

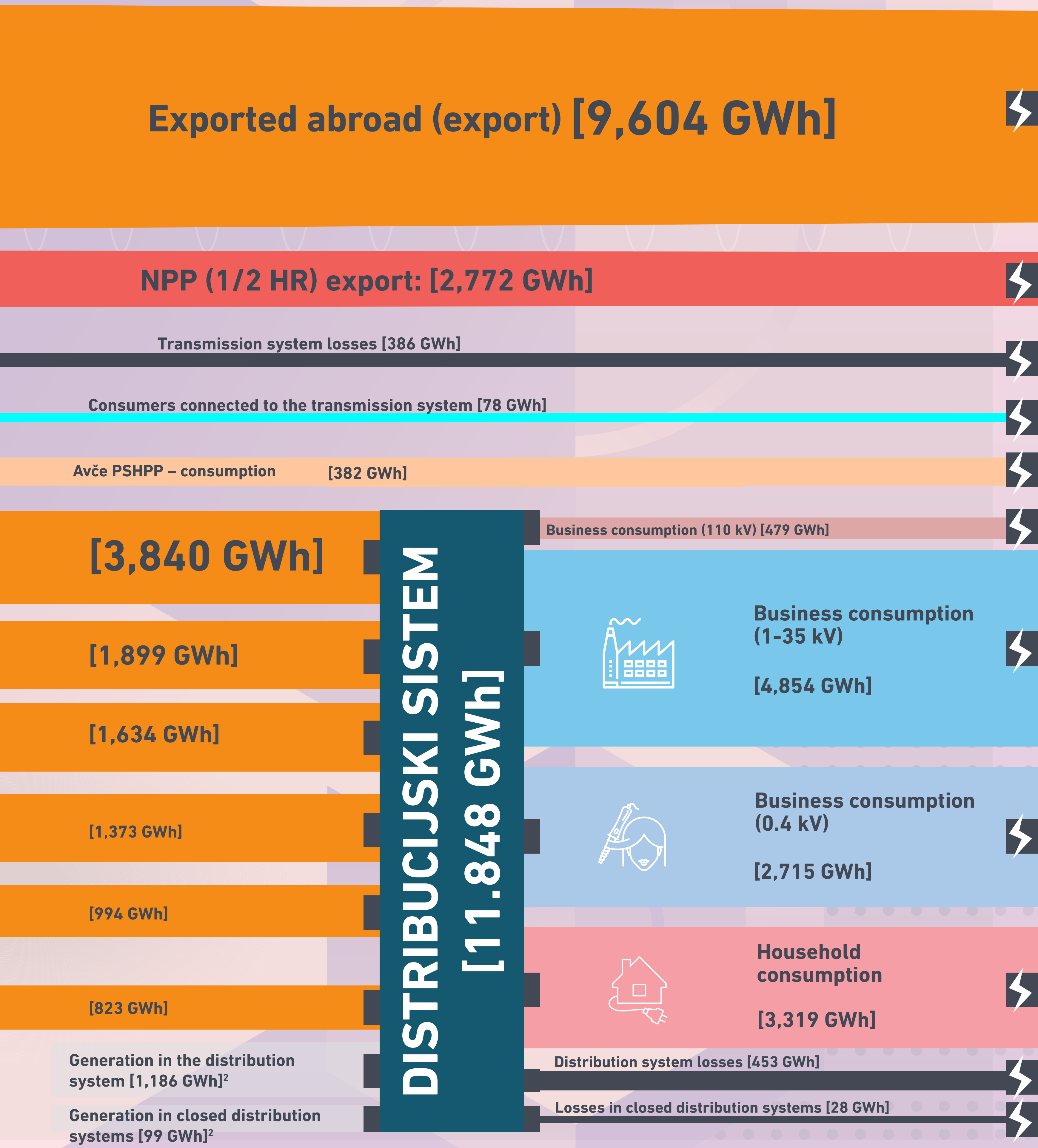
Electricity input to the transmission system [GWh]	**2022**	**2023**	**2024**
Dravske elektrarne Maribor	1,846.9	2,958.6	3,224.8
Savske elektrarne Ljubljana	225.7	397.4	387.7
Hidroelektrarne na spodnji Savi	400.0	682.9	641.4
Soške elektrarne Nova Gorica	313.0	452.9	490.4
Avče PSHPP in the generation regime	251.2	300.2	282.0
Total Hydro	**3,036.7**	**4,792.0**	**5,026.3**
TPP Šoštanj	2,541.8	2,682.9	3,021.4
TPP Brestanica	40.8	–0.1	37.2
TPP Trbovlje	0.1	–1.1	0.6
Javno podjetje Energetika Ljubljana	258.8	159.1	186.7
Total TPP and CHP	**2,841.4**	**2,840.8**	**3,245.9**
Krško Nuclear Power Plant	**5,302.2**	**5,323.4**	**5,544.3**
Total electricity input into the transmission system	**11,180.4**	**12,956.1**	**13,816.5**
Electricity input into the distribution system [GWh]	**2022**	**2023**	**2024**
HPP up to and including 1 MW	158.7	247.3	238.1
HPP above 1 MW	114.1	156.6	163.9
Woody biomass-fuelled facilities	41.5	32.8	34.2
Wind farms	5.7	6.4	6.5
Solar power plants	286.8	361.1	473.0
Facilities using biogas	117.1	111.9	104.3
Waste-to-energy plants	0.7	0.1	0.1
Total RES	**724.6**	**916.2**	**1,020.1**
Total conventional sources	**255.5**	**280.6**	**223.92**
Unidentifiable (withdrawal from storage facilities)	**31.8**	**41.3**	**40.1**
Total electricity input into the distribution system	**1,011.9**	**1,238.1**	**1,284.1**
TOTAL ELECTRICITY INPUT	**12,192.3**	**14,194.2**	**15,100.6**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

ELECTRICITY

FIGURE 1: THE BALANCE OF ELECTRICITY INPUTS AND OUTPUTS IN THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN 2024





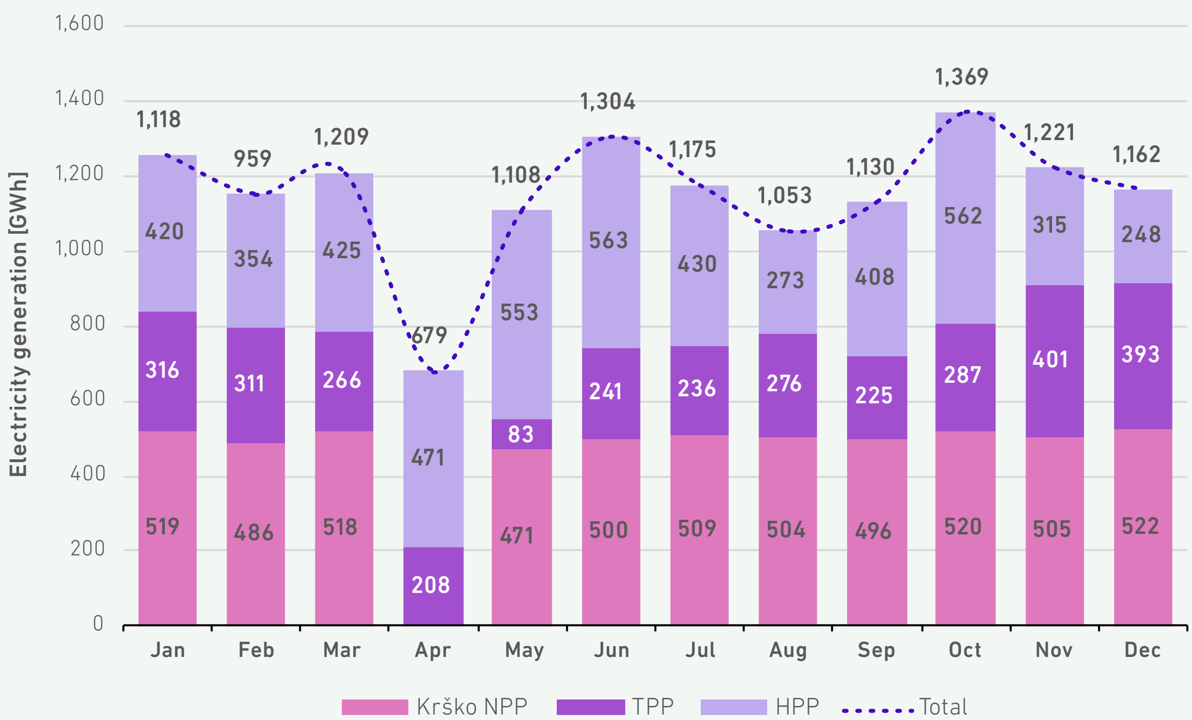
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

2 Withdrawal of electricity from battery storage is covered in Distribution System Generation and Generation in closed Distribution Systems.

Domestic production sources – which include half of the production from the Krško NPP – contributed 12,688 GWh of electricity to the Slovenian electricity system. The demand from final consumers, including system losses, amounted to 12,694 GWh. In 2024, 97.1% of the electricity consumption by final consumers in Slovenia was covered by domestic production sources.

Figure 2 shows the monthly movement of electricity generation in power plants that were connected to the transmission system in 2024. Similar to the previous year, 2024 was characterised by excellent hydrological conditions and even higher electricity production from hydropower plants. Production at the Krško Nuclear Power Plant (Krško NPP) was shut down in April for routine maintenance, while TEŠ 6 was shut down at the end of April for routine maintenance, and the shutdown continued for the first three weeks of May due to the favourable energy market situation and the exceptionally high production at the hydropower plants.

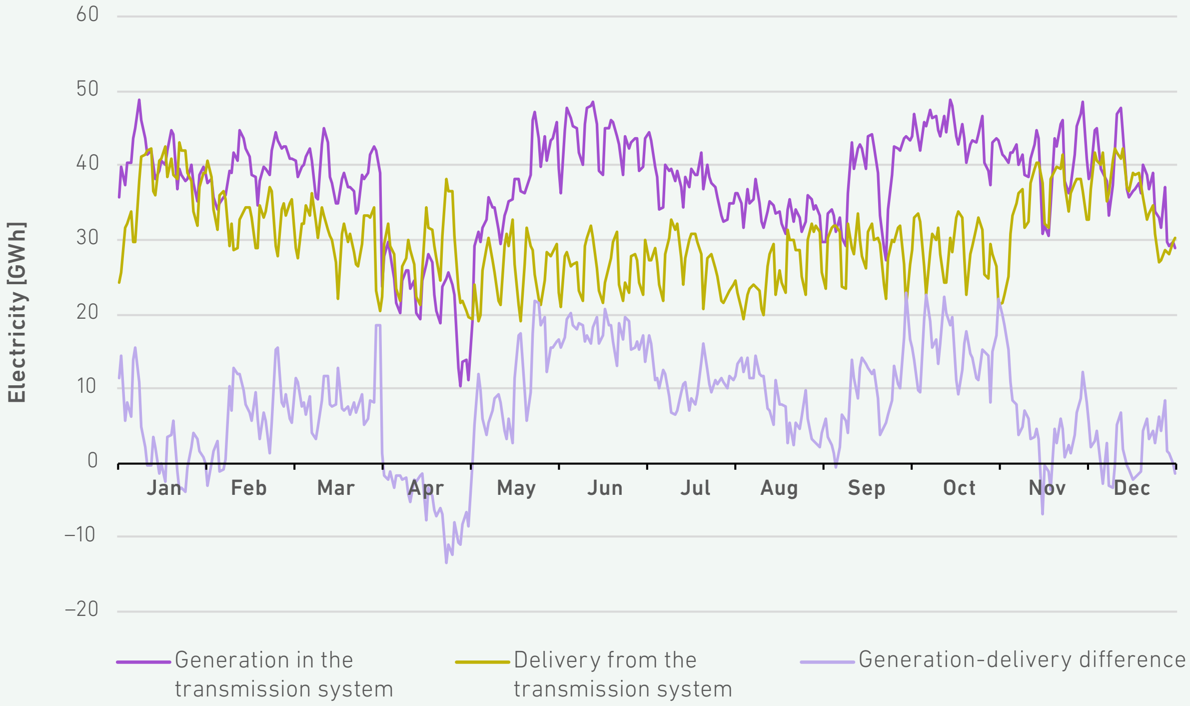
FIGURE 2: MONTHLY VARIATION OF ELECTRICITY GENERATION IN LARGE POWER PLANTS CONNECTED TO THE TRANSMISSION SYSTEM



SOURCES: ENERGY AGENCY, ELES

Figure 3 shows the trend of electricity generation and of electricity offtake from the transmission system, which shows a shortfall in generation practically only during the shutdown of NEK for a scheduled maintenance in April. In the other months, domestic production on average kept up with domestic needs, or even exceeded it significantly most of the time in the period between May to November.

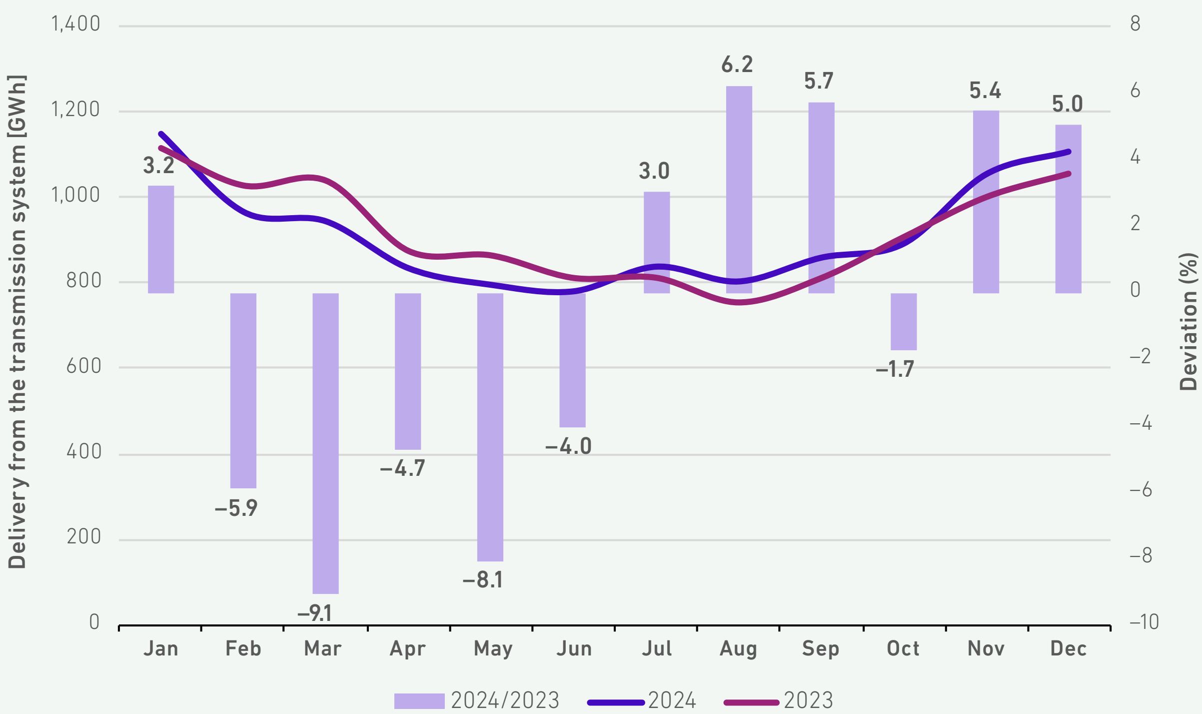
FIGURE 3: DAILY VARIATION OF ELECTRICITY GENERATION AND INPUT INTO THE TRANSMISSION SYSTEM



SOURCES: ENERGY AGENCY, ELES

Figure 4 shows the monthly variation in the delivery of electricity from the transmission system in 2023 and 2024. Shown separately is the monthly margin of delivery during both years, which shows a significant reduction in electricity delivery from the transmission system in 2024 compared to the year before especially in the first half of the year, while in the second half of 2024 the delivery increased again compared to the previous year. For the whole of 2024, the electricity delivery from the transmission system was only 52 GWh lower than in the previous year, and it was 11,025 GWh.

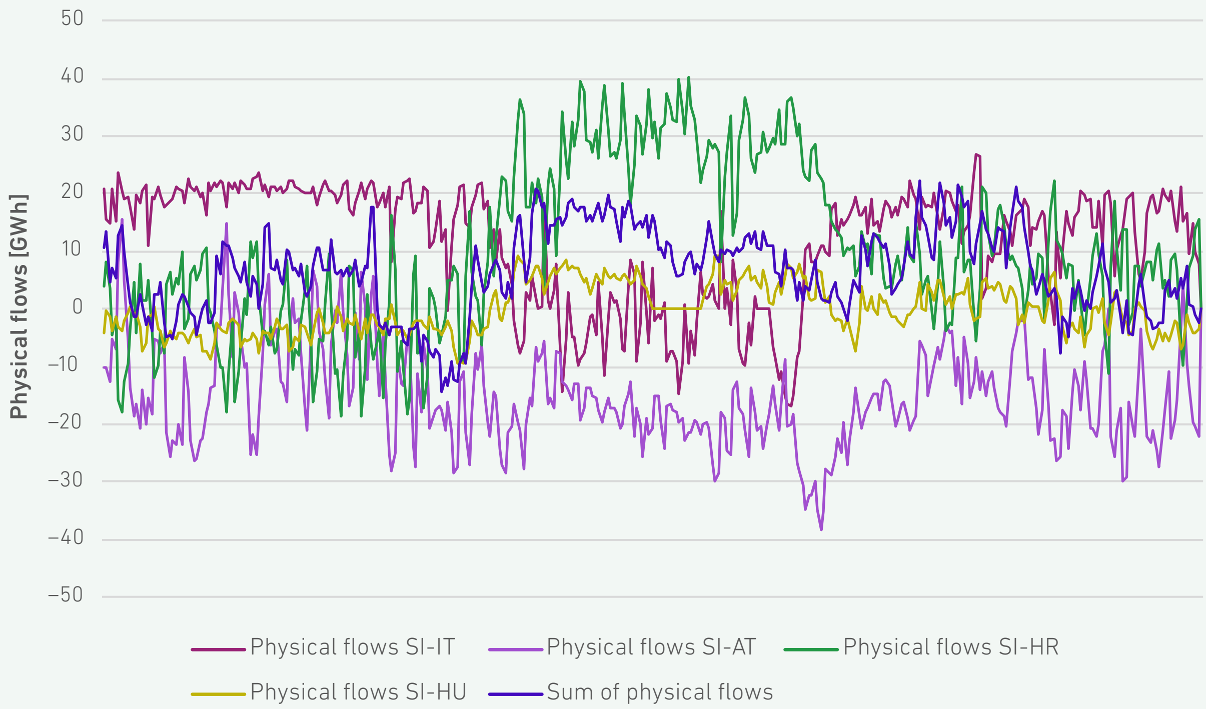
FIGURE 4: MONTHLY DELIVERY OF ELECTRICITY FROM THE TRANSMISSION SYSTEM IN 2023 AND 2024, ALSO SHOWING MONTHLY DEVIATIONS



SOURCES: ENERGY AGENCY, ELES

The Slovenian electricity transmission system is connected to the transmission systems of neighbouring countries on the borders with Austria, Croatia, Italy and Hungary. Based on the sum of 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 the deficit or the export of the surplus electricity from the transmission system. Figure 5 shows the sum of the physical electricity flows at all four borders (SI-AT, SI-HR, SI-IT and SI-HU) in addition to the movement of individual physical flows.

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

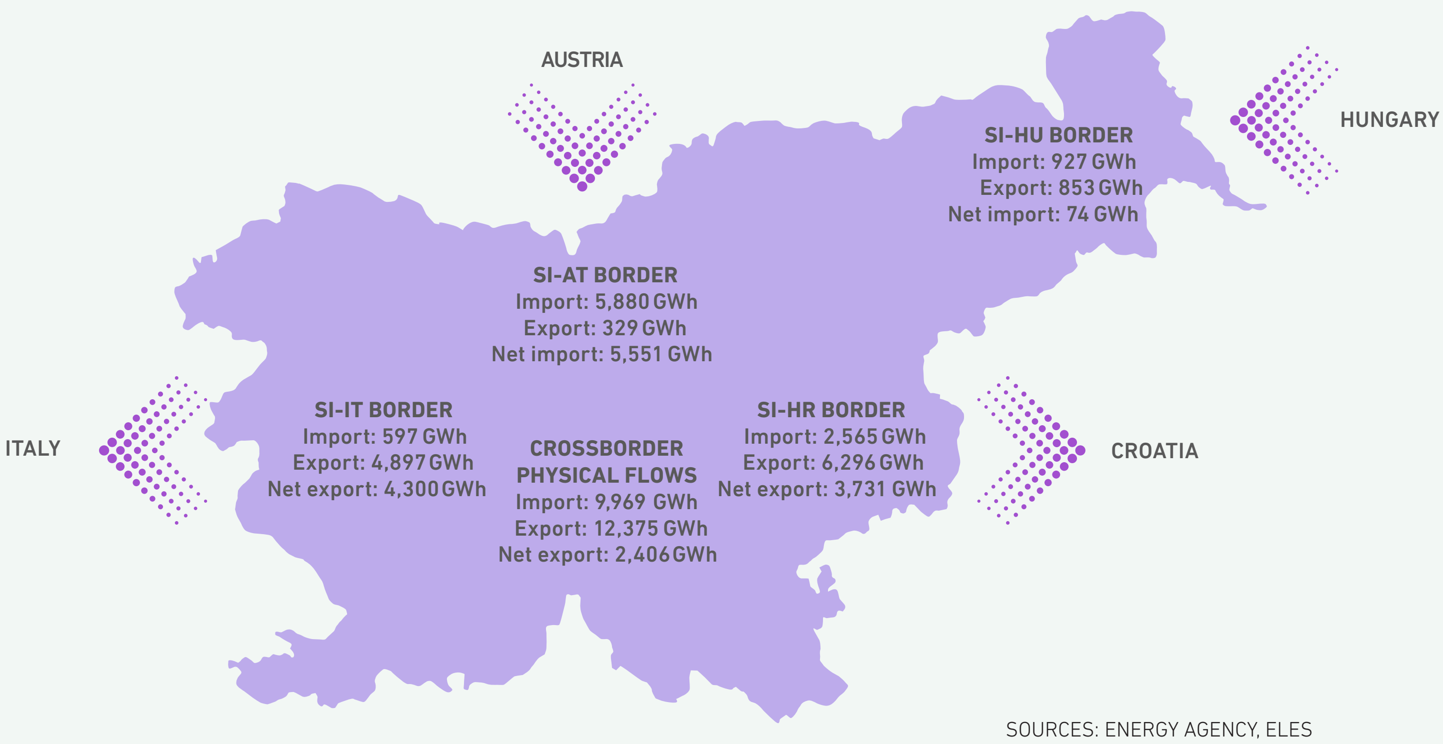


SOURCES: ENERGY AGENCY, ELES

To keep the electricity system balanced, it is important to exchange electricity with neighbouring countries using cross-border interconnectors. Considering the separate observation of physical flows at individual borders with neighbouring countries in 2024, Slovenia was a net exporter of electricity to Italy and Croatia, and a net importer at the borders with Austria and Hungary. In terms of total electricity exchanges at borders with neighbouring countries, Slovenia was a net exporter of electricity in 2024, taking into account the total electricity production in Krško NPP. Figure 6 shows the annual volumes of physical flows at the borders with neighbouring countries. These prove that the Slovenian transmission system is an important element in energy flows within the EU internal electricity market, especially in the direction of Italy, which remains a large importer of electricity due to differences in prices on the annual level.

Taking into account the total production of Krško NPP Slovenia in 2024 a net exporter of electricity

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

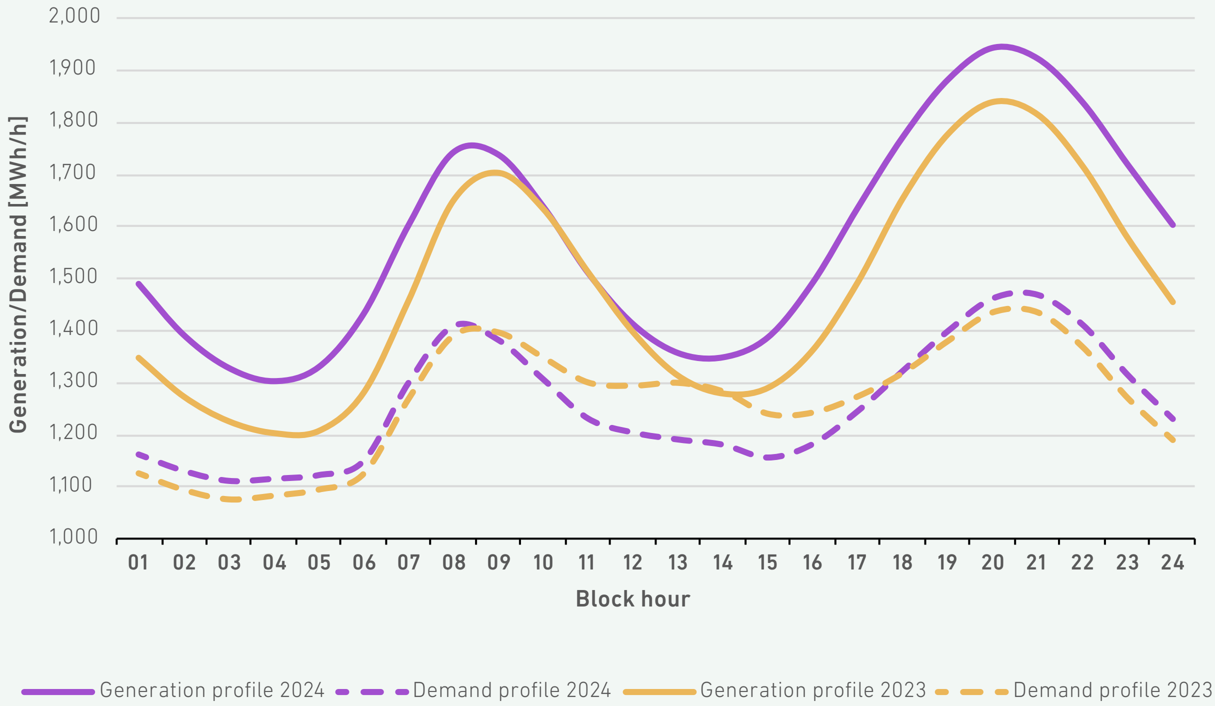


SOURCES: ENERGY AGENCY, ELES

Figure 7 shows the average daily profile of electricity generation and delivery in the transmission system in 2023 and 2024. In 2024, the transmission system was at its lowest load during the night time (around 3 pm), with the highest load occurring twice, first in the morning (around 8 am) and then at a slightly higher level in the evening between 8 pm and 9 pm. Comparing the generation and demand profiles for both years, it can be seen that in 2024, similarly to 2023, generation was on average higher than demand at all hours of the day.

The highest hourly load on the electricity transmission system in 2024, excluding losses, was 2,100 MW, which is 75 MW more than in 2023. It was reached on Monday 22 January 2024 in hour block 9 (between 8 and 9 a.m.). For the third year in a row, the peak occurred in the morning hours, which is a new rule compared to previous years when the peak usually occurred in the evening or at noon and never in the morning.

FIGURE 7: THE AVERAGE DAILY PROFILE OF ELECTRICITY GENERATION AND DELIVERY FROM THE TRANSMISSION SYSTEM IN THE YEARS 2022 AND 2023

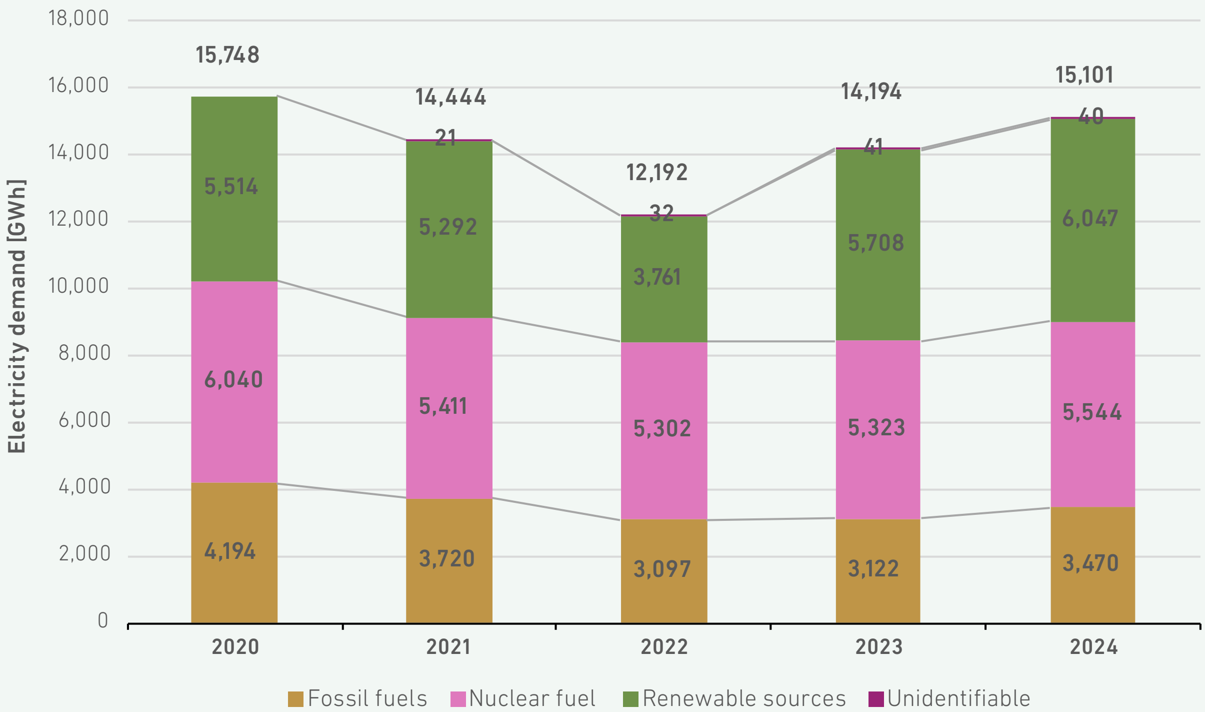


SOURCES: ENERGY AGENCY, ELES

The share of electricity generated in hydropower plants and facilities using RES varies annually depending on hydrological and other conditions and investments in new generating facilities using RES. With increased electricity generation from all primary energy sources, the shares of electricity generated and electricity taken into the electricity system in Slovenia in 2024 were practically the same as in the previous year, at 40.2% for RES, 23.0% for fossil fuel power plants and 36.8% for Krško NPP, which includes the 50% share that Croatia is entitled to under an intergovernmental agreement.

36.8% of the total electricity generated and taken over from the Krško NPP also includes the 50% share belonging to Croatia, 40.2% from RES and 23.0% from fossil fuels

FIGURE 8: ELECTRICITY DELIVERED FROM THE GENERATION FACILITIES TO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 2: PRIMARY ENERGY SOURCES DELIVERED TO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2022–2024 PERIOD

Primary energy sources for electricity generation	2022		2023		2024	
	[GWh]	Share	[GWh]	Share	[GWh]	Share
Fossil fuels	3,097	25.5%	3,122	22.1%	3,470	23.0%
Nuclear fuel	5,302	43.6%	5,323	37.6%	5,544	36.8%
Renewable sources	3,761	30.9%	5,708	40.3%	6,047	40.2%
• Hydro	3,310	88.0%	5,196	91.0%	5,428	89.9%
• Wind	5.7	0.2%	6.36	0.1%	7.00	0.1%
• Solar	287	7.6%	361	6.3%	473	7.7%
• Other RES	159	4.2%	145	2.6%	139	2.3%
Unidentifiable	32	-	41	-	40	-
TOTAL ELECTRICITY INPUT	**12,192**		**14,194**		**15,101**	

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

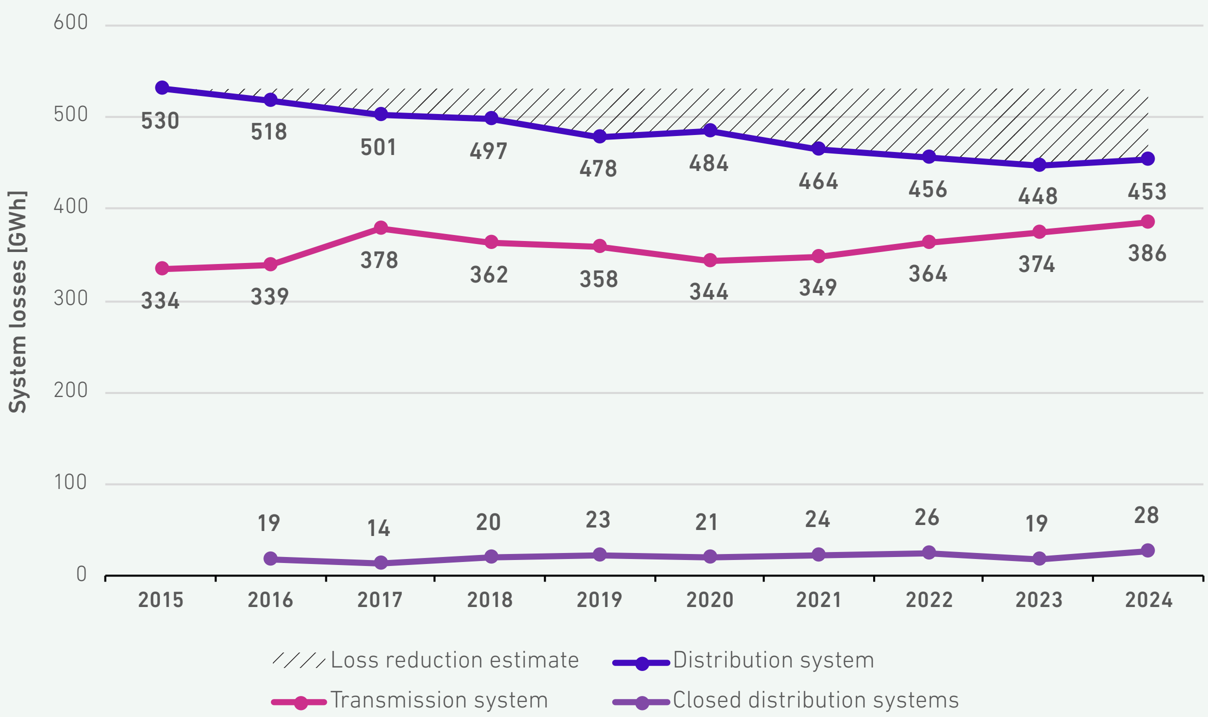
Losses in the Electricity System

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 systems and the direct consumption of electricity from the transmission system. Losses in the distribution system are determined based on the differences between the quantities of electricity at the borders between the transmission and distribution systems and the quantities of electricity measured for the final consumers.

The multi-year trend in the reduction of losses, shown in Figure 9, is the result of various measures, with a focus on the introduction of advanced metering systems that allow better monitoring and control of commercial and technical losses, and a shift towards a higher share of cabling of the medium and low voltage network. As a result of the above measures, the estimated electricity savings for losses on the distribution system over the 2015–2024 period are more than 300 GWh. In 2024, both the share of losses and the amount of electricity losses on the distribution system have increased, which can be attributed to a large extent to inadequate recording of consumption at the metering points of self-supplying customers with annual net metering, whose actual electricity consumption and dispatch are not correctly captured in the electricity balance of Slovenia's electricity balance sheet.

The trend in electricity losses on the transmission system is significantly affected by the inclusion of the Avče PSHPP after 2014 and by the increased share of cross-border electricity trading in exports, imports and transit. The quantities of electricity losses in the transmission, distribution and closed distribution systems and the estimated savings in the period 2015–2024 period are shown in Figure 9.

FIGURE 9: THE QUANTITIES OF ELECTRICITY LOSSES IN THE TRANSMISSION, DISTRIBUTION AND CLOSED DISTRIBUTION SYSTEMS IN THE 2015–2024 PERIOD AND AN ESTIMATE OF THE REDUCTION IN LOSSES ON THE DISTRIBUTION SYSTEM



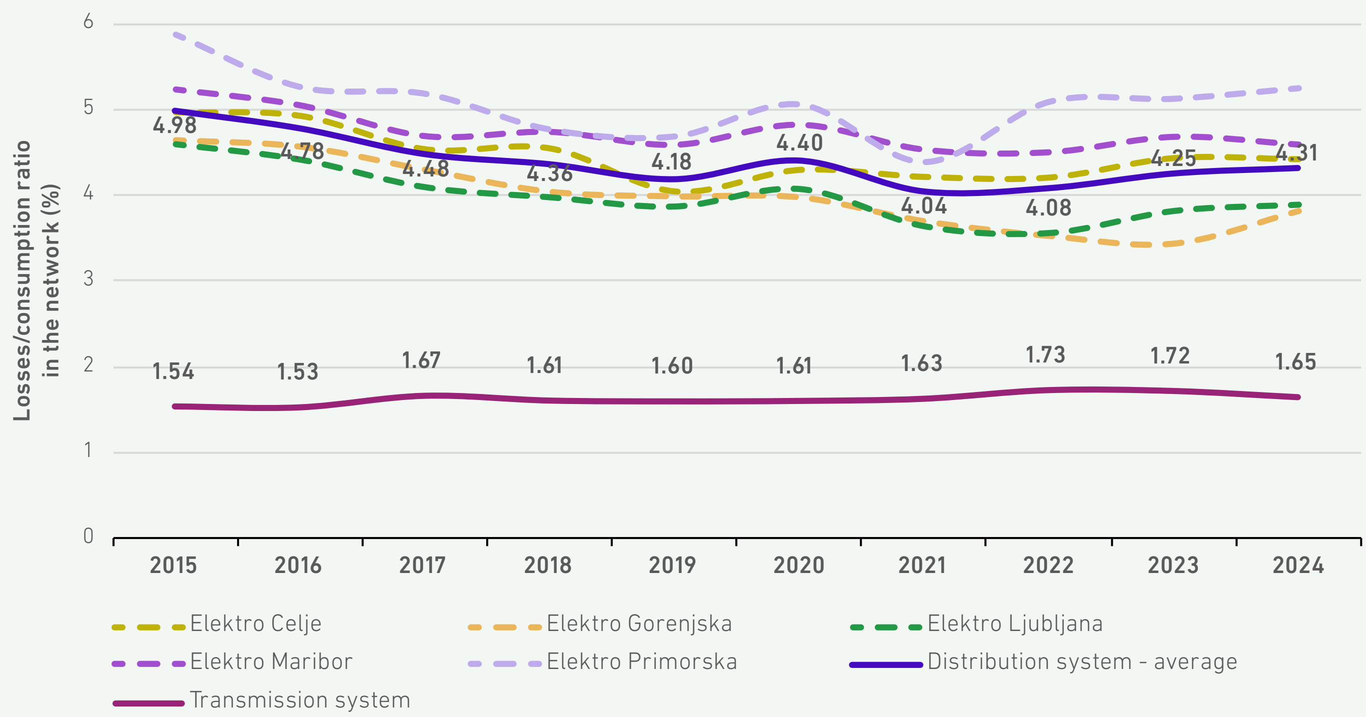
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Loss shares are calculated according to the quantities consumed from the transmission and distribution systems respectively. The increase in the share of losses on the distribution system from 2022 to 2024 is partly related to the actual reduction in consumption by business consumers and partly to the virtual reduction in consumption by household and small business consumers due to the annual netting of production and consumption by self-supplying conusmers. In the transmission system, the additional transit of electricity across the country has led to a steady increase in losses in recent years, with a slight decrease in the share of losses in 2024, which can be linked to higher electricity generation from domestic sources.

Figure 10 shows the shares of losses for ELES, individual distribution companies and the average for the whole distribution system of Slovenia in the 2015–2024 period.

The share of electricity losses on the distribution system is increasing due to a reduction in billed consumption

FIGURE 10: SHARES OF LOSSES FOR THE TRANSMISSION SYSTEM, DISTRIBUTION SYSTEM, AND DISTRIBUTION COMPANIES IN THE 2015–2024 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Electricity Generation

In 2024, In 2023, there were nine companies operating in the Slovenian electricity market with an installed capacity of more than 10 MW. 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 energija, representing the second energy pillar.

Above-average generation in HPPs again - the highest since 2014

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

PRODUCER	Installed capacity [MW]	Share – installed capacity, all producers in Slovenia (%)	Generation [GWh]	Share – generation, all producers in Slovenia (%)
HSE d.o.o.	**1,939.6**	**39.01%**	**7,019.2**	**52.3%**
Hydropower plants	936.6		3,992.9	
Thermal power plants	1,000.0		3,022.0	
Other (CHP, solar, wind)	3.0		4.3	
GEN energija d.o.o.	**1,037.8**	**20.87%**	**3,838.4**	**28.6%**
Hydropower plants	273.9		1,019.9	
Thermal power plants	406.0		37.2	
Nuclear Power Plant*	350.0		2,772.1	
Other (CHP, solar, wind)	7.9		9.2	
**JAVNO PODJETJE ENERGETIKA LJUBLJANA d.o.o. ** **	**251.0**	**5.05%**	**186.7**	**1.4%**
CHP	251.0		186.7	
• Generation using woody biomass	/		30.8	
Other small producers in the distribution network and in closed distribution systems)* **	**1,743.9**	**35.07%**	**2,327.3**	**17.7%**
Hydropower plants	122.9		437.3	
Geothermal power plants	0.0		0.0	
Woody biomass-fuelled facilities	18.6		66.2	
Wind farms	3.4		6.6	
Solar power plants	1,410.2		1,268.0	
Facilities using biogas	36.8		121.5	
Waste-to-energy plants	3.3		3.5	
Facilities using other RES	1.6		0.7	
Facilities using fossil fuels	147.1		423.5	
Total in Slovenia	**4,972.3**	**100%**	**13,371.6**	**100%**
• **in the transmission system**	**3,228.5**		**11,044.4**	

* Taking into account the 50% share of the Krško NPP's installed capacity and generation
** Installed capacity and generation take into account trial operation of the gas-fired unit
*** Other small producers in the distribution system and in CDS (Talum, Acroni, Ravne, Štore, Jesenice and Salonit) and generation in internal consumers' networks (also includes the estimated generation in on-site generation facilities)

SOURCES: ENERGY AGENCY, PRODUCERS, BORZEN, ELECTRICITY SYSTEM OPERATORS

Compared to the previous year, the installed capacities of the major generators, i.e. the HSE and GEN Energija and Energetika Ljubljana, have remained practically unchanged. The increase in installed capacity and electricity production at Energetika Ljubljana is due to the trial operation of a new gas-steam unit, which does not yet have an operating licence. The same applies to the Closed Distribution Systems (CDS), where only the total installed capacity of solar power plants has increased marginally. However, the changes in the generation installations connected to the distribution network have been more significant, with the total connected capacity of generation installations increasing by more than 300 MW, the vast majority of which are solar power plants. According to data from generation companies and electricity operators, 1 MW of fossil fuel cogeneration plants, 1.3 MW of solar plants and 0.3 MW of biogas plants were shut down in 2024.

Most of the electricity generated by small-scale producers connected to the distribution system and the CDS was produced by solar power plants, followed by small hydro and industrial CHP plants. In 2024, smaller producers accounted for 17.7% of electricity generation, an increase of 1.4 percentage points compared to the previous year.

Due to the intergovernmental agreement between Slovenia and Croatia, half of NPP's production belongs to Croatia, which reduces the Krško NPP's share in the actual Slovenian electricity production. Thus, in 2024, Slovenian power plants produced a total of 15,101 GWh of electricity, while Slovenian electricity production was lower at 13,372 GWh. Production increased by 1,078 GWh or 8.8% compared to 2023.

52.1% renewables

27.2% fossil fuels

20.7% nuclear -

actual shares of primary sources for electricity generation in Slovenia, taking into account 50% of the electricity generated and taken into the system from Krško NPP

The electricity balance of delivery and generation, shown in Figure 1 in Table 1 and the structure of energy sources in Figure 8 in Table 2 take into account the generated electricity delivered in the transmission system of the Republic of Slovenia. On the other hand, the data on electricity generation in Table 3 also includes electricity that was generated and consumed in internal networks of end-consumers, including the estimated electricity from self-supply devices. Considering the electricity generated in production facilities, connected in the internal networks of end-consumers and the 50% share generated by the Krško NPP, the primary sources for electricity generation in the Republic of Slovenia in 2024 were fossil fuels with 27.2%, nuclear fuels with 20.7% and renewables with 52.1%. Taking into account the electricity produced in the internal networks of consumers, the total share of renewables is 0.4 percentage points higher than in 2023.

TABLE 4: PRIMARY ENERGY SOURCES FOR ELECTRICITY GENERATION IN SLOVENIA IN THE 2022–2024 PERIOD

	2022		2023		2024	
PRIMARY SOURCE	**Generation [GWh]**	**Share of generation (%)**	**Generation [GWh]**	**Share of generation (%)**	**Generation [GWh]**	**Share of generation (%)**
Fossil fuels	3,279.6	32.1%	3,271.2	26.6%	3,639	27.2%
Nuclear fuel	2,651.1	26.0%	2,661.7	21.7%	2,772	20.7%
Renewable sources	4,272.6	41.9%	6,361.0	51.7%	6,961	52.1%
• Hydro	3,356.7		5,255.0		5,450	
• Solar	628.2		863.8		1,282	
• Wind	5.7		6.4		6.6	
• Other RES	282.0		235.8		223	
TOTAL	**10,203.3**	**100.0%**	**12,293.9**	**100.0%**	**13,372**	**100.0%**

SOURCE: ENERGY AGENCY, PRODUCERS, ELECTRICITY SYSTEM OPERATORS

Electricity Consumption

The total electricity consumption in Slovenia (including the consumption of the Avče PSHPP) in 2024 was 12,694 GWh and 11,827 GWh, respectively, excluding losses in the transmission and distribution systems. The total consumption was almost the same as in 2023, when it amounted to 12,688 GWh, excluding electricity generated and consumed behind meters in the internal installation of consumers. There are three consumers connected to the transmission system, who consumed 78 GWh of electricity in 2024. To Italy from DTS Vrtojba and DTS Sežana via the distribution system was exported 1.7 GWh of electricity. Consumers in the CDSs consumed 898 GWh of electricity, 46 GWh more than in 2023, indicating a slight increase in economic activity within these areas. The Avče PSHPP used 382 GWh to pump water for storage, 24 GWh less than the previous year. Losses in the transmission and distribution system amounted to 867 GWh of electricity, including losses due to the import, export and transit of electricity transported across the country.

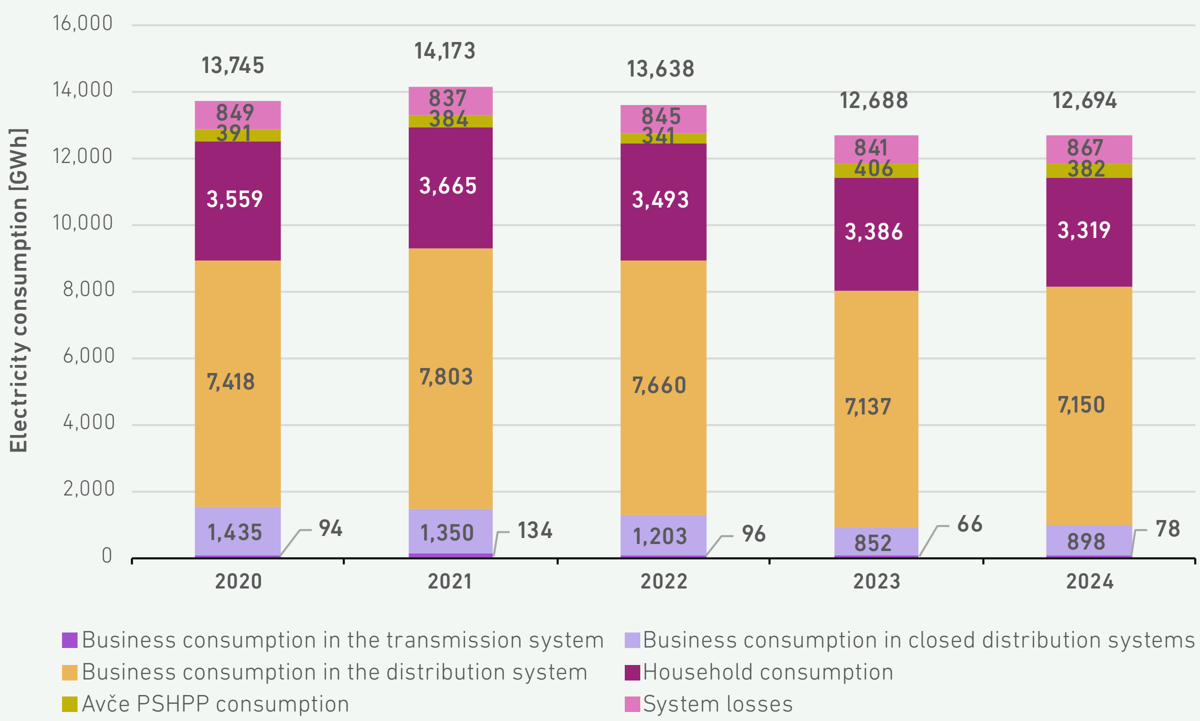
Consumption by business and household consumers in the distribution system amounted to 10,469 GWh, only 54 GWh lower than in 2023, when it amounted to 10,523 GWh. Household consumers consumed 3,319 GWh of electricity in 2024, which is 2% less than the previous year. 3,319 GWh of electricity was consumed by household consumers in 2024, which is 2% less than in the previous year. Consumption by business consumers in the distribution system in 2024 amounted to 7,150 GWh, up 0.2% compared to 2023, while consumption by all business consumers amounted to 8,126 GWh, up 0.9% compared to 2023. Consumption by all final consumers (excluding losses and excluding the Avče PSHPP) in 2024 was only 3 GWh higher than in 2023, amounting to 11,445 GWh.

The total electricity consumption of all final consumers remained at the 2023 level

- **2% reduction in consumption by household consumers**
- **0.9% increase in consumption by business consumers**

The data does not take into account the electricity generated and consumed behind the metering point (self-supply)

FIGURE 11: ELECTRICITY CONSUMPTION IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 5: ELECTRICITY CONSUMPTION IN THE 2022–2024 PERIOD

ELECTRICITY CONSUMPTION [GWh]	2022	2023	2024
Business consumption in the transmission system	96	66	78
Business consumption in the distribution system	7,660	7,137	7,150
Business consumption in closed distribution systems	1,203	852	898
Total business consumption	**8,959**	**8,056**[3]	**8,126**
Household consumption	**3,493**	**3,386**	**3,319**
Total consumption by final consumers	**12,452**	**11,442**	**11,445**
Avče PSHPP consumption in the pumping regime	341	406	382
Losses in the transmission and distribution systems	845	841	867
Total electricity consumption	**13,638**	**12,688**	**12,694**

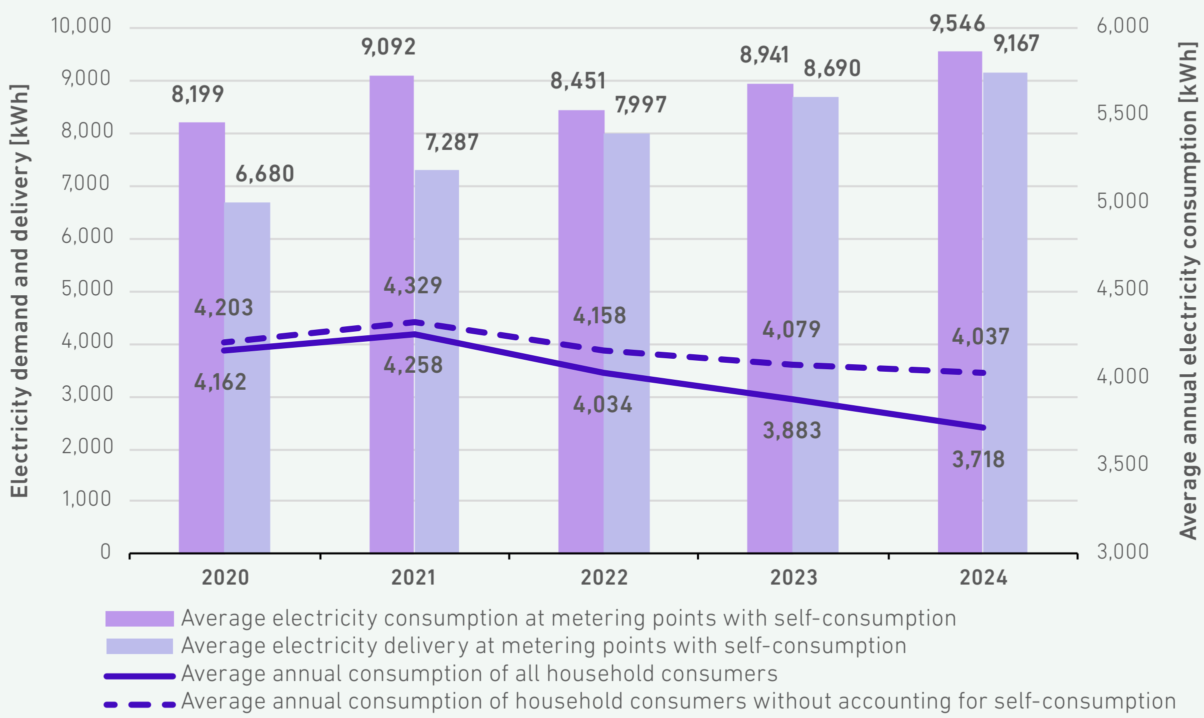
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Figure 12 shows the average annual consumption of household consumers and the average electricity taken and delivered at self-supply metering points under the annual electricity net metering system. The average consumption of household consumers seems to decrease year by year (the solid line on the graph), due to the inclusion of consumption of household customers with self-supply devices, which, due to annual netting, distort the calculation of the average consumption considerably. If these consumers are excluded from the average consumption calculation (dashed line in the graph), the average consumption of household consumers is much higher and does not show such a consuderable downward trend.

4,037 kWh in 2024 for the average consumption of a household customer without a self-supply device

3 Rounding of percentages to whole numbers may result in discrepancies in the totals.

FIGURE 12: ELECTRICITY DEMAND AND DELIVERY OF CONSUMERS WITH ON-SITE GENERATION FACILITIES AND AVERAGE CONSUMPTION OF HOUSEHOLD CONSUMERS IN THE PERIOD 2020–2024



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Demand Covered by Domestic Generation

Demand covered by domestic generation represents the ratio of electricity consumption by final consumers to electricity generation in Slovenia. As shown in Table 6, the largest contributors to domestic generation 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 the domestic generation is connected to the distribution system, but it represents an increasingly important share of total electricity generation in Slovenia from year to year.

97.1-% of electricity demand covered with domestic generation

TABLE 6: CONSUMPTION, GENERATION AND COVERAGE OF DEMAND WITH DOMESTIC GENERATION IN THE 2020–2024 PERIOD

	2020	2021	2022	2023	2024
Generation in the transmission system [GWh]	**11,639**	**10,638**	**8,529**	**10,294**[4]	**11,044**
Hydropower plants	4,747	4,504	3,037	4,792	5,026
Thermal power plants	3,872	3,429	2,841	2,841	3,246
Nuclear power plant (50% share)	3,020	2,706	2,651	2,662	2,772
Generation in the distribution system [GWh]	**1,088**	**1,079**	**1,012**	**1,238**	**1,284**
Total domestic generation [GWh]	**12,727**	**11,717**	**9,541**	**11,533**	**12,328**
Total electricity consumption [GWh]	**13,744**	**14,142**	**13,638**	**12,688**	**12,694**
Total consumption by final consumers	12,506	12,952	12,452	11,442	11,445
System losses	849	837	845	842	867
Avče PSHPP consumption	391	384	341	406	382
Demand covered by domestic generation	**92.6%**	**82.9%**	**70.0%**	**90.9%**	**97.1%**

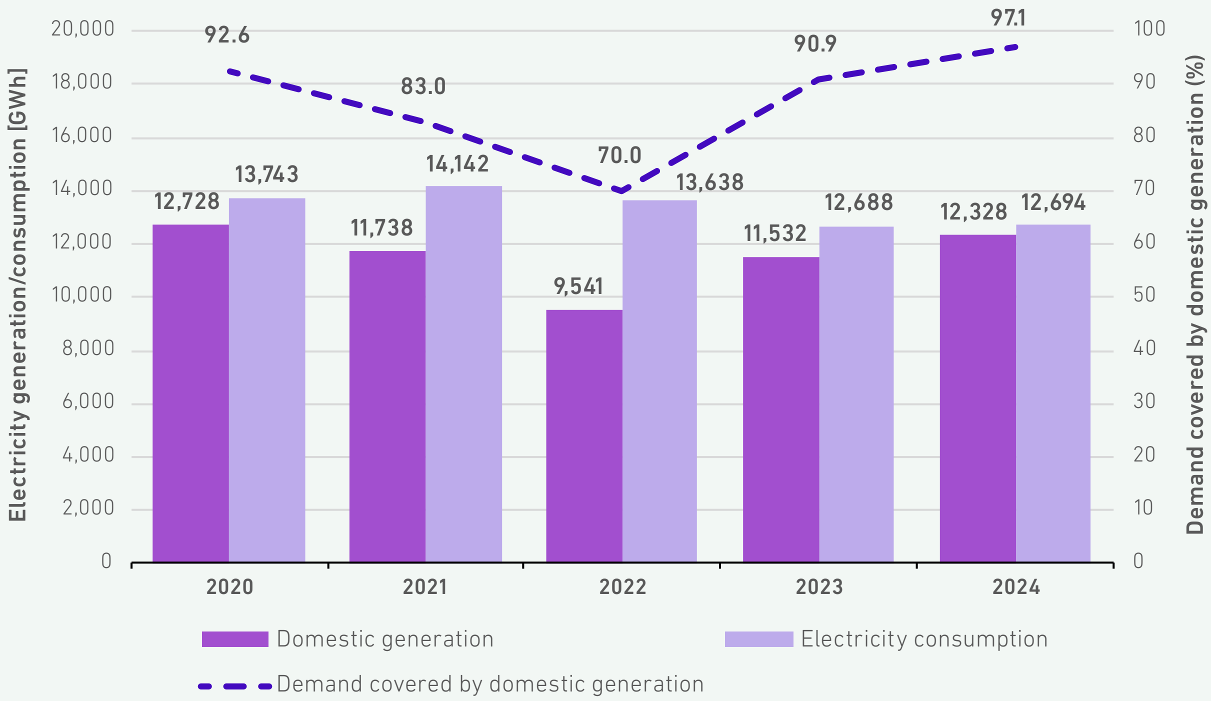
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

In the 2020–2024 observation period, we recorded inter-annual fluctuations in the amount of demand covered by domestic generation. This amount is also directly affected by changes in electricity consumption. The dynamics and structure of total demand are explained in more detail in the previous chapter. In addition to the consumption by final consumers in the transmission and distribution systems, 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.

In 2024, domestic generation covered nearly 97.1% of consumption, the highest figure in the last five years. Thanks to favourable hydrological conditions, hydroelectric power plants contributed the most to this result, while thermal power plants and nuclear power plants also increased their generation.

4 Rounding of percentages to whole numbers may result in discrepancies in the totals.

FIGURE 13: CONSUMPTION, GENERATION AND COVERAGE OF DEMAND WITH DOMESTIC GENERATION IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

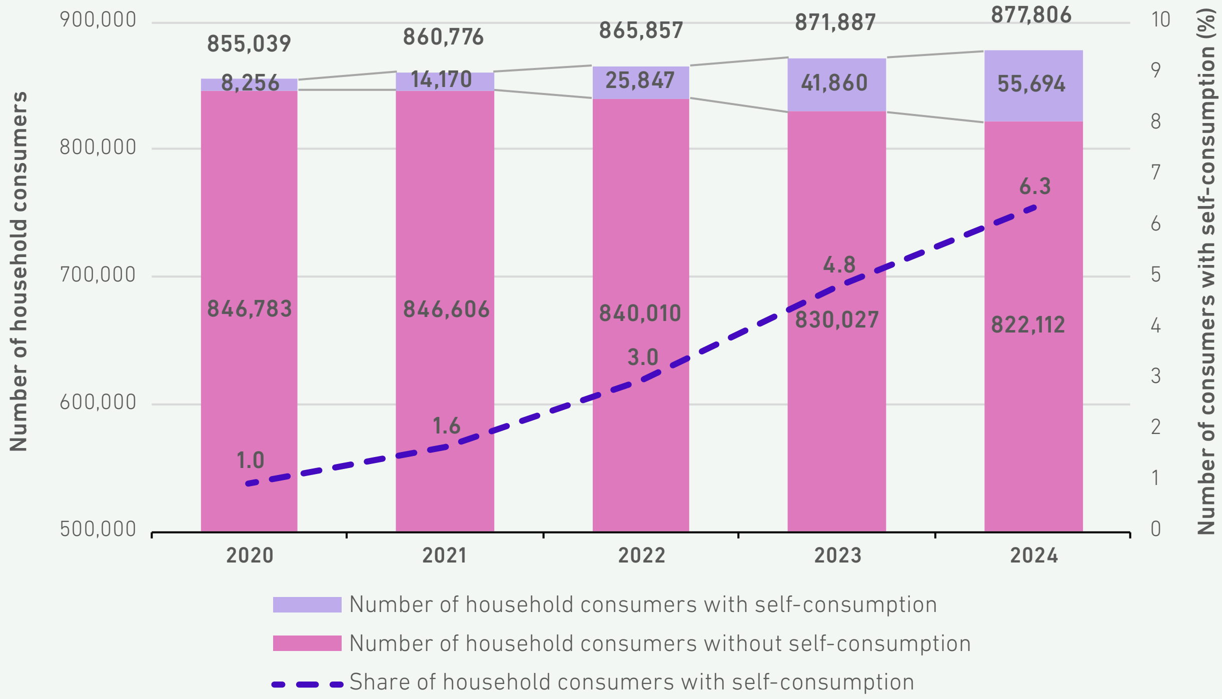
Consumers in the Electricity System

At the end of 2024, 989,892 final electricity consumers were connected to the Slovenian electricity system. Their number increased by 6,698 or 0.7% compared to 2023, including 5,919 household and 779 business consumers.

0.7% more final consumers

Figure 14 shows the trend in the number of household consumers over the period 2020–2024. The total number of household consumers increased by 0.6% per year on average over this period, with a steady increase in the share of consumers with connected self-supply devices, reaching 6.3% of all household consumers in 2024.

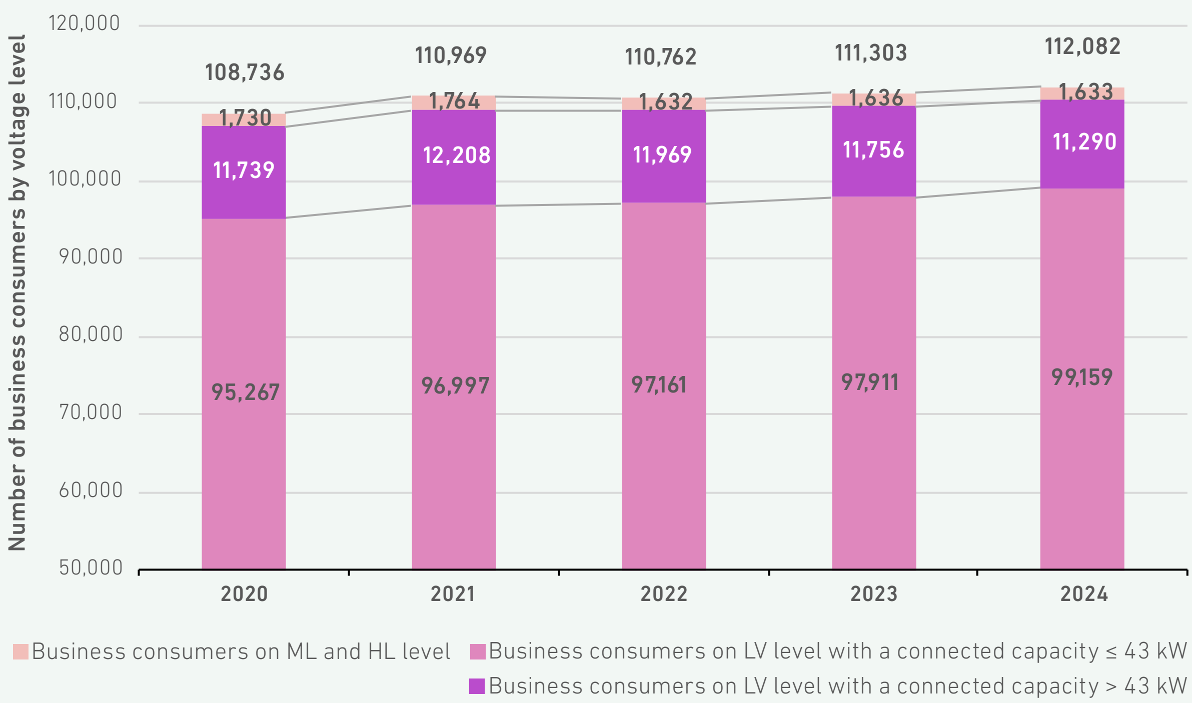
FIGURE 14: NUMBER OF HOUSEHOLD CONSUMERS IN THE 2020–2024 PERIOD



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, separately by voltage levels. In 2024, the number of business consumers was again growing by 0.7%, with the number of consumers with a connection power less than or equal to 43 kW growing by 1.3%, and the number of consumers with a connection power above 43 kW falling by 4%.

FIGURE 15: NUMBER OF BUSINESS CONSUMERS IN THE DISTRIBUTION SYSTEM BY VOLTAGE LEVEL IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

In 2024, 1,686 business and 100 household consumers with an indoor installed production unit were connected to the distribution system under the PS.2 connection scheme, as well as 4,485 business and 55,594 household consumers with connected self-supply installations, the vast majority of them under the annual net metering system. Of all consumers in the distribution system, 6.2% were both consumers and producers of electricity, an increase of 1.5 percentage points compared to the previous year.

6.2% share of consumers who are also producers

The number of commercial consumers in the transmission system remained unchanged compared to the previous year. Three business customers were connected to the TSO at five interconnection points and five operators of CDS at six locations, supplying electricity to 217 business consumers, 24 of whom were also connected to the CDS with an installed production unit.

TABLE 7: NUMBER OF FINAL CONSUMERS OF ELECTRICITY BY TYPE OF CONSUMPTION IN THE 2022–2024 PERIOD

Number of final consumers of electricity by type of consumption	2022	2023	2024
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	110,552	111,099	111,865
Household consumers	865,857	871,887	877,806
Total number of final consumers in the distribution system	**976,409**	**982,986**	**989,671**
Business consumers in closed distribution systems	210	204	217
Household consumers	0	0	0
Total number of final consumers in closed distribution systems	**210**	**204**	**217**
TOTAL NUMBER OF FINAL CONSUMERS	**976,623**	**983,194**	**989,892**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 8: NUMBER OF FINAL CONSUMERS OF ELECTRICITY BY TYPE OF CONNECTION IN THE 2022–2024 PERIOD

TYPE OF FINAL CONSUMER CONNECTION	Final consumers in the distribution system			Final consumers in closed distribution systems			TOTAL		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
Without grid-connected generation facilities									
Business	108,091	106,877	105,724	203	186	193	108,294	107,063	105,917
Household	840,010	830,027	822,112	0	0	0	840,010	830,027	822,112
TOTAL	948,101	936,904	927,836	203	186	193	948,304	937,090	928,029
Installed generation unit									
Business	823	1,342	1,668	6	12	12	829	1,354	1,680
Household	104	100	100	0	0	0	104	100	100
TOTAL	927	1,442	1,768	6	12	12	933	1,454	1,780
Consumers with self-consumption									
Business	1,638	2,880	4,473	1	6	12	1,639	2,886	4,485
Household	25,743	41,760	55,594	0	0	0	25,743	41,760	55,594
TOTAL	27,381	44,640	60,067	1	6	12	27,382	44,646	60,079
Final consumers in the distribution system and in the closed distribution systems									
Business	110,552	111,099	111,865	210	204	217	110,762	111,303	112,082
Household	865,857	871,887	877,806	0	0	0	865,857	871,887	877,806
TOTAL	**976,409**	**982,966**	**989,671**	**210**	**204**	**217**	**976,619**	**983,190**	**989,888**
Final consumers in the transmission system							**4**	**4**	**4**
TOTAL NUMBER OF FINAL CONSUMERS							**976,623**	**983,194**	**989,892**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Renewable Sources

Share of Renewables in the Final Gross Consumption

In 2024, Slovenia adopted updates to its Integrated National Energy and Climate Plan (NECP), in which it committed to reduce total GHG emissions by at least 55% by 2050 compared to 2005, reduce GHG emissions from buildings by at least 70% by 2030 compared to 2005, and achieve at least a 33% share of renewable energy sources (RES) in final energy consumption by 2030. To achieve the 33% RES target by 2030, the NEPN sets the following sectoral targets: at least 55% RES in the electricity sector, at least 45% in the heating and cooling sector and at least 26% in the transport sector.

In 2023, Slovenia for the first time exceeded the 2020 target of 25% with its own RES sources and achieved a RES share of 25.1%, with the following sectoral shares: heating and cooling 34.3%, electricity 41.9% and transport 10.2%. This is the first time that Slovenia has achieved a RES share that exceeds the actual 2020 target without statistical transfer.

The share of RES in electricity increased to 41.9% in 2023, 4.9 percentage points higher than in 2022, mainly due to good hydrological conditions and an increase in solar power generation. The share of RES in the heating and cooling sector in 2023 exceeded that of 2022 by 0.3 percentage points to 34.3%. The share of RES in transport in 2023 was 10.0%, a significant increase compared to 2022, mainly due to lower energy consumption, increased use of biofuels and also electricity. The estimated total share of RES in gross final energy consumption in 2024 is 24.2%, 0.9 percentage points below the actual share achieved in 2023 and 0.8 percentage points below the 2020 target. The estimate shows that the share of RES in the electricity sector also increased by 1.6 percentage points in 2024, from 41.9% to 43.5%, which can be attributed to increased electricity generation from solar power plants and good hydrological conditions in this period as well. Estimated shares of RES in the transport sector (9.1%) and in the heating and cooling sector (32.2%) are in 2024 lower than those achieved in 2023. It should be noted that, due to the still incomplete methodological data for 2024, the uncertainty for the overall share of RES in the individual sectors is estimated at 0.6 percentage points.

The estimated share of RES in the gross final consumption for 2024 is 24.2%

TABLE 9: RES TARGETS ACHIEVED IN 2005 AND 2010 AND IN THE 2015–2023 PERIOD WITH AN ESTIMATE FOR 2024

	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2030
RES share (%)												Esti-mate	Target share
RES share	**19.8**	**21.1**	**22.9**	**22.0**	**21.7**	**21.4**	**22.0**	**25.0**	**25.0**	**25.0**	**25.1**	**24.2**	**33.0**
RES – heating and cooling	26.4	29.5	36.2	35.6	34.6	32.3	32.1	32.1	35.2	34.0	34.3	32.2	45.0
RES – electricity	28.7	32.2	32.7	32.1	32.4	32.3	32.6	35.1	35.0	37.0	41.9	43.5	55.0
RES - transport	0.8	3.1	2.2	1.6	2.6	5.5	8.0	10.9	10.6	7.8	10.02	9.1	26.0

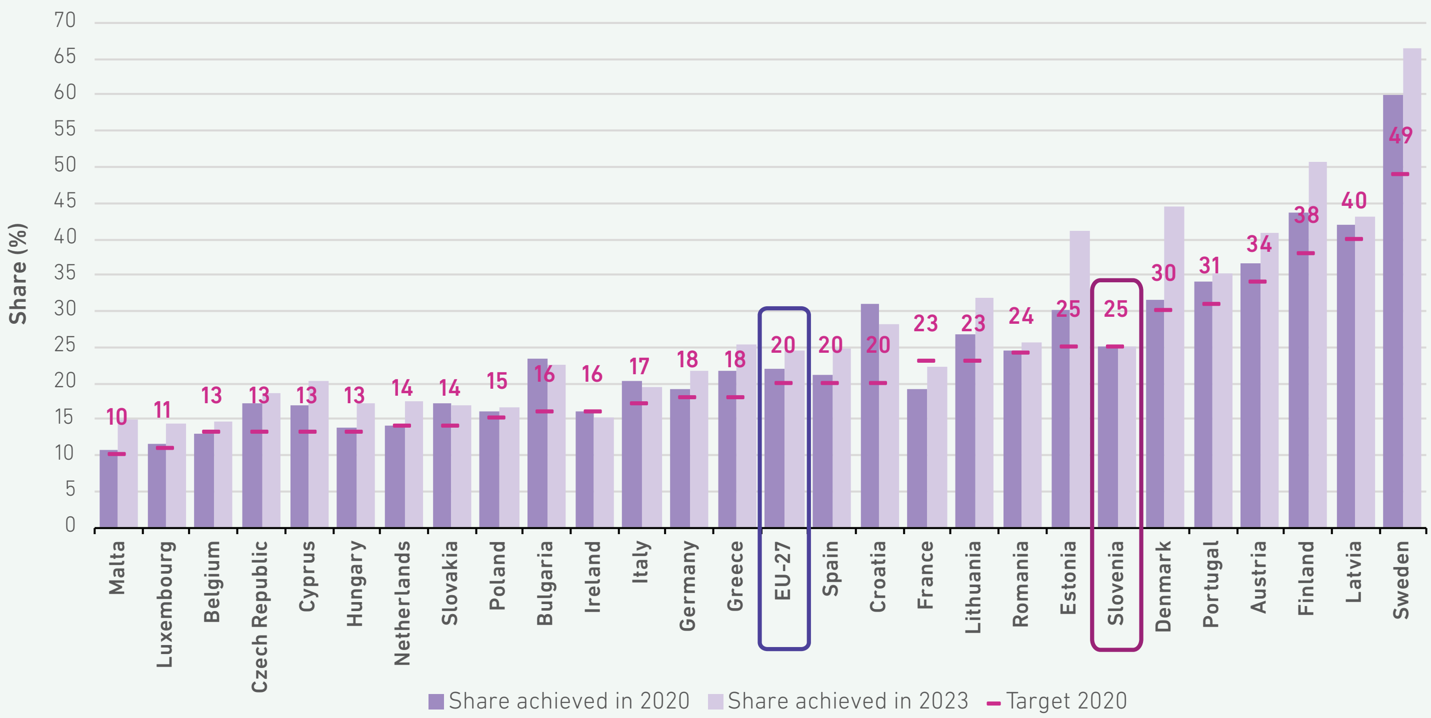
SOURCES: THE JOŽEF STEFAN INSTITUTE, SURS (STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA)

In 2023, the EU has achieved a 24.6% share of RES in gross final consumption, an increase of 1.5 percentage points compared to 2022. However, the EU is still lagging behind the new target for 2030 of 42.5%, with a target of as much as 45% as an additional, recommended target.

Some Member States outperformed the EU average in 2023, with Sweden recording the highest share of RES at 66.4%, followed by Finland at 50.8% and Denmark at 44.9%. In contrast, countries such as Luxembourg (11.6%) and Malta (15.1%) still have low RES shares.

To reach the target of 42.5% by 2030, the EU will need to increase the share of RES by an average of around 2.6 percentage points each year from 2024 onwards. This will require accelerated deployment of RES in all sectors - including electricity, heating and cooling and transport.

FIGURE 16: RES SHARES ACHIEVED BY EU COUNTRIES



SOURCE: EUROSTAT

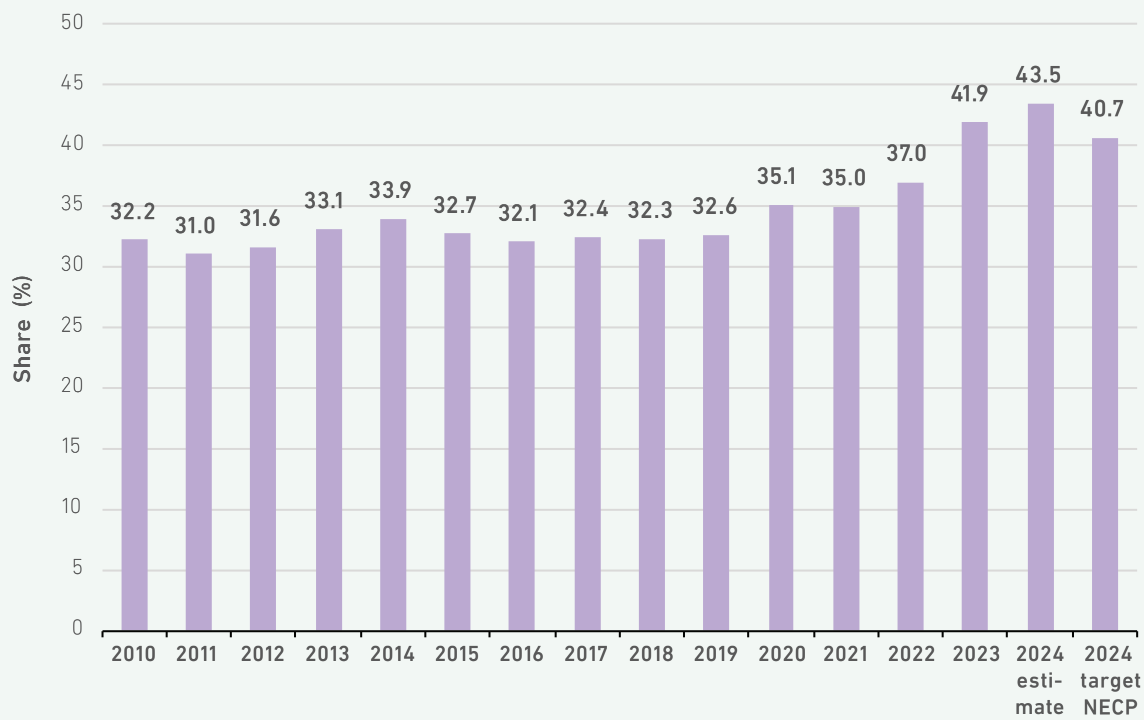
Share of Renewables in the Electricity Sector

The NECP sets targets for the electricity sector for the period 2021–2030, with a 55% share of renewable energy in 2030. In the base year 2020, the share of RES in final energy consumption for the electricity sector was set at 35.1%. In 2022, a share of 37% was achieved, which is an excess over the planned value of 36.5% in the updated NECP.

For 2023, the achieved share of RES in the electricity sector is 41.9%, which exceeds the target set in the updated NECP for that year by 2.6 percentage points. This achievement is the result of an increase in RES electricity generation capacity, mainly due to the growth in the number of solar power plants and improved hydrological conditions.

The estimated value of the share of RES in the electricity sector for 2024 is 43.5%, which is 3.8% higher than the share of RES in 2023.

FIGURE 17: RES SHARES IN THE ELECTRICITY SECTOR IN THE 2010–2023 PERIOD AND AN ESTIMATE FOR 2024



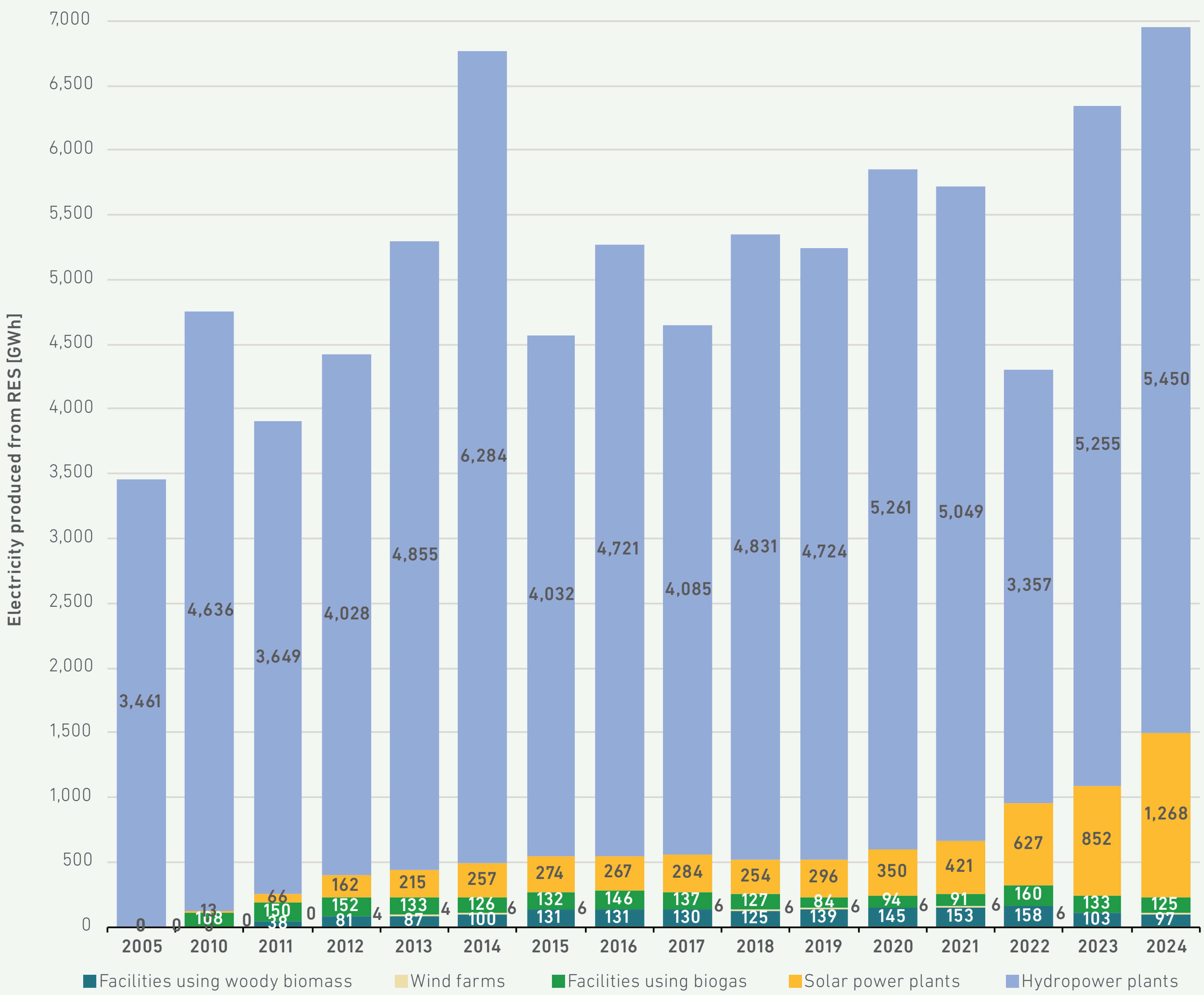
SOURCES: THE JOŽEF STEFAN INSTITUTE, SURS (STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA)

Production from Renewable Sources

In 2024, there were 6,870 GWh of electricity produced from RES, an 8% increase compared to 6,349 GWh in 2023. However, the increase is even more pronounced compared to 4,308 GWh in 2022, with a 59% increase in RES production in 2024. This is mainly due to the improvement in hydrological conditions, which allowed for higher hydropower generation, and the further expansion of solar capacity. In 2024, solar generation increases by 25% compared to 2023, reflecting the growing interest in investing in RES and the continued positive effects of the support schemes in place for these investments.

8% increase in production from RES – the largest share hydropower plants – in solar power plants produced 25% more electricity than in 2023

FIGURE 18: ELECTRICITY GENERATION FROM RES IN THE 2005 BASE YEAR AND IN THE 2010–2024 PERIOD



SOURCES: ENERGY AGENCY, BORZEN, ELES, PRODUCERS, SURS

Incentives for Production from Renewable Sources

Electricity generation from RES plays an important role in reducing greenhouse gas emissions and achieving sustainable development objectives in the energy sector. For this reason, it is considered as one of the priority areas of energy policy. EU Member States can promote the development of such generation through various measures and forms of financial incentives.

In Slovenia, a support scheme for electricity production from RES and CHP was set up in 2009, which includes a guaranteed purchase of the electricity produced or operational support. In addition to the support scheme, investment incentives were also available.

Self-supply by end-users with annual billing, who connect the generating installations - most often solar power plants - directly to the indoor plumbing of buildings, has also made an important contribution to the development of RES generation. Until the end of 2024, integration into the self-supply system was still possible under the current regime applicable to domestic and small commercial consumers. From 2025 onwards, a new regime applies, the main novelty of which is the changed way in which network and other charges are calculated.

RES and CHP Support Scheme

A total of EUR 1,689.9 million has been paid out under the RES and CHP support scheme from 2009 to 2024. These funds supported a total of 11,940.6 GWh of electricity generated. The largest amount of funding was allocated to solar generation, EUR 785.8 million, generating 3,196.8 GWh of electricity. For electricity from CHP using fossil fuels, EUR 384.6 million in support was paid for 4,119.9 GWh of electricity. Biomass received EUR 224.4 million for 1,505.1 GWh produced. Biogas received EUR 204.7 million for 1,654.0 GWh produced. Hydropower received EUR 87.7 million for 1,417.6 GWh, while wind power received the least funding – EUR 2.7 million for 47.1 GWh of electricity.

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

In 2024, the Energy Agency closed the public call for investors to apply for RES and CHP projects for electricity generation to enter the support scheme, which was launched in December 2023. The measure was implemented under the RES and CHP support scheme and, once again, EUR 10 million was available for the administrative allocation of funds to individual projects, as defined in the Long-Term Roadmap for achieving the objectives of promoting the production and use of renewable energy sources. A record 575 projects were submitted to the call, with a total rated capacity of 322.99 MW. Of these, 507 were selected, with a total rated capacity of 259.30 MW. Solar power plants were again the most popular, accounting for almost the entire volume of both the submitted and selected projects, while the number of applications for hydropower and wood biomass plants was negligible. However, there was no interest among applicants for wind farms and biogas plants under this call.

TABLE 10: AN OVERVIEW OF THE GENERATION FACILITY PROJECTS APPLYING TO AND SELECTED IN OPEN CALL IN DECEMBER 2023, COMPLETED IN 2024, GROUPED ACCORDING TO THE TECHNOLOGY EMPLOYED FOR ELECTRICITY GENERATION

Open call - December 2023	Applying projects		Selected projects	
Technology	**Number of projects**	**Installed capacity [MW]**	**Number of projects**	**Installed capacity [MW]**
Hydropower plants	3	0.43	2	0.34
Solar plants	561	322.03	503	258.87
Wind farms	0	0.00	0	0.00
Facilities using biogas	0	0.00	0	0.00
Woody biomass-fuelled facilities	8	0.38	2	0.09
Fossil fuelled CHP	3	0.15	0	0.00
Total number of applications	**575**	**322.99**	**507**	**259.30**

SOURCE: ENERGY AGENCY

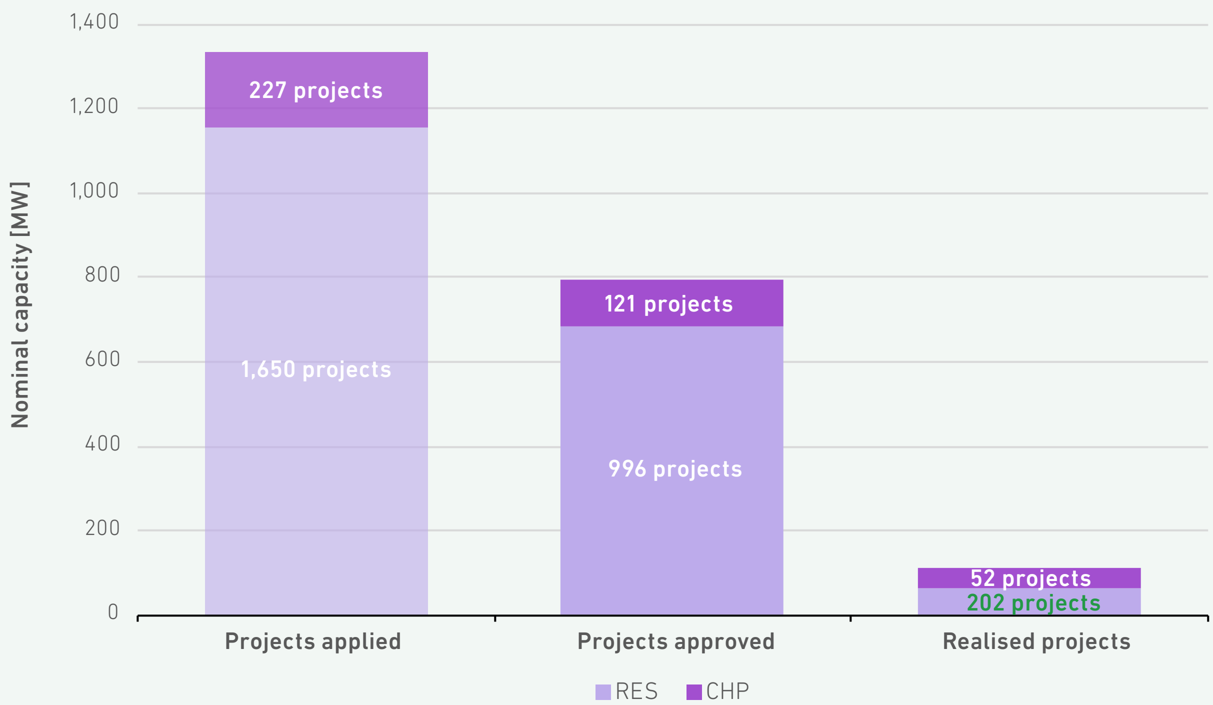
Under the RES and CHP support scheme, the Energy Agency carried out 13 calls for applications for renewable energy sources (RES) and combined heat and power (CHP) projects for entry into the support scheme. In all, 1,877 projects with a total installed capacity of 1,334 MW were registered, the majority of which were RES installations (1,650 projects, 1,154 MW), followed by CHP (227 projects, 181 MW). 1,117 projects with a total installed capacity of 794 MW were selected - of which 996 were RES projects with a capacity of 682 MW and 121 CHP projects with a capacity of 113 MW.

Despite the large number of applications, only 254 projects with a total installed capacity of 112.6 MW were implemented by the end of 2024, representing 22.72% of the total number of selected projects and only 14.18% of the selected installed capacity.

Among the projects implemented, solar power plants stand out in terms of number and capacity, with 144 projects implemented and a total capacity of 46.1 MW, representing 17.8% of the total number of projects selected for this technology. Renewed hydropower plants have a high implementation rate, with 36 projects implemented with a total capacity of 9 MW, or 66.7% of the projects selected. Fossil-fuel CHP from renewed plants also stands out, with 15 projects implemented with a total capacity of 35.4 MW, or 62.5% of the projects selected. Among biomass-fired power plants, six projects were successfully implemented (3.75 MW or 28.6%), as well as the two selected renewable biogas plants (two projects, 1.56 MW), with a 100% implementation rate.

However, the applicants of the selected wind power projects were not very successful, as none of the projects were realised. For most of the wind farm projects, the period within which the applicants would have had to implement the projects in order to be eligible for support has also expired.

FIGURE 19: THE NUMBER AND NOMINAL CAPACITY OF THE PROJECTS FOR RES AND CHP PRODUCTION FACILITIES THAT APPLIED AND WERE CONFIRMED AND CARRIED OUT IN ALL OPEN CALLS



SOURCE: ENERGY AGENCY

Generation Facilities Included in the RES and CHP Support Scheme, Their Total Installed Capacity and the Quantity of Electricity Generated

At the end of 2024, 3,366 production installations were included in the support scheme, 194 fewer than in 2023, representing a 5.45% decrease. This is the eighth consecutive year of decline in the total number of installations in the support scheme. Solar power plants continue to account for the largest number of installations in the support scheme, with a decrease from 3,170 in 2023 to 3,108 in 2024. There is also a marked decrease in fossil fuel cogeneration (CHP) installations, from 241 in 2023 to 137 in 2024. Decreases are also visible in biomass, biogas and hydropower installations.

The main reason for the reduction in the number of power plants in the support scheme is the expiry of the eligibility period, which is 15 years for RES and 10 years for CHP plants.

TABLE 11: NUMBER OF GENERATION FACILITIES IN THE SUPPORT SCHEME AND THE DYNAMICS OF THEIR INCLUSION IN THE 2010–2024 PERIOD

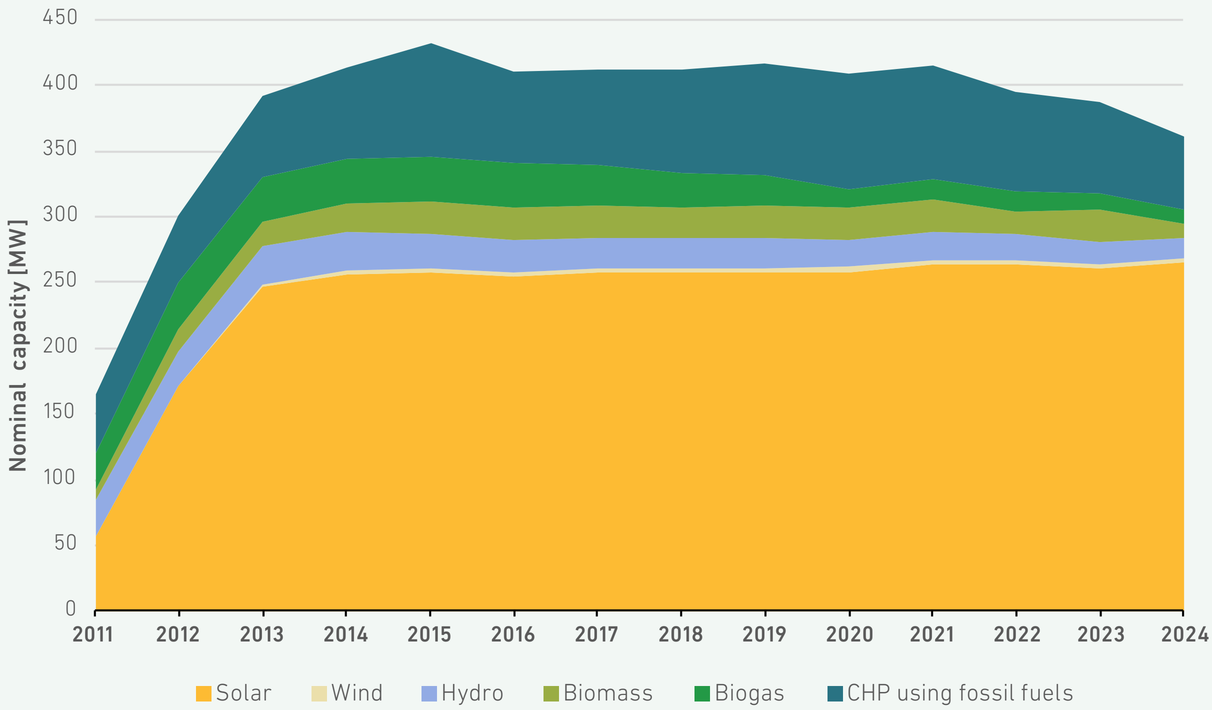
Source	The number of facilities included in the support scheme														
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Solar	381	975	2,406	3,218	3,319	3,339	3,323	3,312	3,301	3,304	3,297	3,286	3,245	3,170	3,108
Wind	3	4	3	5	4	9	7	7	6	4	4	3	2	2	2
Hydro	105	109	108	106	106	106	98	91	93	92	90	92	85	73	68
Biomass	0	3	5	10	19	43	44	43	44	46	40	40	38	54	33
Biogas	0	0	0	0	0	33	32	31	27	24	22	24	22	20	18
CHP using fossil fuels	0	0	0	0	0	390	384	380	388	388	386	366	326	241	137
Total	489	1,091	2,522	3,339	3,448	3,920	3,888	3,864	3,859	3,858	3,839	3,811	3,718	3,560	3,366

SOURCES: ENERGY AGENCY, BORZEN

As the number of installations decreases, so does the total nominal capacity of the generating installations included in the support scheme. At the end of 2024, this amounted to 361.6 MW, 24.9 MW less than the previous year's figure of 386.5 MW. The largest reduction in capacity is observed in fossil-fuel cogeneration installations, where the total capacity fell from 68.2 MW to 55.4 MW, a reduction of 12.8 MW. At the end of 2024, the number of biomass-fired generation installations included in the support scheme was also lower, with the nominal capacity of the included generation installations decreasing from 23.3 MW to 9.4 MW, and for biogas from 13.6 MW to 12.3 MW in 2024, and for hydropower from 17.4 MW to 16.6 MW. The reduction in the number of installations and total installed capacity in the support scheme reflects the gradual ageing and exit of existing production installations from the support scheme.

Despite the lower number of solar installations included at the end of 2024 compared to 2023, only in this group the nominal capacity of the production installations in the support scheme increased compared to the previous year: 264.7 MW at the end of 2024, an increase of 3.8 MW compared to the end of 2023. The inclusion of 11 solar plants with a total nominal capacity of 4.62 MW contributed to this increase.

FIGURE 20: THE TOTAL RATED ELECTRICAL CAPACITY OF THE GENERATION FACILITIES INCLUDED IN THE SUPPORT SCHEME IN THE 2011–2024 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

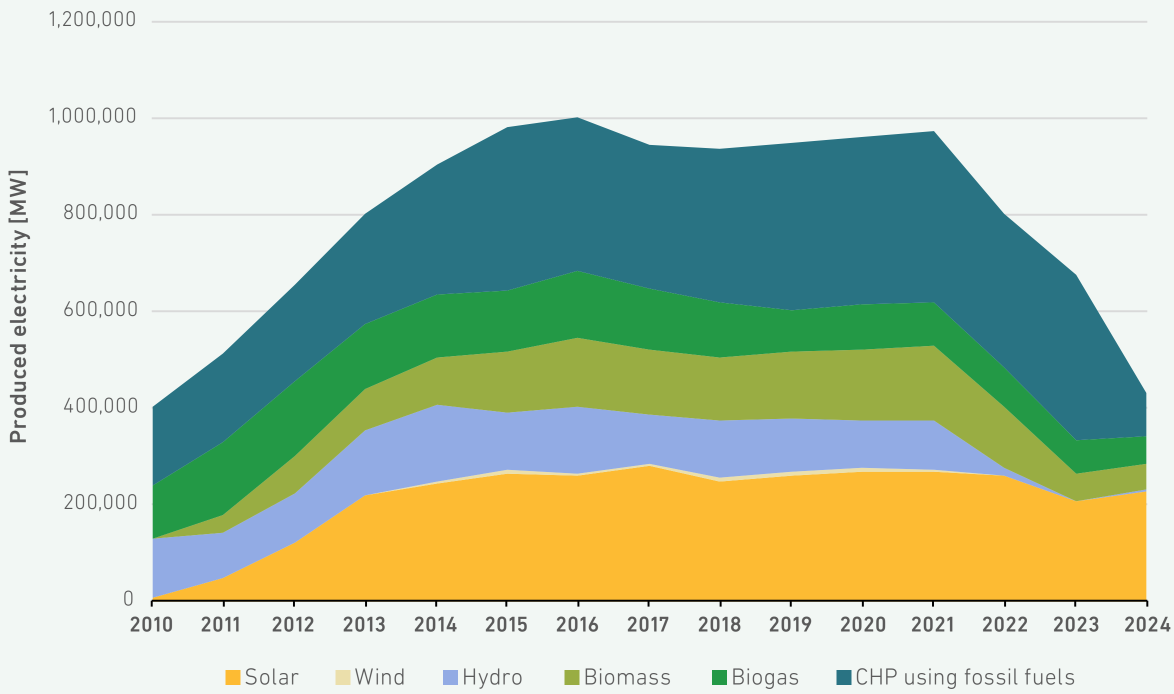
Support paid only for 88.8 GWh of electricity generated in CHP, which is 74% less than in 2023

In 2024, the downward trend in the amount of electricity supported under the support scheme continued. The total amount of supported generation was only 432.9 GWh, which is 242.9 GWh less than in 2023 and the lowest since 2010. One of the main reasons for this decline is the termination of eligibility for support due to the expiry of the regulatory period during which eligibility can be granted. In addition to the above, the reference price of electricity in 2024, although lower than the one in force in 2023 (180,00 EUR/MWh), was still high at 138,74 EUR/MWh. This is still higher than the cost of production for producers who have entered the support scheme through public calls for tenders, which is why in such cases the producers did not receive support even though they were included in the scheme.

The largest decline was recorded in CHP generation installations, where supported generation fell from 342.5 GWh in 2023 to only 88.8 GWh in 2024. In addition to the reduction in the number of installations in the scheme due to the termination of eligibility for support, the main reason for this technology was the significantly lower reference price for natural gas, which fell from 169.72 EUR/MWh in 2023 to 53.94 EUR/MWh in 2024. As the reference price of natural gas determines a variable part of the cost of electricity production in these generation installations, the total cost of production for many CHP installations was consequently lower than the current reference price of electricity, which meant that the producers did not meet the conditions for the payment of the support.

Of the total 432.9 GWh of supported generation, 344.2 GWh was produced from RES and the remainder from CHP. Within RES, solar energy continues to dominate with 229.6 GWh, followed by biogas (60.4 GWh) and biomass (50.9 GWh), while only 3.3 GWh of support was paid in 2024 for electricity generated in hydroelectric power plants.

FIGURE 21: ELECTRICITY GENERATION ELIGIBLE FOR SUPPORT IN THE 2010–2024 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

In 2024, support was paid out for a total of 432.9 GWh of electricity produced, representing 3.2% of all electricity produced in Slovenia in that year (13,371 GWh). This is a continuation of a clear downward trend in both the amount of electricity for which subsidies are paid and, therefore, its share in total electricity production. This compares with 675.8 GWh of supported generation in 2023, representing 5.5% of total generation. A similar trend is also present in the share of the installed capacity of the generating installations included in the support scheme in relation to the total installed capacity of all generating units. Thus, in 2024, 361.6 MW were included in the support scheme, which represents only 7.3% of the total installed capacity in Slovenia (4,972.3 MW). This is the lowest share in the last decade and an important step towards market integration of renewables. However, the reasons for this trend have already been mentioned above.

Support paid only for 3.2% of all electricity produced in 2024

TABLE 12: SHARE OF THE INSTALLED CAPACITY AND ELECTRICITY GENERATION 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	Electricity generated for which support is paid [GWh]	Total Slovenian electricity generation [GWh]	Share of the generated electricity included in the support scheme
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	3,783.5	11.0%	973.2	12,247.9	7.9%
2022	395.3	3,983.4	9.9%	800.8	10,203.3	7.8%
2023	386.5	4,446.6	8.7%	675.8	12,294.5	5.5%
2024	361.6	4,972.3	7.3%	432.9	13,371.0	3.2%

SOURCES: ENERGY AGENCY, BORZEN

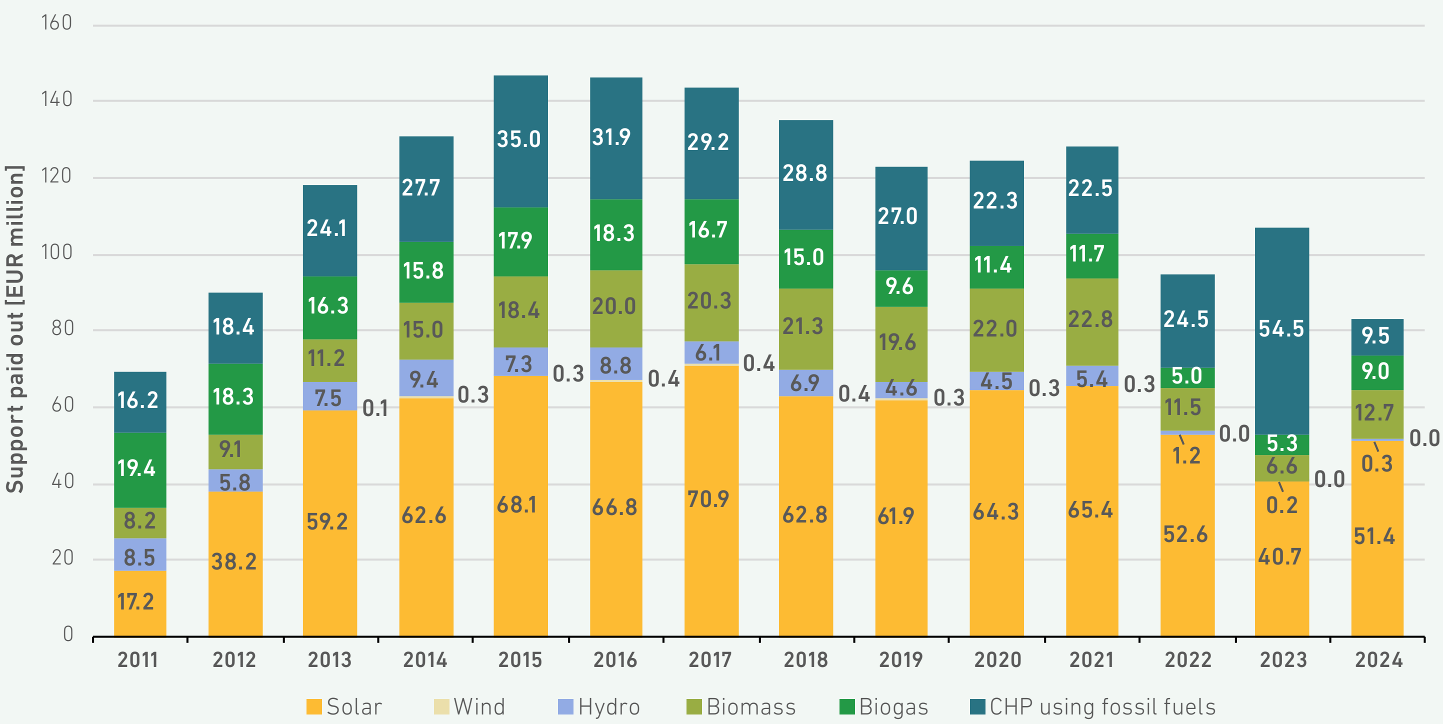
Support Paid Out—Support Scheme Costs

In 2024, EUR 82.90 million of support was paid out for electricity produced from RES and CHP, a 22.6% decrease compared to EUR 107.3 million in 2023. This significant decrease is due to the lower reference price for electricity and natural gas, as well as lower production due to the reduction in the number of installations in the support scheme. Among renewables, the largest share of support payments in 2024 was also received by producers of electricity generated from solar energy, with EUR 51.4 million, 61.9% of the total support payments in 2024. This represents a significant increase compared to 2023, when solar power plants received EUR 40.7 million. This is followed by support payments for electricity generated from biomass with EUR 12.7 million. For electricity produced from biogas, EUR 9.0 million was paid, which also represents a significant increase compared to 2023. However, support payments for electricity produced from hydroelectricity were negligibly low (EUR 0.3 million), and no support was paid for wind power in 2024 either. This is also due to the high reference price of electricity in 2024, which was higher than the production costs of these production installations.

82.6% less support paid for gas-fuelled electricity generation compared to 2023

There was also a significant decrease in support payments for electricity produced in CHP in 2024, with EUR 54.5 million of support paid out in 2023 and only EUR 9.5 million in 2024, a decrease of 82.6%. This is mainly due to the sharp drop in the reference price of natural gas and the consequent reduction in the difference between the cost of production and the market price, which has a direct impact on the level of support.

FIGURE 22: VALUE OF SUPPORT PAY-OUTS IN THE 2011–2024 PERIOD



SOURCE: BORZEN

Self-consumption of renewable electricity

Self-consumption of electricity from renewable energy sources refers to the generation of electricity from renewables for the full or partial coverage of one's own electricity consumption using a self-consumption device. Electricity may be generated using solar, wind, hydro, or geothermal energy, or in a high-efficiency cogeneration (CHP) unit, provided that renewable energy sources are used as the primary fuel.

Self-supply can be individual or collective. Individual self-consumption is intended to cover the electricity needs of a single end consumer. Collective self-consumption includes self-consumption in multi-apartment buildings or renewable energy communities (RECs). In multi-apartment buildings, self-consumption is possible for consumers who use electricity for their own needs through two or more metering points within the same building. Similarly, in RECs, consumers using electricity through two or more metering points may join together.

Since the introduction of the self-supply scheme, only annual net metering was applied. This approach calculated charges for electricity, network use, contributions, and other levies based on the net difference between electricity consumed from and supplied to the grid at the end of the calendar year. In accordance with EU legislation, annual net metering had to be phased out and replaced with billing based on 15-minute metering of both electricity consumption and production. Under the new legal framework, the self-consumption agreement between the supplier and the consumer defines the settlement period and the billing method for delivered electricity.

In 2016, when the first self-consumption systems were being connected, only 135 installations with a total connection capacity of 1.1 MW were installed. By contrast, in 2024, a total of 15,529 new self-consumption systems with a combined installed capacity of nearly 206 MW were connected.

60,245 self-consumption systems

- **Total installed capacity: 779 MW**
- **Estimated electricity production in 2024: 674.2 GWh**

As of 2024, there are 60,245 self-consumption systems in operation in Slovenia, with a total installed capacity of 779 MW and an average system capacity of 12.9 kW.

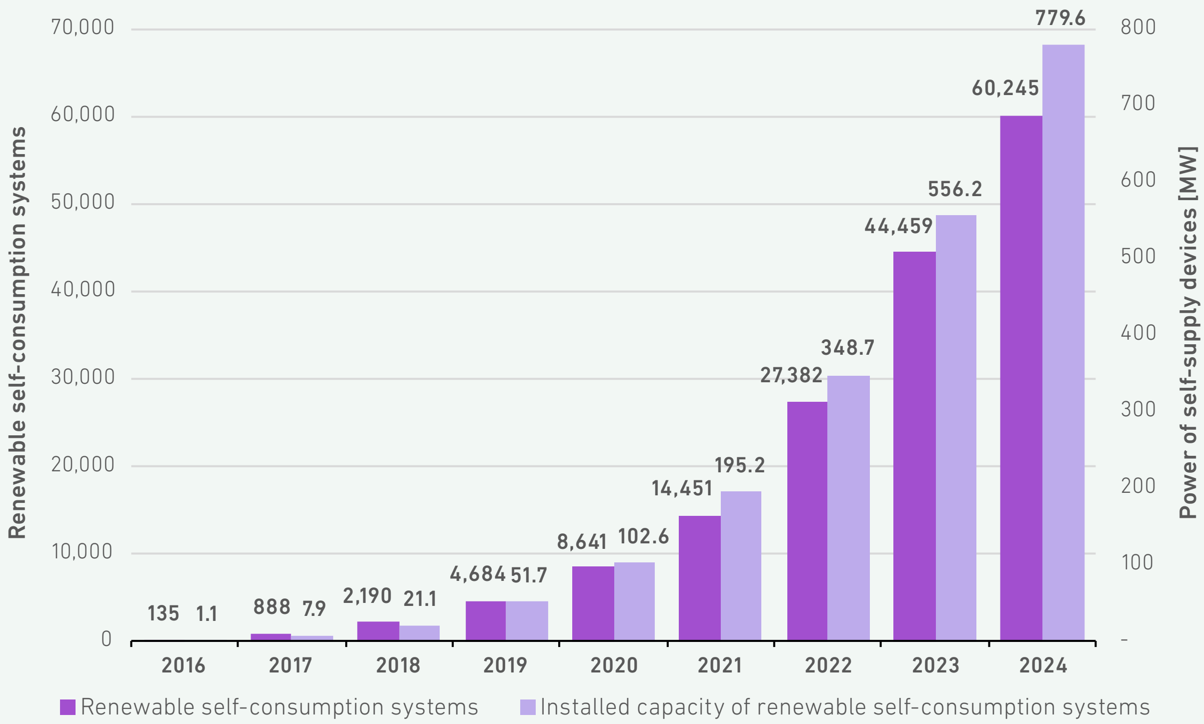
As the number of self-consumption users increases, the average capacity of such systems is also growing. For instance, in 2016, the average capacity of a newly connected self-consumption system was 8.1 kW. This increase is closely related to the growing use of electricity for heating buildings with heat pumps, and more recently, self-consumption is also becoming attractive for home electric vehicle (EV) charging.

In accordance with the current legislation and the amended ZSROVE-B Act, which changes the conditions for participation in the annual net metering self-consumption scheme, further connections under this system can be expected in 2025.

In the future, it is expected that new self-consumption systems will only be connected under the new regulation on self-consumption, introduced as part of the ZSROVE Act, which no longer provides for annual net metering.

At the same time, the new legislation expands eligibility for self-consumption to include all user categories, and is thus no longer limited to household and small business consumers.

FIGURE 23: NUMBER AND INSTALLED CAPACITY OF RENEWABLE SELF-CONSUMPTION SYSTEMS IN THE 2016–2024 PERIOD



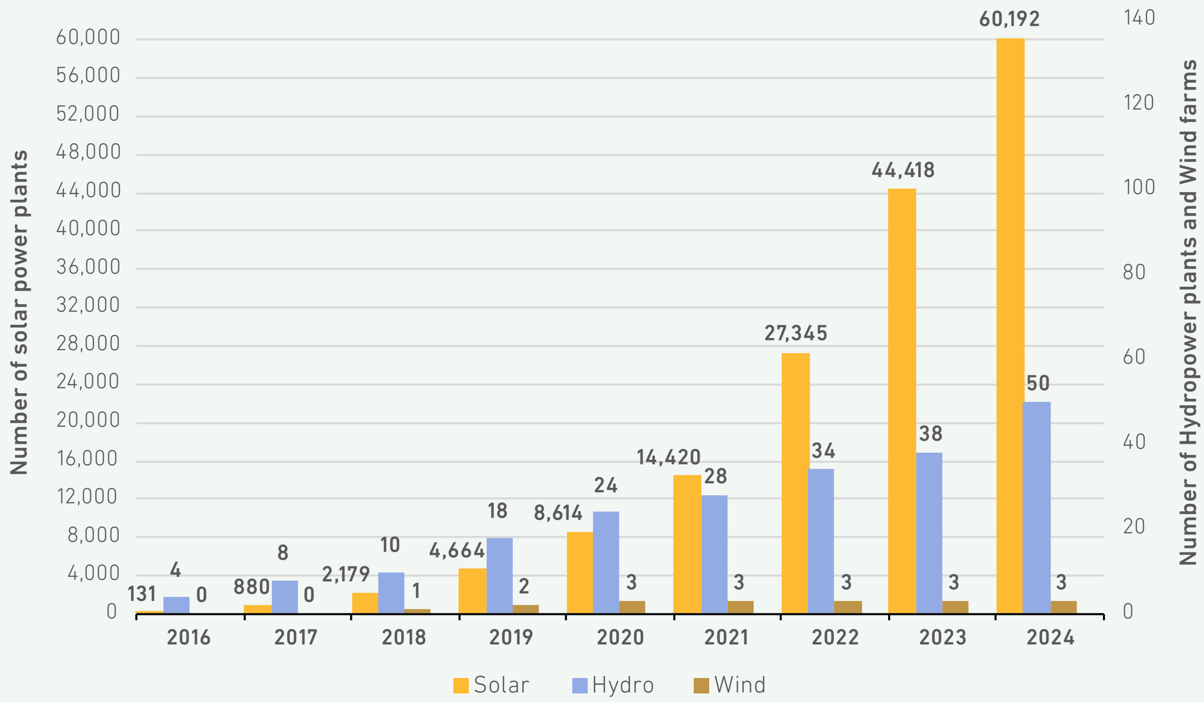
SOURCES: ENERGY AGENCY, ELES, ELECTRICITY DISTRIBUTION COMPANIES, BORZEN

In accordance with current legislation, a self-consumption system may generate electricity using solar, wind, hydro, or geothermal energy. It may also be a high-efficiency cogeneration (CHP) unit, provided that renewable energy sources are used as the primary energy source. In practice, solar power plants represent the overwhelming majority of installations, with 60,192 systems in operation. In contrast, only 50 systems use hydropower, and just three use wind energy.

As of now, there are no self-consumption systems that utilize geothermal energy, nor are there any CHP units powered by renewable energy sources.

In recent years, the number of production units for collective self-consumption has been increasing steadily. The first such installation was connected in 2019 with a capacity of 14 kW. In 2020, four systems were added with a total capacity of 86 kW, followed by 25 systems in 2021 (1,100 kW), 29 in 2022 (2,000 kW), and 122 in 2023 (5,000 kW). In 2024, 110 new systems were connected with a combined capacity of 5,500 kW. By the end of 2024, a total of 291 collective self-consumption systems were in operation, with an overall installed capacity of 13,700 kW.

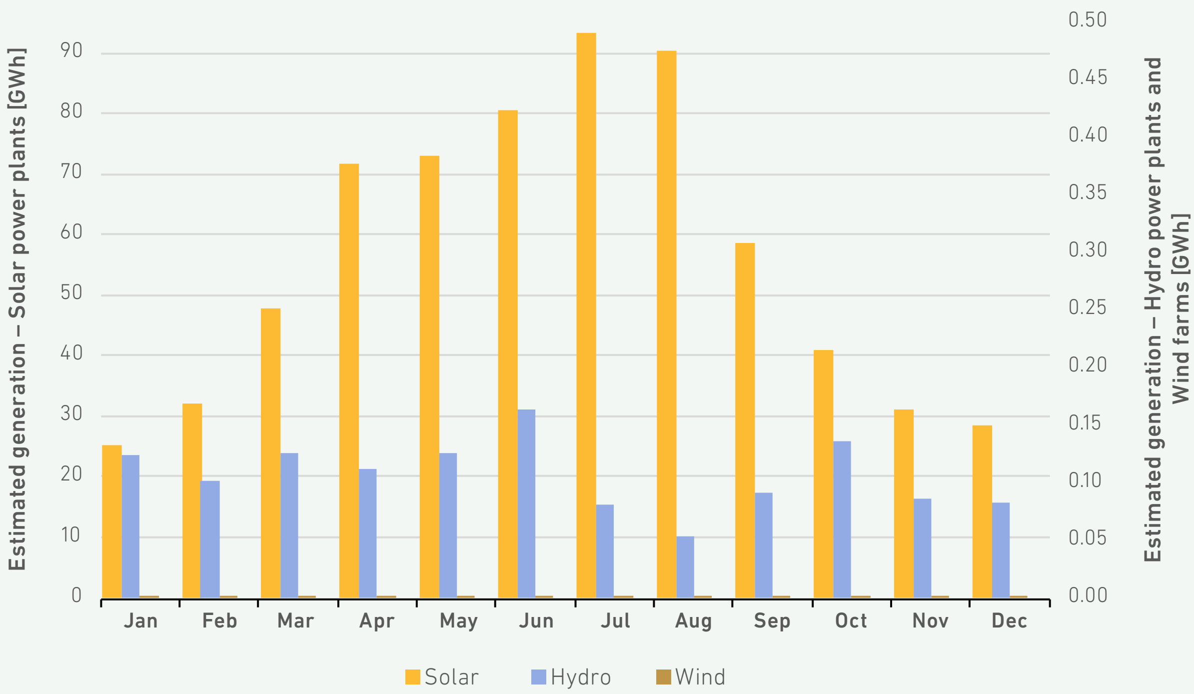
FIGURE 24: NUMBER OF RENEWABLE SELF-CONSUMPTION SYSTEMS IN THE 2016–2024 PERIOD BY GENERATION SOURCES



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

The annual electricity production from self-consumption systems connected behind the final consumer's metering point can only be estimated due to the measurement methods and annual netting of produced and consumed electricity. This estimate depends on the type of production units, their installed capacity, and the reference monthly operating hours during which the units can operate. Since 99.8% of all self-consumption systems are solar power plants, the estimated electricity production is strongly influenced by seasonal, geographical, and weather factors. In 2016, the estimated production from self-consumption systems was only 0.6 GWh, increasing to 674.2 GWh in 2024.

FIGURE 25: ESTIMATED ELECTRICITY GENERATION FROM SELF-CONSUMPTION SYSTEMS IN 2024 BY MONTH AND TECHNOLOGY



SOURCE: BORZEN

CASE STUDY
System analysis of electricity usage and generation by consumers with self-supply

The inclusion of self-supplying consumers in the so-called metered consumption[5] creates the conditions for a more robust analysis of electricity generation from self-consumption installations. We therefore present below more detailed results on electricity demand and delivery at the system level.

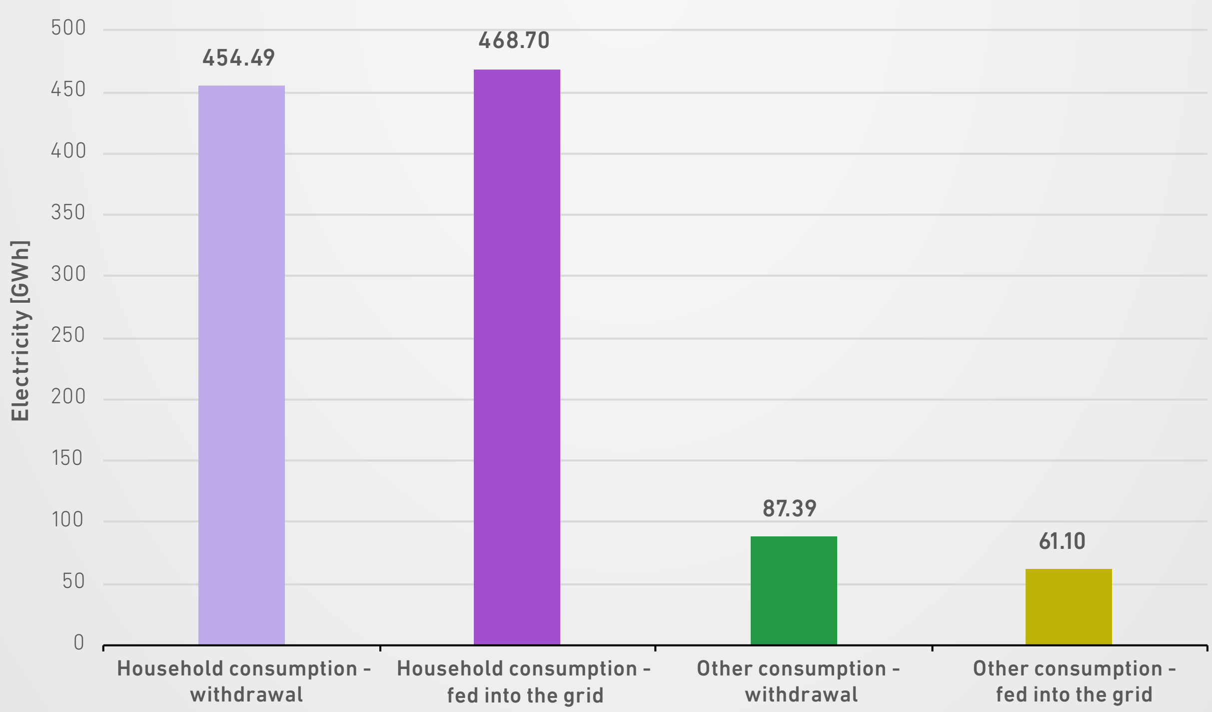
The report analyses validated, aggregated annual 15-minute profiles of energy consumption and delivery for self-supplying consumers, separately for household and other consumption in 2024, for suppliers ECE, Energija Plus, E3, Petrol, Energetika Ljubljana, GEN-I, SunContract, NGEN, BISOL Energija and FLEXGRID[6,7].

The results of the analysis are presented below by type of consumption (households and other consumption represented by small business consumption) at the system level and the level of individual distribution system areas.

In 2024, self- supplying consumers consumed 12.08 GWh more electricity than they fed into the grid at the system level (Figure 26):

	Electricity withdrawn [GWh]	Fed-in electricity [GWh]
All self-consumers/prosumers	541.88	529.80

FIGURE 26: AMOUNT OF SUPPLIED AND CONSUMED ELECTRICITY BY SELF-SUPPLYING CONSUMERS IN 2024



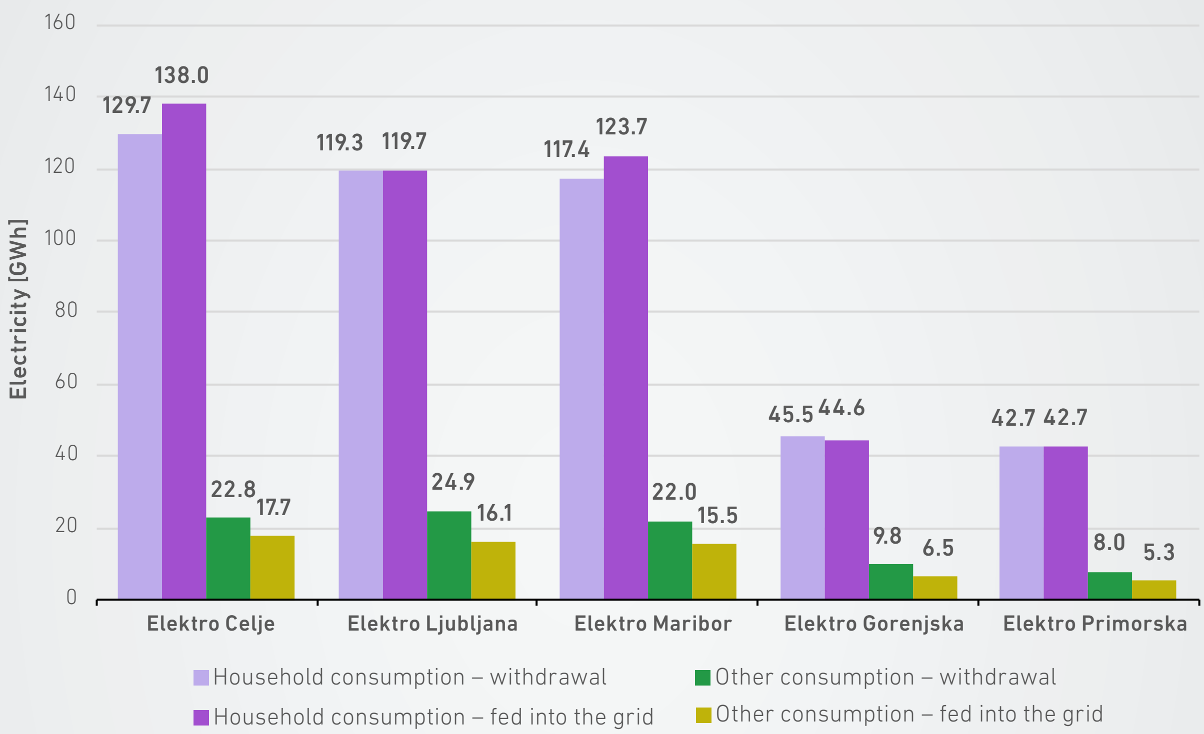
SOURCE: ELES

5 Not all self-supplying consumers have smart meters installed yet.
6 The data source is the POMP platform of the National Data Hub. The data are validated.
7 Limitations: Data include self-supply with billing connection schemes PS.3A and PS.3B (OS.3A.1, OS.3B.1, OS.3B.3) and available 15-minute metering. The system aggregated electricity quantities of self-supplying consumers deviate from the annualised billing quantities by 7% and 5% for electricity taken and delivered to the network respectively.

For household consumption, users delivered about 3% more electricity to the grid than they took in, while for other consumption the amount of electricity taken in is 43% higher than the amount of electricity delivered.

However, the analysis at the level of the distribution areas shows certain specificities. Figure 27 shows the average oversizing of self-supply generating installations for household consumers according to the annual consumption coverage criterion in the areas of Elektra Celje and Elektra Maribor.

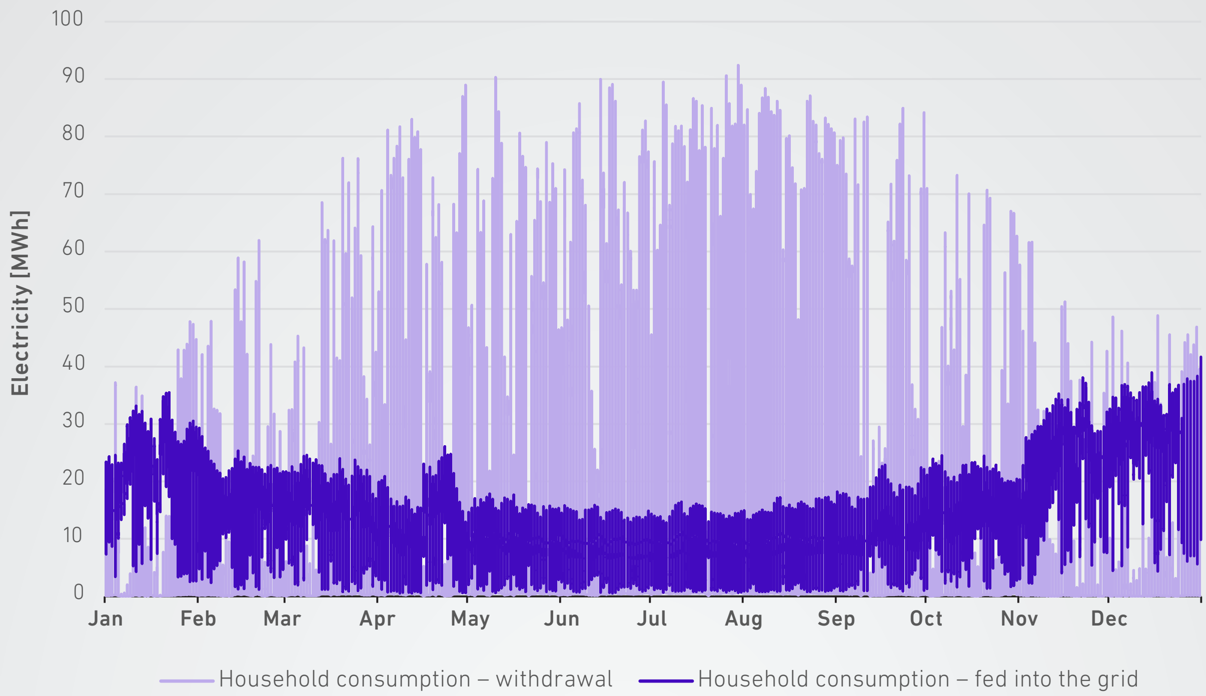
FIGURE 27: SELF-CONSUMPTION CONSUMERS – ELECTRICITY TAKEN FROM AND DELIVERED TO THE GRID BY DISTRIBUTION SYSTEM AREAS IN 2024



SOURCE: ELES

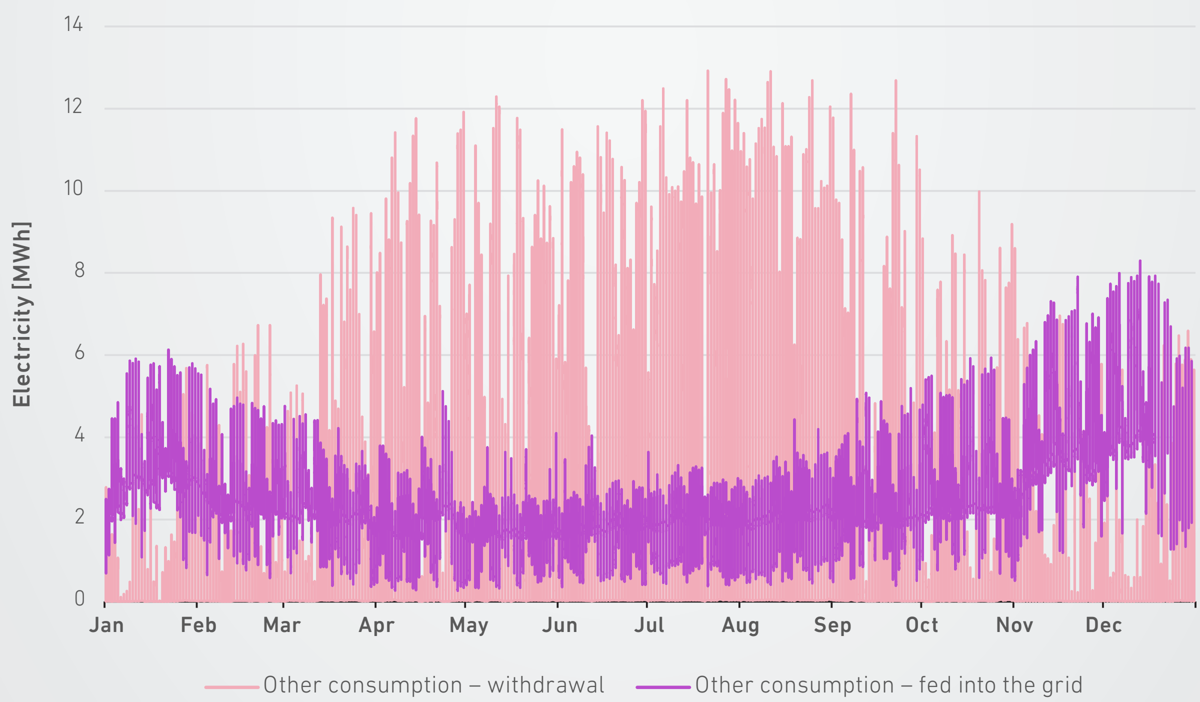
The following figures show the aggregated 15-minute profiles of electricity withdrawn and delivered for the entire portfolio of self-supplying household (Figure 28) and other consumers (Figure 29). The patterns of electricity withdrawn and delivered are similar for household and small business consumption, as both types of consumption cause significant electricity surplus during the warmer months.

FIGURE 28: AGGREGATED GENERATION AND CONSUMPTION PROFILE OF ALL SELF-CONSUMPTION HOUSEHOLD CONSUMERS IN 2024



SOURCE: ELES

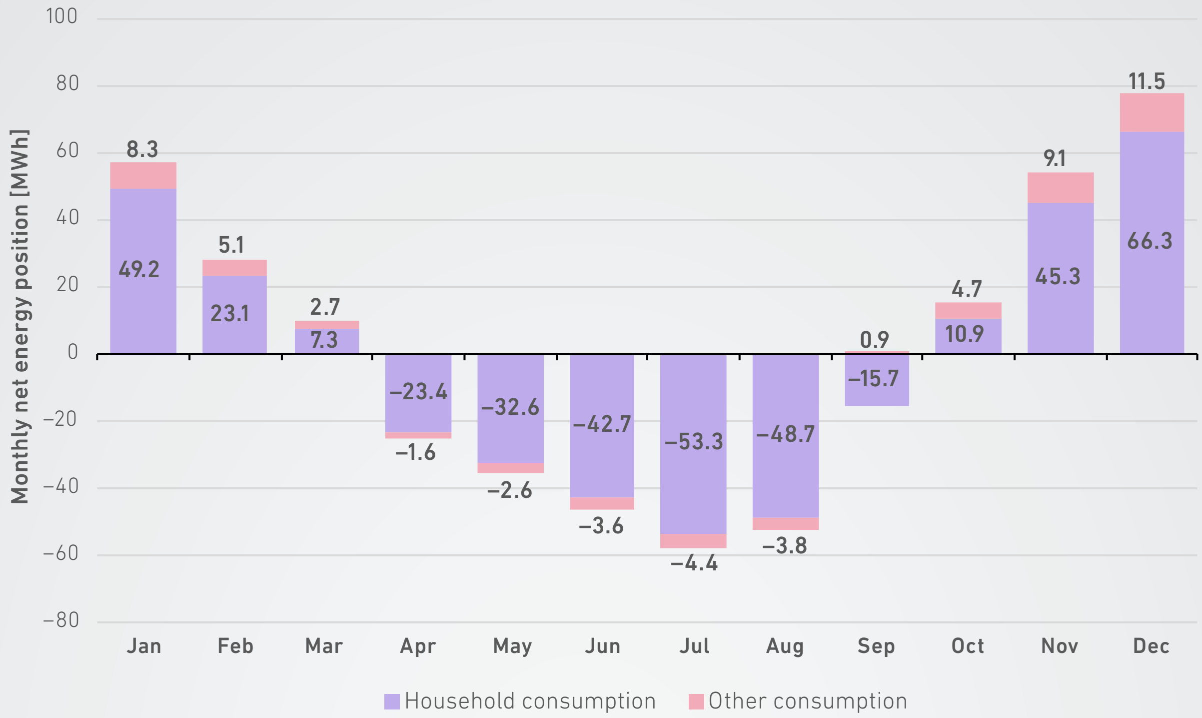
FIGURE 29: AGGREGATED GENERATION AND CONSUMPTION PROFILE OF ALL OTHER SELF-CONSUMPTION CONSUMERS IN 2024



SOURCE: ELES

The next figure shows the net energy positions of all suppliers separately by consumer group (Figure 30), showing the differences in the monthly volumes of electricity received and delivered by all self-supplying consumers (household and non-household). The figures clearly show, albeit expected, seasonality: in winter, when consumption is higher and solar generation is reduced, suppliers have to provide more electricity to consumers than they receive from them. In contrast, this trend is reversed in April-September due to more hours of sunshine.

FIGURE 30: DIFFERENCES IN MONTHLY AMOUNTS OF SUPPLIED AND WITHDRAWN ELECTRICITY BY SELF-CONSUMPTION CONSUMERS IN 2024



SOURCE: ELES

The analysis by individual supplier reveals significant differences in the size of the portfolios of such consumers, with the dominant supplier in the group under consideration standing out. In terms of the financial risks associated with electricity price differentials, these differences are not sufficient to provide a comprehensive assessment of risk exposure. The structure of each supplier's overall portfolio plays a crucial role in assessing risk exposure.

The vast majority of self-supplying consumers, classified as active consumers under the ZOEE definition, are supplied based on annual energy netting. In practice, during the period under review, these are mainly 'invest and forget' consumers, which in practice makes them the most passive consumers. The only mechanism that encourages them to use the network more efficiently is the new way of charging the network fee. However, we expect a very different behaviour from self-supplying consumers who are not (or will no longer be) involved in annual net energy metering and mainly invest in hybrid self-supply systems with storage. It will therefore be interesting to monitor their grid usage profiles in the coming years and compare them with those of other self-consumers.

Regulation of Network Activities

Unbundling of Activities

Electricity transmission and distribution companies are required to maintain separate accounts for each of their transmission and distribution activities, as would be the case if separate undertakings were to carry out the distribution and transmission activities.

ELES is the operator of the combined system and, in 2024, performed the activities of a public utility service of transmission and distribution system operator. In addition to its utility activities, ELES carries out non-electricity activities. Within its non-electricity activities, ELES also began in 2024 to undertake an initiative under the Act on infrastructure for alternative fuels and the promotion of the transition to alternative fuels in transport, supporting the development of e-mobility (source: ELES unaudited Annual Report). ELES discloses in its Annual Report separate financial statements for these activities, as well as the criteria for allocating assets and liabilities, costs, expenses, and income, which are taken into account in the preparation of the separate accounts and financial statements. ELES also discloses in its Annual Report the separate financial statements for these activities, as well as the criteria for allocating assets and liabilities, costs, expenses, and income.

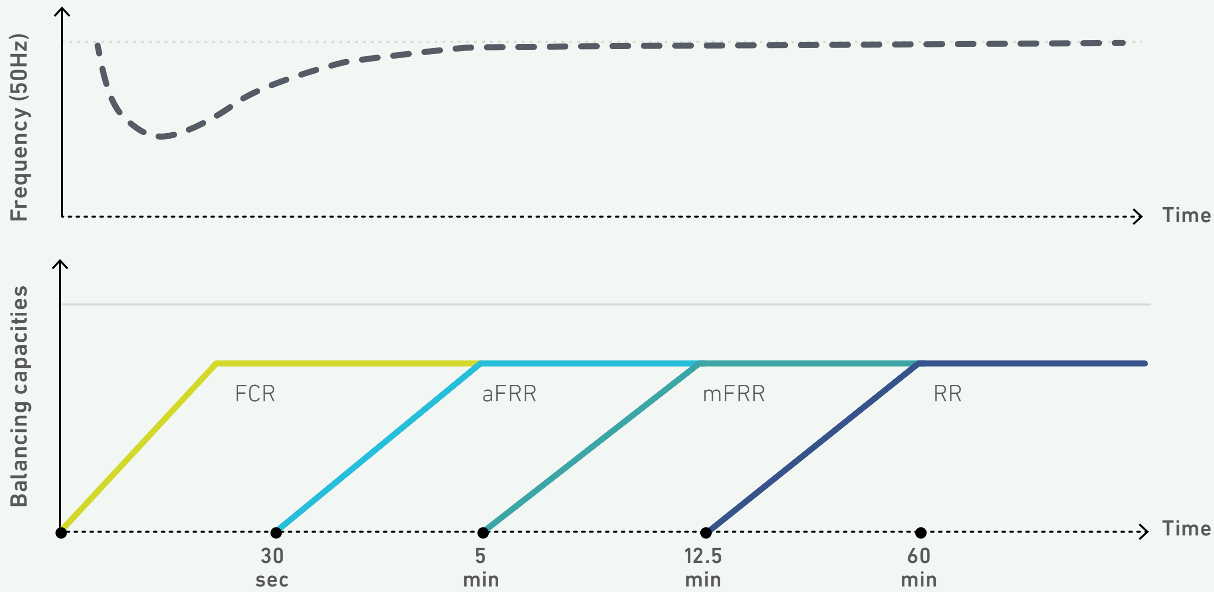
Based on the approval of the Government of the Republic of Slovenia (the Government), SODO—and, since the merger, ELES—delegated the public service activities provided by the DSO to distribution companies. The distribution companies engage in other non-electricity-related activities in addition to the activity contractually delegated to them by the provider of public service activities of the DSO. Therefore, the distribution companies maintain separate accounting records in their books and prepare separate financial statements for the activity contractually delegated to them by the provider of public service activities of the DSO, as well as for their non-electricity-related activities. In their annual reports, distribution companies disclose separate financial statements for these activities, as well as the criteria for allocating assets and liabilities, costs, expenses, and revenues used in the preparation of separate accounting records and financial statements.

Technical Services by the Operators

Ancillary Services

In the event of significant fluctuations in consumption or production, such as the failure of a power plant, part of the network or other unforeseeable changes in the operation of the national or wider European transmission network, the individual TSOs in their respective regulatory area shall act with their primary control, which is available almost immediately. The amount of system services to which each TSO is committed is determined by a voluntary agreement and calculated based on the relevant production volumes, using commonly agreed-upon procedures. An example of the process of activation of individual services is given in Figure 31:

FIGURE 31: RESERVE ACTIVATION PROCEDURES IN CASE OF INSUFFICIENT GENERATION CAPACITY



SOURCES: ENERGY AGENCY, ENTSO-E

Ancillary services are services that the transmission system operator must provide to facilitate the normal operation of the entire electricity system. They encompass the following:

- frequency containment reserve (FCR),
- automatically activated frequency restoration reserve (aFRR),
- manual frequency restoration reserve (mFRR);
- voltage and reactive power control; and
- provision of a black start.

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 categorised into frequency services, which encompass FCR, aFRR and mFRR, as well as non-frequency services, which include voltage regulation and the provision of a black start. Frequency ancillary services belong to balancing services in the electricity system in addition to purchasing on the balancing market. 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 crucial.

For 2024, ELES has planned the following reserve capacities for frequency ancillary services:

- FCR: ±14 MW,
- aFRR: +60 MW, −60 MW,
- mFRR: +190 MW, −48 MW.

The projected volume of frequency system services for 2024 in the area of automatic frequency maintenance and activation was the same as in the last two years, while the requirements for the volume of the frequency maintenance reserve and the manual frequency recovery reserve decreased, the latter mainly due to the changed definition of the reserve to be provided by each TSO within the SHB block.

In 2024, 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 (Regulation (EU) 2017/2195). These provisions mandate leasing services based on market principles for the shortest possible leasing period, with aFRR and mFRR leases to be made separately for the positive and negative balancing directions. The leasing of balancing power is to be separated from the purchase of balancing energy. In 2024, ELES selected the aFRR and mFRR providers locally through the Slovenian balancing platform, while the FCR providers were chosen through the international FCR Cooperation platform, in which ELES has been participating since 2021.

The selection of FCR providers through FCR Cooperation takes the form of auctions for four-hourly reserve provisioning products. The auctions are conducted on a common platform operated by one of the four German TSOs.

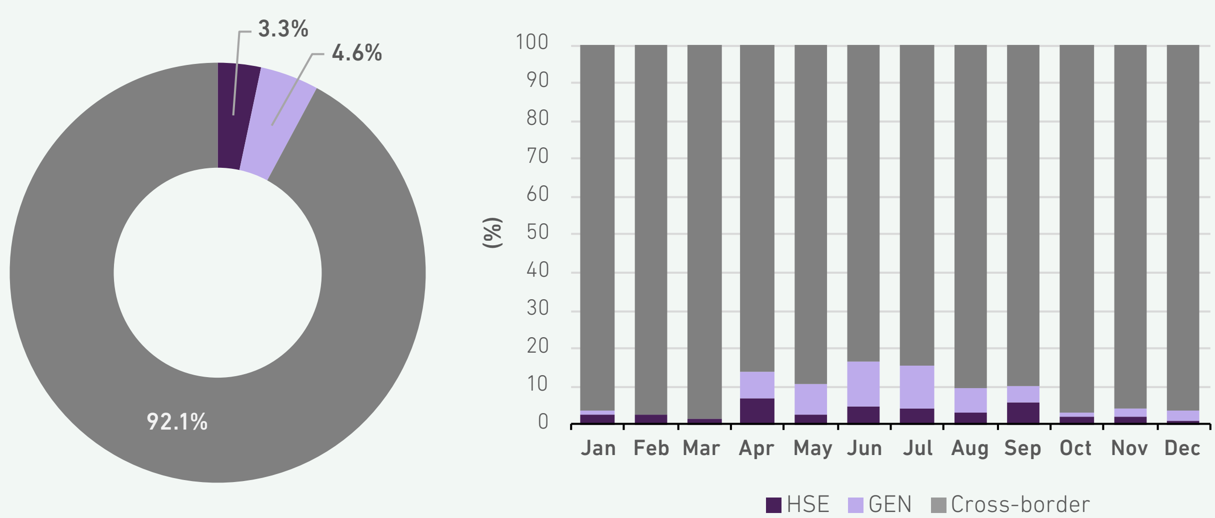
TABLE 13: PRICE OF FCR AND THE SHARE OF FCR LEASED IN SLOVENIA IN 2024

	Average marginal lease price [EUR/MW/h]	Lease cost not considering the FCR cooperation benefits [EUR]	Lease cost [EUR]	Share of FCR leased domestically (%)
Total	**16.26**	1,995,446.86	**988,272.45**	**7.9%**

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

Table 13 shows ELES's total FCR costs by month and the share of Slovenian FCR requirements covered by Slovenian providers. The average marginal cost of leasing FCR in 2024 was 16.26 EUR/MW/h. The total cost of the lease, excluding the benefits of the FCR Cooperation mechanism, would have been EUR 1,995,446.86. However, the final cost, taking into account the mechanism, was EUR 988,272.45. This means that the total cost was EUR 1,007,174.41 lower due to participation in the cooperation. Compared to 2023, the total cost of implementing the FCR service increased by EUR 227,834.74. The share of activated FCR from Slovenian sources increased slightly from 5.45% in 2023 to around 7.9% in 2024, but remains at a low level nonetheless. The share of domestic activation is also illustrated in Figure 32. ELES has met most of its FCR needs through purchases through the European FCR Cooperation platform, which includes an increasing number of EU Member States. The FCR cost-benefit sharing system continues to be optimised and provides greater cost-efficiency compared to national leasing. Several factors contribute to the limited share of domestic providers, including high electricity prices, which provide better opportunities in the primary energy market, and the impact of frequent load changes, which cause wear and tear on electricity generation equipment over time.

FIGURE 32: SHARES OF ACTIVATED RESERVE RESOURCES FOR FREQUENCY MAINTENANCE ON AN ANNUAL AND MONTHLY BASIS



SOURCE: ELES

ELES has implemented the aFRR service providers for 2024 separately for power (aFRR) and balancing energy. All bidders with a valid aFRR Technical Capability Certificate were allowed to participate in the aFRR auctions. Selected aFRR bidders had to bid daily an amount of energy corresponding to the amount of balancing power allocated in the auction, while all bidders with a valid aFRR Technical Capability Certificate were allowed to bid balancing power up to a value corresponding to the total recognised aFRR regulating power.

In accordance with the provisions of Regulation (EU) 2017/2195, ELES stopped the annual auctions for the aFRR and mFRR for 2023. The total amount of reserve, ±60 MW, was leased by ELES in two parts: ±30 MW of leased balancing power in monthly auctions and ±30 MW in daily auctions. The aFRR system service was provided by four qualified providers in 2024, with only three providers actively participating in practice. Two of these providers provided the service using conventional generation resources, and the third also utilised battery storage. Bids for balancing energy could be submitted up to two hours before delivery (H-2).

TABLE 14: AUCTIONS RESULTS FOR aFRR

Positive balancing direction (aFRR+)		
	Allocated volume [MW]	**Average weighted price [EUR/MW/h]**
Monthly auctions	30	8.98
Daily auctions	30	8.97
Negative balancing direction (aFRR–)		
	Allocated volume [MW]	**Average weighted price [EUR/MW/h]**
Monthly auctions	30	8.49
Daily auctions	30	8.48

SOURCE: ELES

The requirements for sizing the manually activated frequency restoration reserves (FRR) are specified by SO GL, SONPO-E, ZOEE, and SAFA. In line with the sizing requirements for the provision of rFRR and the agreement on the joint provision and sharing of reserves in the SHB (Slovenia, Croatia, BIH) (RDMF), under which the partners have shared the provision of the necessary amounts of mFRR, ELES has slightly reduced the planned power lease in 2024 to 190 MW of positive mFRR and 48 MW of negative mFRR. A key reason for the reduction was the revised definition of the reserve to be provided by each TSO under the SHB block.

ELES solicited bids for mFRR services for 2024 separately for power (mFRR) and balancing energy, both positive (mFRR+) and negative (mFRR–). Only bidders with a valid certificate of technical capability to provide the mFRR service were eligible to participate. ELES provided part of the required reserve in the positive direction through the lease of a power product of an annual duration, involving two bidders. The remaining part of the upstream volume was necessary, and the entire downstream volume was leased in daily auctions on an hourly basis.

The mFRR+ service was provided by five providers in 2024. The bulk of the leasing, 74%, was supplied by one provider, while the remaining providers contributed 10%, 8%, 6% and 2% of the total volume. For the mFRR service, six providers participated, with a slightly more dispersed distribution of shares: the largest provider provided 31% of the required volume, followed by shares of 27%, 23%, 9% and twice 5% each. Some of the providers with lower shares were observed to provide the service only intermittently or only in specific months, which is typical for new entrants. Their presence is likely linked to the introduction of new technologies for providing the service or to the development of options for adjusting the off-take of contracted users. Participants in the mFRR+ and mFRR– auctions have primarily provided backup power through conventional generation units. Still, some capacity has also been supplied through distributed resources, battery storage, and demand response measures. The results of the auctions are presented in the Table 15

.

TABLE 15: AUCTION RESULTS FOR mFRR

Positive balancing direction (mFRR+)		
	Already allocated volume [MW]	**Price achieved [EUR/MW/h]**
Annual purchase of a product	150	5.70
	Allocated volume [MW]	**Average weighted price [EUR/MW/h]**
Daily auctions	70	4.262
Negative balancing direction (mFRR–)		
	Allocated volume [MW]	**Average weighted price [EUR/MW/h]**
Daily auctions	48	2.215

SOURCE: ELES

For 2024, ELES has not specifically selected the providers of non-frequency system services. At the end of 2023, ELES for 2024 concluded annexes to existing contracts for the provision of system services within the framework of the voltage and reactive power regulation process, as well as the commissioning of non-externally fed generators (black start).

Table 16 shows the individual system service costs for 2024. It should be noted that only costs financed by the transmission system network charge are shown, while energy activation costs for frequency system services are funded from balance billing. The balance group leaders bear these costs.

The total costs of the system services in 2024 were EUR 1,435,070.63 lower than in 2023. The decrease in total costs was due to the lower volume of leasing the manual reserve for frequency recovery in both positive and negative directions, which is reflected in significantly lower costs for these two services.

TABLE 16: COSTS OF ANCILLARY SERVICES IN 2024

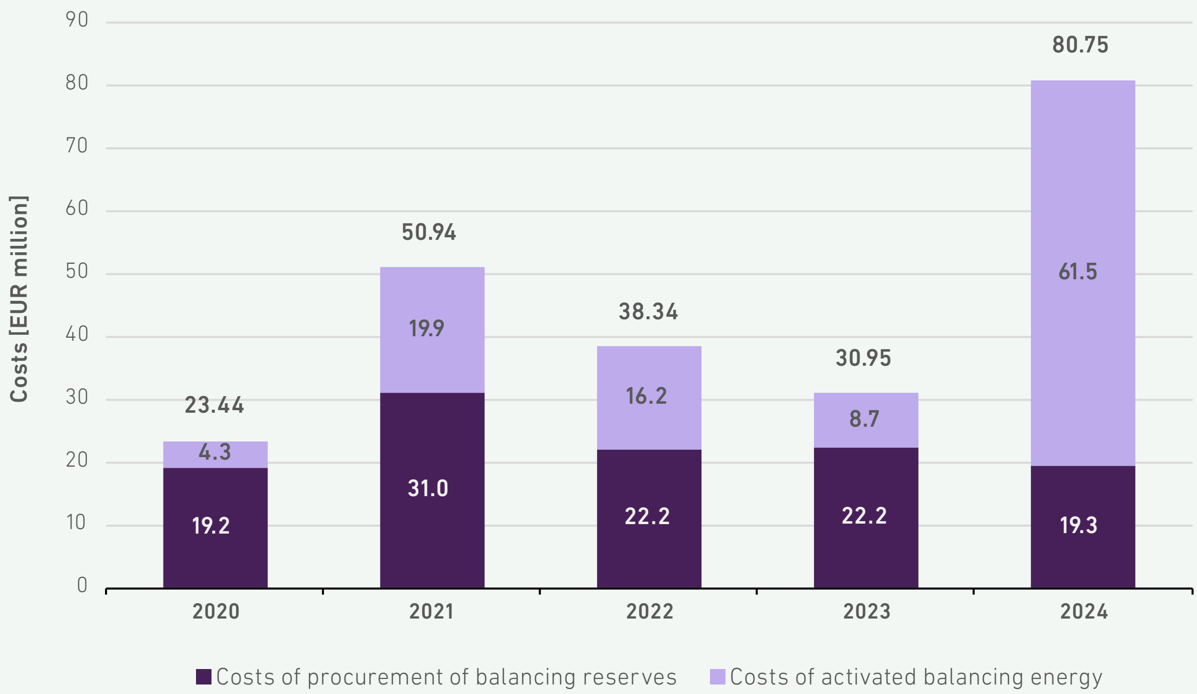
Ancillary service	Annual cost not including VAT [EUR]
FCR	994,599.91
Positive aFRR	4,488,815.00
Negative aFRR	4,255,148.00
Positive mFRR	8,615,582.00
Negative mFRR	934,818.00
Voltage and reactive power control	3,934,868.00
Provision of a black start	2,544,000.00
Total	**25,767,830.91**

SOURCE: ELES

ELES leased all the necessary reserve capacity, energy and other services in 2024 within the scope of the prescribed ancillary services, recording no deviations from the planned volumes.

In individual cases where the monthly and daily auctions failed to deliver the prescribed volumes for the aFRR and mFRR services, respectively, it triggered the alternative procedure foreseen in ZOEE. In 2024, this procedure was activated twice for the aFRR service and four times for the mFRR service. In all these cases, the lease price was set by the Energy Agency by decision and amounted to EUR 9.00/MW/h for aFRR+, EUR 8.50/MW/h for aFRR–, EUR 5.71/MW/h for mFRR+ and EUR 4.50/MW/h for mFRR–.

FIGURE 33: TOTAL COSTS FOR BALANCING THE ELECTRICITY SYSTEM IMBALANCES IN 2024



SOURCES: ELES, BORZEN

Balancing and Imbalance Settlement

The entity responsible for balancing the deviations 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 using imbalance settlement, which features a 15-minute chargeable interval.

The year 2024 marked the second year of implementing the balance pricing model, which is based on a single price in each settlement period, regardless of the direction of the deviation. This approach was outlined in the amended Electricity Market Operating Rules, which took into account, among other things, that metered consumers included household consumers with 15-minute readings and, as of February 2024, self-supplying consumers. The amended rules took effect on 1 February 2024.

The average imbalance price in 2024 was EUR 92.11/MWh, a 9% decrease compared to EUR 101.18/MWh the previous year. The annual average SIPX index in 2024 was EUR 91.29/MWh, representing a 12.2% decrease from 2023.

In the first four months of 2024, average monthly prices for deviations were 46% lower compared to the same period of the previous year. The differences were less pronounced between May and October, while in November and December, the imbalance prices were 48% higher compared to the same period in 2023. The average monthly values of the C imbalance prices and the SIPX index for the years 2023 and 2024 are shown in the graph below (Figure 34).

FIGURE 34: AVERAGE DAILY VALUES OF PRICE DEVIATIONS C AND THE SIPX INDEX

SOURCE: BORZEN

The single imbalance price calculation model applied since 2023 remains unchanged in 2024. The highest imbalance price in 2024 was reached on 29 July at 2,625.81 EUR/MWh, more than double the highest price in 2023 of 1,306.84 EUR/MWh, which was reached on 12 September. The lowest price in 2024 was EUR –1,635.51/MWh, recorded on 21 August, which is significantly lower than in 2023, of –600.06 EUR/MWh, reached on 9 March.

Maximum hourly imbalance price 2,625.81 EUR/MWh (29 July), Minimum hourly imbalance price –1,635.51 EUR/MWh (21 August)

Average monthly deviation prices in 2024 were lowest in March and April at 59,00 EUR/MWh and highest in November at 146,77 EUR/MWh on average. In comparison, the lowest average monthly prices in 2023 were reached in May at 72.45 EUR/MWh, and the highest in January at 147.24 EUR/MWh.

Under certain conditions, separate prices can still be calculated for positive and negative variances; however, in the vast majority of cases, the prices are identical, as the settlement interval is based on a single price.

TABLE 17: AVERAGE, HIGHEST AND LOWEST VALUES OF PRICE DEVIATIONS FOR C AND SIPX IN SETTLEMENT INTERVALS

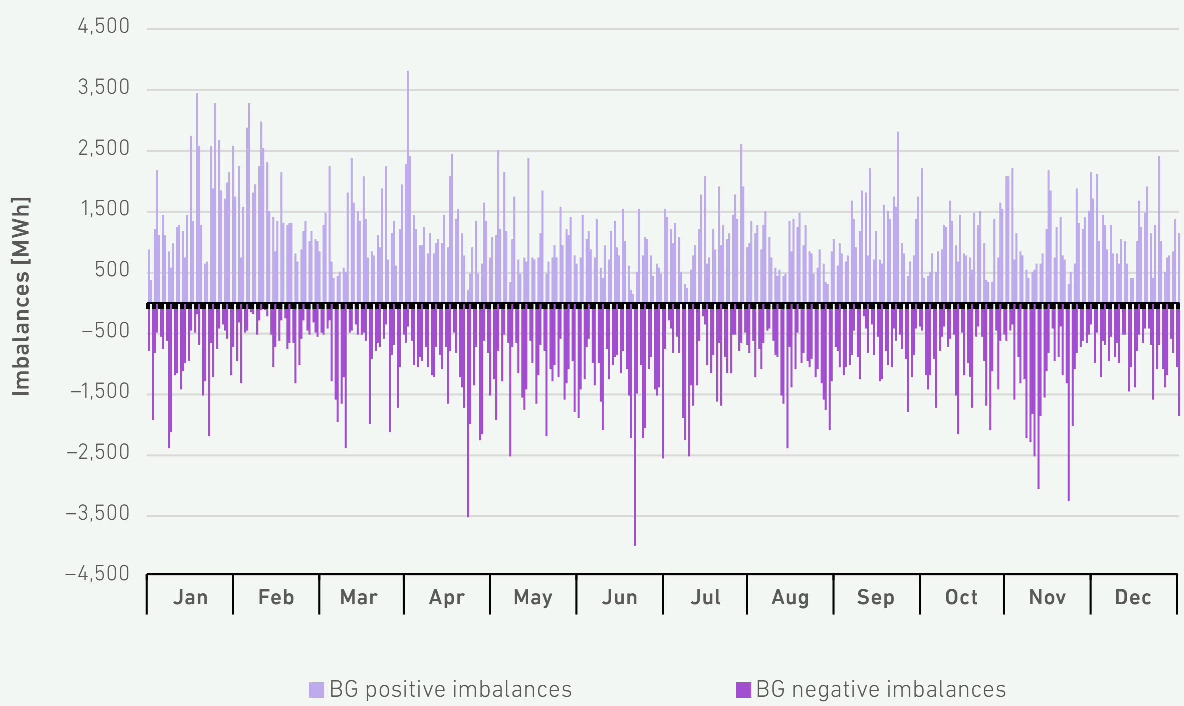
	2023 [EUR/MWh]		2024 [EUR/MWh]	
	C	SIPX	C	SIPX
Average prices of the settlement interval	**101.20**	**103.91**	**92.11**	**91.29**
Highest value	1,306.84	426.18	2,625.81	1,022.27
Lowest value	–600.06	–500.00	–1,635.51	–105.88

SOURCE: BORZEN

The highest total monthly positive imbalances of the balance groups (energy surplus) in 2024 were recorded in January, amounting to 49,848 MWh. The highest total monthly negative imbalances (energy deficit) were recorded in November, amounting to 41. The average monthly imbalances of the balance groups in 2024, taking into account both positive and negative imbalances, amounted to approximately 67,551 MWh. This is an increase of more than 20% compared to the previous year, when the average was 56,146 MWh.

The figure below shows the total daily sum of positive and negative deviations for all balance groups in Slovenia in 2024.

FIGURE 35: DAILY IMBALANCES FROM CONSUMPTION FORECASTS IN THE SLOVENIAN NETWORK IN 2024



SOURCE: BORZEN

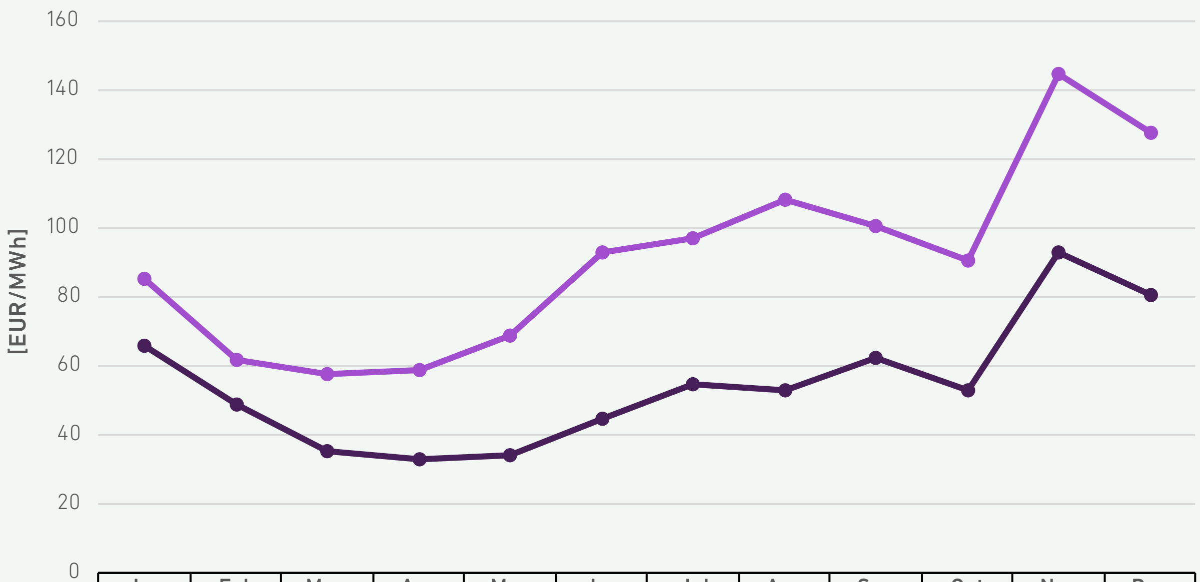
The data for 2024 show that in December, there were no markedly high positive imbalances, as has been typical in previous years. In the past, these imbalances were often due to billing peculiarities when taking into account surpluses from self-supply installations. Since the entry into force of the amended Electricity Market Operating Rules, effective from 2023, these surpluses are accounted for within the annual balance settlement, which has contributed significantly to stabilising the December values.

In line with the dynamics of inclusion of consumers in the metered diagrams as set out in the System Operating Instructions for the Distribution System (SONDSEE), all non-household consumers with a connection capacity below 43 kW were included in the metered consumers as of 2023, followed by household consumers and then self-supplying consumers as of 2024. All these changes have had an impact on the composition and structure of the remaining consumption diagram, with the market operator playing a crucial role in facilitating timely communication and coordination among stakeholders in the market.

Balancing energy for balancing deviations in the Slovenian electricity system is provided by the transmission system operator ELES. In 2024, 357 GWh were used for balancing negative deviations, and 407 GWh were used for balancing positive deviations.

The average hourly balancing prices, calculated based on all balancing costs and volumes, are shown in Figure 36. The S+ represents the short settlement price (purchase of energy) and the S- the long settlement price (sale of energy). All types of system reserves are taken into account in the calculations: FCR (frequency containment reserve), aFRR (automatic frequency restoration reserve), mFRR (manual frequency restoration reserve), RR (replacement reserve including balancing market), FSkar (frontier deviation) and other balancing quantities, including energy from the IGCC mechanism in accordance with Article 91 of the applicable Electricity Market Operating Rules.

FIGURE 36: AVERAGE MONTHLY REGULATION COSTS (S+ IN S–) IN 2024



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
S+	85.58	62.02	57.74	59.24	68.78	92.91	97.43	108.09	100.99	90.87	144.53	127.59
S–	65.79	49.02	35.76	32.99	34.10	44.78	55.11	53.38	62.47	53.10	93.03	80.56

SOURCE: BORZEN

The average balancing prices in 2024 were lower than in 2023, both for positive (S+) and negative (S-) balancing. The average price of positive balancing was 91.23 EUR/MWh, compared to 100.20 EUR/MWh in 2023. The price of negative balancing decreased from 70.59 EUR/MWh to 56.85 EUR/MWh. The differences between the average prices of S+ and S- also decreased slightly in absolute terms compared to 2023.

TABLE 18: TRENDS IN THE TOTAL IMBALANCES OF THE BALANCE RESPONSIBLE PARTIES AND AT THE BORDERS OF THE SLOVENIAN REGULATION AREA IN THE 2020–2024 PERIOD

	2020	2021	2022	2023	2024
Total positive imbalances of the balance responsible parties [MWh]	245.421	245.997	304.004	395.440	431.164
Total positive imbalances of the regulation area [MWh]	300.190	324.665	374.111	496.849	561.162
Total negative imbalances of the balance responsible parties [MWh]	177.414	236.796	210.779	278.317	379.444
Total negative imbalances of the regulation area [MWh]	262.243	341.339	335.860	413.335	511.117

SOURCES: BORZEN, ELES

In 2024, the trend of positive imbalances outweighing negative imbalances has continued. At the system level, total positive imbalances amounted to 561,162 MWh, while negative imbalances reached 511,117 MWh. The ratio was similar in 2023, indicating the continued dominance of surpluses in the electricity system. In addition to the above, the observed trend of higher positive imbalances can also be partly attributed to the lower forecast accuracy of market participants, which is due to the increasingly volatile and more complex to predict renewable generation that is part of the suppliers' portfolio, and the consequent increased activity for the TSO to lease more balancing volumes, which has increased the cost of activated energy (see Figure 33 for details).

At the same time, in 2024, problems with the timeliness and quality of the data required for balance clearing have occurred in several consecutive months. The issues were primarily due to the inclusion of new consumer categories in the metered diagram system and changes in the data processing and transmission procedures of the electricity distribution companies.

Higher imbalances costs also due to less accurate forecasting of market participants' consumption

Quality of Supply

Continuity of Supply

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

Average electricity supply interruption was 195 minutes

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

Based on the data on SAIDI and SAIFI indicators, calculated at the level of individual distribution companies, the Energy Agency calculated the aggregate value of these indicators, considering the total number of consumers in Slovenia. The monitoring of SAIDI and SAIFI parameters over the observation period reveals a gradual improvement in the level of quality of supply. In 2024, the electricity supply to each consumer was interrupted on average 2,51 times in a duration of 195.3 minutes per interruption.

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. In recent years, the MAIFI parameter has shown some volatility.

Figures 37 in 38 show the SAIDI and SAIFI indicators for unplanned long-term interruptions, classified by causes of interruption on internal and external events, as well as force majeure, for the 2020–2024 period, while Figure 39 shows the MAIFI parameter for the same observation period. All parameters are calculated at the national level

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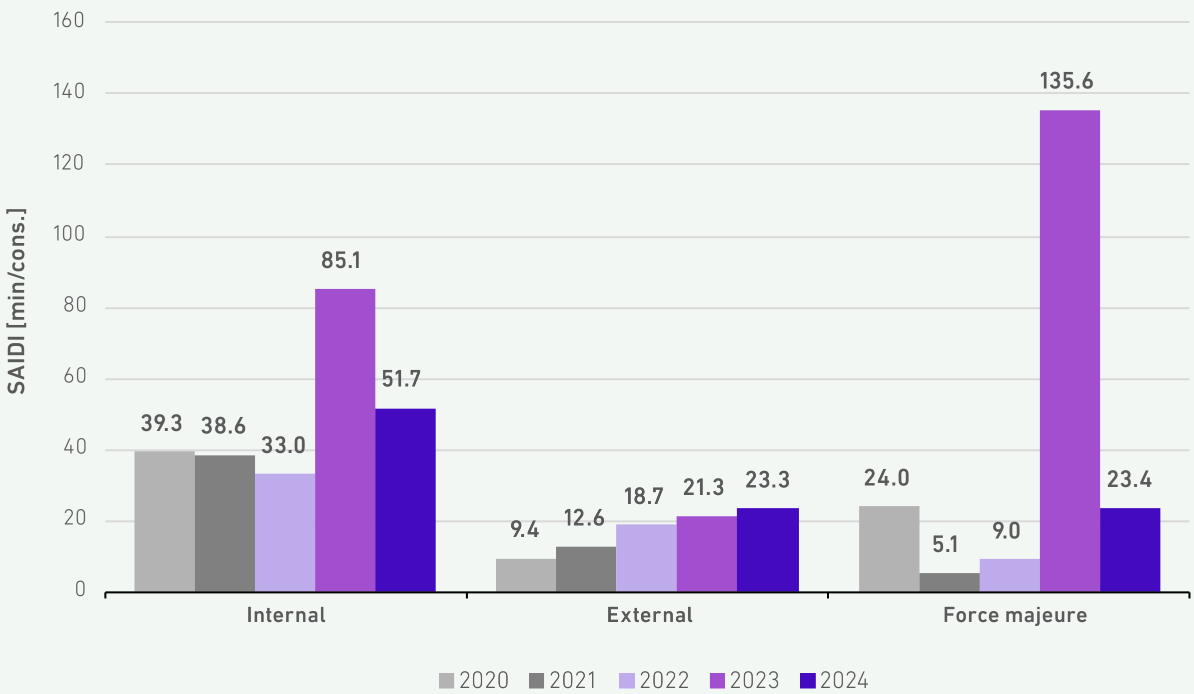
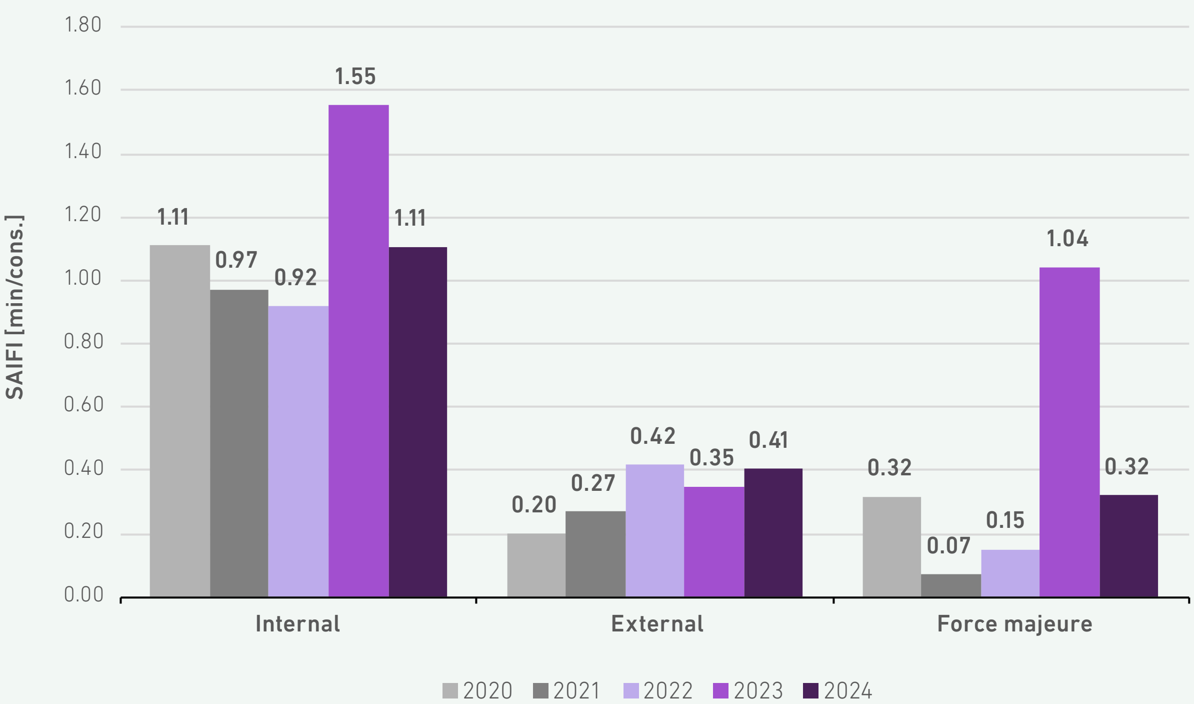
FIGURE 37: SAIDI FOR UNPLANNED LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2020–2024 PERIOD



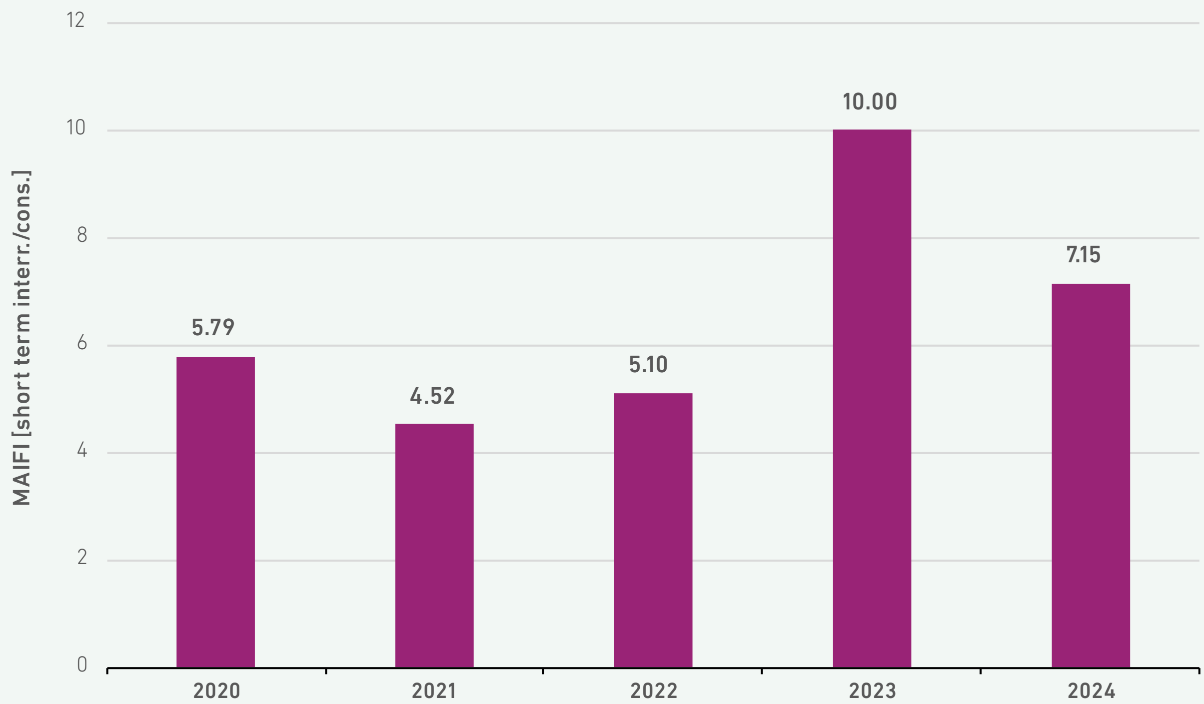
SOURCE: ENERGY AGENCY

FIGURE 38: SAIFI FOR UNPLANNED LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

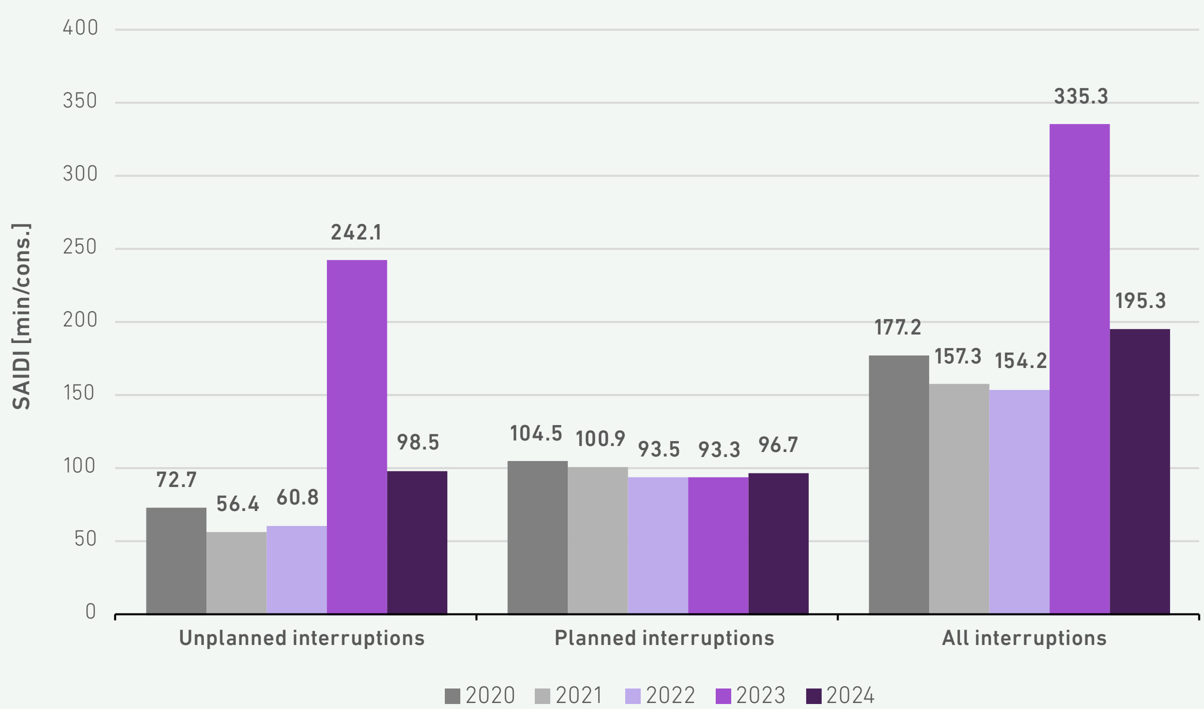
FIGURE 39: MAIFI IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

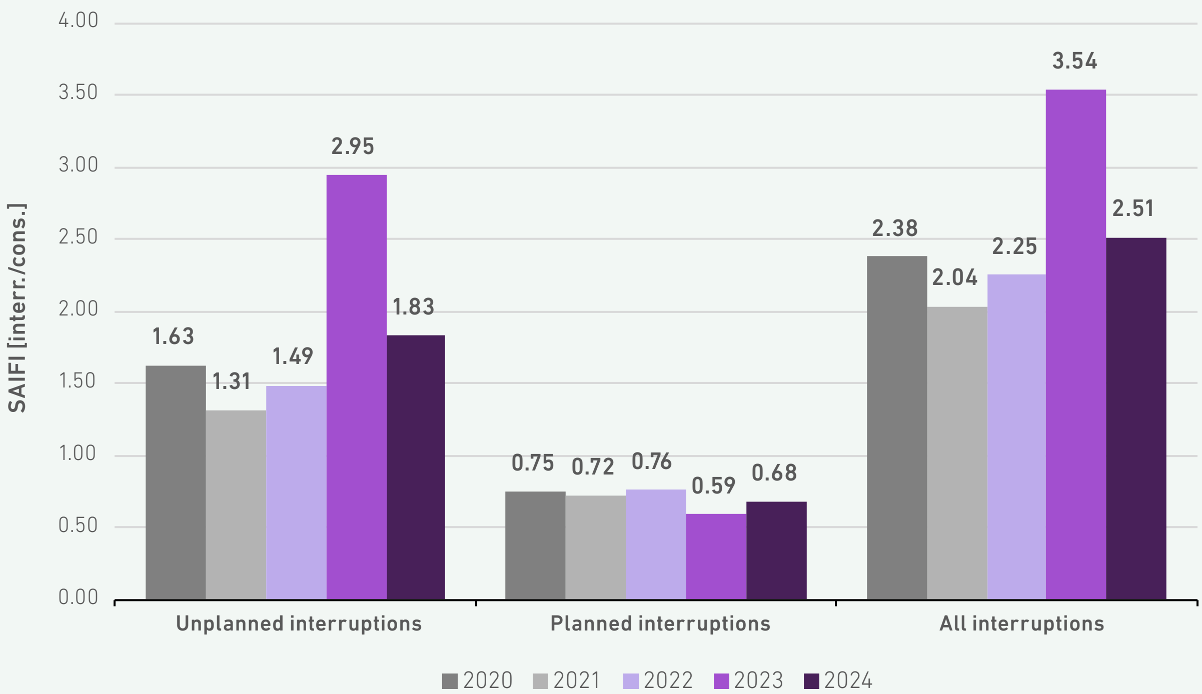
Figures 40 in 41 show the aggregate value for the SAIDI and SAIFI indicators for unplanned, planned, and all interruptions in Slovenia in the 2020–2024 period.

FIGURE 40: SAIDI FOR ALL LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

FIGURE 41: SAIFI FOR ALL LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

Commercial Quality

The required level of commercial quality is determined by the system 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., payment of compensation to the consumer concerned. On the basis of system standards, a consumer can expect a certain quality level, as these standards indicate the average level of service quality or the share of all customers provided with the required service quality.

In 2024, compensation was paid to five consumer for a breach of guaranteed standards regarding the time taken to correct non-compliance in terms of the supply voltage deviations. Based on the three-year trend of commercial quality parameters, we conclude that the level of commercial quality has generally remained steady, except in the area of by connection-related services.

The level of the commercial quality of services in the area of connection-related services is falling, largely due to delays in connection approvals for self-supply devices

Table 19 shows the ranges (minimum and maximum values) of the commercial quality parameters for the 2022–2024 period.

TABLE 19: RANGE OF THE COMMERCIAL QUALITY INDICATORS IN THE 2022–2024 PERIOD

Commercial quality parameters	2022		2023		2024	
	Min.	Max.	Min.	Max.	Min.	Max.
Connection-related services						
Average time to issue an approval for connection (days)	18.2	36.7	21.2	68.1	22.1	62.8
Average time to issue a cost estimate or pro forma invoice for simple works (days)	2.8	7.7	2.4	7.2	2.8	6.6
Average time to issue a contract for connection to the LV system (days)	4.3	22.6	4.3	12.5	3.4	10.9
Average time to activate a connection to the system (days)	1.7	7.3	2.5	19.3	2.4	32.1
Customer service						
Average response time to consumers' written questions, complaints, or enquiries (days)	1.7	3.8	0.5	5.2	1.9	6.4
Average hold time in the call centre (s)	5.0	87.9	5.0	107.8	7.0	150.2
Call centre performance indicator (%)	83.0	94.5	86.8	90.8	74.0	93.1
Technical services						
Average time to restore supply following a failure of a current limiting device (06:00 - 22:00)	1.1	2.2	0.8	2.0	0.8	2.6
Average time to restore supply following a failure of a current limiting device (22:00 - 06:00)	1.0	2.0	1.4	2.1	0.8	2.5
Average response time to voltage quality complaints (days)	14.1	25.1	11.9	27.6	9.9	28.7
Average time to resolve voltage quality inconsistencies (months)	0.8	29.3	0.2	32.5	0.4	23.0
Metering and billing						
Average time to remedy meter failures (days)	1.4	5.6	1.1	20.5	2.9	9.1
Average time to restore supply following disconnection due to non-payment (hours)	0.1	6.3	0.1	0.3	0.1	0.2

SOURCE: ENERGY AGENCY

The most common reasons for complaints are delays in the granting of connection consent, which are mostly related to the connection of self-supply devices (down compared to 2023), and exceeding the maximum time to rectification of supply voltage deviation discrepancies, both of which have been the most common reasons for complaints in the past. However, while the overall number of complaints has decreased, the overall share of justified complaints has increased in 2024 compared to 2023. The data on commercial quality complaints for the 2022–2024 period are summarised in Table 20.

Increase in the total share of justified complaints compared to 2023

TABLE 20: NUMBER AND SHARES OF JUSTIFIED COMMERCIAL QUALITY COMPLAINTS IN THE 2022–2024 PERIOD

Reason for complaint	Total number of complaints			Number of justified complaints			Share of justified complaints		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
Connection activations									
Exceeding the time to activate the connection to the system	1	6	2	1	5	2	100%	83.30%	100%
Inadvertent disconnection due to an error by the maintenance crew	0	1	4	0	1	3	-	100%	75%
Quality of supply									
Exceeding the maximum time to resolve voltage quality deviations	22	25	26	11	21	12	50%	84%	46.15%
Exceeding the time limit to respond to a voltage quality complaint	4	3	1	3	3	1	75%	100%	100%
Exceeding the maximum permitted duration and number of unplanned long-term interruptions (applies only to end- consumers on the MV system)	0	0	0	0	0	0	-	-	-
Metering									
Delay in repairing a meter malfunction	86	16	2	3	0	0	3.50%	0%	0%
Billing, invoicing and debt collection									
Delay in responding to consumers' written questions, complaints, or enquiries	25	19	28	8	7	11	32%	36.80%	39.29%
Connection-related services									
Delay in issuing a connection approval	50	531	398	40	83	232	80%	15.60%	100%
Consumer services									
Failure to notify consumers about a planned interruption in time	5	5	20	0	0	2	0%	0%	10%
TOTAL	**193**	**606**	**481**	**66**	**120**	**263**	**34.2%**	**19.8%**	**54.7%**

SOURCE: ENERGY AGENCY

In 2024, CDSs continued to monitor commercial quality. Due to greater system rigidity and a relatively low number of consumers, CDSs did not receive any consumer complaints relating to commercial quality.

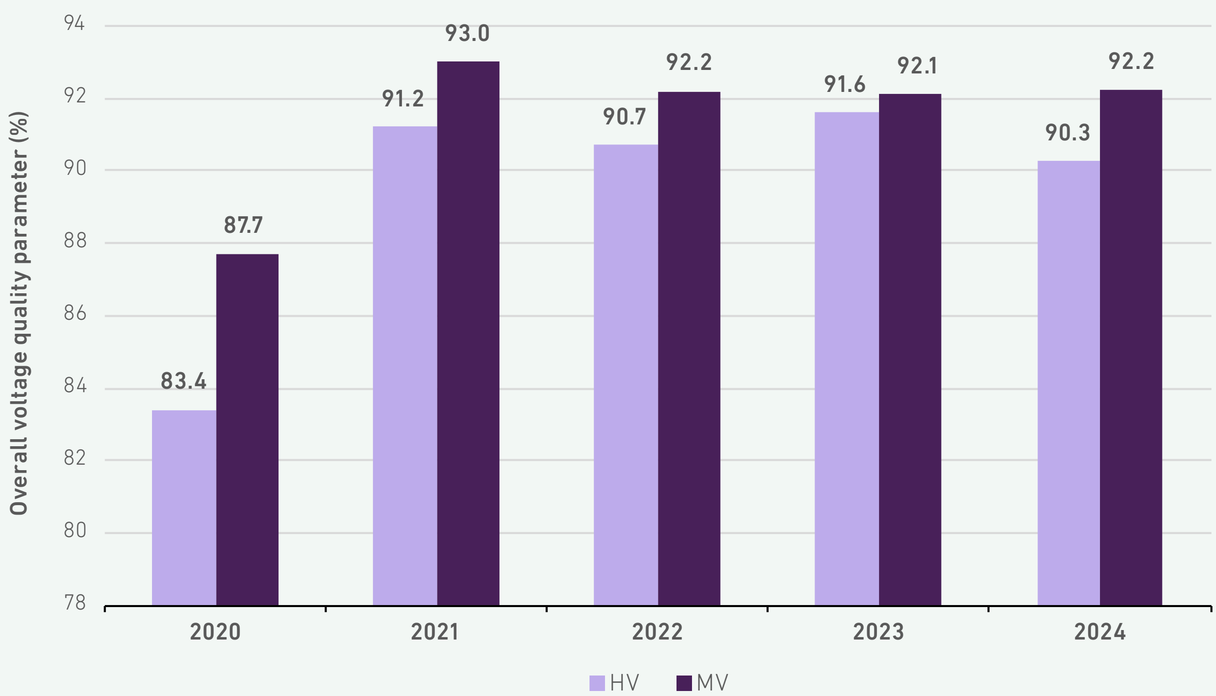
Voltage Quality

Increase in the share of justified complaints about voltage quality

The two system operators and the distribution companies are required to perform regular monitoring at the border of the transmission and distribution networks, as well as at delivery points for larger users. Additionally, periodic monitoring is conducted according to a predefined schedule. When addressing a consumer's complaint, the voltage quality is monitored for at least one week. The voltage quality is also monitored as part of the procedure for issuing connection approvals, before connecting a new consumer.

Based on 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 complied with the requirements of the technical standard. Figure 42 shows the overall voltage quality parameter for the 2020–2024 period.

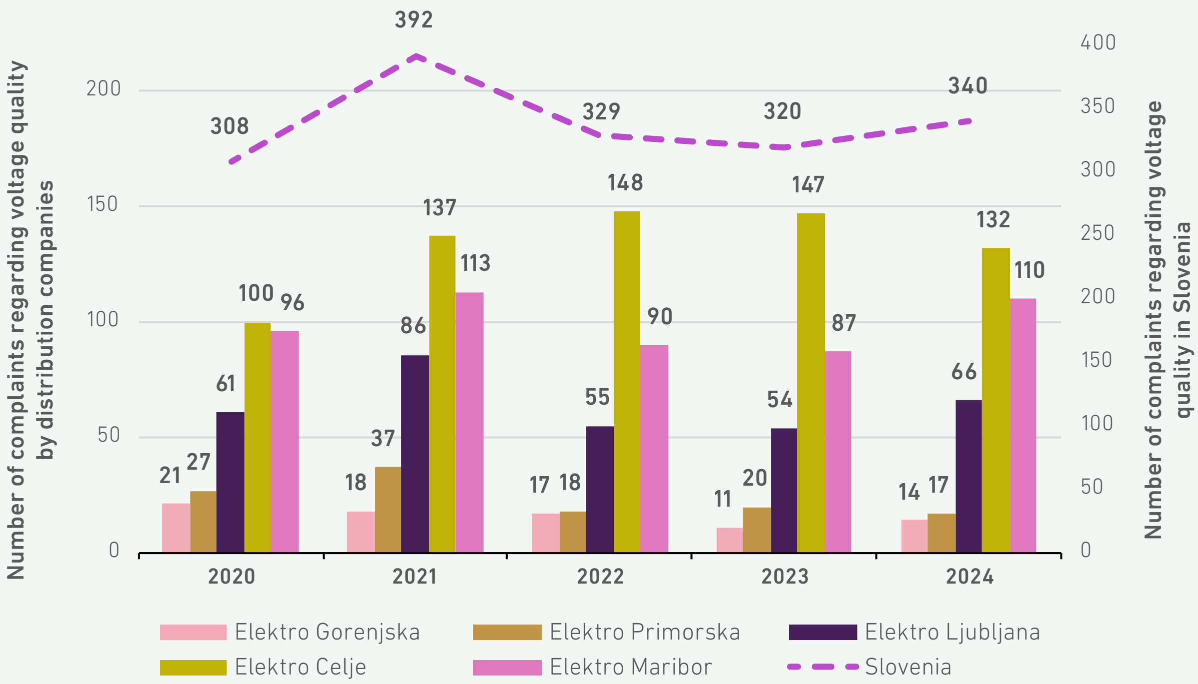
FIGURE 42: THE OVERALL VOLTAGE QUALITY PARAMETER BY INDIVIDUAL VOLTAGE LEVEL IN THE DISTRIBUTION SYSTEM OVER THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

Figure 43 shows separately the trend in the number of voltage quality complaints per distribution company and for Slovenia as a whole, which has slightly increased in 2024 and correlates with the overall voltage quality status parameter for the MV network in Figure 42.

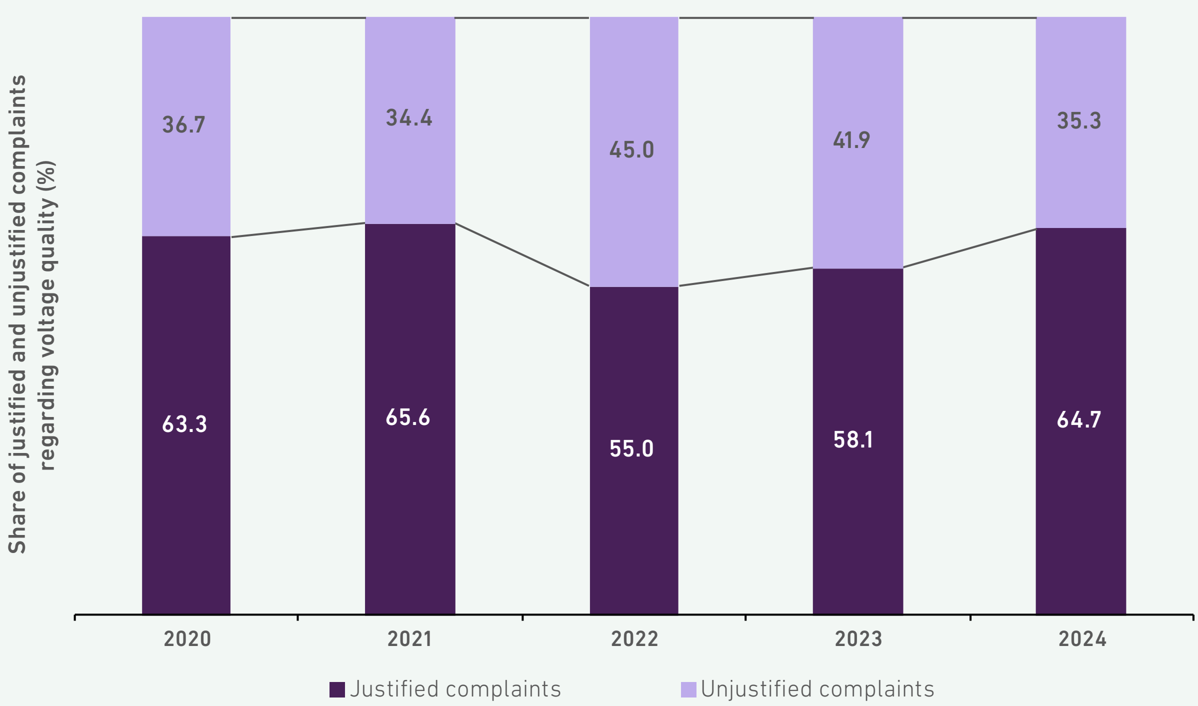
FIGURE 43: NUMBER OF COMPLAINTS REGARDING VOLTAGE QUALITY BY DISTRIBUTION COMPANIES AND IN SLOVENIA IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

In 2024, with the increase in the total number of complaints related to voltage quality, the number of justified complaints also increased, as shown in Figure 44.

FIGURE 44: SHARE OF JUSTIFIED AND UNJUSTIFIED VOLTAGE QUALITY COMPLAINTS IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

ELES carried out the continuous monitoring of voltage quality in the high-voltage network at 196 connection points between the distribution system, producers and direct consumers. Similar to previous years, there have been repeated breaches of standards due to the occurrence of flicker. Non-compliance with the standard for flicker was detected at 126 measuring points, where the long-term flicker stayed above 1 for at least one week, with an average out-of-compliance period of 10.3 weeks per individual non-compliant measuring point. No other breaches of voltage quality compliance were observed in the transmission system.

In 2024, voltage quality monitoring according to the standard was also conducted by CDS operators, who recorded no complaints related to voltage quality.

Multi-Year Development of the Electricity Network

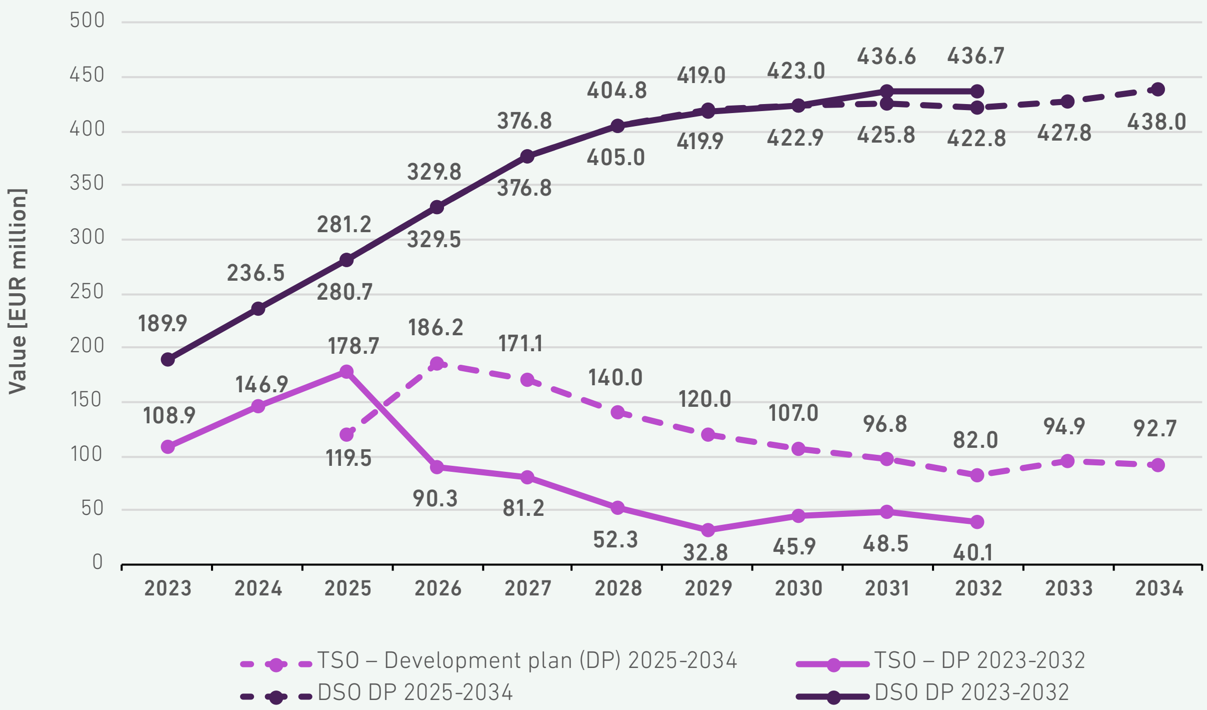
The operator of the combined electricity transmission and distribution system must prepare 10-year development plans for the electricity transmission and distribution system every second year and obtain the Energy Agency's approval for them. The plans must be developmentally coordinated and take into account national strategic orientations in the energy field. In its planning, the electricity operator applies a prescribed uniform methodology that takes into account long-term consumption forecasts, analyses of expected operating conditions, the degree of reliability of supply to customers, economic analyses, as well as the possible location of new generation sources. The development plan must be based on existing and projected supply and demand, and the electricity operator is obliged to take into account the national energy and climate objectives set out in the NEPN when drawing up the development plan and, in the event of changes to the NEPN, must test the consistency of the development plan within nine months and amend or supplement it as necessary.

The starting point for planning in the transmission system development plan is an analysis of the current situation in the transmission system. The development plan shall include an assessment of the potential for increasing the energy efficiency of the electricity infrastructure through load balancing, as well as an analysis of the coverage of consumption by generation resources and the adequacy of generation resources and an assessment of the need for transmission capacity, which shall form the basis for defining the time dynamics of the planned investments and their financial evaluation.

In the development plan for the distribution system, the operator shall analyse the period of the previous development plan, analyse electricity and power consumption forecasts and prepare a distribution infrastructure investment plan for the whole country, which shall also be financially evaluated, giving priority to measures to increase the energy efficiency of the existing electricity infrastructure using load balancing and demand response and the purchase of system services.

In its development plans for the period 2023–2032, the electricity operator has taken into account, among other things, the scenarios for the transition to a low-carbon society set out in the NEPN and the related investments needed in electricity infrastructure, which are valued at EUR 825.6 million for the transmission system and at more than EUR 3.5 billion for the distribution system over the ten-year development plan period.

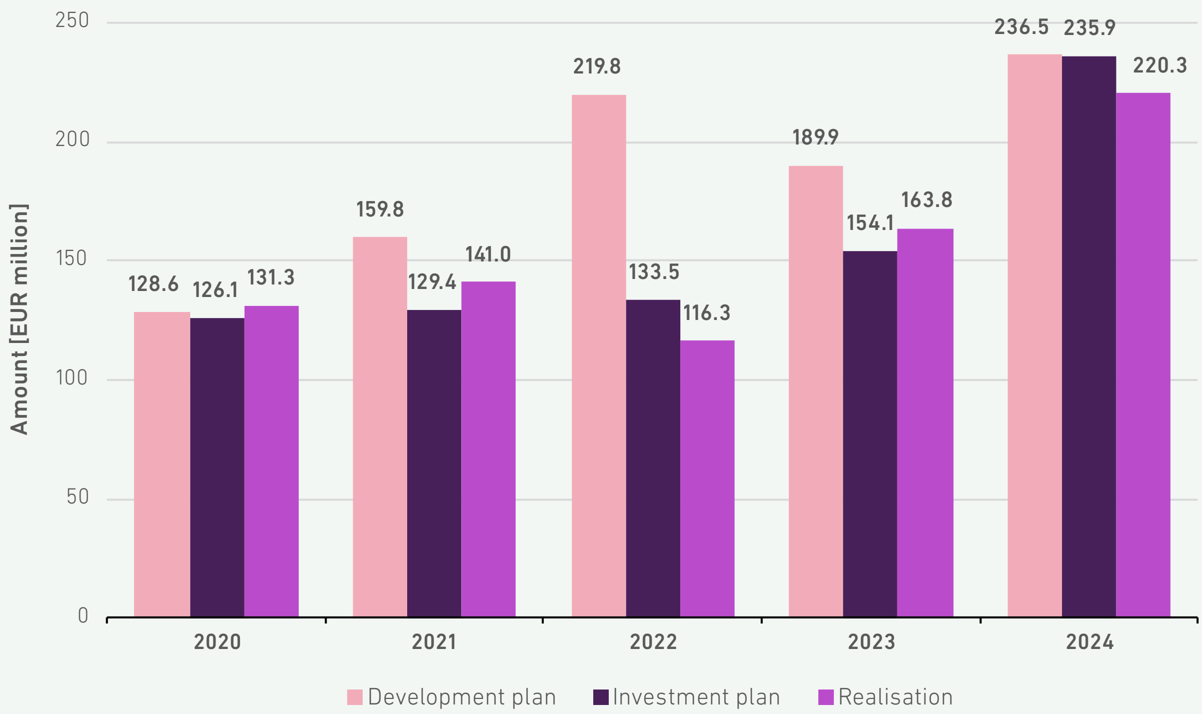
FIGURE 45: ASSESSMENT OF INVESTMENT PLANS FROM THE DEVELOPMENT PLANS OF ELECTRICITY OPERATORS FOR THE PERIOD 2023–2032 AND COMPARISON WITH THE NEW DEVELOPMENT PLAN FOR THE 2025–2034 PERIOD



SOURCE: ELES

A comparison of the distribution operator's development plan for the period 2023–2032 with the new development plan (Figure 45) for the period 2025–2034 reveals a very good alignment of planning, with a slight divergence between the two development plans only after 2030. The situation is different for the two transmission system development plans, where there is a shift in investments and, in addition, a significant increase in investment values.

FIGURE 46: COMPARISON OF THE AMOUNTS IN THE DEVELOPMENT AND INVESTMENT PLANS FOR THE ELECTRICITY DISTRIBUTION SYSTEM ALONG WITH THE REALISATION

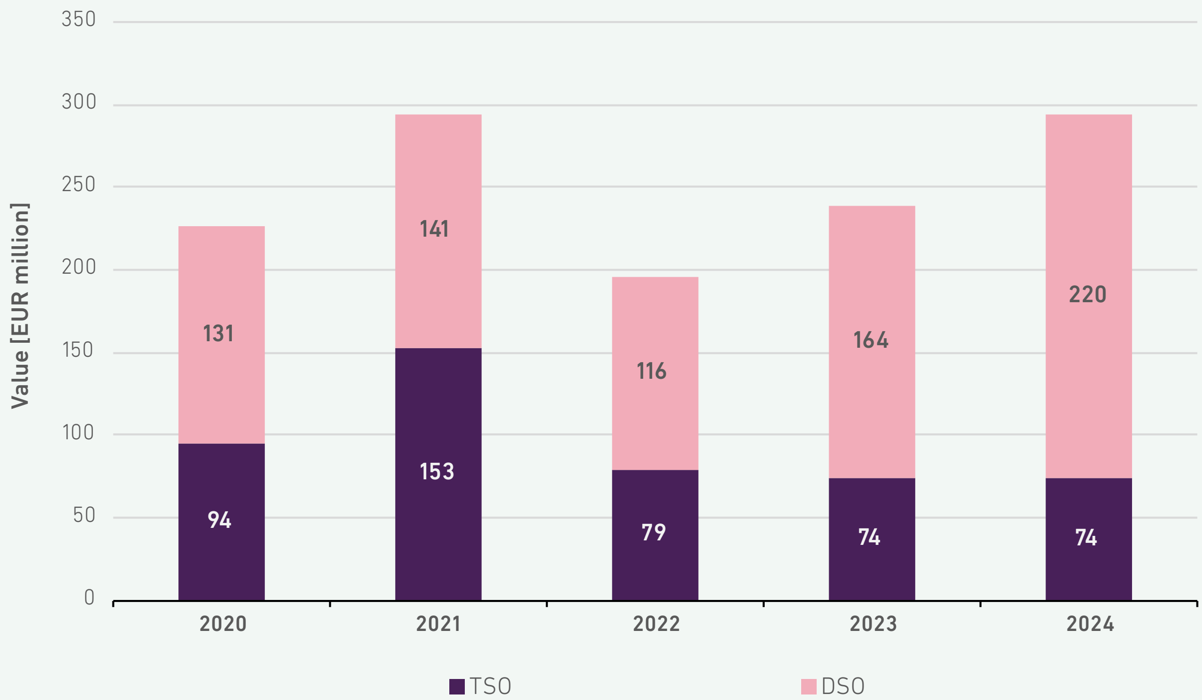


SOURCES: ELES, ELECTRICITY DISTRIBUTION COMPANIES

Supervision Over the Implementation of Electricity System Operators' Development Plans

For the transmission system, the operator allocated EUR 73.7 million for investments in 2024, which is just over 50% of the resources foreseen in the regulatory framework or the development plan. Of this, EUR 19.6 million was for new investments, EUR 45 million for reconstructions and EUR 9.1 million for other commercially necessary investments. Network investments accounted for the largest share, at 81.51%, followed by investments in other commercially necessary assets at 12.3%, and investments in smart grids at 3.1%. The remainder was in the areas of operations, secondary equipment and telecommunications. Among new constructions, investments in the 110 kV Koper-Izola-Lucija transmission and cable line connection, amounting to EUR 7.1 million, the new building and secondary equipment at DTS Maribor, amounting to EUR 5.9 million, and the investment in DTS Lucija, amounting to EUR 1.4 million, stand out in terms of value. Among the reconstructions, the most significant investments are the renewal of the transmission line connections DV 2x110 kV Divača-Pivka-Ilirska Bistrica for almost EUR 14.7 million, DV 110 kV Hudo-Kočevje for EUR 7.3 million and DV 2x110 kV Gorica-Divača for EUR 7.2 million, as well as the replacement of a 400/110 kV transformer and the installation of a 110/20 kV transformer for captive use at DTS Maribor for EUR 4.6 million.

FIGURE 47: TRANSMISSION SYSTEM OPERATOR AND DISTRIBUTION SYSTEM OPERATOR INVESTMENTS FOR THE 2020–2024 PERIOD



SOURCES: ELES, ELECTRICITY DISTRIBUTION COMPANIES

For the activity of the distribution system operator, the operator and the distribution system owners have allocated EUR 220.3 million for investments in 2024, which is 6.6% less than planned in the regulatory framework and 6.8% less than foreseen in the development plan. Of this, EUR 113.4 million was allocated to new investments, EUR 87.6 million to reconstructions, and EUR 19.3 million to other commercially necessary investments. In terms of voltage level, the largest share of investments, at 41.1%, was made in the medium voltage network, followed by 27.3% in the low voltage network and 13.4% in the high voltage network. The remainder is accounted for by investments in secondary equipment, which comprise 9.4% of the total, and other commercially necessary investments. In 2024, the highest-ever investment in the distribution system in terms of value is recorded, but this does not necessarily translate into a proportionally higher level of investment in physical terms, as this is also an area where operators are facing a significant increase in the prices of materials and services for the construction of the electricity infrastructure. Notwithstanding the variations in realisation, 2024 shows the highest consistency between the realisation of the development plan and the investment plan in recent years (Figure 46).

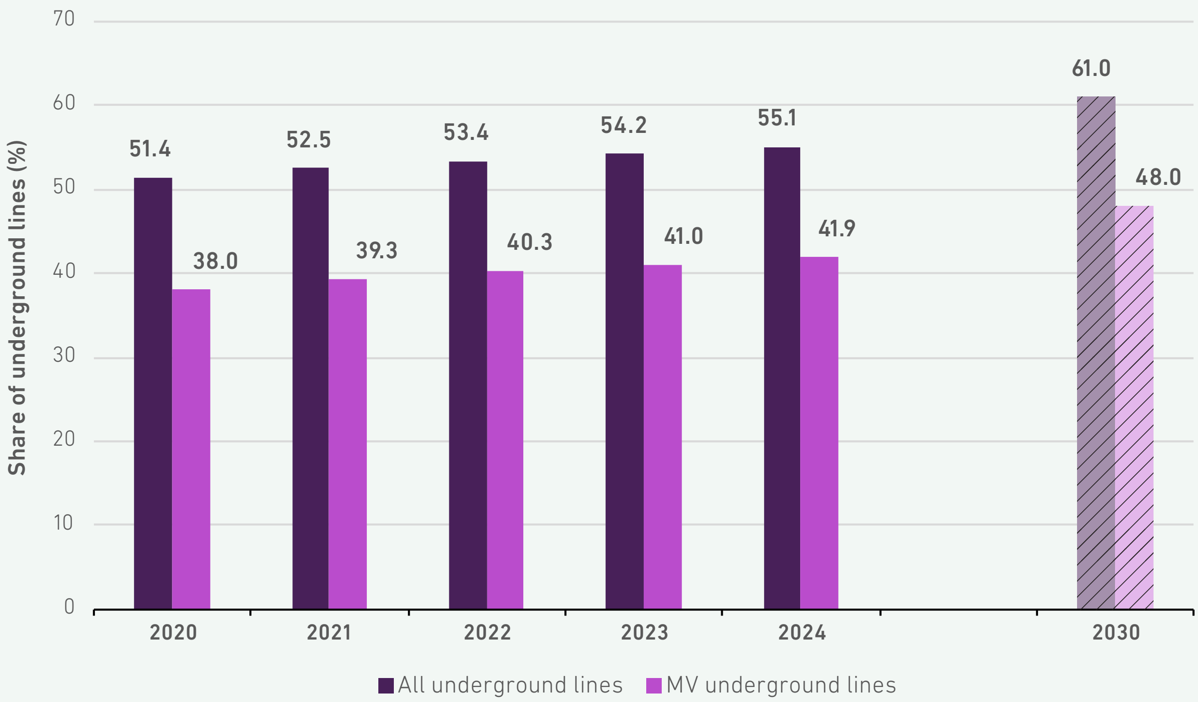
The highest realisation in terms of value

The growth of the share of underground lines in the distribution system slows down to only 0.9 percentage points in 2024

- **increasing deviation from the target in the NEPN**

The share of underground lines in the distribution system has been increasing at an average annual rate of around 1.0% in recent years, reaching 55.1% of all distribution lines at the end of 2024, or 41.9% if only MV distribution lines are considered. However, the growth in the share of underground lines has slowed slightly in recent years and remains at 0.9 percentage points in 2024, for both the share of all underground lines and the share of MV underground lines. Assuming such growth over the next period, electricity distribution companies are moving further and further away from the target of at least 50% of MV underground lines envisaged by the NEPN to increase the resilience of the electricity distribution network.

FIGURE 48: GROWTH IN THE SHARE OF UNDERGROUND DISTRIBUTION LINES IN THE 2020–2024 PERIOD AND THE PROJECTION FOR 2030



SOURCES: ENERGY AGENCY, ELES, ELECTRICITY DISTRIBUTION COMPANIES

TABLE 21: TRANSMISSION AND DISTRIBUTION ELECTRICITY INFRASTRUCTURE IN SLOVENIA AT THE END OF 2024

Transmission system	
400 kV lines	828 km
220 kV lines	328 km
110 kV lines	2,004 km
HV/HV DTS	8
110 kV DS	1
Distribution system	
110 kV lines	892 km
35 kV, 20 kV, 10 kV lines	18,771 km
0.4 kV lines	46,588 km
110 kV/MV DTS	97
MV/MV	7
MV DS	76
MV/LV TS	18,794

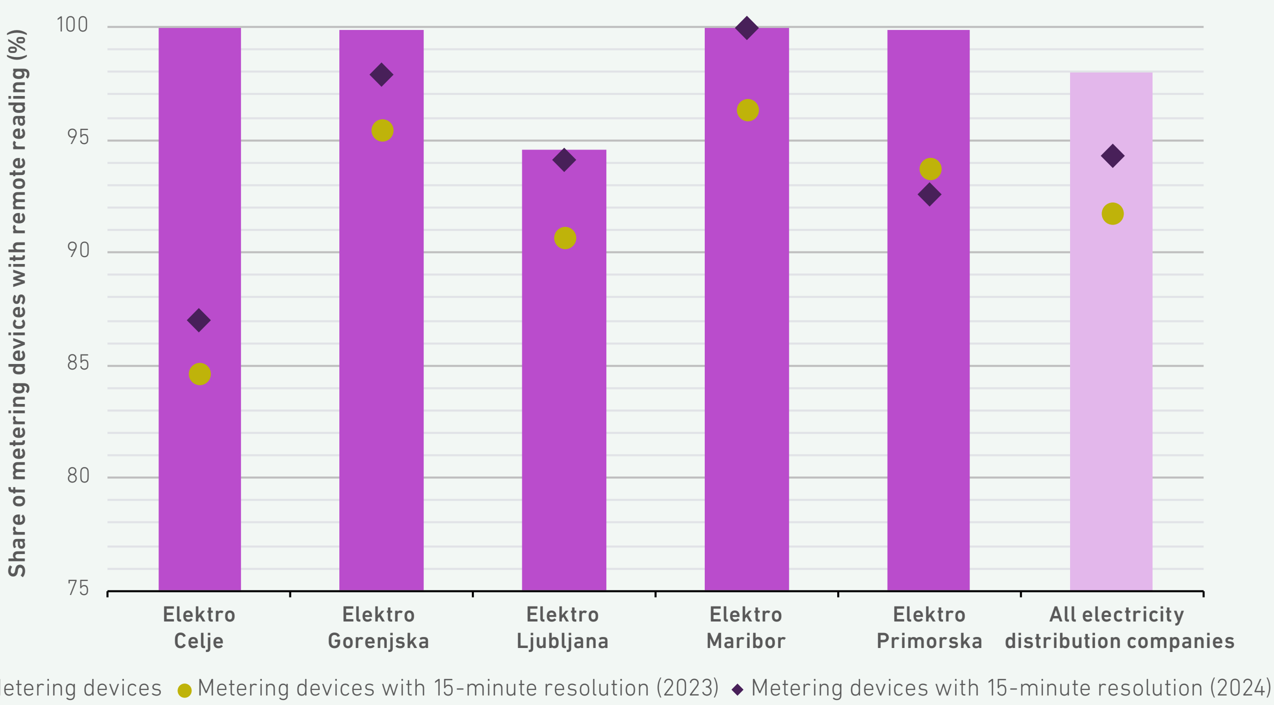
SOURCES: ELES, ELECTRICITY DISTRIBUTION COMPANIES

Development of the Advanced Metering System in Slovenia

Slovenia is among the leading European countries in the installation of advanced metering. By the end of 2024, 96.7% of consumers on the distribution system were equipped with advanced metering devices, and 94.8% of them were connected to remote metering data acquisition systems. Of these, about 94.3% are capable of capturing detailed metering data with 15-minute resolution or are already compliant with the revised net metering methodology. The percentage of smart meters that do not yet allow 15-minute measurements is already negligible for certain electricity distribution companies, with a maximum variation of 13% (Figure 49).

96.7% of consumers on the distribution system equipped with advanced metering devices

FIGURE 49: SHARE OF METERING DEVICES WITH REMOTE READING CAPABILITIES AND 15-MINUTE RESOLUTION (INCLUDING AMR)



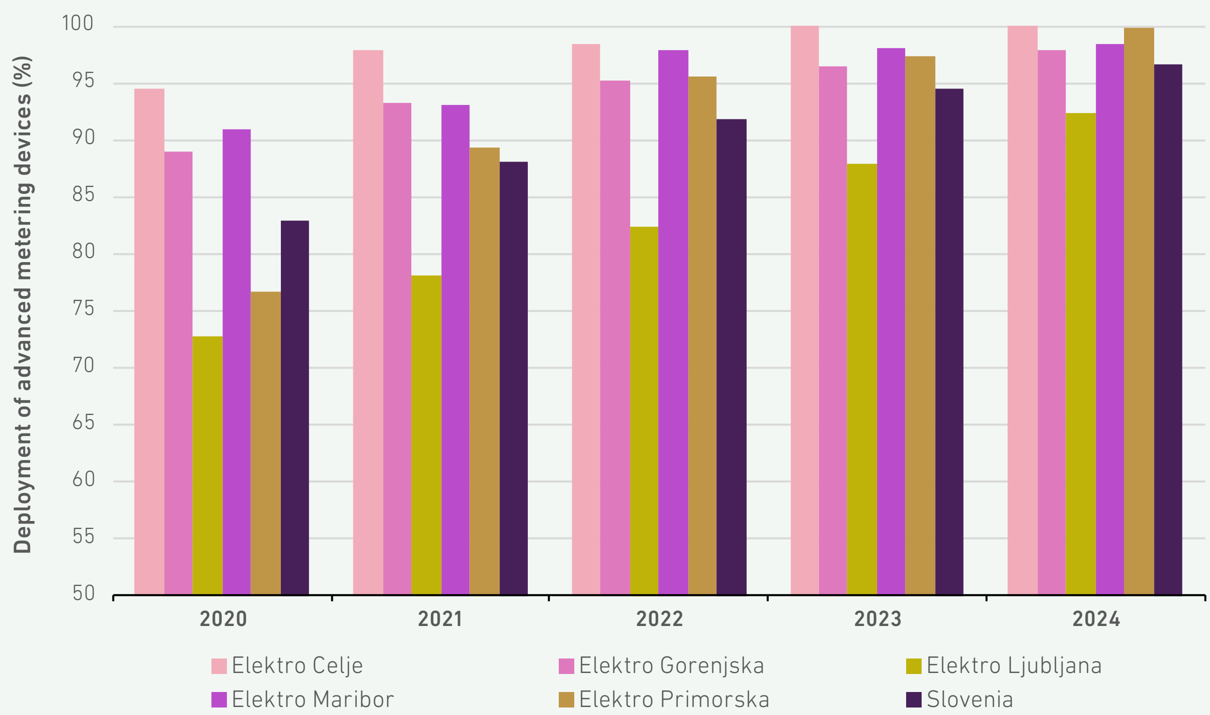
SOURCE: ELES

More than half of the metering devices with a 15-minute reading resolution (55.79%) are equipped with a dedicated local I1 interface, which enables the processing of detailed metering data in near real-time. This functionality is essential for advanced end-users involved in system and other advanced energy services. However, any active customer not provided with an I1 interface or not compliant with the regulatory framework for interoperability is entitled to a free replacement of the metering equipment with an appropriate one.

Embedded smart meters meet the requirements of the MID in the context of the requirements of the new network charging methodology.

The proactive implementation of measures to improve the quality of metering data by eliminating or limiting sources of end-customer interference affecting the communication paths or the transmission of metering data to the metering centres has contributed to the predictability of 15-minute metering (significantly less than 1% of customers switch between different billing methods, i.e. billing based on 15-minute metering data or not, every month).

FIGURE 50: TREND OF DEPLOYMENT OF ADVANCED METERING DEVICES IN THE 2020–2024 PERIOD



SOURCE: ELECTRICITY DISTRIBUTION COMPANIES

Development of Smart Grids and Deployment of New Technologies

Smart grid development in Slovenia is defined, in terms of substance, by the study Update of the national smart grid roadmap[8]. The study lists the key projects that, through the use of the technologies identified in the study, are expected to 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.

In 2024, the Energy Agency continued its activities on implementing performance regulation for smart grid investments based on a limited set of performance indicators (KPIs) at the system level. A second sampling of smart grid investment performance data, based on KPIs, was conducted in 2023 to fully prepare obliged entities for periodic reporting on an annual basis.

Second sampling of smart grid investment performance data based on KPIs carried out

The definitions of the indicators were harmonised based on the findings from sampling the available data for the calculation of the above indicators for the separate DSO and TSO roles of distribution companies and ELES. On this basis, the Energy Agency has prepared an update to the Act, outlining the methodology for establishing the regulatory framework for electricity operators, which also includes updates to the definitions for establishing the KPIs. As a result, the right conditions will be in place in 2025 for KPI-based regulation of smart grid investment performance to take off in the Slovenian environment. The incentive scheme complements the incentive schemes for smart grid investment projects and the incentive scheme for research and innovation projects. These schemes remain unchanged from the previous regulatory period and were presented in detail in the State of the Energy Sector in Slovenia 2020 Report. Appropriate limits are set for smart grid projects to prevent multiple financial incentives from being offered to deliver the same benefits.

The Energy Agency publishes on its website the applications for research and innovation projects, basic information on investment projects and reports on all projects it has qualified under its regulatory methodology, as well as monitoring of all qualified projects.

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

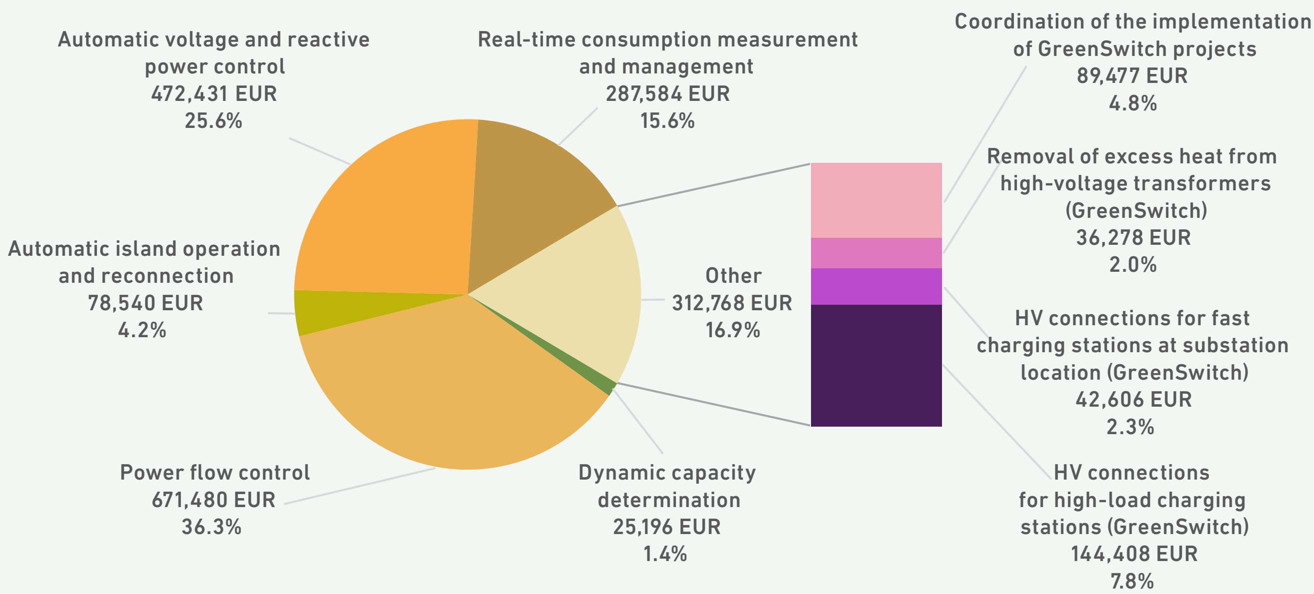
Smart Grid Investments

In 2024, the NEDO project was completed, and the Energy Agency received an application for the approval of smart grid incentives under the GreenSwitch investments, with a total value of EUR 146.2 million. The GreenSwitch project is classified as a Smart Grid Project of Common Interest (PCI) and is coordinated by ELES. It was presented in more detail in the Report of the Energy Sector in Slovenia 2023. Investment realisation data for 2024 is not available due to the accounting mechanism for deviations from the regulatory framework; therefore, all values below refer to 2023.

Reduced intensity of smart grid investments on the transmission network

The following figure 51 shows the structure of the TSO's investment realisation by individual smart grid functions. The total value of the TSO's investments in smart grids amounted to approximately EUR 1.85 million, which is 2.49% of the total realised investments. 54.6% of the investments are related to the launch of GreenSwitch activities. Compared to the previous year, a significant decrease in the intensity of the TSO's investments in smart grids can therefore be observed, with a comparable value of its total investments. In the future, the TSO can be expected to invest more in GreenSwitch activities.

FIGURE 51: STRUCTURE OF ELES' INVESTMENTS IN 2023 BY SMART GRID FUNCTIONS

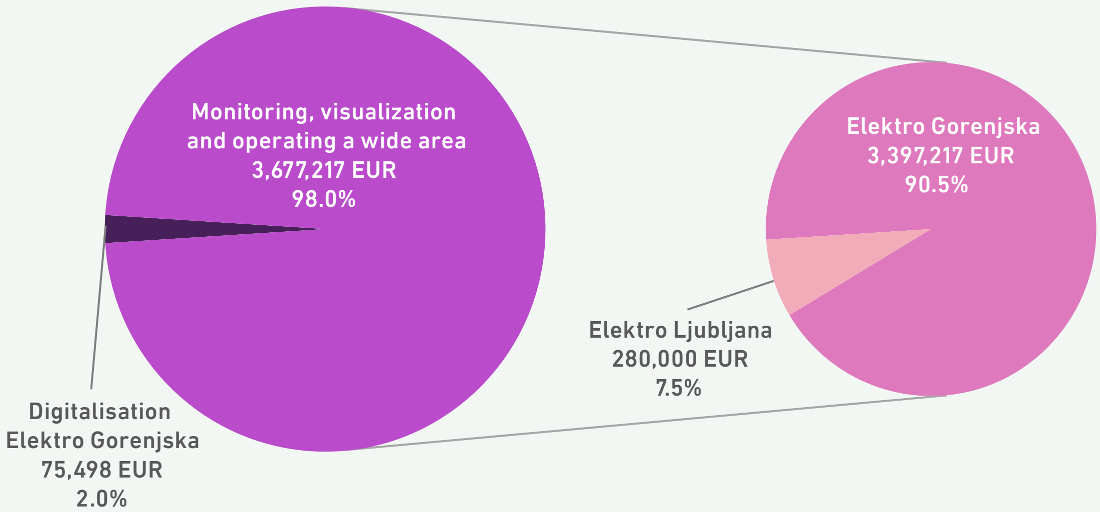


SOURCE: ENERGY AGENCY

Figure 52 shows the structure of distribution investment realisation by individual smart grid functions. The total value of smart grid investments amounted to approximately EUR 3.75 million, representing 2.29% of the total value of distribution investments, and includes investments by Elektro Gorenjska and Elektro Ljubljana, which are being implemented within the GreenSwitch project. The remaining companies did not report any smart grid investments in 2023. The launch of the GreenSwitch project has therefore led to an increase in distribution investments in smart grids. In the future, investments from this project can also be expected at Elektro Celje.

GreenSwitch has led to an increase in distribution activity in smart grid investments

FIGURE 52: STRUCTURE OF DISTRIBUTION INVESTMENTS IMPLEMENTATION IN 2024 BY SMART GRID FUNCTION



SOURCE: ENERGY AGENCY

Smart Grid Investment Incentive Scheme projects are eligible for implementation based on a project application submitted to the Energy Agency. The incentive is granted based on the project's qualification and an assessment of the associated assets mobilised, which must meet the definition of smart grids and smart energy infrastructure set out in the general act governing the methodology for establishing the regulatory framework. The Energy Agency grants the incentive based on an assessment of the actual activated assets of the qualifying smart grid project, as reported by the liable entities in the annual regulatory framework deviation accounting process. Figure 53 shows a comparison of the undepreciated value of activated assets in smart grid projects as of December 31 of each year for which an incentive is granted and the undepreciated value of smart grid assets for which regulated undertakings do not receive an incentive[9] or for which regulated undertakings have not applied to qualify a project for the smart grid investment incentive scheme. In 2023, ELES in the role of the TSO received an incentive for the activated assets related to the NEDO and SINCRO.GRID projects. On the distribution side, Elektro Gorenjska activated funds related to the GreenSwitch project and received an incentive for smart grid investments based on this project.

9 These projects are classified internally by companies as smart grid projects, but do not meet the formal requirements of the Energy Agency.

FIGURE 53: OVERVIEW OF THE CARRYING AMOUNT OF ACTIVATED SMART GRID ASSETS AS OF DECEMBER 31 OF EACH YEAR

SOURCE: ENERGY AGENCY

The data presented indicates that the GreenSwitch project has provided new impulse for smart grid investments. In addition to ELES, the project also includes Elektro Celje, Elektro Gorenjska, and Elektro Ljubljana. As project activities progress, investments are expected to intensify in the coming years on both the transmission and distribution sides of the grid.

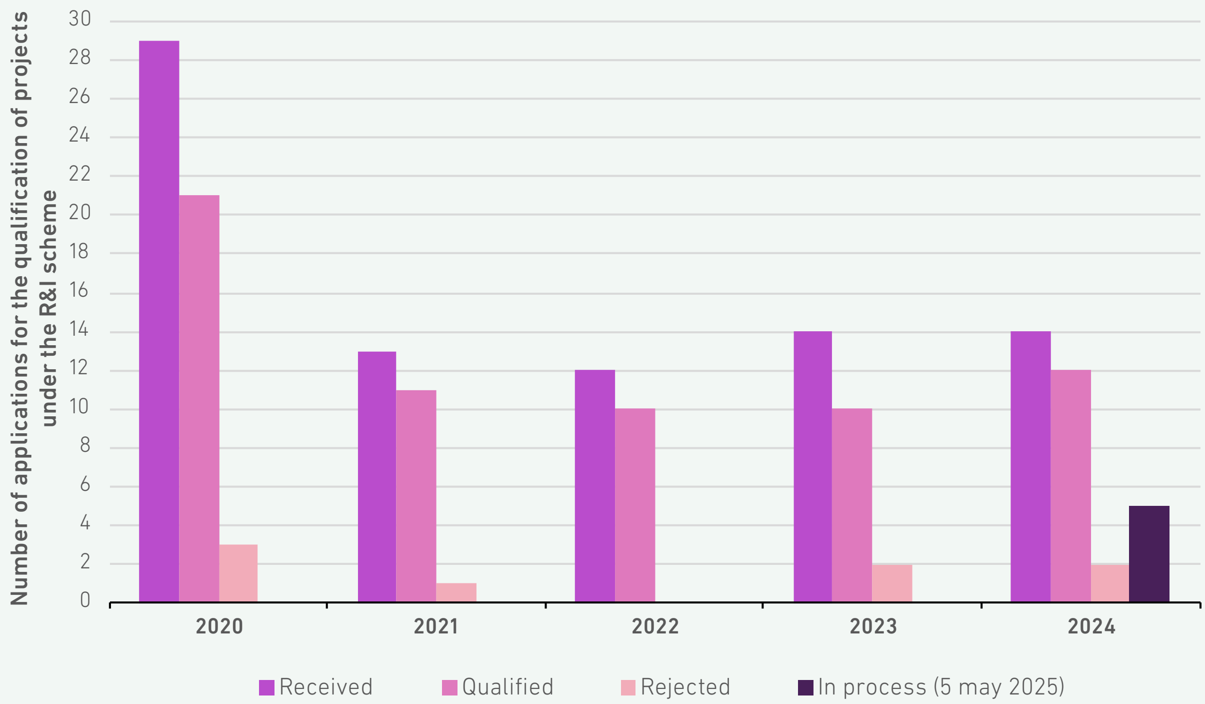
However, despite the renewed smart grid strategy, the remaining two distribution companies have not reported any smart grid investments. These investments also fall short of the levels outlined in the strategy, which in turn affects the pace of network development required to achieve the goals of the green transition.

Projects Included in the Research and Innovations Scheme

In 2024, the Energy Agency received 14 applications for qualification of projects under the Research and Innovation (RI) scheme, of which 12 projects were qualified and 12 projects were closed. At the end of 2024, five projects were still undergoing qualification. Figure 54 illustrates the number of applications for project qualification under the RI scheme by year.

12 projects qualified for the RI scheme

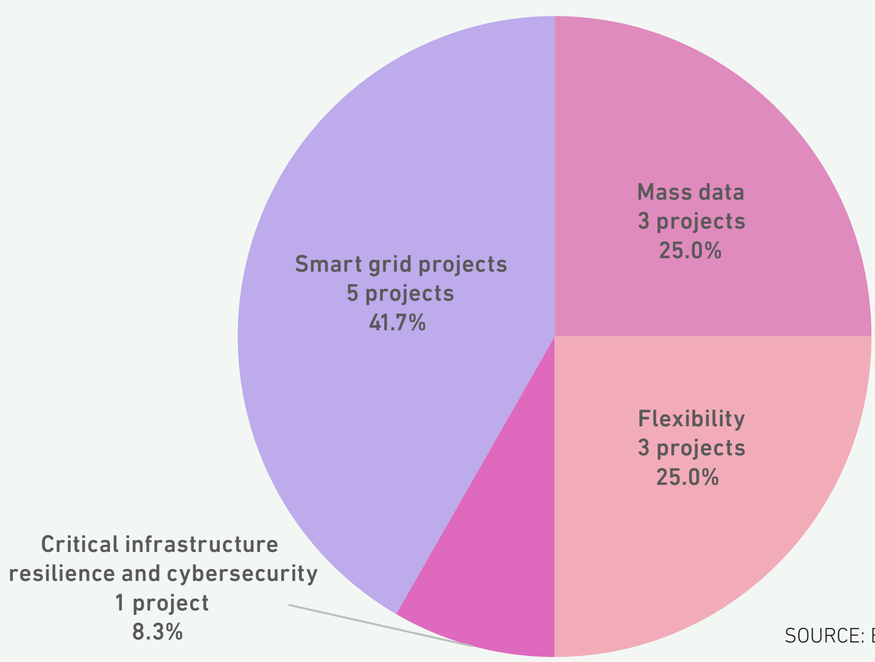
FIGURE 54: OVERVIEW OF THE NUMBER OF APPLICATIONS FOR THE QUALIFICATION OF PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME



SOURCE: ENERGY AGENCY

Figure 55 gives an overview of the main themes in 2024 of the qualified projects. Compared to the previous year, there is a notable increase in the share of projects focused on developing smart grids. The share of projects addressing resilience and utilising mass data for the benefit of the electricity system remains high. Unfortunately, the Energy Agency does not see a clear transfer of project results - even if they have proven to be efficient and useful - from the context of research and innovation schemes, which are usually limited to specific parts of the grid, to broader investment projects.

FIGURE 55: STRUCTURE OF THE MAIN TOPICS OF QUALIFIED PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME IN 2024



SOURCE: ENERGY AGENCY

RI cost realisation data for 2024 is not available due to the accounting mechanism for deviations from the regulatory framework; therefore, all values below refer to 2023.

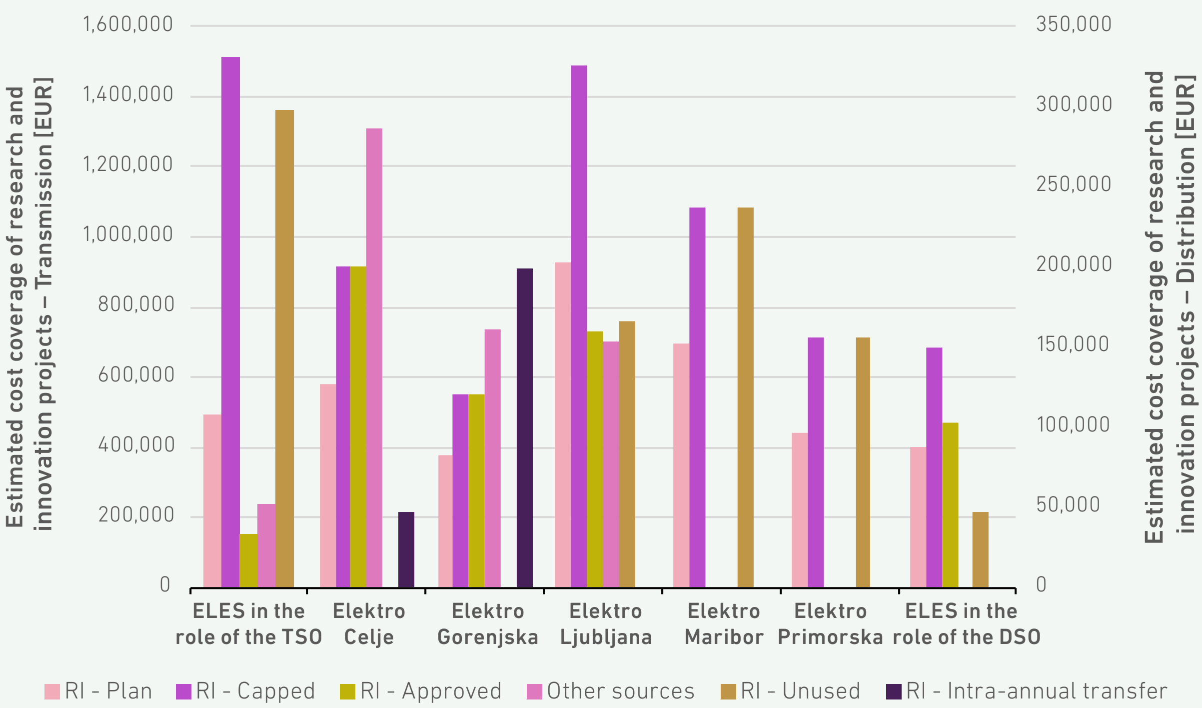
EUR 0.73 million for project activities under the RI scheme

In the 2023 regulatory framework year, the planned costs for implementing RI projects were set at 0.25% of the planned resources to cover eligible costs in 2022 (labelled »RI-Plan« in Figure 56). The cap on the total value of costs devoted to R&I for a given undertaking is set at 0.5% of the recognised resources to cover the undertaking's eligible costs (labelled »RI-Capped« in Figure 56). In 2023, ELES and the distribution companies carried out RI project activities covered by the RI scheme for a value of approximately EUR 0.73 million and by other sources for a value of approximately EUR 0.84 million (funds taken over free of charge from the Horizon Europe, ARIS, etc. programmes, labelled »Other sources« in Figure 56).

Compared to the previous year, the coverage of project activities by the RI scheme has increased, outpacing other sources. ELES, in its role as TSO, utilised only the RI scheme to cover the costs of its projects, without relying on other sources. Elektro Celje and Elektro Gorenjska exceeded the ceiling with realised costs. This indicates inadequate cost planning and means that costs exceeding the cap are carried over into the following year. Elektro Maribor and Elektro Primorska did not carry out project activities under the RI scheme.

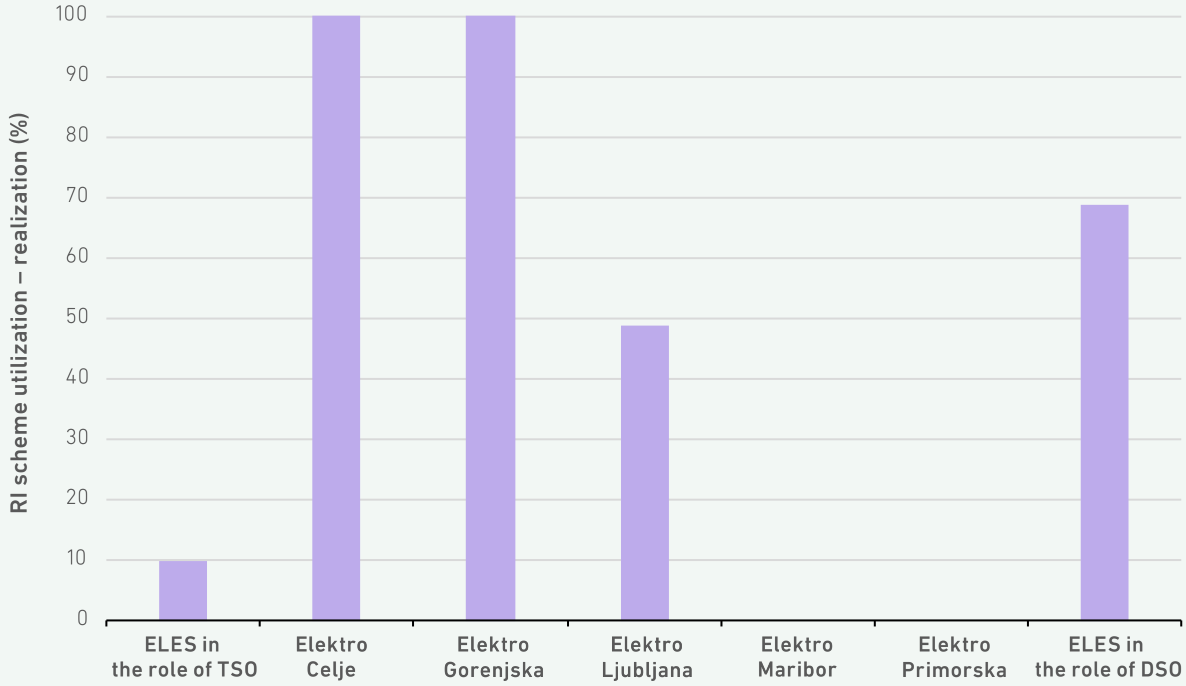
Figure 56 shows a comparison of the absolute value of planned, capped, realised and unused (labelled »RI-Unused« in Figure 56) costs from the RI scheme. In contrast, Figure 57 shows the utislisation rate of the RI scheme relative to the level of the cap mentioned above.

FIGURE 56: UTILISATION OF THE RI SCHEME BY INDIVIDUAL COMPANIES IN RELATION TO THE PLANNED VALUES FROM THE REGULATORY FRAMEWORK AND THE NON-REPAYABLE FUNDS OBTAINED FROM OTHER SOURCES



SOURCE: ENERGY AGENCY

FIGURE 57: SHARE OF RECOGNIZED RI COSTS BY INDIVIDUAL COMPANIES IN THE REGULATORY FRAMEWORK DEVIATION PROCEDURE IN RELATION TO THE CAPPED VALUE



SOURCE: ENERGY AGENCY

CYBERSECURITY OF THE POWER SYSTEM

In 2024, the electricity sector was standing at the crossroads of three disruptive dynamics: further electrification, accelerated digitalisation, and growing geopolitical and security tensions. While electrification remains a key strategy for meeting the EU's climate objectives, it also increases reliance on complex digital systems and distributed energy resources, thereby heightening exposure to cyber threats. As digital infrastructure becomes an integral part of critical energy systems, ensuring its security is as vital as safeguarding the reliability of physical supply. This is the backdrop for the updated set of threats and risks for 2024 (Figure 58) as outlined in key strategic documents, including the ENISA report Foresight Cybersecurity Threats for 2030 – Update 2024[10], the CEER report on cybersecurity, the SGTF Recommendations for a European Network Code on Cybersecurity, and global assessments such as the World Economic Forum's report[11] Global Cybersecurity Outlook 2024.

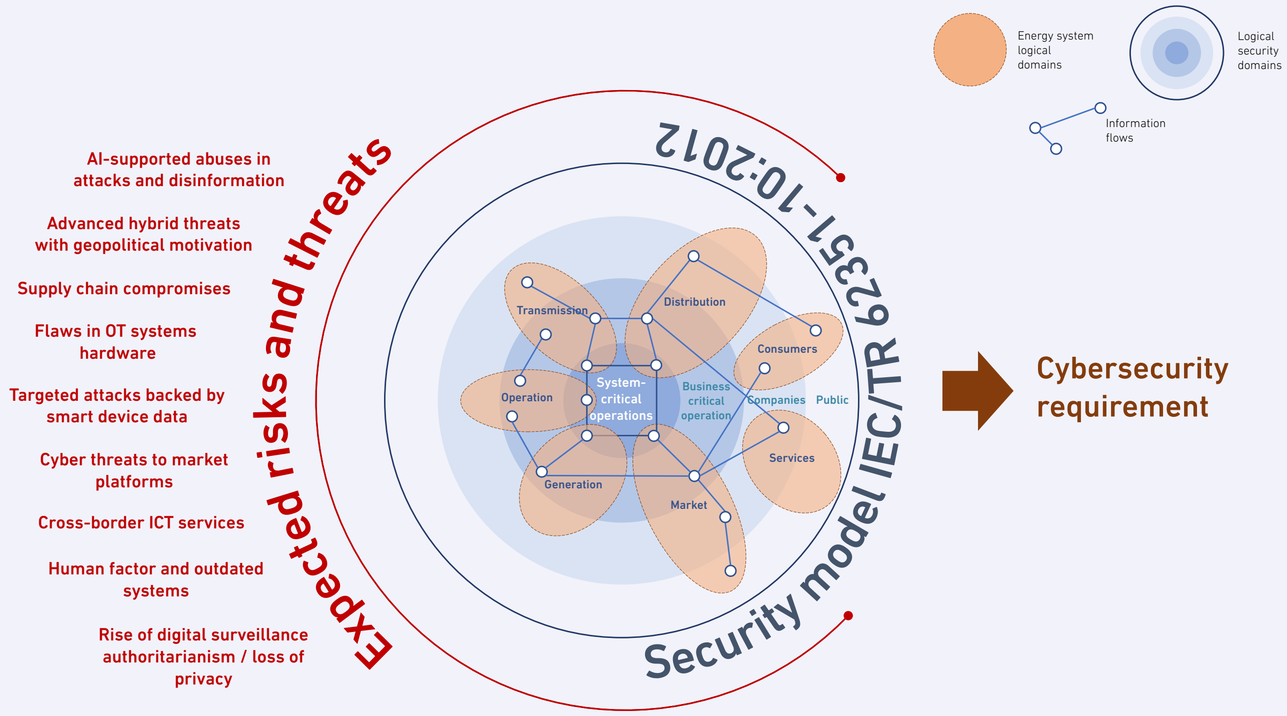
These sources consistently highlight seven overarching threats specific to the energy sector:

- Misuse of Artificial Intelligence (AI): Attacks using generative AI (e.g., spoofed[12] SCADA operators, orchestrated IoT attacks) can seriously compromise the reliability of monitoring and anomaly detection.
- Compromise of the software supply chain: Vulnerabilities in open-source components, small and medium-sized suppliers (SMEs), and integrated systems represent critical entry points for attacks.
- Shortage of human resources: EU regulators and ENISA emphasise a significant shortage of OT/IT security experts, which undermines the sector's ability to respond effectively.
- Hybrid threats and influence operations: Attacks involving both physical and digital components, often supported by disinformation, are on the rise - especially in the context of geopolitical tensions.
- Outdated systems and unpatched vulnerabilities: A large proportion of critical systems in the energy sector relies on outdated infrastructure (e.g., PLCs, RTUs), where security measures are often applied on an ad hoc basis

10 https://www.enisa.europa.eu/publications/foresight-cybersecurity-threats-for-2030-update-2024-executive-summary
11 https://www3.weforum.org/docs/WEF_Global_Cybersecurity_Outlook_2024.pdf
12 eng. »deepfake«

- Dependency on cross-border (cloud) ICT services: The centralisation of data services and cloud platforms creates vulnerabilities, where a single failure can compromise entire network segments.
- Loss of privacy and digital surveillance: Smart meters and other connected devices collect granular data that enable detailed profiling of users, requiring strict control of data flows and default compliance with GDPR provisions.

FIGURE 58: EXISTING RISKS AND THREATS



SOURCES: ENISA, CEER

At the EU level, the Cybersecurity Network Code (NCCS) was adopted in the first half of 2024, setting out technical and organisational measures to protect electricity networks and operationalising the requirements of Directive (EU) 2022/2555 (hereafter referred to as the NIS 2 Directive)[13]. The NCCS applies exclusively to electricity, while regulation for the gas sector is still under development - highlighting existing regulatory gaps. The year 2024 was also marked by an increase in targeted cyber-attacks on ICS/SCADA systems, confirming the assessment of the increasing vulnerability of decentralised and dispersed networks. In response, the European regulator ACER called for the establishment of crisis protocols coordinated between national authorities and operators.

In Slovenia, the Slovenian Government's Information Security Office (URSIV) plays a central role in cybersecurity. At the same time, the Energy Agency promotes awareness through the Slovenian Energy Security Forum (SEVF), which informs and connects stakeholders, and has continued to develop a system of indicators for assessing cyber-risk preparedness over the past year. Test sampling was repeated in 2024 using a modified EPRI methodology, which evaluates a measure of cyber threat preparedness and provides a basis for correlating investments, ISO 27002/27019 activities, and actual security events in the medium term.

Despite progress, challenges remain: coherence across sectors, standardisation of security practices and the creation of an effective European resilience architecture. At the forefront are the requirements for cybersecurity by design, recruiting and investing in staff, and building response capabilities, which will be key to the secure digital transformation of the sector.

13 Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (NIS 2 Directive)

Regulatory Aspects – Important Activities

In 2024, activities continued to cover the regulatory aspects of cybersecurity in the energy sector, as well as specific regulatory elements within the scope of national regulators. Within the scope of its tasks, the Energy Agency monitored investments in information security and, to this extent, the activities of mandatory public utility service providers in the area of information security and data protection, as well as the development aspects of this area. In addition, as part of the regular monitoring and reporting on the state of cybersecurity, the Energy Agency conducted a second pilot sampling of key indicators for cyber risk/threat preparedness, taking into account the principle of phasing in the planned regular reporting framework, as foreseen for 2025. The pilot sampling, similar to the first one, covered indicative tactical and operational indicators necessary for calculating the selected strategic indicators. As in the first trial sampling, the Energy Agency focused on the key strategic indicator on protection[14] (S^*_{PS}), limiting its calculation to the most weighted related indicators: the tactical indicator for the protection of edge points or network perimeter indicator (T^*_{NPPS}), tactical indicator for the protection of network endpoints (T^*_{EPS}), the tactical human resources activity indicator (T^*_{HSS}), the operational indicator of the average time between incidents (OI^*_{MTBI}), and their subordinate indicators.

Within the CEER Cybersecurity Working Group (CEER CS WS), the regulator participated in the process of monitoring the implementation of the Network Code for Cybersecurity in the Energy Sector (these activities are the subject of a separate section below) and in the preparation of the CEER Annual Report on Cybersecurity Activities in the Energy Sector. In the framework of ACER's REMIT Information Security Implementation Group (ACER RISIG), regulators have discussed risk assessment methodologies. They have also been active within the RISIG in assessing specific regulators' processes for enabling or extending access to REMIT data exchange. The Energy Agency has also been involved in other substantive coordination on REMIT data exchange between national regulators and external authorised stakeholders.

In the past year, some regulators, including the Energy Agency, have also actively participated in the international CIGRE WG 2.54, which addresses cybersecurity issues in the electricity sector, primarily from a regulatory perspective. WG 2.54 addresses how regulators and regulated entities worldwide approach the design, implementation, and evaluation of measures to strengthen the cybersecurity of critical energy infrastructure.

In the technical draft of the brochure, Slovenia is presented in the context of a case study prepared by the Energy Agency. It is one of 11 cases from different countries (e.g. Italy, USA, Brazil, India) that will be benchmarked to draw conclusions and recommendations of the Working Group.

Within the scope of cybersecurity in the NCCS, regulators have begun collaborating within the framework of the newly established ACER Cybersecurity Task Force. The Energy Agency has also joined the group.

Cyber Europe 2024 Excercise

ENISA Cyber Europe - the largest cyber exercise focused on the energy sector in the European area

In 2024, the electricity operator, distribution companies, and the Energy Agency actively participated in one of Europe's largest cybersecurity exercises, Cyber Europe 2024, organised by the European Cybersecurity Agency (ENISA). The primary objective of the exercise was to assess Member States' preparedness for complex, multi-sectoral cyber incidents and to evaluate the effective communication and coordinated response of key stakeholders under realistic conditions. The scenario of »table-top« exercise envisaged coordinated attacks on critical infrastructure - in particular on electricity systems - and simulated:

- SCADA and Operational Technology (OT) system disruptions,
- disinformation campaigns affecting public confidence in energy supply,
- parallel physical disruptions, which added to the complexity of the cyber challenges.

The exercise identified the energy sector as a key part of the national security infrastructure and as a primary target of attack. In cooperation with the operators performing service of public economic interest and the competent authorities, the following was verified:

- response protocols and communication between system operators, competent authorities and SI-CERT,
- real-time management of (simulated) incidents, including simultaneous IT and physical disruptions,
- internal decision-making and crisis management procedures, with a focus on ensuring continuity of supply.

14 The Strategic Indicator and its sub-indicators are discussed in more detail in the Report on the State of the Energy Sector in Slovenia 2023.

Key findings

The exercise revealed several challenges and opportunities for improvement:

Area	Challenges	Recommendations
Communication	Disunity among stakeholders	Establishment of permanent protocols
Technical response	Incomplete response procedures	Update of response plans
International consistency	Delays in data exchange	Strengthening cross-border contact points
Resilience of OT systems	Lack of realistic tests	Regular simulation of attacks on ICS[15]

Alongside these challenges, the exercise also highlighted the need to engage better decision-makers, who often lack access to timely information or tools to make quick decisions in cyber crises.

Participation in the Cyber Europe 2024 exercise confirmed the strategic importance of the energy sector for national cyber resilience. The exercise served as a valuable instrument for:

- Identify gaps in existing security practices,
- strengthening cross-sectoral and cross-border preparedness; and
- align national practices with European guidelines, in particular in the context of the implementation of the NIS 2 Directive.

The Network Code for Cybersecurity (NCCS)

In May 2024, Commission Delegated Regulation (EU) 2024/1366[16], was published in the Official Journal of the EU, establishing the Network Code on Cybersecurity (NCCS). It is the first comprehensive regulation to systematically address cybersecurity aspects in the context of cross-border electricity flows, building on Regulation (EU) 2019/943 on the internal market for electricity. The Code is the basis for the operational implementation of the NIS 2 Directive in the energy sector.

The NCCS sets out the obligations of electricity operators (TSO, DSO) about:

- risk assessment methodologies at three levels: EU, regional and national,
- the development of safety policies and measures,
- reporting obligations and resilience testing,
- information sharing with regulators and cybersecurity authorities.

Enforcement of the Network Code for Cybersecurity of Cross-Border Electricity Flows

An essential aspect for implementing the Code in the Member States is the distinction between the roles of the National Regulatory Authority (NRA) and the National Cyber Security Authority (NCA). While the NRA is responsible for regulation, supervision and tracking compliance with sectoral legislation, the NCA is in charge of compliance with the NCCS:

- enforcement powers,
- the function of approving or disapproving operators' methodologies and reports; and
- the role of liaison body (contact point) with ACER, ENTSO-E and other NCAs in the EU.

15 Industrial Control Sistems

16 Commission Delegated Regulation (EU) 2024/1366 of 11 March 2024 supplementing Regulation (EU) 2019/943 of the European Parliament and of the Council by establishing a network code with sector-specific rules for cybersecurity aspects of cross-border flows of electricity (hereinafter referred to as Delegated Regulation (EU) 2024/1366)

Possible scenarios for the role of the Regulator:

Scenario	Description	Tasks for the Regulator
Regulator in the exclusive role of NRA	National Information/Cybersecurity Authority becomes the NCA for the NCCS (natural choice given the role under NIS 1[17]/NIS 2).	The Regulator provides opinions, monitors compliance, and progress reports, but does not have a significant role in enforcing the NCCS, such as assessing risk methodologies.
Regulator in the interim role of NCA	Pending the Member State's decision on the NCA, the Regulator plays this role.	The Regulator shall lead the validation process of the methodologies and coordinate the activities between the TSO/DSO and ACER/ENTSO-E.
Regulator as NRA and NCA for the NCCS	The Member State shall delegate the NCA function to an authority in the role of energy regulator.	The Regulator becomes the central decision-maker in the sector's safety cycle, which requires a challenging organisational and staff expansion.

Important activities of the NCA

The Regulators and the NCA have carried out activities within the scope of the guidance of Delegated Regulation (EU) 2024/1366 (Article 8(1) and Article 18(1)), according to which the TSOs (liable enties under the NCCS), DSOs and the NCAs are charged with different tasks in the context of the cyber risk assessment methodology to be submitted to ACER for further coordination.

If the scenario of a transitional role of the NCA is realised, the Regulator acts as NCA until the Member State's decision on the NCA, and its role includes assessing the adequacy of the risk assessment methodology, in line with sectoral guidelines, coordinating with the TSO/DSO (which meet the criteria under the NCCS), in particular regarding technical capacity and maturity of implementation, ensuring compliance with European standards (e.g. ISO 27005, ENISA recommendations).

Important activities of the NRA

By the end of the year, the NRAs were working on the development of an internal plan for benchmarking in line with the expected ACER guidance (Article 13(1)), setting up a working group to identify comparable indicators (KPIs), costs and functions of the solutions, preparing a basic methodological scheme to assess the effectiveness of the implementation of security measures (ex-ante).

One of the most challenging and strategic tasks of the NRAs under the NCCS, as identified in Article 13 of Delegated Regulation (EU) 2024/1366, is benchmarking, which requires ACER to publish non-binding guidance by 13 June 2025 for benchmarking cybersecurity measures in cooperation with ENISA. The implementation of Article 13 means that the NRA, whether or not it also has the role of NCA, already, as an NRA, takes on the active strategic task of evaluating the impact of cybersecurity investments. This requires not only an increased level of cooperation with the European institutions, but also an internal readiness for advanced regulatory analytics. In addition to methodologies and operational oversight, benchmarking is becoming a crucial mechanism for enhancing the sector's long-term cyber resilience.

The NCCS represents a significant regulatory shift in the approach to electricity system cyber resilience. It presents both a challenge and an opportunity for regulators - depending primarily on whether they act in their primary role as NRAs or also (temporarily or permanently) as NCAs. The complexity and depth of regulatory and supervisory intervention in power system cybersecurity, as well as the scope of activities and cooperation with other actors at the national and European levels, will depend on this decision.

Operational Aspects – Important Activities

Public Service Companies

Within SEVF, expert dialogue continued in the fields of information and cybersecurity, as well as data protection, with national authorities, European and other institutions (SI-CERT, URSIV, ACER, CEER), and with providers of public services in the energy sector. The dialogue was proactive, including concrete test sampling of selected key indicators of cybersecurity risk preparedness. The SEVF provided an expert platform for the exchange of experiences, good practices and other relevant information on cyber threats and security risks.

Additional activities were carried out by public service providers[18], primarily in the area of Business Informatics (IT), with a similar intensity to that of the previous year. IT was the focus of 53% of the activities, while 28% of the activities were carried out in the area of process informatics (OT). Of the remaining activities, 2% were carried out in the area of measurement, and 16% of additional activities were carried out in unclassified areas (Table 22, item Other). A summary of the volume of highlighted actions or activities by stakeholder, broken down by ISO 27002|27019 domains and areas, is shown in the table (Table 22), and the normalised distribution of activities by domain is shown in the polar chart in Figure 59.

17 Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 on measures for a high common level of network and information systems security in the Union

18 Additional activities are all activities carried out to improve the maturity of the implementation of existing in-formation/cybersecurity controls per domain as defined by ISO 27002|27019 or new/additional controls.

TABLE 22: ADDITIONAL ACTIVITIES OF PUBLIC SERVICE PROVIDERS IN THE FIELD OF INFORMATION/CYBER SECURITY

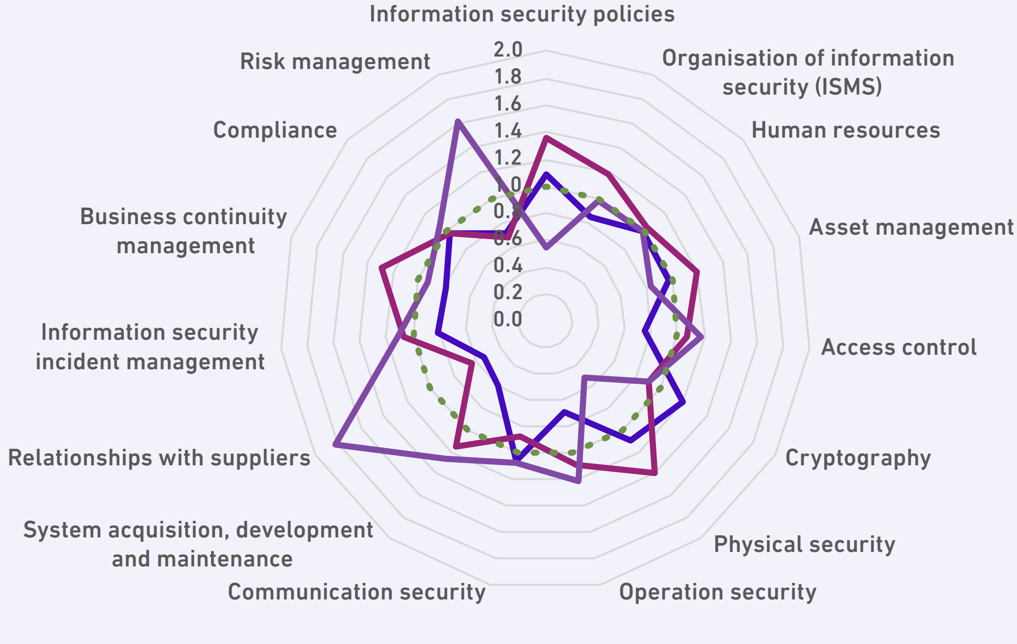
Domain	Area	ELES	EL-MB	EL-CE	EL-LJ	EL-GO	EL-PR	Plinovodi
IT	Information security policies	–	–	–	–	–	–	–
OT		–	–	–	–	–	–	–
Measurements		–	–	–	–	–	–	–
Other		–	–	✓	–	–	–	✓✓
IT	Organisation of information security (ISMS)	–	–	–	–	–	✓	✓
OT		–	–	–	–	✓	–	–
Measurements		–	–	–	–	–	–	–
Other		–	–	–	✓	✓	–	✓✓✓
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	Relationships with suppliers	–	–	–	✓	✓	–	✓✓✓
OT		–	–	–	–	–	–	✓
Measurements		–	–	–	–	–	–	–
Other		–	–	–	–	✓	–	✓✓
IT	Information security incident management	✓	✓✓	✓	✓✓	✓✓	✓✓	✓✓✓
OT		✓	✓✓	✓	–	–	✓	✓✓✓
Measurements		–	–	–	–	–	–	–
Other		–	–	–	✓✓	–	–	✓✓✓
IT	Business continuity management	✓	–	–	✓	✓	✓	✓
OT		–	–	–	✓	✓	–	✓
Measurements		–	–	–	–	–	–	–
Other		–	–	✓	–	–	–	✓✓✓
IT	Compliance	✓	–	✓	–	✓✓	✓	✓✓✓
OT		–	–	–	–	✓	–	✓✓
Measurements		–	–	–	–	–	–	–
Other		–	–	✓	✓✓	✓✓	✓	✓✓
IT	Risk management	✓	✓✓	–	✓	–	–	✓✓✓
OT		–	✓✓	–	–	–	–	✓✓
Measurements		–	✓✓	–	✓	–	–	–
Other		–	–	✓✓	–	✓✓	–	✓✓✓

Key: Domain/area covered

	Number of additional activities (x)
✓	0 ≤ x < 3
✓✓	3 ≤ x < 6
✓✓✓	6 ≤ x
–	No additional activities

SOURCES: ENERGY AGENCY, ELES, PLINOVODI, ELECTRICITY DISTRIBUTION COMPANIES

FIGURE 59: NORMALISED[19] DISTRIBUTION OF ACTIVITIES AND DEVIATIONS IN THE VOLUME OF ACTIVITIES BY PUBLIC SERVICE COMPANIES BY DOMAIN



SOURCES: ENERGY AGENCY, ELES, PLINOVODI, ELECTRICITY DISTRIBUTION COMPANIES

FIGURE 60: THE MOST IMPORTANT SUB-AREAS OF ADDITIONAL ACTIVITIES BY PUBLIC SERVICE COMPANIES BY SUB-AREA ACCORDING TO ISO 27002

SOURCES: ENERGY AGENCY, ELES, PLINOVODI, ELECTRICITY DISTRIBUTION COMPANIES

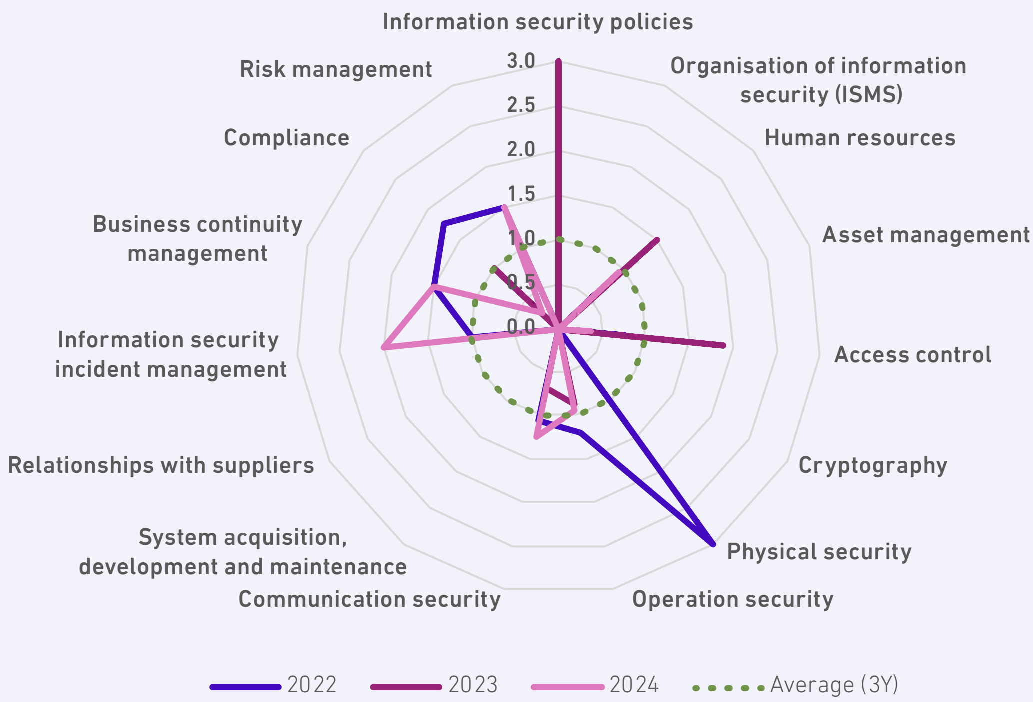
19 Aggregated activities are normalized to a three-year average.

Within the scope of additional activities by public service companies, the most prominent sub-areas, according to ISO 27002, are presented in a multi-level pie chart (Figure 60). Most activities focused on operational security, access control, information security incident management, and communications security.

ELES

The Combined Transmission and Distribution System Operator carried out 38 additional activities in 2024 within the scope of its normal information/cybersecurity activities, of which 82% in business informatics, 5% in process informatics and 13% in unclassified activities. Compared to the 3-year average, the most important areas for improving the maturity of information security controls according to ISO 27002|27019 were human resources, access management and communications security, and information security policies. Similar to the previous period, activities were focused on the areas of operations security, communications security, and human resources (Figure 61).

FIGURE 61: NORMALISED[19] DISTRIBUTION OF ACTIVITIES AND DEVIATIONS IN THE VOLUME OF ACTIVITIES BY ELES BY ISO 27002 DOMAIN



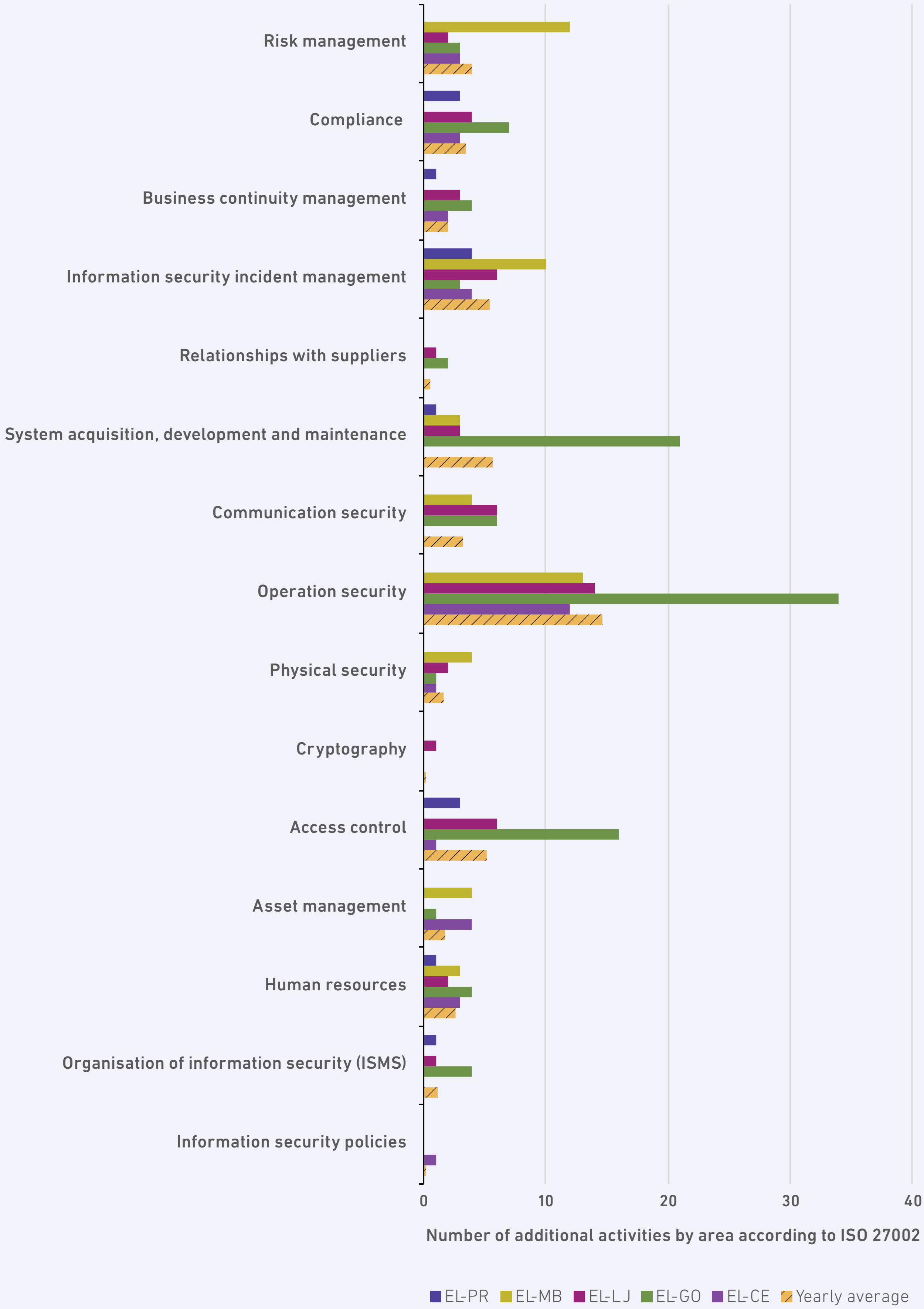
SOURCES: ENERGY AGENCY, ELES

Distribution companies

EDPs carried out a total of 282 additional information security activities in 2024. Of these activities, 55% were carried out in the business IT area, 28% in the process IT area, 5% in the metering area and 12% in unclassified activities. The major areas of additional activity or maturity improvement for ISO 27002 information security controls are compared in the chart in Figure 62. A normalised comparison of the activity by area is given. A comparison of the aggregated volume of activities of the distribution companies with annual trends is presented in the chart in Figure 63.

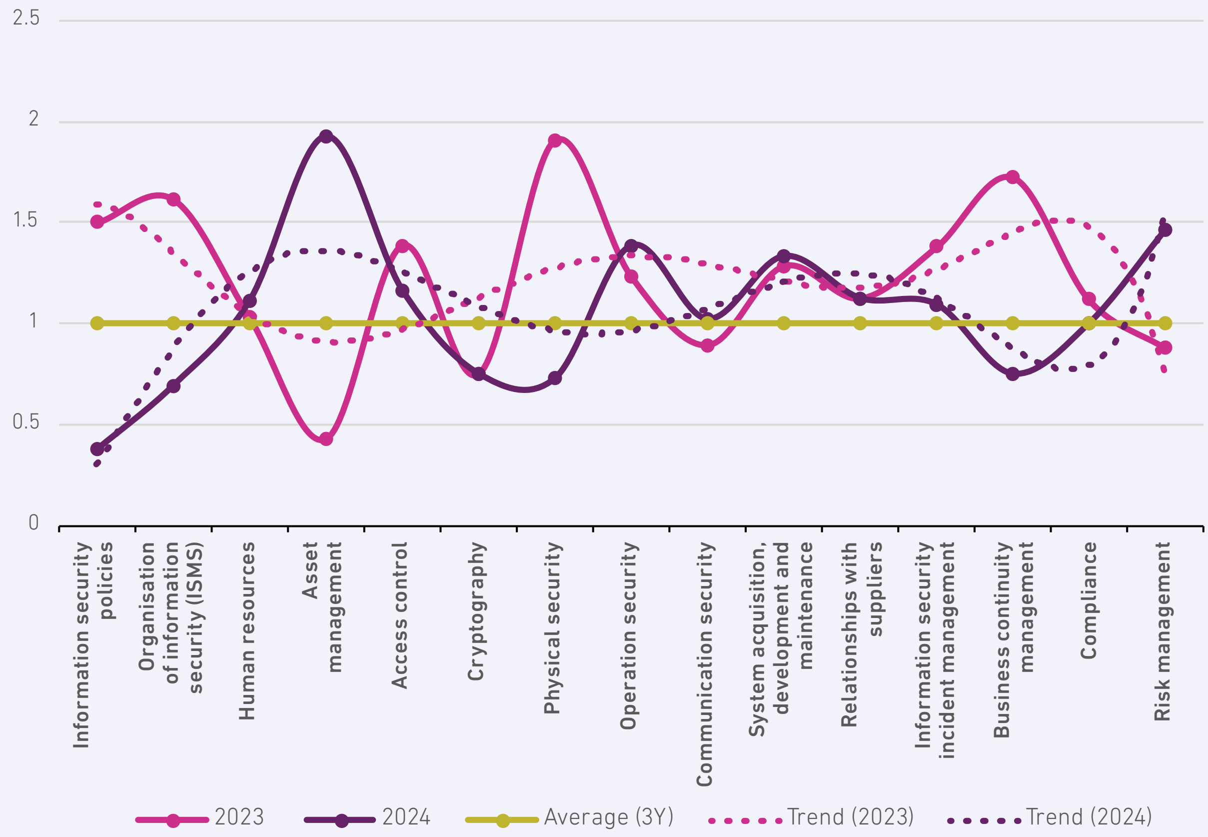
Over the past year, most EDP activities were focused on areas such as operations security, incident management, access management, systems acquisition, development, maintenance, and business continuity management. A comparison of the total activities against a three-year average, along with trends, is illustrated in the graph in Figure 63.

FIGURE 62: NORMALISED DISTRIBUTION OF THE VOLUMES OF ACTIVITIES BY EDCS BY AREA WITH RESPECT TO THE ANNUAL AVERAGE



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

FIGURE 63: NORMALISED[19] COMPARISON OF AGGREGATED VOLUME AND EDCs ACTIVITY TRENDS

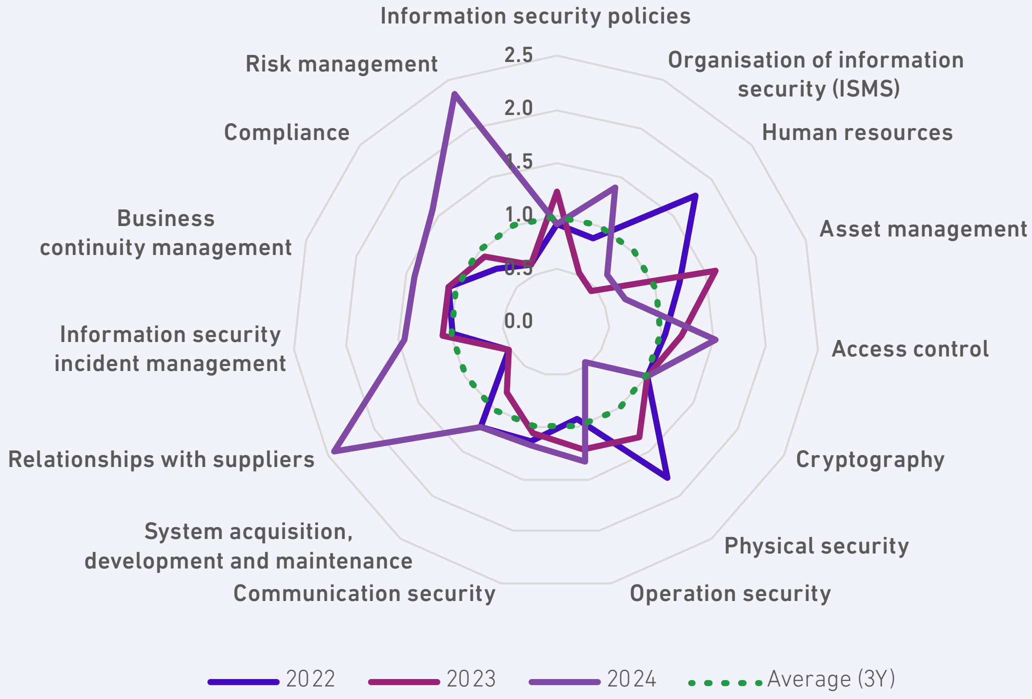


SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

Plinovodi

The natural gas transmission system operator has further increased the volume of additional activities in 2024. There were 310 additional activities carried out, of which 49% in business informatics, 31% in process informatics and 20% in unclassified activities. Compared to the three-year average, the improvement in the maturity of controls in the ISO 27002 information security domains, explicitly focusing on supplier relations, risk management, compliance, and access management (Figure 64).

FIGURE 64: NORMALISED[19] COMPARISON OF THE TOTAL VOLUME AND TRENDS OF ACTIVITIES BY THE PLINOVODI COMPANY



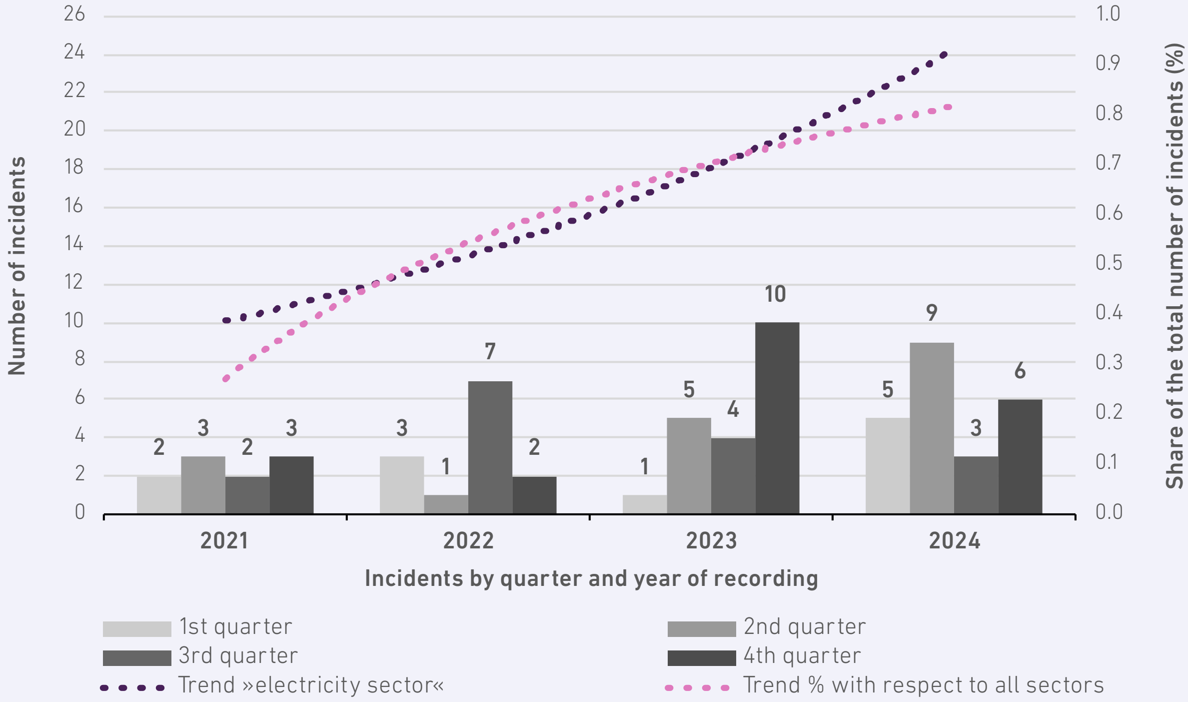
SOURCES: ENERGY AGENCY, PLINOVODI

Cyber Incidents in the Energy Sector

In 2024, both the first and second halves of the year were characterised by cyber activity, which is likely to have been further exacerbated by the still tense geopolitical situation. Compared to previous comparable periods, the number of incidents[20] was higher in the first half of the period and lower in the second half of the period. The upward trend in incidents in the energy sector is no longer commensurate with the increase in total reported incidents (aggregate of more complex technical incidents and less severe incidents) in the SI-CERT report. In particular, the aggregate of incidents shows a slight decrease in the short term, but this trend is not observed in the energy sector. SI-CERT reported incidents (excluding luring/phishing incidents) evaluated according to the NOKI[21], were 3,128, which is approximately one-sixth less than in the previous year. In 2024, the share of incidents in the energy sector (of which public service operators are also a part) decreased by 0.2%, according to the cumulative decrease detected (Figure 65).

20 Technically more complex incidents as defined by SI-CERT in the 2024 Annual Report.
21 National Cyber Incident Response Plan

FIGURE 65: CYBER INCIDENTS IN THE ENERGY SECTOR AND THE SHORT-TERM TREND

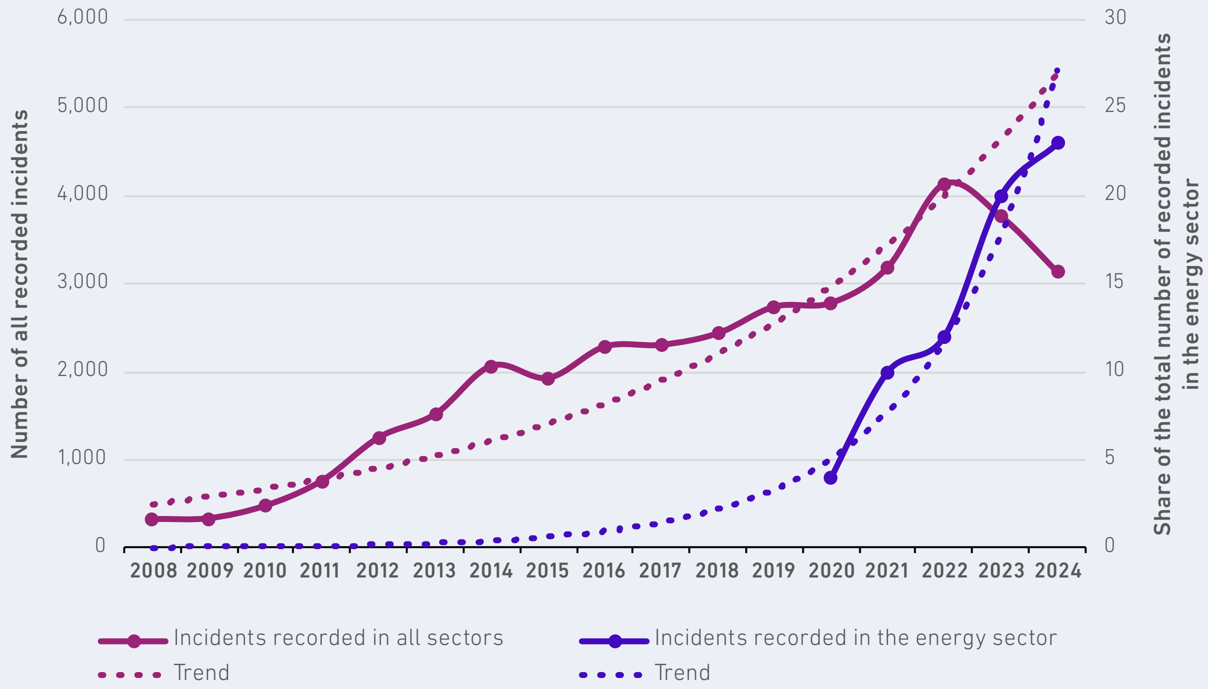


SOURCES: ENERGY AGENCY, URSIV, SI-CERT

Comparing the share of incidents in the energy sector to the total number of reported incidents to SI-CERT, which is still below 1% in the 2024 Cybersecurity Report[22] there is no longer a short-term correlation with the overall growth trend in other sectors, as the number of cumulative reported incidents has decreased over the last year (see Figure 66). Despite the relatively small but not negligible share of incidents in the energy sector, there is an upward trend. Although the marked increase seen between 2022 and 2023 is currently no longer observed, the rate of growth of incidents in the sector remains worrying. Compared to the total number of incidents reported to ENISA[23] for the energy sector in the European area (NIS 1), the national share is 11.5%.

22 https://www.cert.si/kibernetska-varnost-2024-v-stevilkah/
23 https://ciras.enisa.europa.eu/

FIGURE 66: LONG-TERM PROJECTION (EXPONENTIAL – WORST-CASE – APPROXIMATION) OF THE GROWTH OF INCIDENTS IN THE SECTOR



SOURCES: ENERGY AGENCY, URSIV, SI-CERT

Network Charge for the Electricity Transmission and Distribution System

Determining the Network Charge

The Energy Agency accomplishes the economic regulation of the electricity system operators' activities using the regulated network charge method. 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 the eligible costs within the regulatory period, as well as the network charge deficit from previous years.

Through regulation, the Energy Agency incentivises the efficiency of electricity operators and system use, research and innovation, and investment in new or innovative technologies, ensures the operators' 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 they 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), quality of supply (Q) and incentives (S). Since 1 January 2023, the eligible costs have included the costs of flexibility services by the distribution operator (FSC) and performance incentives for smart grid investments (S(E)).

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

.

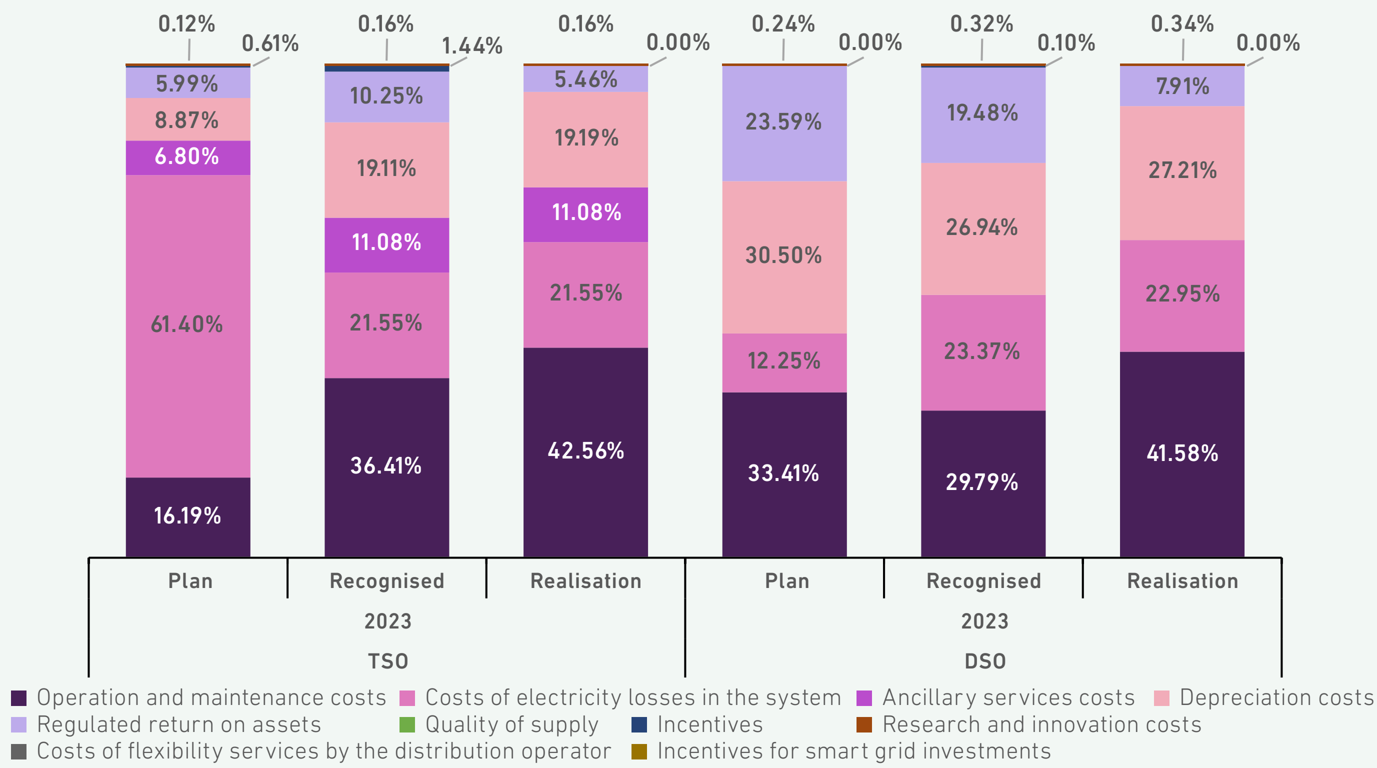
Regulatory period from 1 January to 31 December 2023

In 2023, on 2 October 2023, SODO, which performed the activity of Distribution System Operator, merged with ELES, which performed the activity of Transmission System Operator. Since the merger, ELES has been the operator of the combined system, performing separately the activities of transmission system operator and distribution system operator.

In 2024, based on the criteria set out in the Act on the Methodology for Establishing the Regulatory Framework for Electricity Operators issued by the Energy Agency in 2022, ELES converted the planned eligible costs for the regulatory period from 1 January to 31 December 2023 (hereinafter referred to as the 2023 regulatory period) into the costs recognised by regulation separately for the activities of the transmission system operator and the activities of the distribution system operator. The Energy Agency verified the recalculation and issued decisions on the deviation from the regulatory framework. It also calculated the realised eligible costs based on data from the accounts of the electricity operators and distribution undertakings.

Figure 67 shows the structure of eligible costs for the activities of the transmission and distribution system operator, with the costs of the distribution system operator calculated as the sum of eligible costs of EDCs and the distribution system operator.

FIGURE 67: THE STRUCTURE OF THE ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION AND DISTRIBUTION SYSTEM OPERATOR IN THE 2023 REGULATORY PERIOD



SOURCE: ENERGY AGENCY

The structure of the planned eligible costs of the TSO (Figure 67) for the 2023 regulatory period is different with respect to the structure of the recognised and realised eligible costs, as the TSO activity was planned to partially cover the cost of electricity to cover network losses for the distribution system, with a planned electricity price significantly higher than the realised one. The structure of the planned eligible costs of the DSO has not changed considerably in the 2023 regulatory period compared to previous regulatory periods.

A comparison of the structure of the TSO's recognised and realised eligible costs (Figure 67) for the 2023 regulatory period shows that there is a significant difference in the items of operation and maintenance costs and regulated return on assets. As in previous regulatory periods, the share of realised O&M costs in total realised eligible costs is higher than for recognised eligible costs. This implies that the TSO has operated cost inefficiently on the O&M cost side and has consequently realised a lower regulated return than the one recognised by regulation.

A comparison of the structure of the DSOs' recognised and realised eligible costs for the 2023 regulatory period shows that the DSOs' activity in the area of O&M costs is also cost inefficient, which is also reflected in a lower realised regulated return than that recognised by regulation.

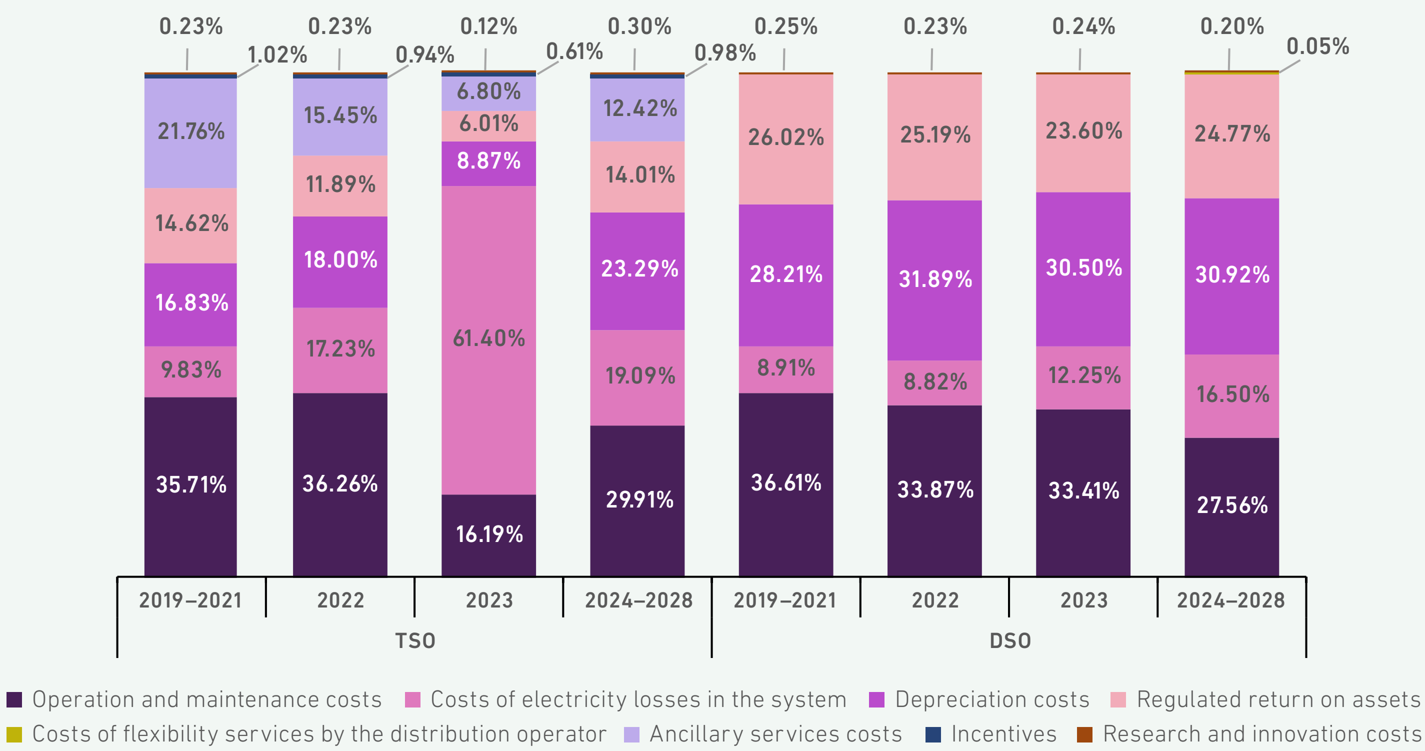
In addition to operational efficiency, the level of the TSO's realised regulated return is also influenced by incentives, the level of other revenues and the recording of network charge surpluses and deficits in the accounts.

Regulatory period from 1 January 2024 to 31 December 2028

On 1 January 2024, a five-year regulatory period started, running until 31 December 2028. In 2023, the Energy Agency set the regulatory framework for the regulatory period from 1 January 2024 to 31 December 2028 (hereinafter the 2024–2028 regulatory period) for transmission and distribution system operators using two Decisions. The Energy Agency established the regulatory framework for the above regulatory period based on the Act on the Methodology for Establishing the Regulatory Framework for Electricity Operators, which was issued in 2022.

For the regulatory period 2024–2028, the Energy Agency has set the eligible costs for the TSO at EUR 1,214 million and for the DSO at EUR 1,929 million.

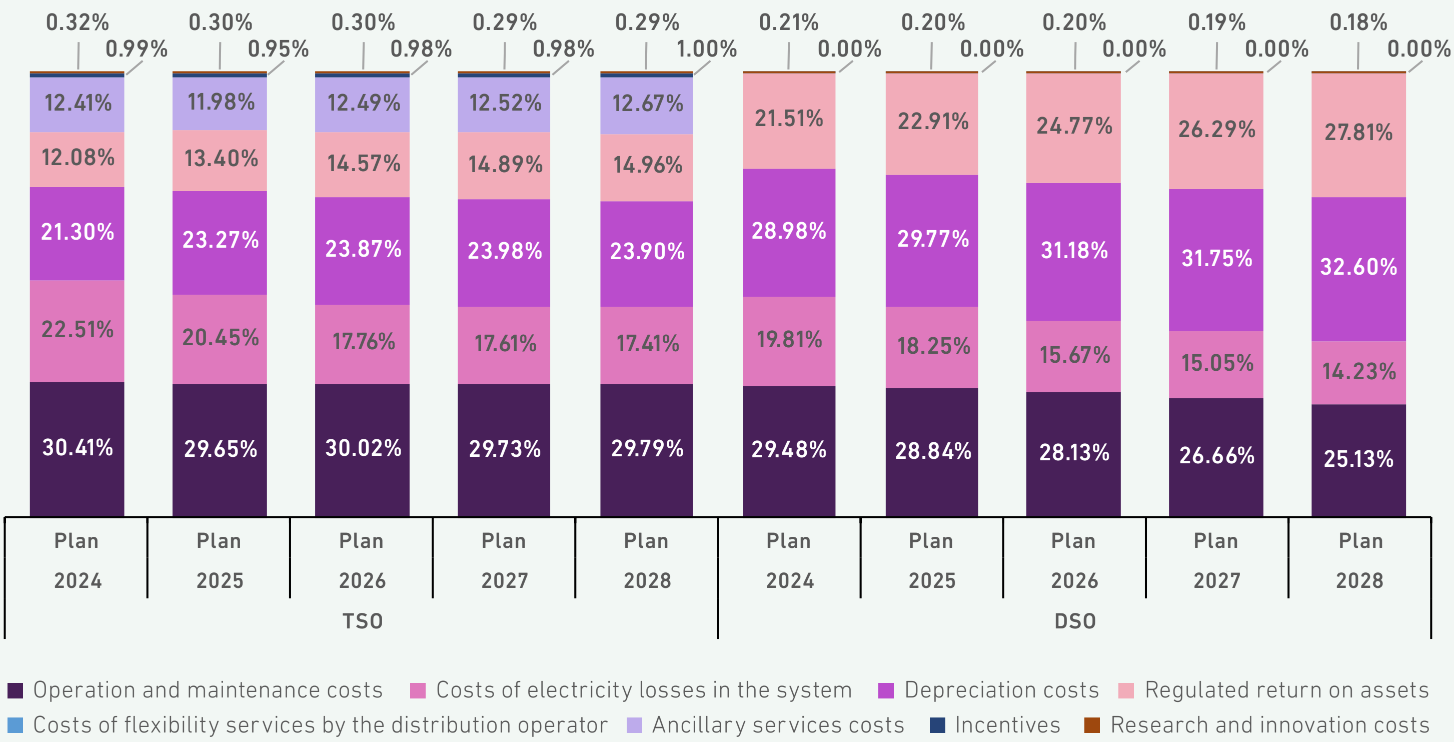
FIGURE 68: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION AND DISTRIBUTION OPERATOR FOR THE 2019–2028 PERIOD



SOURCE: ENERGY AGENCY

The structure of the planned eligible costs of the TSO (Figure 68) for the regulatory period 2024–2028 has changed slightly compared to the regulatory periods before 2023 due to higher planned electricity costs to cover network losses. The planned electricity costs for covering network losses are higher in the 2024–2028 regulatory period compared to the pre-2023 regulatory periods due to higher electricity prices. The same applies to the structure of the planned eligible costs of the DSO.

FIGURE 69: STRUCTURE OF PLANNED ELIGIBLE COSTS OF TRANSMISSION AND DISTRIBUTION SYSTEM OPERATORS BY INDIVIDUAL YEAR OF THE 2024–2028 REGULATORY PERIOD



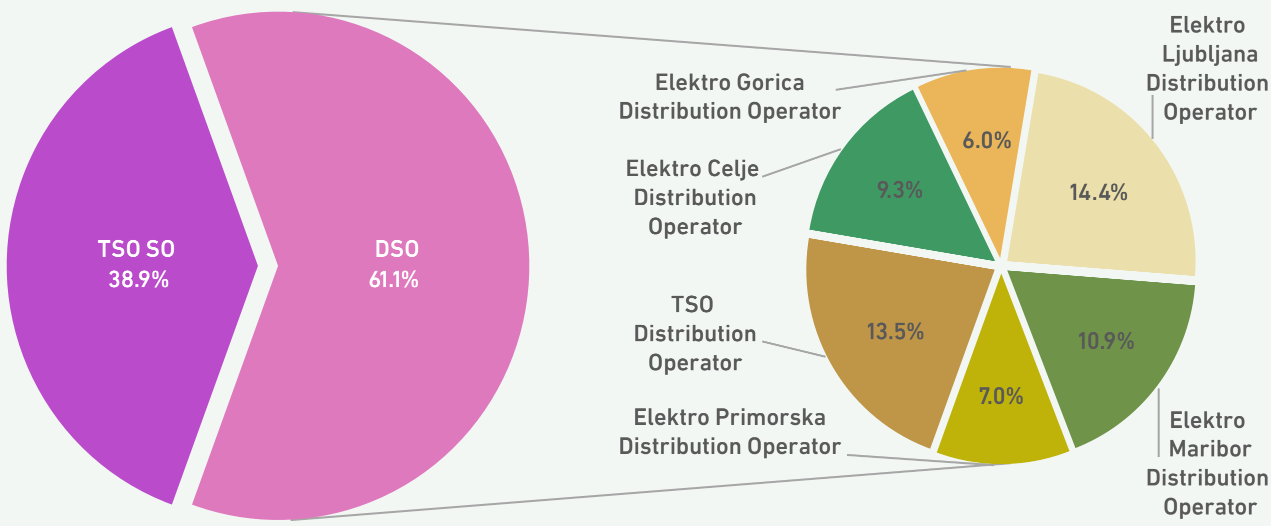
SOURCE: ENERGY AGENCY

The structure of the TSO's and DSO's planned eligible costs (Figure 69) by year of the regulatory period 2024–2028 shows that the structure is changing, with an increasing share of planned depreciation and planned regulated return on assets. This is due to the planned investments in both transmission and distribution system assets in the 2024–2028 regulatory period.

Regulatory year from 1 January 2024 to 31 December 2024

For 2024, the first year of the 2024–2028 regulatory period, the Energy Agency has set the planned eligible costs for the TSO at EUR 230.4 million. For the DSO, eligible costs of EUR 362.4 million have been planned for 2024. The structure of the planned eligible costs for each company is shown in the figure70.

FIGURE 70: STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION AND DISTRIBUTION SYSTEM OPERATOR IN THE 2024 REGULATORY PERIOD BY INDIVIDUAL COMPANY



SOURCE: ENERGY AGENCY

To cover the planned eligible costs of the TSO (EUR 230.4 million), sources of eligible costs of EUR 276.3 million were planned, namely planned network charges of EUR 96.4 million, planned other revenues of EUR 125.1 million and the surplus of network charges from previous years of EUR 54.8 million. Thus, for the TSO activity, a surplus of network charges has been planned, which will be used to cover the planned deficit of network charges of the DSO activity, according to the legislation.

In 2024, EUR 97.3 million[24] of network charges were levied to cover the recognised eligible costs of the TSO, which is 0.9% more than planned.

To cover the planned eligible costs of the DSO (EUR 362.4 million), sources of EUR 306.2 million were planned for 2024 to cover eligible costs, namely planned network charges of EUR 294.6 million and planned other revenues of EUR 16.9 million. At the same time, it was planned to cover in 2024 the deficit of the network charge of previous years, amounting to EUR 5.3 million. Thus, a network charge deficit of EUR 56.2 million was planned for the Distribution System Operator activity, which is covered by the planned network fee surplus of the Transmission System Operator activity of EUR 45.9 million. The remainder of the planned deficit of the DSO network charge remained uncovered.

In 2024, EUR 303.8 million[25] of network charges were levied to cover the recognised eligible costs of the DSO, which is 3.12% more than planned.

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 voltage level (HV, MV or LV), type of connection (busbar or feeder), operating mode (operating hours) and type of consumption.

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

In 2024, for the period from January 1 to September 30, the method of charging the network charge was applied, where the electricity operator classified the final consumers into a consumer group according to the voltage level (HV, MV, LV), the method

24 Source: Electricity distribution companies and ELES unaudited data
25 Source: Electricity distribution companies and ELES unaudited data

of connection (busbar, outlet), the operating regime (operating hours) and the type of consumption. By time of day, the network tariff rates for the transmission and distribution system were divided into:

- higher daily tariff rates during the higher tariff period (HT), which were charged from Monday to Friday between 6:00 and 22:00, and
- the lower daily tariff rates during the lower tariff period (LT), which were charged during the rest of the period and on Saturdays, Sundays and public holidays from 00.00 to 24.00, or
- uniform daily tariff rates (ET), which were charged from 00.00 to 24.00 on all days.

During this period, for low-voltage unmetered end-users and household consumers, the billing power was determined based on the rated power of the device for preventing the contracted load from being exceeded (billing fuses) and the type of connection (single-phase or three-phase connection), while for consumers with a connection power greater than 43 kW, the billing power was determined every month on the basis of the average of the three highest power outputs achieved over the duration of the higher tariff.

In the period from October 1 to December 31, a revised method of net metering was applied, whereby the net metering tariff rates for the transmission and distribution system were divided based on time blocks. Time blocks represent closed periods of the day of at least one hour duration and are determined based on the system peak load. The billing system in force from July 7, 2018, to September 30, 2024, had only one season block in place. Before July 7, 2018, the network charge was calculated based on two seasons. In the new billing system, the calendar year is divided into two seasons, as follows:

- The higher (or winter) season comprises January, February, November and December.
- The low (or summer) season comprises March, April, May, June, July, August, September and October.

There are three blocks of time within a day, blocks 2, 3, 4 and 5 within a month in the low season and blocks 1, 2, 3 and 4 in the high season.

The time blocks in the low season are as follows:

- Time block 2 runs from 07.00 to 14.00 and from 16.00 to 20.00, Monday to Friday, or on weekdays.
- Time block 3 runs from 7.00 to 14.00 and from 16.00 to 20.00 on Saturdays, Sundays and other public holidays and from 6.00 to 7.00, 14.00 to 16.00 and 20.00 to 22.00 on Mondays to Fridays.
- Time block 4 runs from 22.00 to 6.00 Monday to Friday and from 6.00 to 7.00, 14.00 to 16.00 and 20.00 to 22.00 on Saturdays, Sundays and public holidays.
- Time block 5 runs from 22:00 to 06:00 on Saturdays, Sundays and public holidays.

The high season schedule is as follows:

- Time Block 1 runs from 07.00 to 14.00 and from 16.00 to 20.00 on Mondays to Fridays.
- Time Block 2 runs from 7.00 to 14.00 and from 16.00 to 20.00 on Saturdays, Sundays and public holidays and from 6.00 to 7.00, 14.00 to 16.00 and 20.00 to 22.00 on Mondays to Fridays.
- Time block 3 runs from 22.00 to 6.00 Monday to Friday and from 6.00 to 7.00, 14.00 to 16.00 and 20.00 to 22.00 on Saturdays, Sundays and public holidays.
- Time block 4 runs from 22:00 to 06:00 on Saturdays, Sundays and public holidays.

For system users at all voltage levels, the billing power shall be determined as the sum of the predetermined contracted capacity and any excess power, representing the measured power of consumption above the contracted capacity. The contracted capacity was determined by the electricity operator for consumers with a connection capacity equal to or less than 43 kW as the average of the three measured peaks of the last peak season before the contracted capacity was determined (for the period from 1 January 2024 to 31 December 2024, 15-minute data from the winter season from 1 November 2022 to 28 February 2023 were used). Any excess power over the contracted capacity was only charged to users with a connection power above 43 kW, and to those users with a connection power equal to or less than 43 kW who did not agree with the proposed billing power and changed it at their own request and subsequently exceeded it.

For those consumers for whom 15-minute measurements are not available (less than 10%), the billing power shall be determined on the basis of the rating of the device for preventing overruns of the agreed load (billing fuse) and the type of connection (single-phase or three-phase connection).

For new users of the system, due to the unavailability of previous metering data, contracted capacity is determined on the basis of the maximum 15-minute peak power within the billing month. New customers are considered to be transmission and collection points where one of the conditions is met:

- less than 70% of the last winter season's data is available,
- a first-time user,
- a new paying consumer,
- self-supply connection at the metering point,
- a reconnecting user if the metering point has been disconnected for more than 30 days.

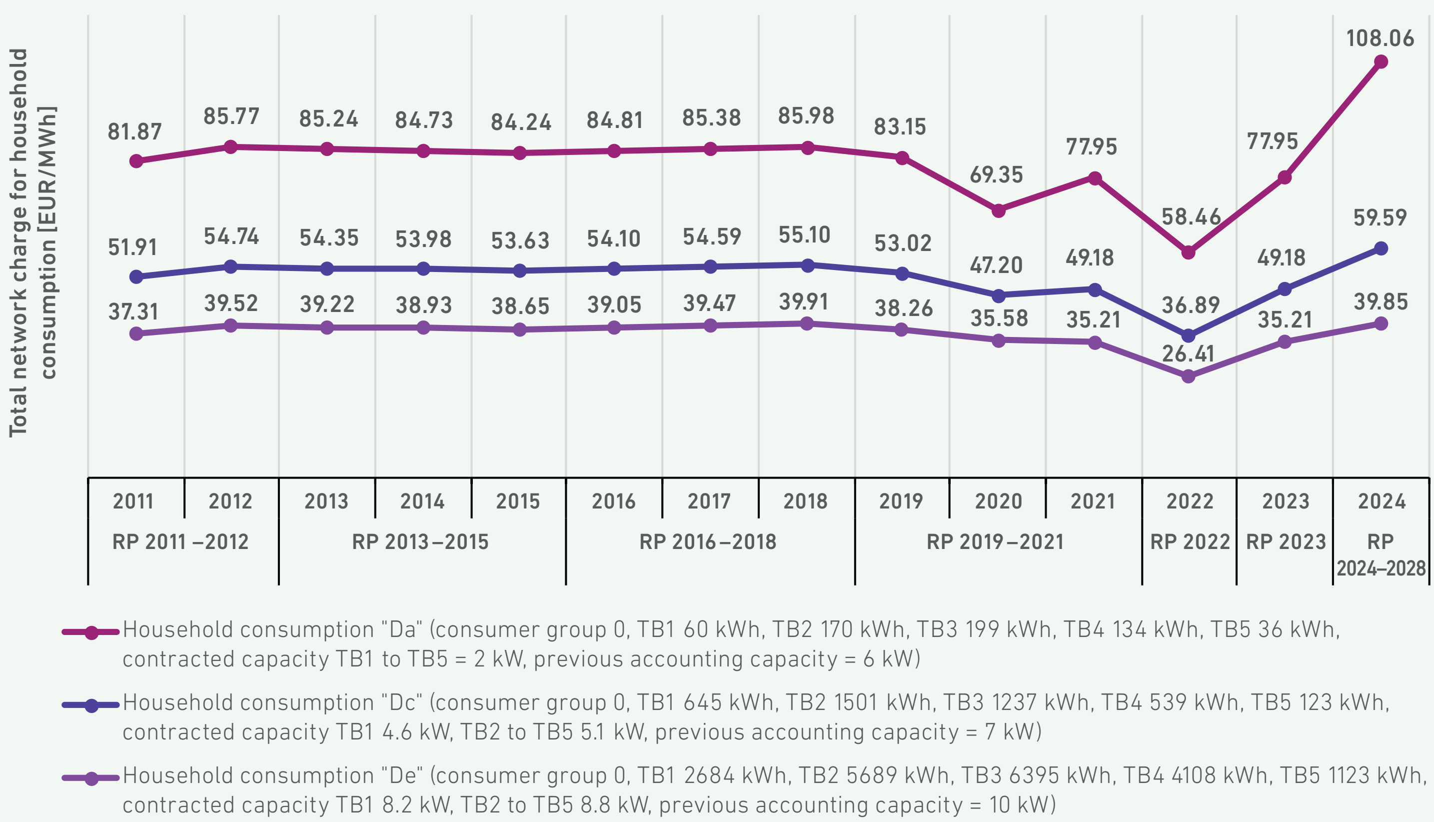
Figures 71 in 72 show the evolution of the total network charge for the transmission and distribution system by year of the regulatory periods for some typical household and business consumers defined by standard customer groups.

The fluctuation of the network charge for household consumption was noticeable from 1 March to 31 May 2020, when household and small business consumers were not charged a tariff rate for the billing power due to the adoption of an extraordinary measure by the Energy Agency to mitigate the social and economic consequences of the epidemic. Another notable drop in the total network charge volumes is seen in 2022, when the National Assembly adopted a similar measure through the Law on Emergency Measures to Mitigate the Impact of High Energy Prices (ZUOPVCE). For both electricity operators, all tariff rates for billed power and delivered working energy for all consumer groups were reduced to zero from 1 February to 30 April 2022.

The year 2024 was marked by the reform of the network charging methodology, which entered into force in 2022 and became definitively applicable in October 2024. The change in methodology increased the annual cost of the network charge, especially for household consumers with very low electricity consumption and customers at higher voltage levels. For the year 2024, an increase in the network charge is visible for all typical residential and commercial customers. The reason for this increase lies in the change of methodology within the year, as two of the three months (November, December) were in the high season, which is characterised by higher monthly network charge amounts. The excess network charge is taken into account in the calculation of the variations within the regulatory framework, which has a direct impact on the level of tariff lines in the future. If the new way of charging the network charge had been applied at the beginning or in the middle of 2024, as planned when setting the 2024 network charge rates, the increase in the network charge would not have occurred for the majority of household customers on an annual basis.

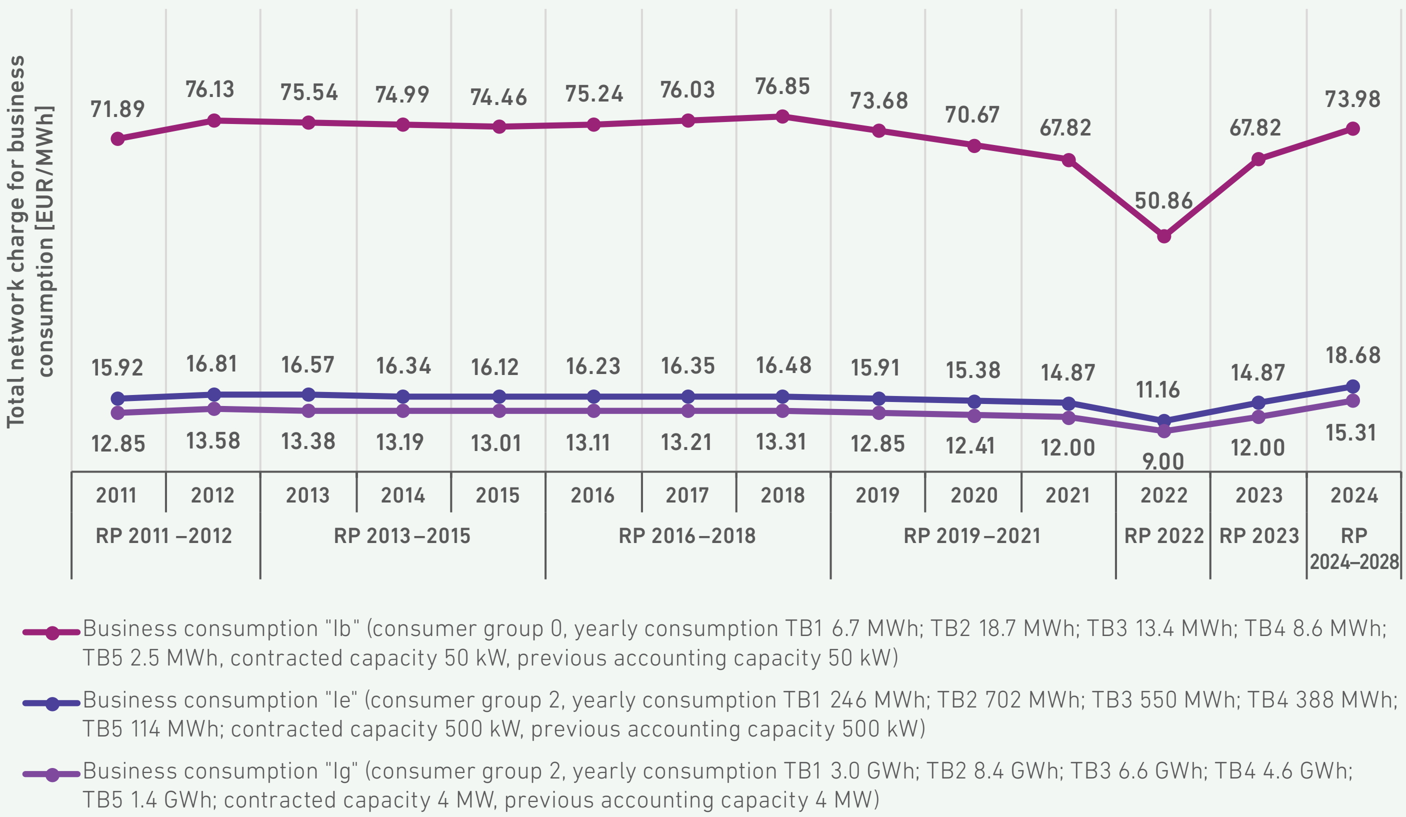
Compared to 2023, an increase of EUR 21.6 million in network charges for the distribution system and EUR 4.3 million in network charges for the transmission system was collected in 2024.

FIGURE 71: FLUCTUATION OF THE TOTAL NETWORK CHARGE FOR THE TRANSMISSION AND DISTRIBUTION SYSTEMS FOR SOME TYPICAL HOUSEHOLD CONSUMERS PER REGULATORY PERIOD



SOURCE: ENERGY AGENCY

FIGURE 72: FLUCTUATION OF THE TOTAL NETWORK CHARGE FOR THE TRANSMISSION AND DISTRIBUTION SYSTEMS FOR SOME TYPICAL BUSINESS CONSUMERS PER REGULATORY PERIOD



SOURCE: ENERGY AGENCY

CASE STUDY
Effects of the Network Tariff Reform

The Energy Agency conducts continuous monitoring of the effects of the new network tariff calculation methodology based on a methodological approach that relies on evaluating a set of more than 30 key performance indicators. The set of indicators used for monthly effect monitoring represents a narrower selection of the indicators above. Also, it takes into account the resource limitations required for data processing by the DSOs providing public service.

Below are the indicators based on which the monthly effects during the first six months of implementing the new tariff calculation method were assessed.

TABLE 23: KEY INDICATORS FOR MONITORING EFFECTS ON A MONTHLY BASIS IN THE PERIOD OCTOBER 2024 – MARCH 2025

Area	#	Indicator	Explanation
Quality of detailed measurement data processing	A.1	Share of metering points calculated on the basis of 15-minutes consumption measurements	The objective is to bill as many custom-ers as possible on the basis of 15-minute metering data. This is achieved by increasing the share of consumers equipped with smart meters and by eliminating the interference in PLC communication that is prevalent in the current generation of AMS.
	A.2	Transitions between billing types due to variations in data quality (PLC communication)	
Active demand	B.1	Number of metering points with changed contracted capacity (CP)	The objective is to encourage active consumption and thus changes in CP. At the same time, the aim is to achieve efficient active consumption, i.e. consumption adjustments that do not lead to charging CP. Changes in the volume of charged CP can be an indicator of improvement or deterioration in the efficiency of the adjustment of consumption, and the volume of charged or informed CP is an indicator of the methodological appropriateness of the determination of CP.
	B.2	Number and share of metering points with changed CP and charged CP	
	B.3	Performance of active demand following a change of CP without charging CP	
	B.4	Average share of metering points with consumption surpluses above charged or informed CP	
	B.5	Charged CO to all consumers	
Impact of network load reduction	C.1	Scope of grid load reduction during peak impact periods for incremental network development costs (TB 1)	The reduction of CP is an indicator of the planned grid load reduction during the critical period for the incremental costs to be incurred. A rough financial evaluation of the peak load unit provides a rough estimate of the reduction in the required network charge due to the reduction of the system peak.
	C.2	Actual peak load reduction in TB1	Comparison of system peak loads during the period when the grid is systemically most loaded (Time Block 1) between the last two higher seasons reveals an actual decrease or increase in grid utilisation. The observed reduction in peak load supports the findings in Section C.1. Using a rough financial valuation per unit of peak load, it is possible to approximately estimate the reduction in required network charges due to the decrease in the system peak.
Use of data services	D.1	Number of registered metering points in My Elektro	The use of the My Elektro web portal[26] is key to raising consumer awareness of network use and a prerequisite for making informed decisions about consumption. The use of local access to real-time metering data demonstrates the extent of more advanced active consumption, which is usually automated using an energy management system.
	D.2	Number of metering points with activated access to real-time metering data	

26 https://www.mojelektro.si

Consumers response	E.1	Statistics on 8/5 correspondent customer support, answering calls during office hours	The extent of customer support provision is an indirect indicator of customer awareness/information, the level of un-derstanding of the new billing method as well as the acceptability of the change.
	E.2	Customer structure	
	E.3	Key areas	

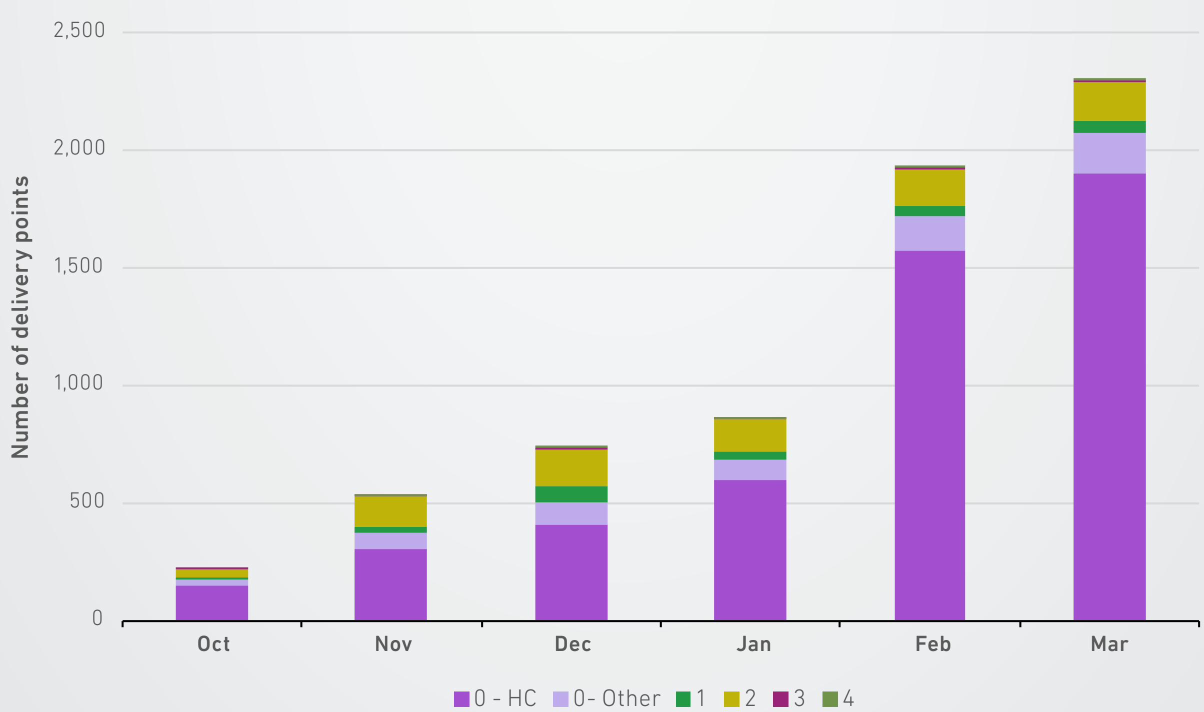
KPI – Quality of metering data processing

The share of metering points billed based on 15-minute billing metering data (including billing of new consumers[27], which are billed based on their capacity achieved during the billing period) has been stabilised at an average of 90% monthly (A.1).The share of new consumer billing is reduced from around 22.5% in 2024 to around 14% in 2025. The share of transitions between billing based on 15-minute data and two-tariff billing with administratively determined capacity due to inconsistencies in data quality with the criteria of the new methodology (inconsistencies caused by interference in PLC communication) is between 0.2% and 0.4% monthly (A.2)., with a strong predominance of the switch to billing based on 15-minute billing data.

KPI – Active demand

The number of metering points with changed CP (B.1) is an indicator of the evolution of active demand based on network price signals. The analysis shows the monthly growth of this type of consumption in all user groups over the whole observation period (Figure 73).

FIGURE 73: NUMBER OF DELIVERY POINTS WITH CHANGED CONTRACTED CAPACITY BY USERS GROUP



SOURCE: ELES

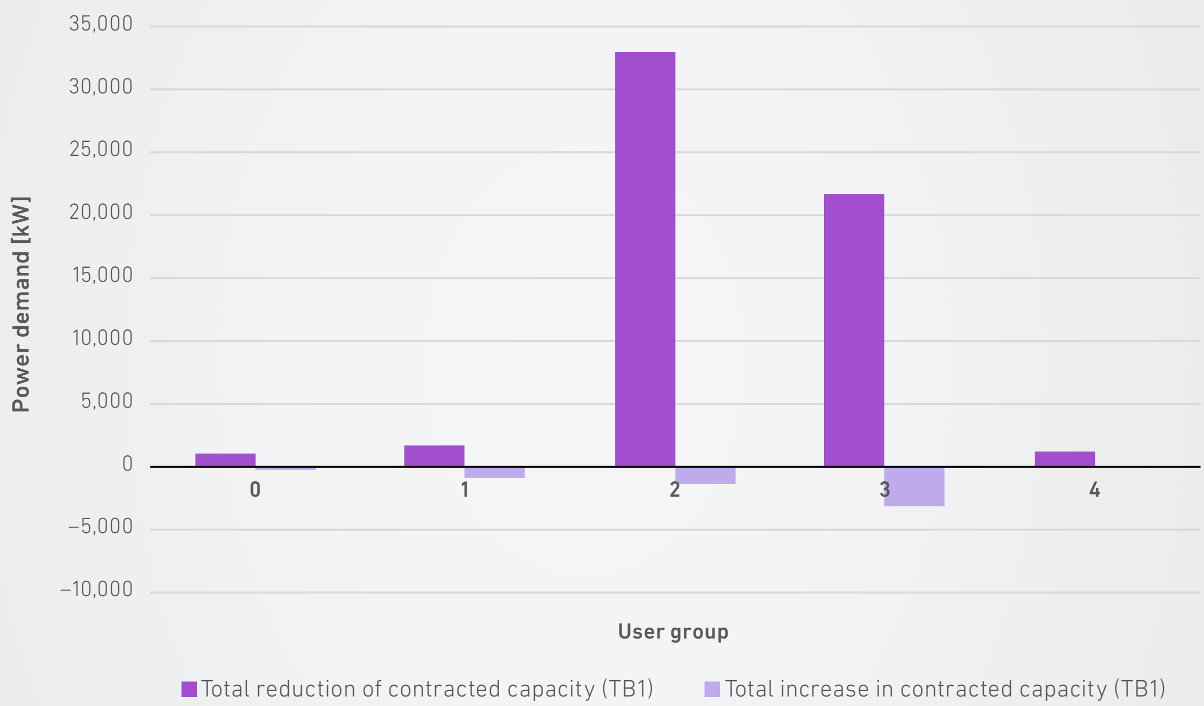
27 https://www.uro.si/novi-uporabniki

The number of metering points with changed CP and charged excess capacity (B.2) in the observed period is 2,529, of which 1,859 are households. The average share of these metering points is 35%. As a consequence, the performance of the consumption adjustment without charging the exceeding contracted capacity (B.3) is 65% on average for all consumer groups (63% for household consumers). The average share of metering points with consumption surpluses above contracted capacity (charged or informed capacity); B.4) is around 18%, the largest share is in consumer group 3, namely 26%. The charged excess capacity to all consumers (B.5) in the period from October 2024 to March 2025 amounted to EUR 920,427 for 552,334 kW of excess capacity, which amounts to an average of EUR 1.67/kW (for HC: EUR 0.65/kW). The average charge for exceeding contracted capacity at the level of an active consumer in the household consumption segment is EUR 2.76/consumer.

KPI - Impact of network load reduction

The planned network load reduction during the peak period is estimated at approximately 52 MW, which corresponds to about 2.5% of the system peak (Time Block 1; C.1).

FIGURE 74: DECREASE OR INCREASE IN DOM IN TB1 BY USER GROUPS (0, 1, 2, 3, 4) IN TERMS OF NETWORK LOAD REDUCTION[28]



SOURCE: ELES

Indicative quantitative assessment of the impact of network load reduction for 2025, taking into account the measured performance of demand response (B.3): 65%) and additionally a qualitative assessment of the reduction in CP due to other factors[29] the Energy Agency estimates at ≈ 26 MW, which would theoretically imply a network charge relief of ≈ EUR 260 million of incremental cost (taking into account a nominal incremental cost of **EUR 10 million/MW**). This indicative benefit assessment is made taking into account the 10-year development plans in force in 2024, based on an evaluation of the incremental cost of the development, taking into account the following:

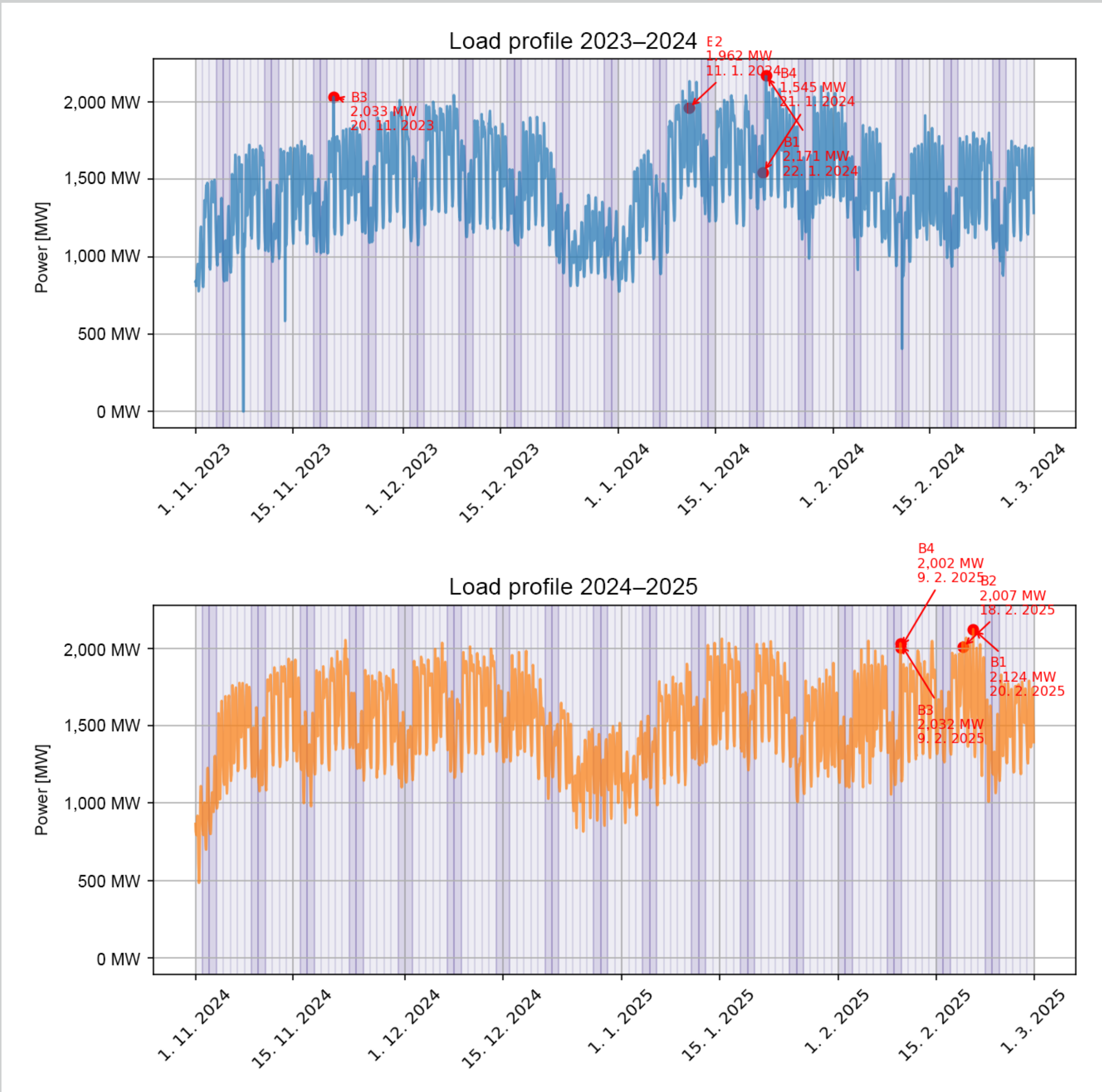
- pessimistic scenario for peak growth (2025 - 2,470 MW, 2032 - 3,035 MW; growth = 565 MW);
- optimistic scenario for peak growth (2025 - 2,210 MW, 2032 - 2,517 MW, growth = 307 MW);
- Investment value (TSO+ DSO) = **EUR 3,689 million**;
- Network development cost per unit of peak load ranges from **EUR 6.5 million to EUR 12.0 million/MW**.

28 Positive values represent planned network load reduction and negative values represent additional network load. The net value (the difference between the two quantities) is taken into account when evaluating the impact.

29 Taking into account the 50% impact due to changes in consumption not related to the effect of the network price signals and deviations from the contracted capacity when adjusting consumption.

The comparison of the system peak by time block in the last peak seasons (C.2) supports the above findings. The analysis shows a shift of 45 MW of demand from TB 1 to TB 2.

FIGURE 75: ANALYSIS OF SYSTEM PEAK LOADS DURING RECENT HIGH-DEMAND SEASONS



SOURCE: ENERGY AGENCY

TABLE 24: COMPARISON OF SYSTEM PEAK LOADS BY TIME BLOCKS

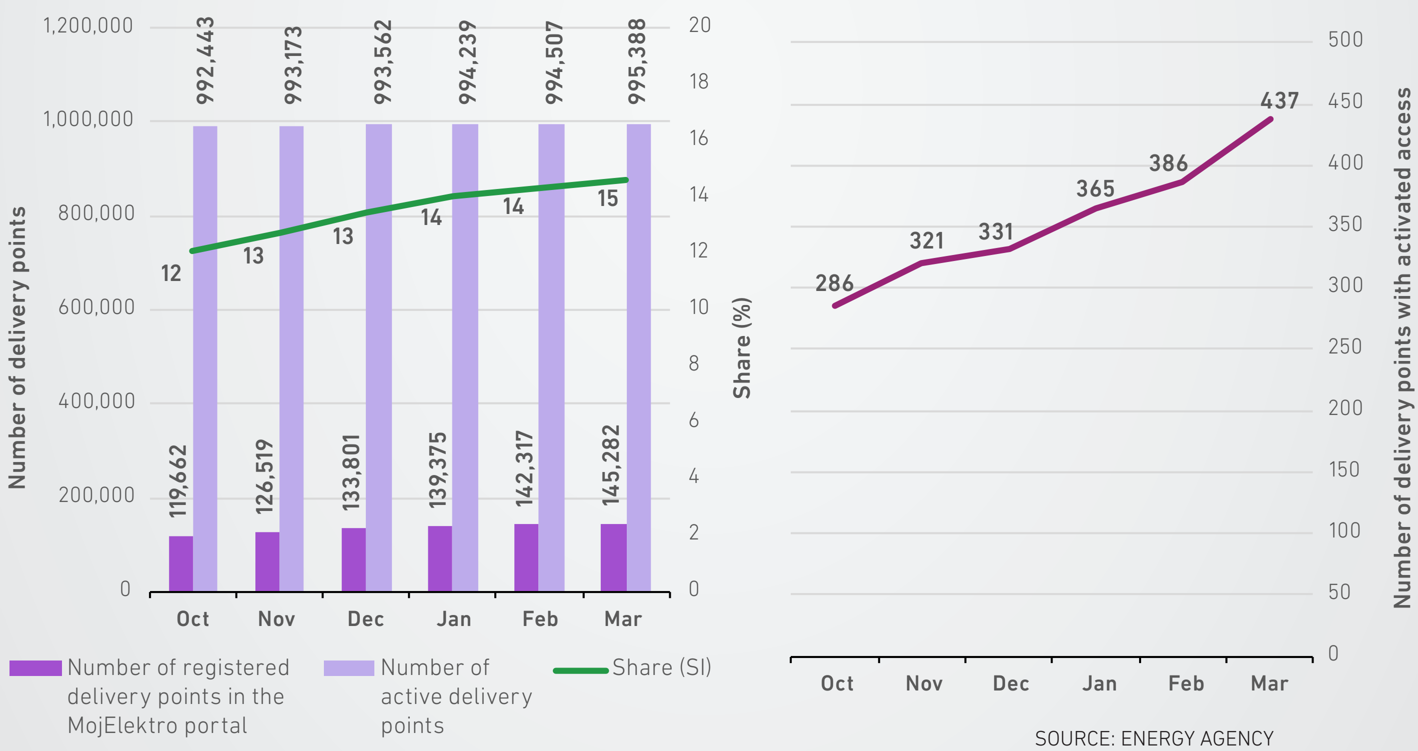
TB	Peak VS 23/24 [MW]	Peak VS 24/25 [MW]	Δ [MW]	Δ (%)
1	2,171	2,124	–47	–2.16
2	1,962	2,007	45	2.29
3	2,033	2,032	–1	–0.05
4	1,545	2,002	457	29.58

SOURCE: ENERGY AGENCY, ELES

KPI - Use of data services

The number of registered metering points in My Elektro (D.1) up to and including March 2025 is approximately 145,000, or approximately 15%. Metering points with activated access to real-time metering data (D.2) were used by 437 consumers[30] in March 2025

FIGURE 76: NUMBER OF MOJELEKTRO PORTAL USERS (LEFT) AND NUMBER OF DELIVERY POINTS WITH ACTIVATED LOCAL ACCESS TO REAL-TIME MEASUREMENT DATA (RIGHT) IN THE PERIOD FROM OCTOBER 2024 TO MARCH 2025



SOURCE: ENERGY AGENCY

During the period of targeted strategic communication with the interested public from summer 2023 onwards, the Energy Agency notes an accelerated development of new business models in the field of electricity supply, the development of real-time consumption monitoring solutions and load management solutions based on network and market price signals. The range of these demand-side solutions effectively meets the needs of consumers, and the investment in these systems can pay back even the smallest consumer in just a few years.

30 Assuming that the number of metering points is equal to the number of consumers

KPI – Consumers response

In the context of providing 8/5 correspondence support to customers (by correspondence or telephone during office hours; E.1), the Energy Agency has made ≈ 1,000 customer communications during the period of application of the methodology in 2024, and has provided an individual response to customers in 85% of all communications. During the observation period, it handled up to 30 calls/day, up to 45 e-mails/day[31] and six physical visits to clients. The number of communications is strongly correlated with the media attention on the issue and increased in December when consumers received their first invoice of the high season, but dropped markedly after the high season ended.

The following structure of customers (E.2) requesting customer assistance is found: self-supply consumers (≈ 70%), HCs with low consumption or minimum billing capacity issues (≈ 30%), purely individual "average consumers" and business consumers (focus on RES+CHP contribution), and individual active consumers.

The key areas of the grid charging issue (E.3) are: calculation of the network charge, level of charged costs, CP, power/energy differentiation, smart meter issues, administratively determined contracted capacity, payback period of investment in self-supply. Consumers also provided the Energy Agency with personal opinions on the reform of the network charge itself (≈ 10% of all communications).

31 Forwarded to the Energy Agency's info + URO e-mail address

Allocation and Use of Cross-Zonal Transmission Capacities

The allocation and use of cross-zonal transmission capacities (hereinafter: CZCs) in the EU is governed by Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (hereinafter: Regulation (EU) 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 2022, this area was additionally governed by Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (hereinafter: Regulation (EU) 2015/1222), which governs the day-ahead and intraday calculation and allocation of CZC, and Commission Regulation (EU) 2016/1719 of 26 September 2016 on establishing a guideline on forward capacity allocation (hereinafter: Regulation (EU) 2016/1719), which lays down the rules on calculating and allocating CZCs for time frames longer than day-ahead.

Regulation (EU) 2015/1222 stipulates that the day-ahead CZC allocation must take place within the framework of continuous market coupling in the form of auction trading. Intraday CZC allocation must likewise take place within the framework of continuous market coupling, but in the form of continuous trading. On the other hand, Regulation (EU) 2016/1719 decrees that, for periods longer than day-ahead, the allocation of CZCs may take the form of assigning physical or financial rights to use the CZCs through the use of explicit auctions. This assignment should be conducted through a common European auction platform and using unified rules for a common European market. Slovenia has been participating in the so-called 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. In June 2022, the Cirkovce-Héviz 400 kV transmission line began operating. With that, a direct transmission link between Slovenia and Hungary was established. Immediately after this link was established, the border in question was integrated into the European single day-ahead market coupling. In June 2022, there was also an essential change in the Core region, which includes Slovenia's borders with Austria, Croatia and Hungary, as from then on a power flow-based (FB) method will be used to allocate the available CZCs instead of the Available Transmission Capacity (ATC) method used previously. The ATC method continues to be used in the region of Northern Italy, which includes the Slovenian border with Italy.

This means that in 2024, day-ahead CZC allocation at all Slovenian borders took place in the context of pan-European single day-ahead market coupling, in line with the provisions of Regulation (EU) 2015/1222.

In addition to the TSO, BSP Energetska Borza – re-designated by the Energy Agency as the Nominated Electricity Market Operator (IOTEE) for the Slovenian trading area at the end of October 2023 for an indefinite period based on the conditions set out in Regulation (EU) 2015/1222 – 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 Regulation (EU) 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. According to this principle, any capacities that their holders fail to nominate by a certain deadline to confirm they're being used are transferred to day-ahead allocation, whereby holders of CZC use rights are compensated by a payment equal to the product of the price difference between the two markets resulting from the day-ahead market coupling and the amount of unused capacity. The Joint Allocation Office (JAO), headquartered in Luxembourg, took the role of the common European auction platform at all Slovenian borders. All annual and monthly auctions at the Slovenian borders were conducted in accordance with the so-called harmonised auction rules, which also apply at all other borders in the common European electricity market.

The introduction of CZC allocation based on power flows means that it is no longer possible to show the allocated volumes and revenues at individual borders, as this method also makes use of a virtual bidding zone, which takes into account the boundaries between bidding zones outside the Core region. Only the realised revenue at individual borders and in the virtual area can be shown. Table 25 gives the revenue by borders, where the virtual area is called the "slack zone". Revenues are shown according to both the gross and the net approach. The gross approach means that the total amount of congestion income is shown, while in the net approach, the costs of compensating transmission capacity holders for their curtailment and reimbursing non-nominated long-term transmission capacity are deducted.

TABLE 25: REALISED REVENUES IN 2024 AT EACH BORDER

Border	Gross approach [EUR]	Net approach [EUR]
Austria	41,762,933	15,400,371
Croatia	30,630,877	21,729,394
Italy	75,310,298	44,267,835
Hungary	19,400,767	10,652,669
Slack Zone	102,706,506	102,706,506
Total[32]	**269,811,380**	**194,756,774**

SOURCE: ELES

A large part of the revenue realised in 2024 was also realised in the virtual area. A significant part of the energy flows between Slovenia and the trading areas of the Core region also passes through the trading areas of Italy and Switzerland, which are not part of the Core region. Even after 2022, when revenues from the allocation of CZCs were almost three times higher than in previous periods before the energy crisis, the trend of high revenues continued. This is due to the continuation of the trend of higher price differentials between Slovenia and Italy and between Slovenia and Hungary compared to the differentials between Slovenia and Austria and Croatia. The widening of the exchange price differentials has occurred despite a general decrease in day-ahead market electricity prices at the beginning of 2024 and an increase in the last months of 2024. The result was an increase in the economic attractiveness of electricity transmission through Slovenia, which in turn has led to increased trading and the associated revenues from the CZCs.

Promoting Competition

The year 2024 was a watershed year for the European Union in the transformation of the internal electricity market. Following the European Commission's March 2023 proposal in response to the 2022 energy crisis, key legislative changes were adopted in May 2024 and came into force on 16 July 2024. The reform introduced long-term contracts such as power purchase agreements (PPAs) to stabilise prices and encourage investment in renewables. Member States were given the possibility to set up guarantee schemes to mitigate the financial risks associated with these contracts. In addition, capacity mechanisms to ensure sufficient electricity generation have been transformed from temporary to structural elements of the market, thereby enhancing security of supply. The new rules have given consumers more choice of contracts, including the possibility of long-term pricing and dynamic pricing, and better protection against disconnection for vulnerable groups. There was also a focus on promoting energy sharing, for example, by allowing surplus solar energy to be shared between neighbours. In 2024, renewable electricity generation in the EU reached record levels, surpassing the use of fossil fuels and thus accelerating the transition to clean energy. The electricity market reform was part of the EU's broader industrial transition plan, which includes reducing electricity taxes and simplifying state aid rules to support investment in clean industry. In 2024, the EU took an essential step towards a more stable, sustainable and consumer-friendly electricity market. However, challenges remain in terms of infrastructure connectivity and coordination between Member States, which will require further action and cooperation in the coming years.

The following is a quantitative and qualitative assessment of the state of electricity markets in Slovenia.

32 Rounding to whole numbers may result in discrepancies in totals.

Wholesale Market

In the following sections, we focus mainly on trading on the spot wholesale markets, which are also organised in Slovenia and allow for comparison with other reference markets.

Electricity Prices

At EU level, 2024 was marked by a significant growth in renewable generation, which, combined with nuclear and hydro generation, lower gas prices - especially in the first half of the year - and moderate demand, contributed to the lowest average wholesale electricity prices after 2021.

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

The Slovenian electricity market lies at the crossroads of four major European markets, the German, Austrian, Italian and South-East European markets. The Slovenian market is included in the inter-regional day-ahead market coupling at the borders with Austria, Italy, Croatia and Hungary. As part of the intra-day market coupling, the Slovenian electricity exchange market is included in the single European intra-day market as of 2022 on the borders with all neighbouring countries.

Influencing Factors

Wholesale electricity prices on the day-ahead market in 2024 within the EU-27/EEA (Norway) were significantly lower than in the previous year. ACER reports in its annual wholesale market overview report[33] that the average price was 81 EUR/MWh, a decrease of around 16% compared to 2023 and the lowest since 2021. This situation was mainly due to favourable conditions in the first half of the year – increased renewable generation, favourable hydrology, record natural gas storage capacity and the recovery of generation from nuclear power plants in France, which had been somewhat curtailed two years before due to maintenance work. Despite the significant decrease in the average wholesale electricity price, the day-ahead market price trend continues to show marked seasonal fluctuations. While low prices prevailed in the first quarter, they increased again towards the end of the year due to lower wind conditions and higher demand for electricity in cold weather. The incidence of negative prices increased by a further 50% compared to 2023, meaning that on average, 2.8% of the hours in the year had an electricity price below 0 EUR/MWh. At the same time, price volatility also increased, but it varied significantly between regions in Europe and is strongly linked to the stochastic nature of renewable generation. For example, the Central and Eastern European regions experienced a marked price increase in July-September due to heat waves and dry spells, while in December, Germany experienced markedly high prices as a result of cold and windless weather.

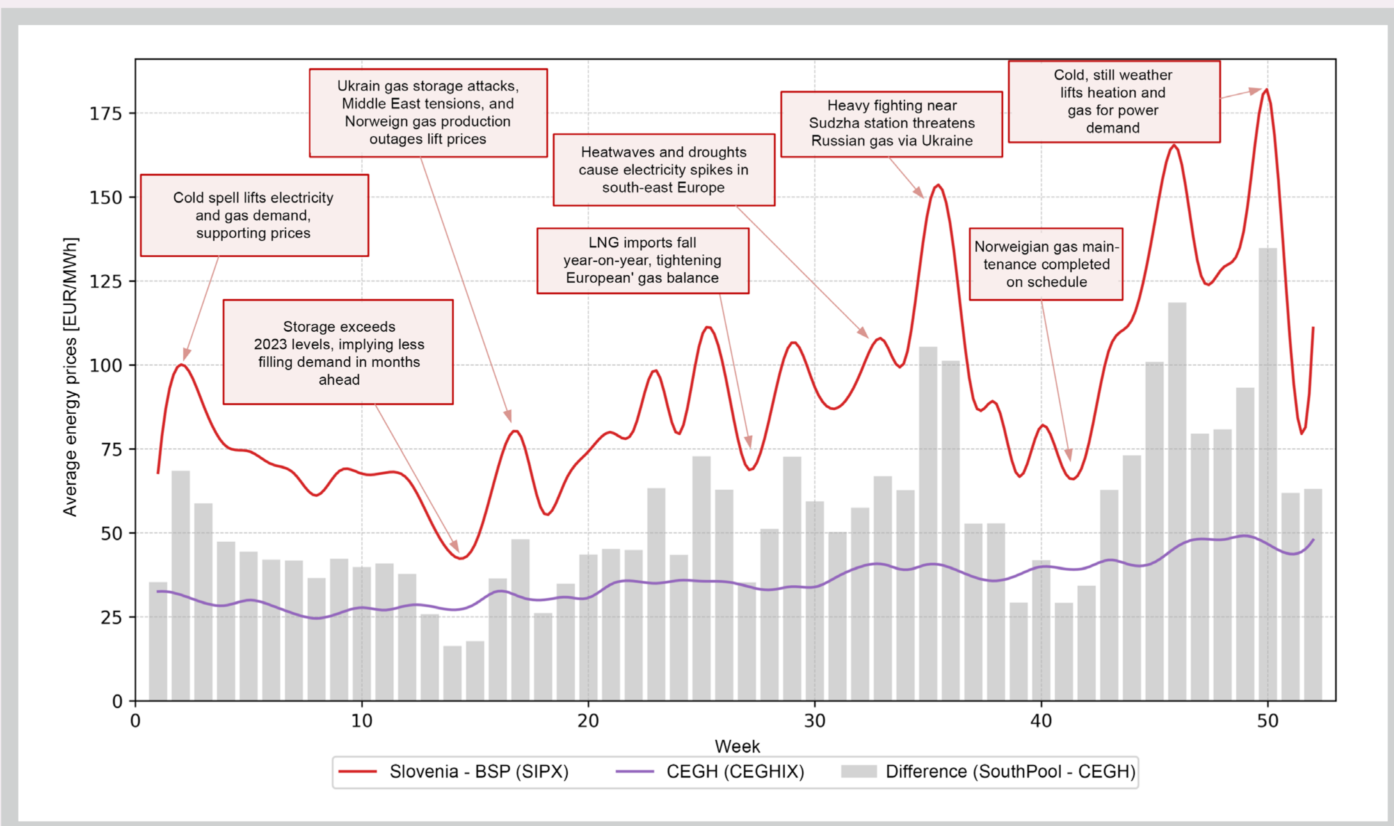
The degree of price convergence in day-ahead markets between European regions is an important indicator of the degree of market integration. At the same time, full price convergence cannot be achieved as it would require disproportionately high investment in network infrastructure. In the long term, price convergence is promoted by market integration measures and the expansion of transmission capacity. At the same time, short-term divergences may arise due to constraints in available cross-border capacity, outages of transmission links or changes in the composition of production and consumption. In 2024, convergence levels remain low in the Nordic, Baltic and Hansa regions, while in South-Eastern Europe, the share of hours with full convergence has increased to 70%. In contrast, in Italy and Greece, the share has decreased to 20%, and the Northern Italy area is also experiencing lower levels of price convergence than in the past[34].

33 ACER (2025). Key developments in European electricity and gas markets. 2025 Monitoring Report
34 European Comission (2024). Quarterly report on European electricity markets, vol. 17, issue 4, covering fourth quarter of 2024 - with focus on annual overview for 2024.

Price dynamics in the electricity market are closely linked to wholesale natural gas prices. ACER's report concludes that the higher correlation between the prices of these two energy products occurs in times of high gas consumption and less carbon-intensive systems. In comparison, the lower correlation prevails in real-time and systems with a high penetration of renewables. The year 2024 was marked by a substantial increase in solar generation, which, together with wind, hydro and nuclear, reduced the need for fossil fuels. As a result, the share of electricity generated from fossil sources averaged 33%, reaching an all-time low. Despite the reduction in the overall use of fossil resources, gas-fired power plants played an important role in meeting peak demand, especially during periods of reduced production from solar and wind power, confirming that fossil resources remained important, especially in providing short-term flexibility and for security of supply.

Gas prices were stable at the beginning of the year, before rising again from the spring onwards due to reduced LNG imports, increased gas demand in Asia and various geopolitical factors. E.g. at the end of 2024, the transit of Russian gas via Ukraine was terminated, which further affected the gas market situation and increased the supply costs for Central European countries. A visual summary of the most important global developments and factors that have influenced energy prices on European markets, and consequently also prices on the Slovenian Energy Exchange (BSP) and the Austrian gas hub (CEGH), which is the price reference for gas purchases in Slovenia, is provided in Figure 77.

FIGURE 77: SUMMARY OF THE MOST SIGNIFICANT DRIVERS OF PRICES IN 2024[35]



SOURCES: MONTEL, ACER

35 Tailored display of original visualization Key developments in European electricity and gas markets (ACER), p. 22

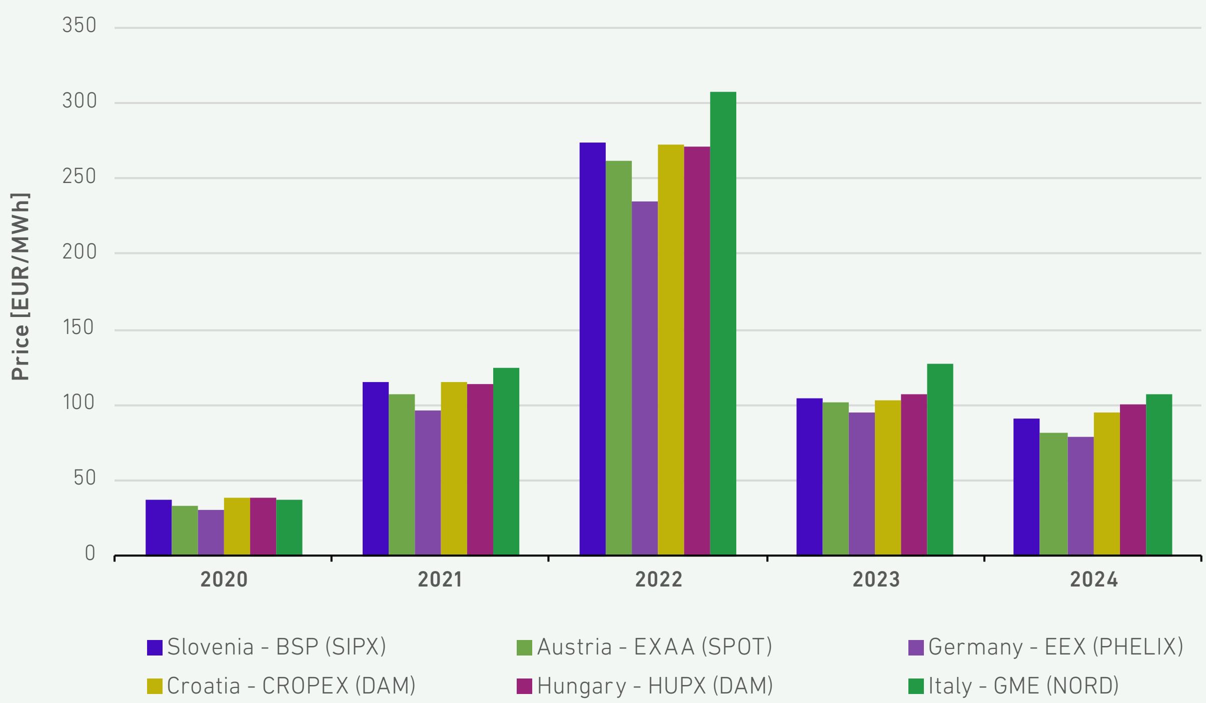
Figure 78 shows the evolution of average prices of base energy on the stock exchanges in Slovenia, neighbouring countries and Germany over the last five years. Prices on the Slovenian stock ex-change in 2024 were most comparable to prices in Croatia.

In 2024, the average price of base prices on the Slovenian power exchanges decreased by 12.5% compared to 2023, reaching a value of EUR 91.29/MWh. As shown in Figure 78, electricity prices decreased slightly on all markets observed. Similarly to 2023, the highest average day-ahead market price in 2024 was recorded on the Italian GME (NORD) market.

A decrease of around 14% in exchange prices compared to 2023

The lowest average price for base energy in the benchmark was again recorded on the German power exchange, where the price was 79.57 EUR /MWh. Compared to 2023, average prices there decreased by 16.4%. Due to the high liquidity of the German electricity market, prices on the local exchanges also have a significant impact on the rest of the markets within the European Union.

FIGURE 78: TRENDS IN THE AVERAGE BASE PRICE IN THE DAY-AHEAD MARKET IN SLOVENIA AND IN FOREIGN EXCHANGES IN THE 2020–2024 PERIOD

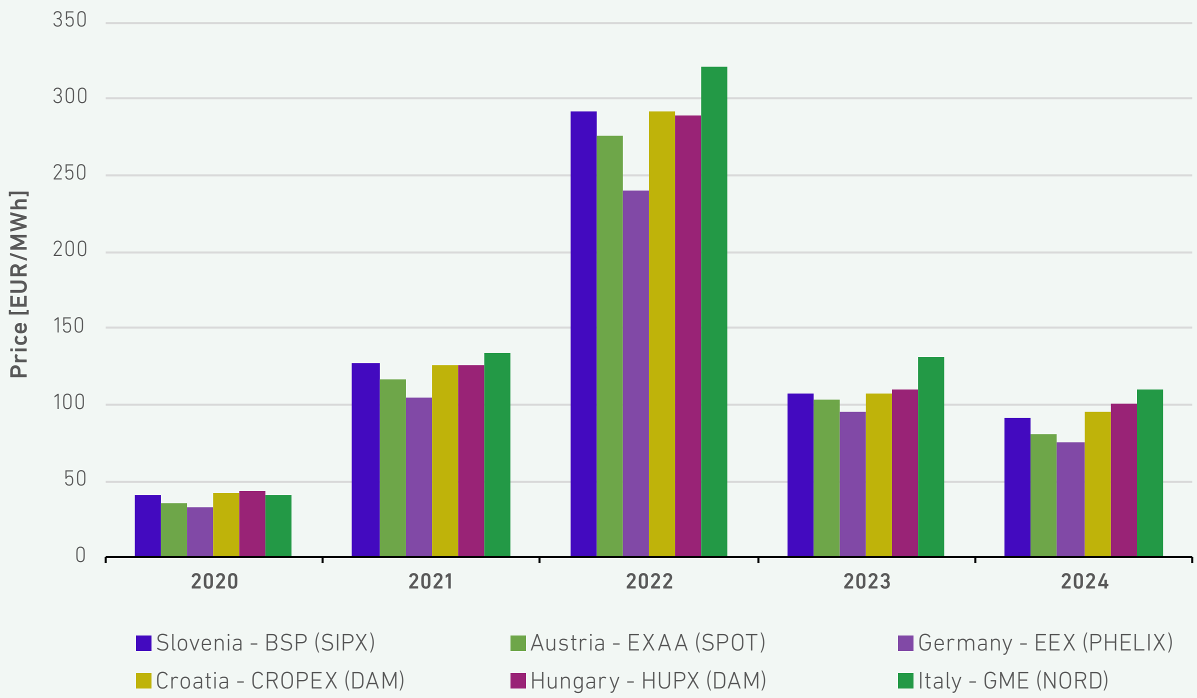


SOURCE: MONTEL

The evolution of the average day-ahead market price of peak energy in individual markets is shown in Figure 79. In 2024, the average market price of peak energy on the Slovenian power exchange decreased by 14.5% compared to 2023, to 91.40 EUR/MWh.

Although the average price of peak energy on the Italian GME market decreased by 15.9% compared to 2023, it remained the highest among all observed markets in 2024. The average price on the Italian GME market (NORD) was 110.52 EUR/MWh.

FIGURE 79: TRENDS IN THE AVERAGE PEAK PRICE IN THE DAY-AHEAD MARKET IN SLOVENIA AND IN FOREIGN EXCHANGES IN THE 2020–2024 PERIOD



SOURCE: MONTEL

Wholesale electricity prices on the spot markets were mostly stable in the first half of 2024, ranging between 60 and 120 EUR/MWh. In the summer months (July and August), there were significant price spikes, especially on the markets of Germany (EEX), where individual day values reached close to 400 EUR/MWh, and Croatia (CROPEX), where the value was close to 300 EUR/MWh. These are periods of increased volatility, which can be associated with constrained generation (e.g. low wind or hydropower generation) and increased demand due to a heatwave. In the autumn-winter period (September–December), the trend continues with occasional spikes, with Slovenia (BSP) experiencing some of the more pronounced peaks over 200 EUR/MWh (e.g. November and December). At the end of June, an extraordinary event can also be observed on the German Energy Exchange (EEX), which resulted in an average day-ahead trading price of around 500 EUR/MWh, while the long-term average for the period was around 50 EUR/MWh. A computer error on the EPEX SPOT on 25 June[36], resulted in a sharp increase in the price of electricity. On that day, prices for an hourly product in Germany jumped to 2,325 EUR/MWh in one hour.

In Italy (GME NORD), prices are the most stable, almost unchanged compared to other countries. Hungary and Slovenia show similar price fluctuations, but Slovenia shows more volatility, suggesting a greater influence of local factors and possibly less liquidity in the market. Austria and Croatia follow a similar trend to Slovenia, but with smaller extremes. Austria and Croatia follow a similar trend to Slovenia, but with smaller extremes. Germany (EEX) stands out with the most significant fluctuations - from pronounced price peaks to negative prices, consistent with more RES and more market flexibility.

Figure 80 shows increased price volatility in the second half of 2024, mainly due to changing generation and demand conditions. Such trends confirm the need for improved system flexibility, cross-border interconnections and measures to mitigate volatility, especially during periods of high RES generation.

In 2024, base energy prices were highest in the last quarter. In Slovenia, the average price in the last quarter was 136.87 EUR/MWh, in Germany 119.22 EUR/MWh, and in Hungary, as high as 156.68 EUR/MWh. The lowest average prices for baseload energy in all markets were in the second quarter. The highest prices for baseload energy on day-ahead markets in 2024 were reached in December, with the daily price for day-ahead markets reaching EUR 156.68/MWh in Hungary.

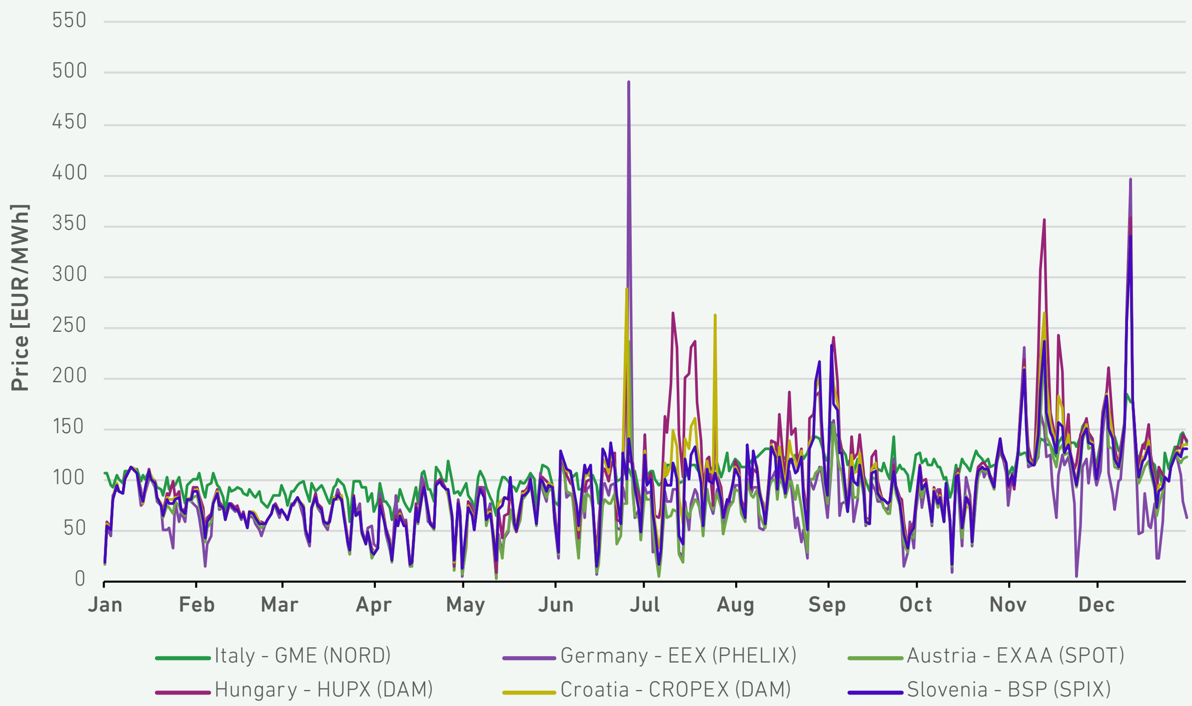
36 https://www.epexspot.com/sites/default/files/download_center_files/240710_Update%20on%20Market%20Incident%20of%2025%20June%20 2024.pdf

The highest spot energy prices on the day-ahead markets in 2024 were reached in December, with the daily price for spot energy on the Slovenian exchange reaching an absolute peak of 503 EUR/MWh on December 12, 2024. The highest hourly price in 2024 was reached on August 29, when it amounted to 1,022.27 EUR/MWh between 5:00 p.m. and 6:00 p.m.. In 2023, the highest hourly price was reached in September, amounting to 426.18 EUR/MWh.

If we arbitrarily define price peaks as exceeding three times the average hourly prices of the year, there were 108 cases of price peaks in Slovenia, while in 2023, there were three such cases.

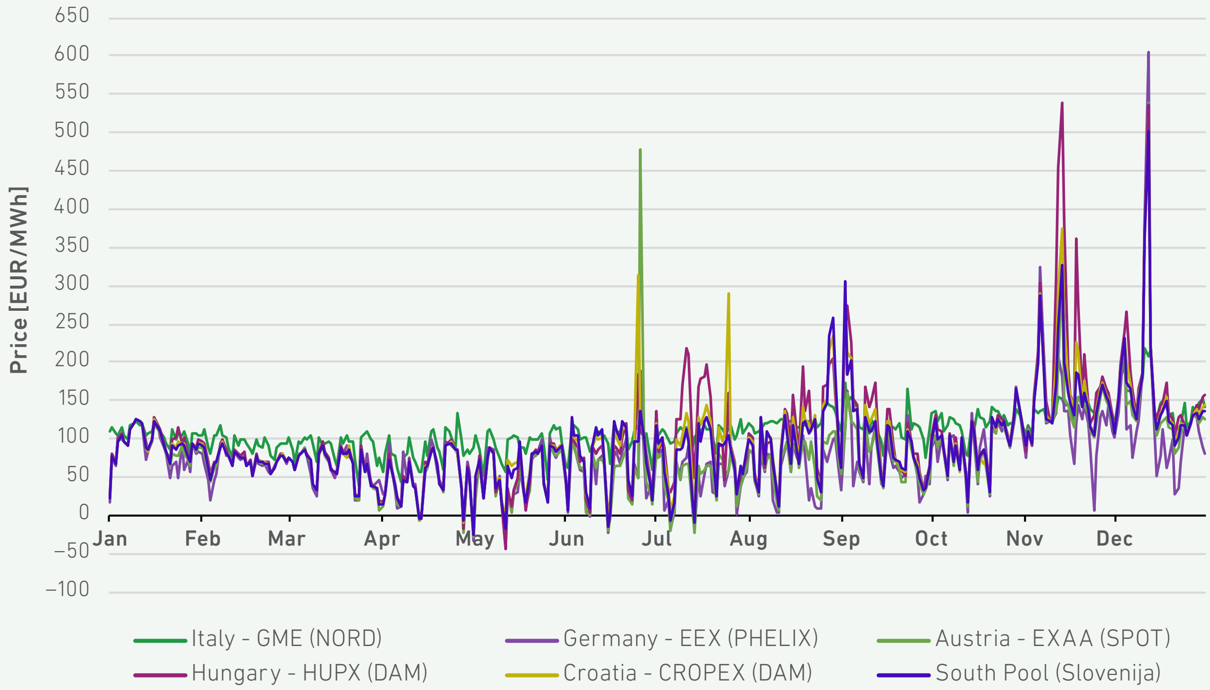
On the Slovenian market, a negative hourly price was recorded in 2,019 hours in 2024 and 96 hours in 2023. On the German market, a negative hourly price was recorded in 459 hours and only 301 hours in 2023.

FIGURE 80: TRENDS IN THE BASE PRICE ON THE DAY-AHEAD MARKET IN SLOVENIA AND ON THE NEIGHBOURING EXCHANGES



SOURCE: MONTEL

FIGURE 81: 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 day-ahead prices achieved on the BSP (Slovenia), GME (Italy), EXAA (Austria), CROPEX (Croatia) and HUPX (Hungary) stock markets in 2023 and 2024.

The Austrian market offered lower prices in a significantly higher number of cases in 2024, re-flecting the better liquidity and price advantage of EXAA compared to BSP. The drop in the share of equal prices indicates a greater difference in the trading structure and probably also in the production situation. In 2024, the BSP has often been claimed as a cheaper market com-pared to Hungary and Croatia. The biggest differences remain when comparing with the Italian market, where prices are much higher.

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

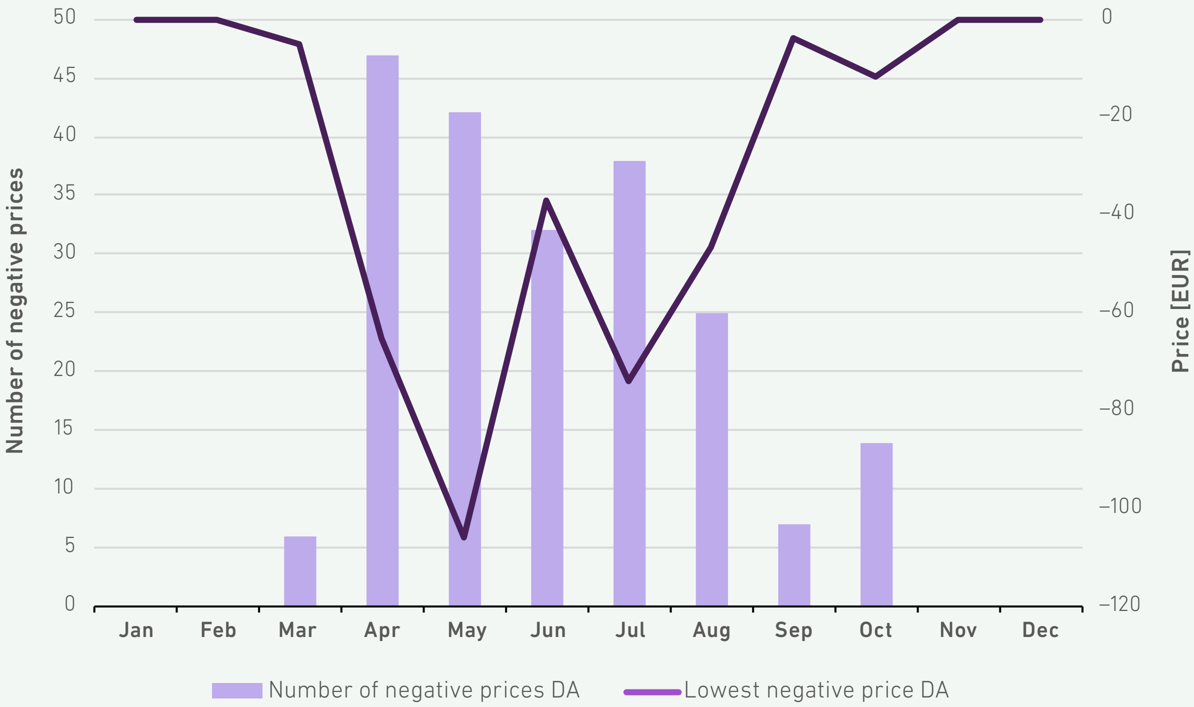
	Share of hours in 2023	Share of hours in 2024
Lower price in BSP than GME	82.09%	76.11%
Lower price in GME than BSP	9.59%	13.34%
Same price in BSP and GME	8.32%	10.55%
Lower price in BSP than EXAA	27.91%	23.72%
Lower price in EXAA than BSP	41.74%	59.91%
Same price in BSP and EXAA	30.35%	16.37%
Lower price in BSP than CROPEX	42.48%	59.87%
Lower price in CROPEX than BSP	27.17%	24.61%
Same price in BSP and CROPEX	30.35%	15.51%
Lower price in BSP than HUPX	47.93%	61.22%
Lower price in HUPX than BSP	23.32%	25.05%
Same price in BSP and HUPX	28.74%	13.73%

SOURCES: ENERGY AGENCY, MONTEL

In 2024, there was a marked increase in the number of negative prices, with the most frequent occurrences in the day-ahead market (BSP) between March and October. In 2024, 211 negative hourly prices were recorded, an increase of 119% compared to 2023, when there were 96 negative hourly prices. Day-ahead market negative prices increased by more than 100% compared to the previous year. The highest number of negative prices occurred in April 2024, when a negative price occurred 47 times. The lowest price achieved was on 12 May 2024 for the H15 hour and was −105,88 EUR/MWh.

Day-ahead market negative prices increase by more than 100% compared to the previous year

FIGURE 82: ANALYSIS OF NEGATIVE PRICES ON THE BSP MARKET FOR DAY-AHEAD (DA)

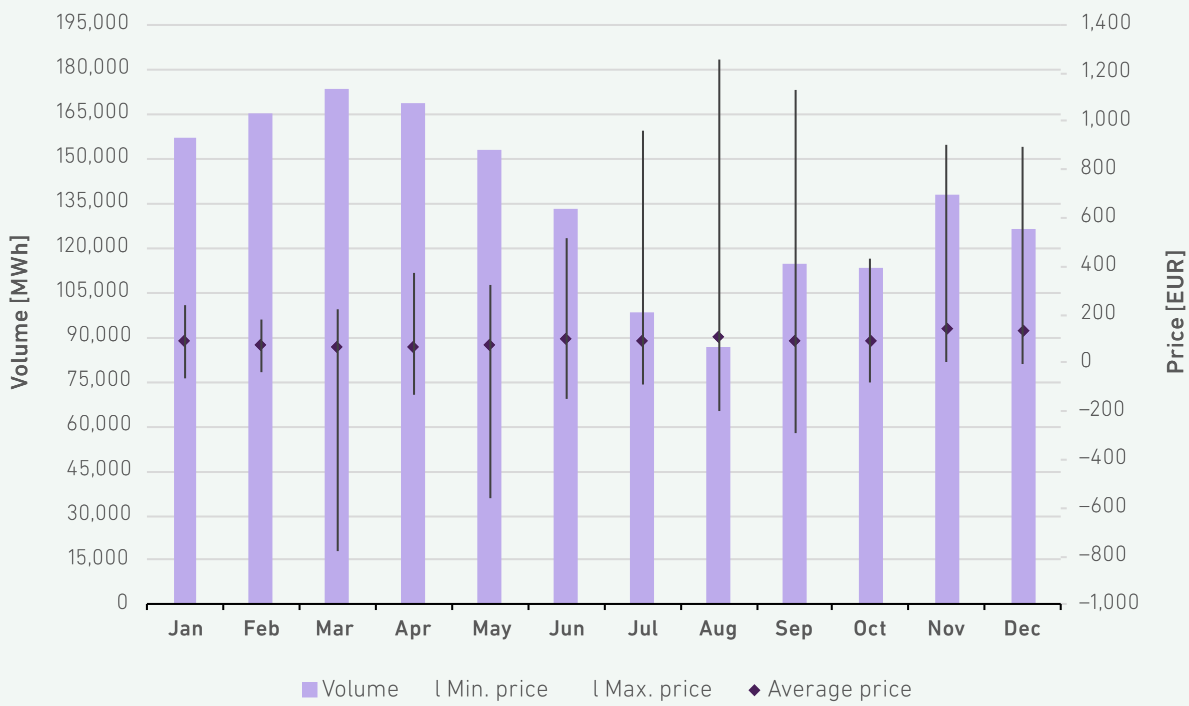


SOURCE: BSP

Prices on the Intraday Continuous Market

Figure 83 shows the movement of trading volumes and average price ranges[37] of all products on intraday spot market. During the summer months, there has been a drop in the volume of spot trading and the largest spreads in the average price of each product.

FIGURE 83: VOLUME OF TRADING AND PRICE RANGES IN THE INTRADAY MARKET

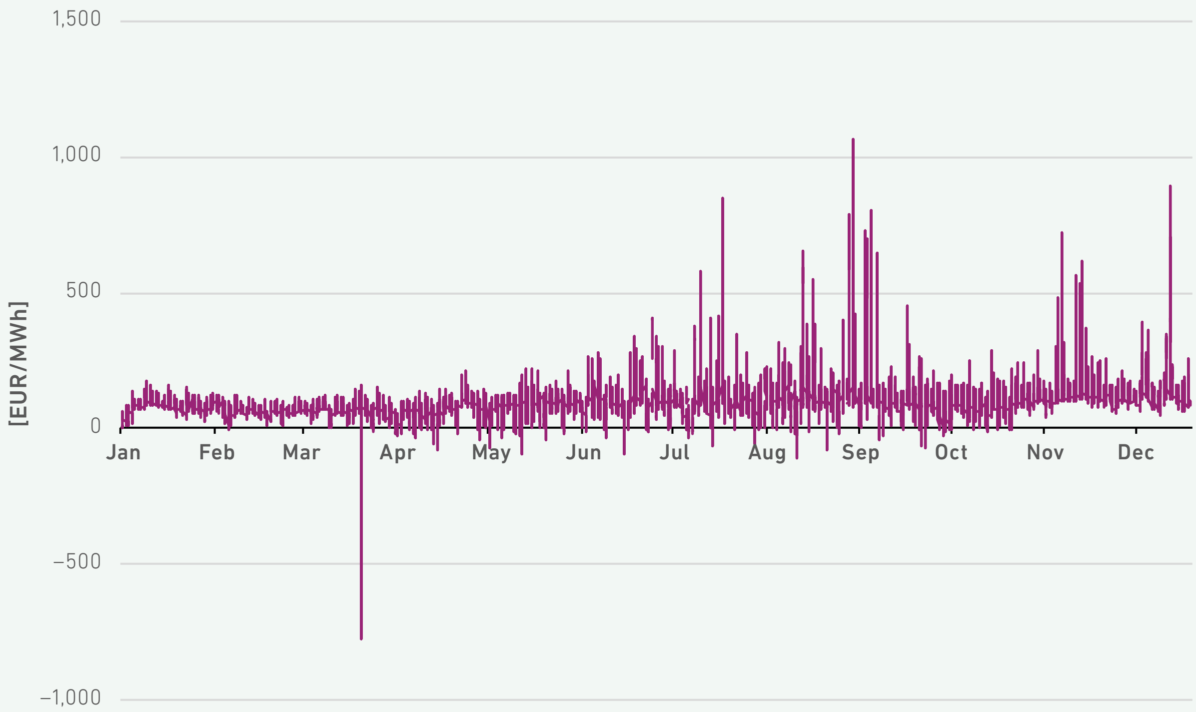


SOURCE: BSP

37 The average price represents a weighted average of all trades executed for a given product, with the weight determined by the volume of each trade.

The average price of hourly products on the intraday market in 2024 was 94.43 EUR/MWh, which is 12.2% lower than the average price in 2023 of 107.55 EUR/MWh. The highest price for an hourly product on the intraday market occurs on 28 August 2024 for the hourly product H20 at 1,064.46 EUR/MWh, while the lowest price occurs on 20 March 2024 for the hourly product H6 at –776.82/ EUR MWh.

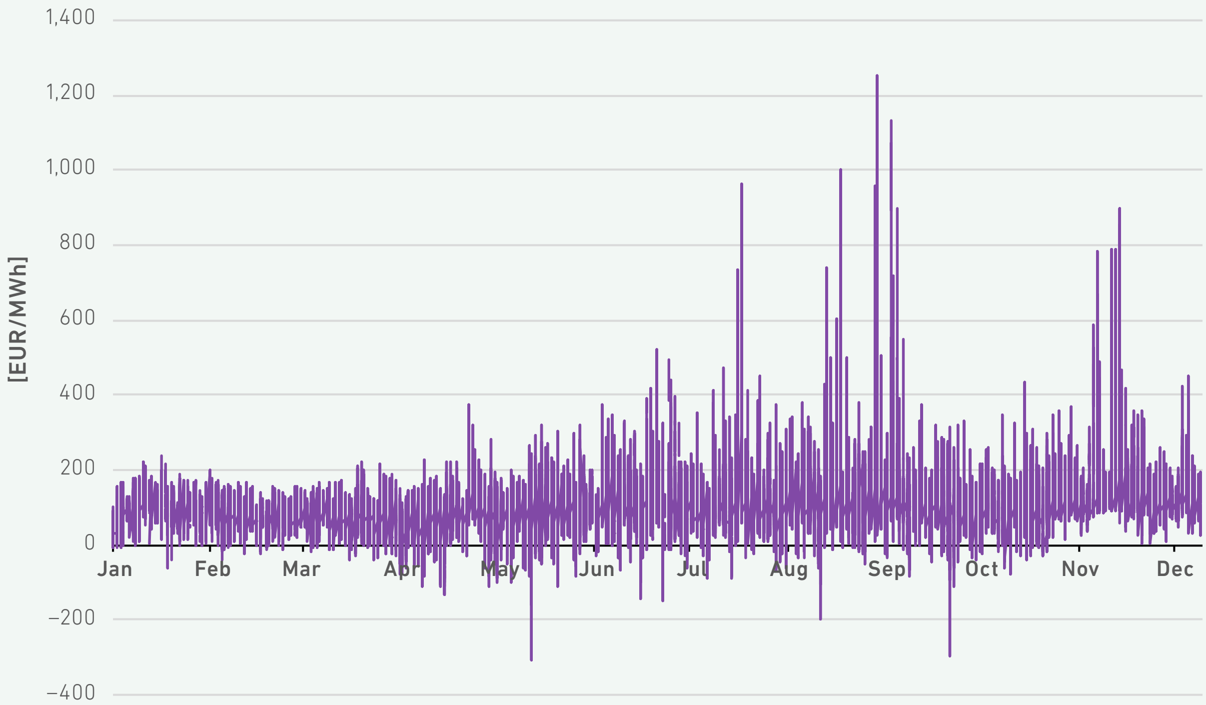
FIGURE 84: DEVELOPMENT OF PRICES OF THE HOURLY PRODUCT ON THE BSP INTRADAY MARKET



SOURCE: BSP

The average price of 15-minute products on the intraday market in 2024 was 94.65 EUR/MWh, which is almost 12% lower than the price in 2023, when the average price was 107.5 EUR/MWh, and 65.6% lower than in 2022, when the average price was 275.09 EUR/MWh. The highest price for the 15-minute product on the intraday market occurs on 29 August 2024 for the interval between 18.45 and 19.00. It amounts to 1,254.07 EUR/MWh, while the lowest price, also as for the hourly product, occurs on 12 May 2024 for the interval between 16.00 and 16.15 and amounts to –308,69 EUR/MWh.

FIGURE 85: DEVELOPMENT OF THE PRICES OF THE 15-MINUTES PRODUCT ON THE BSP ID MARKET

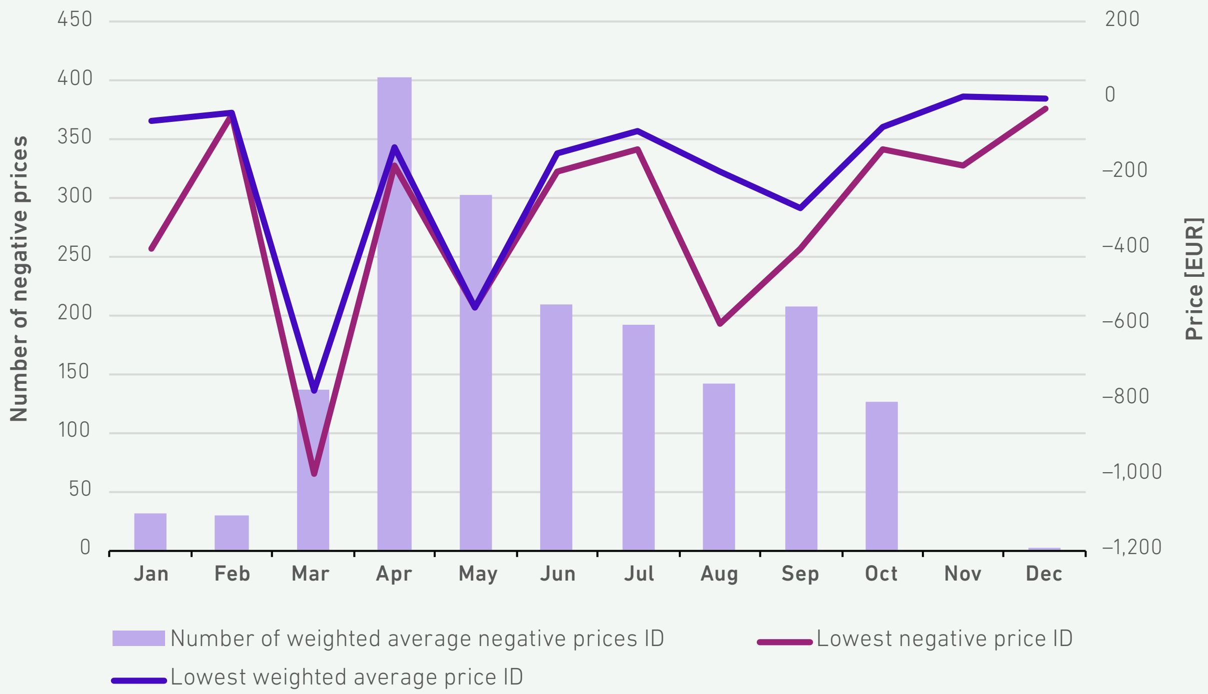


SOURCE: BSP

The intraday market also saw a marked increase in the number of negative average prices in 2024, occurring in all months except November 2024. In 2024, the average negative price for block, hourly and 15-minute products was recorded 1,781 times, an increase of 150% compared to 2023, when it occurred 710 times. In 2024, the majority of average negative prices (85%) were achieved on 15-minute products. The highest number of negative average prices occurred in April 2024, when the average negative price occurred 403 times across all products. The lowest negative average price achieved was on 20 March 2024 for the hourly product H6 and amounted to EUR −776,82/MWh. Otherwise, negative price transactions took place in all months of 2024. The lowest actual price achieved was also on 20 March 2024 for the hourly product H6 and amounted to 100 EUR/MWh.

150% increase in the number of weighted negative prices in the intraday

FIGURE 86: VOLUME OF NEGATIVE PRICES IN THE INTRADAY MARKET



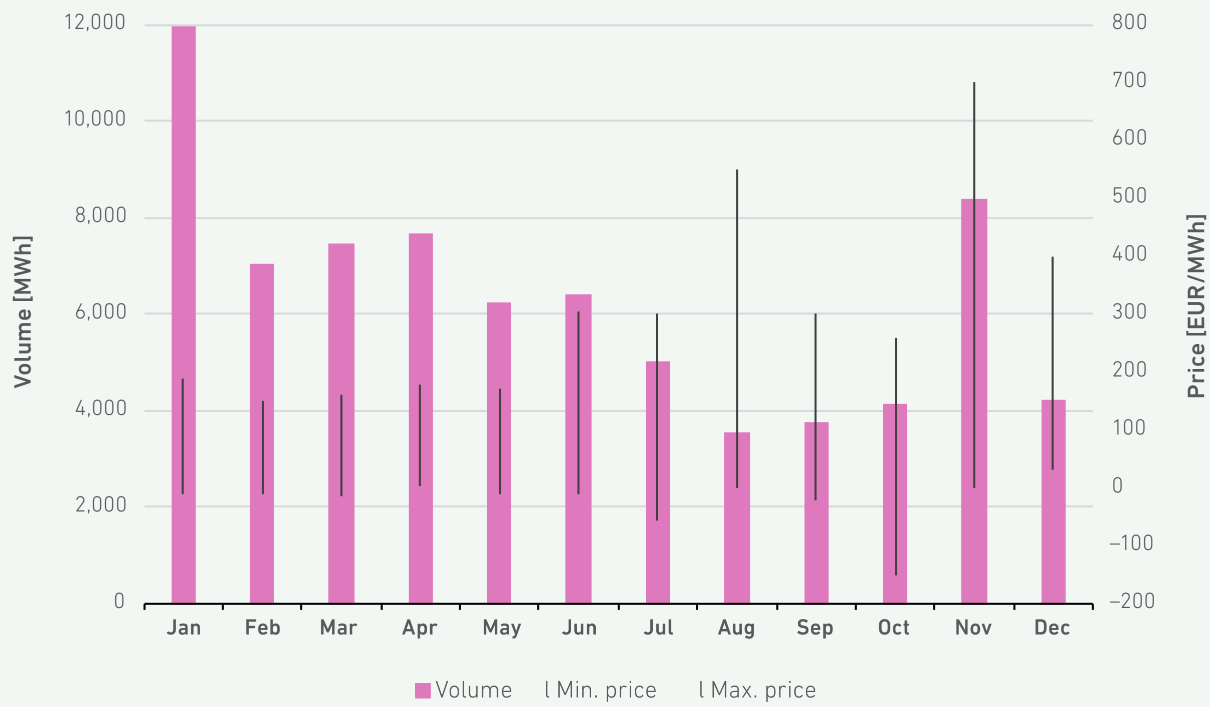
SOURCE: BSP

Energy Prices on System Balancing Markets

The Energy Agency monitors all organised markets where energy is traded for system balancing, i.e. the ancillary services organised by the TSO and the balancing market of the market operator. The prices for the lease of balancing power to ensure the availability of units participating in the ancillary services market, unintentional deviations (FSkar) and imbalance netting (IGCC) are analysed in the section Provision of system services. The analysis below focuses exclusively on balancing energy prices.

The highest electricity price in the balancing market of the market operator in 2024 is 700 EUR/MWh, and the lowest is –150 EUR/MWh. The highest prices occur when balancing energy is purchased, and the lowest prices reflect the sales of peaking energy by the TSO. In addition to the TSO, five other members participated in the balancing market of the operator. The highest price was reached in the morning hours of 13 November 2024. The TSO continued to act mainly as a seller of electricity in the balancing market in 2024.

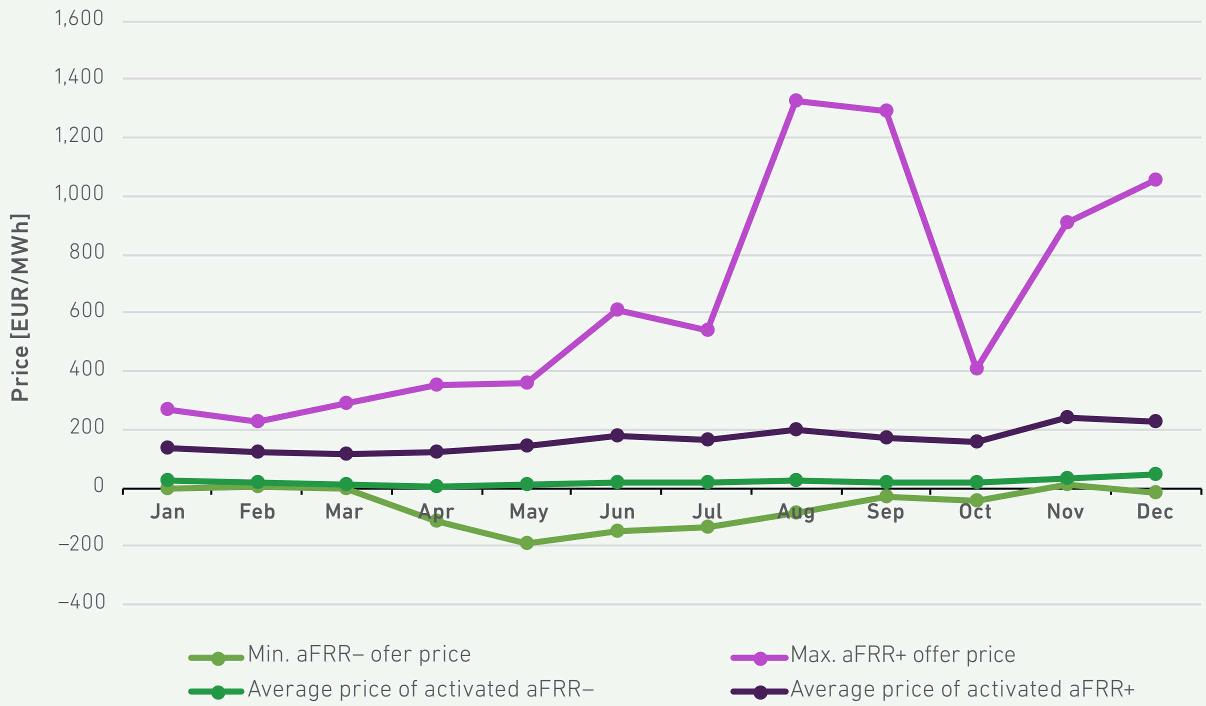
FIGURE 87: VOLUME OF TRADING AND PRICE RANGES IN THE MARKET OPERATOR BALANCING MARKET



SOURCE: BORZEN

In the frequency system services market, balancing energy prices for the frequency restoration reserve (FRR) are set according to the collected bids from qualified balancing service providers, separately for positive (FRR+) and negative (FRR–) balancing, and separately for the automatic (aFRR) and manual frequency restoration reserve (mFRR). The TSO uses a trading platform to collect bids and activate aFRR and mFRR energy. On this platform, energy bids are collected for each hour, and the system selects the most favourable one according to the ordered list of bids and the balancing needs, which is the basis for the activation of the balancing energy and the irrevocable pay-as-bid transaction.

FIGURE 88: PRICE TRENDS OF OFFERS AND ACTIVATED aFRR ENERGY



SOURCE: ELES

Figure 88 shows the evolution of bid prices and activated energy of the aFRR– and aFRR+ frequency restoration reserve. Due to the activations according to the ordered bid list, the realised prices are more favourable than the bid price range shown. The highest monthly average prices for aFRR+ positive balancing were achieved in November, when the average price of activated energy was 239.55 EUR/MWh. The lowest and thus least favourable monthly average prices for aFRR– negative balancing were achieved in April, when the average price of activated energy was 7.18 EUR/MWh. The lowest hourly bid price for aFRR– was on 12 May 2024 for the H15 hour and, due to price capping, coincided with the lowest day-ahead market price of –190.58 EUR/MWh. The most significant difference between the prices for positive and negative balancing was observed in November, when it was 204.83 EUR/MWh.

In the aFRR automatic reserve market, the measures of the Act on Energy Crisis Management Measures (ZUOKPOE), which entered into force on 22 September 2022, are still in force. Initially, it capped bid prices at 1.3 times the day-ahead trading price achieved for positive balancing and 0.7 times the day-ahead trading price achieved for negative balancing. At the beginning of 2023, due to the lower day-ahead market prices, the methodology was adjusted to redefine the following limiting factors, which were also valid throughout 2024:

TABLE 27: THE aFRR CAPPING FACTOR, WHICH IS SET ACCORDING TO SIPXh

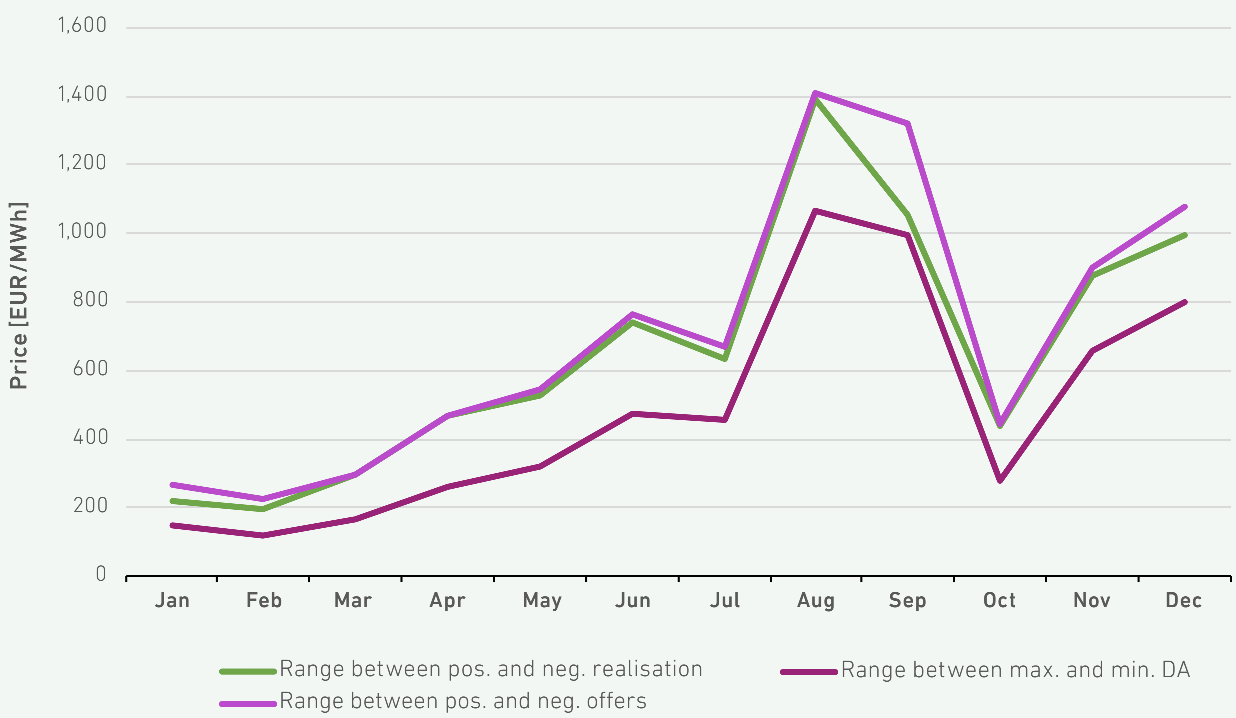
SIPXh in EUR/MWh	aFRR+ Factor	aFRR– Factor
Up to 0.00	0.8	1.2
From 0.01 to 200.00	1.8	0.2
From 200.01 to 350.0	1.5	0.5
From 350.01 to 450.00	1.4	0.6
From 450.01	1.3	0.7

SOURCE: ELES

The maximum price for balancing energy aFRR+ and the minimum price for balancing energy aFRR– per hour of supply h shall be determined as the product of SIPXh and the corresponding factor aFRR+ and aFRR–, respectively. This value represents the maximum price for aFRR+ and the minimum price for aFRR– that a BSI may quote when making energy bids for aFRR balancing energy for a delivery hour h.

It can be seen from Figure 89 that there are no significant differences in bids and realisations in the range between positive and negative energy throughout the year. This is due to the still valid measure of the ZUOKPOE, which limits the bid prices as indicated in Table 27 It is also observed that all bidders usually bid close to the maximum or minimum allowed price. As a consequence, the realisation is carried out at these prices and thus does not lead to significant differences in the range of realised/offered aFRR+/aFRR–. The most considerable difference between the latter is observed in September, when the realised prices were nevertheless slightly lower than the bids.

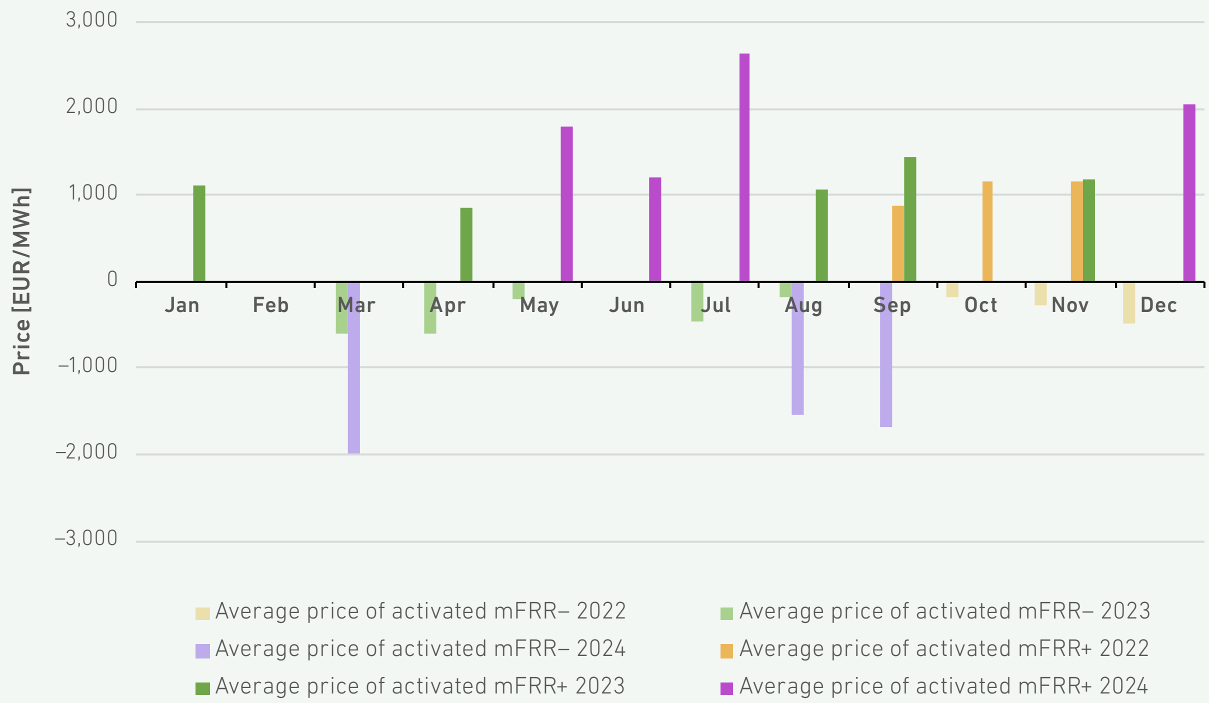
FIGURE 89: CORRELATION BETWEEN THE RANGE OF MINIMUM PRICES OF THE REALISED/OFFERED aFRR– AND THE MAXIMUM PRICES OF THE REALISED/OFFERED aFRR+, THE AVERAGE PRICE OF THE DAY-AHEAD TRADING AND THE RANGE OF THE MINIMUM AND MAXIMUM PRICE OF THE DAY-AHEAD TRADING



SOURCE: ELES

Figure 90 shows the average prices of activated energy mFRR+ and mFRR– for the months when the energy was activated. The prices of activated energy mFRR+ and mFRR– show a clear upward trend. In particular, in 2024, there is a significant jump compared to the previous year. In 2024, the positive mFRR balancing was only activated in May, June, July, and December, while the negative mFRR balancing was activated in March, August, and September.

FIGURE 90: PRICE TRENDS OF ACTIVATED mFRR ENERGY



SOURCE: ELES

CASE STUDY
Comparative analysis of prices on the European platforms MARI and PICASSO and on the ELES balancing market

As part of the efforts to create a single and efficient European electricity market, ENTSO-E, the European association of transmission system operators, has already in 2017 initiated the development of two key EU-wide centralised trading platforms for the exchange of balancing energy: PICASSO for automatic reserve for frequency restoration (aFRR) and MARI for manual reserve for frequency restoration (mFRR). The introduction of these mechanisms has made the European reserve market more integrated and responsive - allowing market cooperation between countries, greater choice of providers and more efficient handling of power system deviations, while the expected significantly increased liquidity, especially in the future when the remaining Member States will join PICASSO/ MARI, will undoubtedly have a positive impact on price developments.

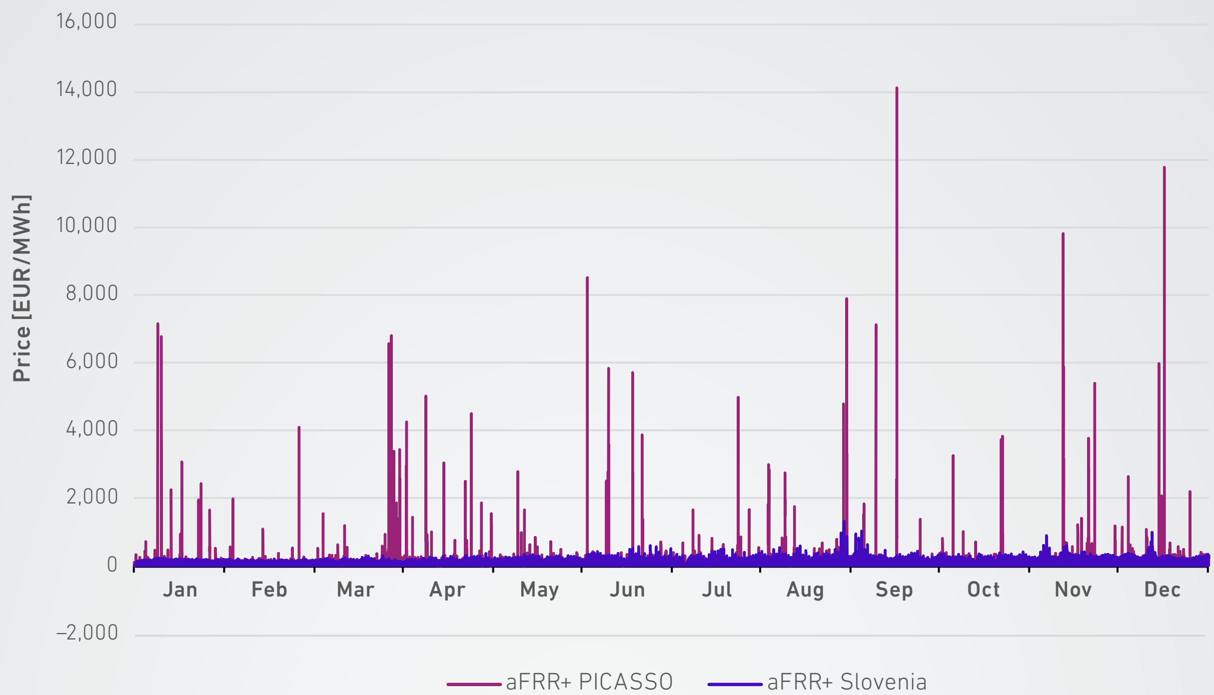
The PICASSO platform was set up to improve the efficiency of system balancing, reduce the cost of reserve activation and increase the transparency of market signals. It entered its operational phase in 2022, and by the end of 2024, it was connecting TSOs from nine countries.

An analysis of the prices achieved in 2024 reveals marked differences between the PICASSO platform and the ELES balancing market for the aFRR balancing service.

While on PICASSO, the prices for positively activated energy (aFRR+) range over a wide range, from around 0 EUR/MWh up to 14,129.29 EUR/MWh, on the ELES balancing market for the aFRR balancing service+, these values range between –27 EUR/MWh and 1,313 EUR/MWh.

An important indicator of the difference between the PICASSO market and the ELES balancing market for the aFRR balancing service+ is the weighted average price, which takes into account the volumes of individual activations. In Slovenia, this was 186 EUR /MWh, while on the PICASSO platform, it was about 34% higher, reflecting the higher frequency and price of activations on the European market.

FIGURE 91: COMPARISON OF POSITIVE AUTOMATIC BALANCING PRICES BETWEEN THE PICASSO MARKET AND THE ELES BALANCING MARKET FOR THE aFRR+

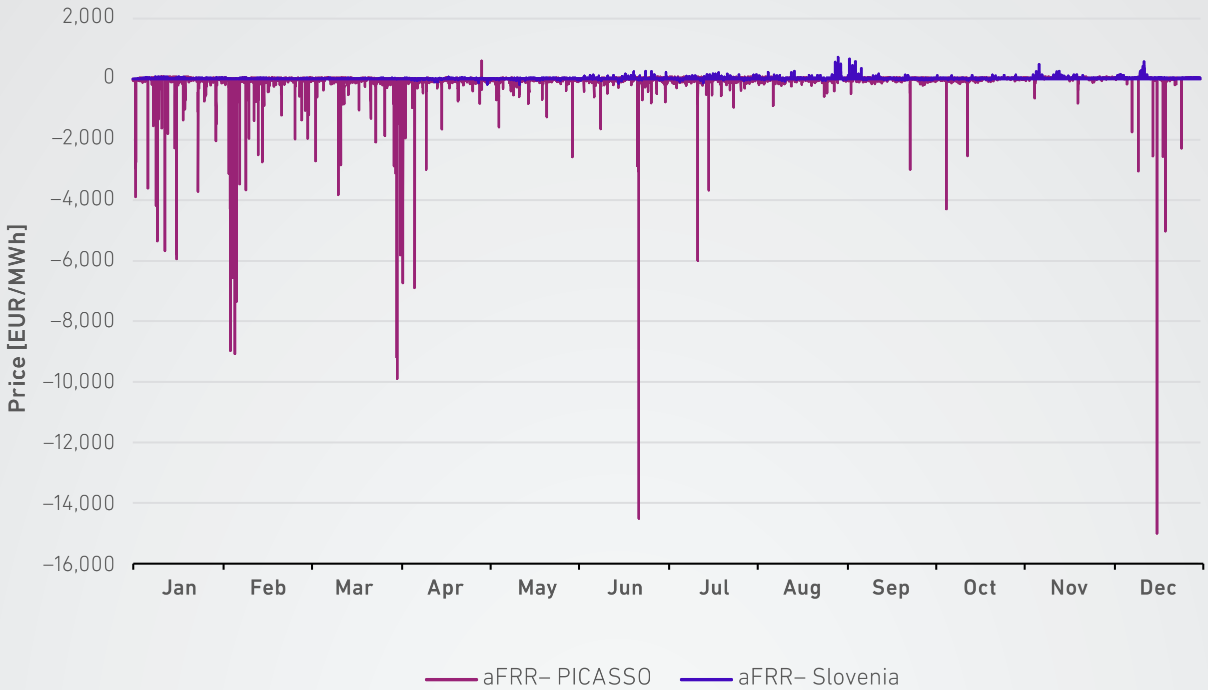


SOURCES: ELES, APG

In the negative direction (aFRR–), the differences are even more pronounced. On the PICASSO platform, prices ranged between 598 EUR/MWh and –15,000 EUR/MWh, while on the ELES balancing market for the aFRR– balancing service prices ranged between –190.74 EUR/MWh and 720 EUR/MWh.

The weighted average price on the ELES balancing market for the aFRR– balancing service was positive (18.14 EUR/MWh), while on the PICASSO balancing market it was negative at around –189 EUR/MWh, reflecting the fact that negative activations (e.g. production decrease or consumption increase) are more frequent in the European context.

FIGURE 92: COMPARISON OF NEGATIVE AUTOMATIC BALANCING PRICES BETWEEN THE PICASSO MARKET AND THE ELES BALANCING MARKET FOR THE aFRR–



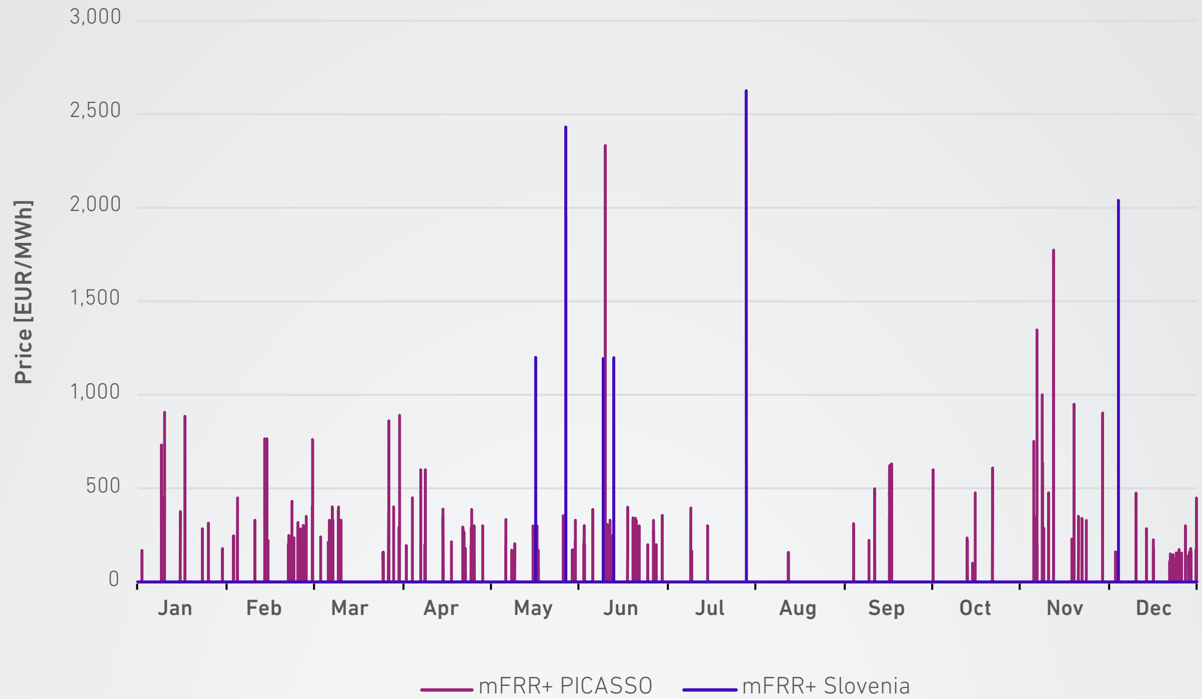
SOURCES: ELES, APG

The MARI project, which started to be developed in 2017, aims to establish a common European platform for the exchange of mFRR reserves (manually activated), similar to the one provided by the PICASSO platform for aFRR. The platform started operations in October 2022 with a handful of TSOs, and by the end of 2024, 10 TSOs from different European countries were already actively participating in it.

In contrast to the PICASSO case, a comparison between MARI and the ELES balancing market for the mFRR balancing service shows a different picture in terms of prices achieved. In the ELES balancing market, activations are less frequent and activation prices, compared to the MARI platform, are markedly high.

On the MARI platform, prices for positively activated energy in 2024 ranged from around 91 to 2,332 EUR/MWh, while the price range on the ELES balancing market for the mFRR balancing service+ was smaller, but positioned higher - between 1,192 and 2,625 EUR/MWh. The average values on MARI are lower – as confirmed by the weighted average price, which in Slovenia was 1,933 EUR/MWh, while on MARI it was around 77% lower.

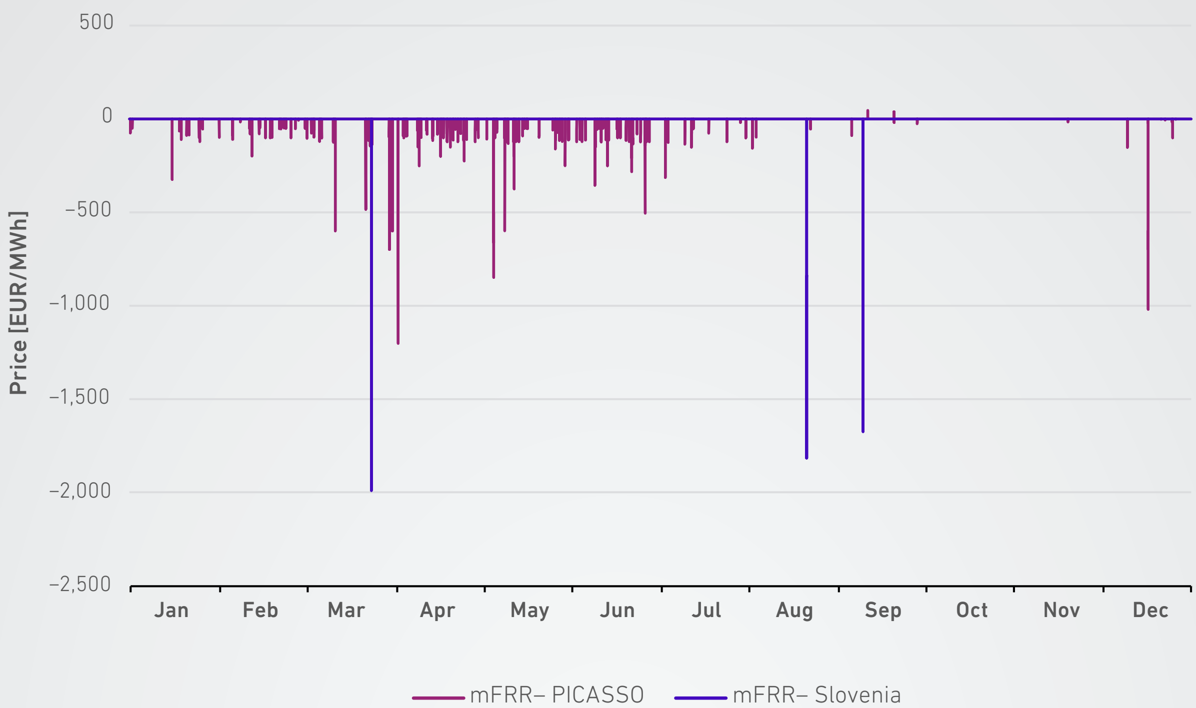
FIGURE 93: COMPARISON OF POSITIVE MANUAL BALANCING PRICES BETWEEN THE MARI MARKET AND THE ELES BALANCING MARKET FOR THE mFRR+



SOURCES: ELES, APG

With negative activation, the price differences increase further. On the MARI platform, prices ranged between –1,203 EUR/MWh and 45 EUR/MWh, while on the ELES balancing market for the mFRR balancing service, prices ranged between –1,991 EUR/MWh and –837 EUR/MWh, with the weighted average price in the ELES balancing market equal to –1,488 EUR/MWh, which is 85% lower than the weighted average on MARI platform (–222 EUR/MWh).

FIGURE 94: COMPARISON OF NEGATIVE MANUAL BALANCING PRICES BETWEEN THE MARI MARKET AND THE ELES BALANCING MARKET FOR THE mFRR–



SOURCES: ELES, APG

A comparative analysis of the prices achieved on the PICASSO and MARI platforms compared to the ELES balancing market shows significant differences in market structure, pricing dynamics and market efficiency.

The analysis confirms that the PICASSO platform, as part of a broader and more competitive European market, faces a significantly wider range of prices, which is due, among other things, to a diversified provider structure, increased liquidity, more flexible pricing and cross-border cooperation. A key reason for the narrower price spread is the capping of bid prices in the ELES balancing market for the aFRR balancing service under the 2022[38] Act on measures for crisis management in the field of energy supply, which is in force until the end of 2025 and distorts competition in this market. In fact, the methodology of the Act limits the bid prices with day-ahead price capping factors (SIPX).

A comparison of the prices achieved between the MARI platform and the ELES balancing market for the mFRR balancing service reveals a very different picture. While the Slovenian market sees fewer frequent activations, these are often associated with markedly high price extremes. On the other hand, the MARI platform shows a more even and stable price distribution, which indicates a more liquid market and a higher level of competition, which is often lacking in the Slovenian market due to the limited number of providers.

Given the legal limitation (Article 23 of ZUOKPOE), which obliges the TSO for a period until the end of 2025 to set a cap for balancing service providers to offer balancing energy of the automatic frequency recovery reserve in a way that balancing service providers do not make unjustified profits, it is expected that ELES will prepare all processes during the transition period to enable providers to quickly integrate into both platforms after the expiry of the limitation.

The planned inclusion of Slovenia in PICASSO/MARI will therefore have a significant impact on the costs of balancing imbalances, while finally ensuring efficiency in the context of the system balancing market, as it will be subject to adequate liquidity and competition. This will create an appropriate price signal to incentivise balance groups to minimise deviations, which was not guaranteed in 2024.

38 Act on measures for crisis management in the field of energy supply (ZUOKPOE)

Market Price of Electricity for which Producers are Eligible for Support

In 2024, under the RES and CHP support scheme in Slovenia, 432.9 GWh of electricity produced was supported, of which 252.9 GWh was supported through operating support and 186.4 GWh was taken over by the Support Centre under guaranteed buy-back. The generators covered by the support scheme that received operating support sold the electricity they generated on the market themselves or consumed it as part of their haircut. The average price achieved in 2024 for sales on the market was EUR 67.57 EUR/MWh, which is only 39.9% of the average price achieved in 2023, when the high sales prices defined by the extreme electricity market conditions at that time were achieved. However, the average sales price achieved in 2024 was still between 22% and 53% higher than in the period 2018–2021. The electricity taken from the generators under the guaranteed purchase by the Support Centre was auctioned in 2024 in accordance with the Support Centre's ECO Group Transmission Rules at a price of 109.11 EUR/MWh, while the Support Centre's 2023 electricity auction achieved a price of 317.00 EUR/MWh. The weighted average of the two prices of electricity sold on the market for which the generators are also paid subsidies was 85.46 EUR/MWh in 2024, 6.4% lower than the average hourly price on the BSP, which is 91.29 EUR/MWh for 2024. The average price of electricity sold on the market by generators receiving operating subsidies was 26% lower than the average hourly price on the BSP in 2024.

As the electricity produced under the support scheme represented only 3.2% of the total electricity produced in Slovenia in 2024, it did not have a significant impact on the trading and the prices achieved under the scheme.

TABLE 28: COMPARISON OF THE AVERAGE SELLING PRICE OF ELECTRICITY FOR WHICH PRODUCERS ARE ELIGIBLE FOR SUPPORT WITH THE AVERAGE ANNUAL BASE PRICE OF ON THE BSP DURING THE 2018–2024 PERIOD

Year	Average selling price of producers with operational support [EUR/MWh][39]	Price achieved at auction by the Centre of Support [EUR/MWh]	Weighted average of both prices [EUR/MWh]	Average hourly price on the BSP [EUR/MWh]
2018	44.05	47.33	44.54	51.16
2019	55.41	58.88	55.86	48.74
2020	52.66	55.87	53.10	37.55
2021	44.84	43.86	44.71	115.03
2022	106.69	125.11	108.71	274.47
2023	169.54	317.00	190.87	104.33
2024	67.57	109.11	85.46	91.29

SOURCES: ENERGY AGENCY, BORZEN, BSP

39 The average price is published on the basis of Article 20 of ZSROVE.

Allowance Trading

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

The adjustments to the free allocation of greenhouse gas emission allowances introduced by Directive (EU) 2018/41[40] and made effective by Commission Implementing Regulation (EU) 2019/1842[41], have improved the efficiency and incentives provided by the free allocation, but have increased the administrative burden and made the previous date of issue of the free allocation, 28 February, unrealistic. To better take into account the adjustments to the free allocation of allowances, it was appropriate to make adjustments to the compliance cycle. The deadline for competent authorities to allocate allowances free of charge should therefore be postponed from 28 February to 30 June, and the deadline for operators to surrender allowances should be delayed from 30 April to 30 September (Directive (EU) 2023/959[42])[43].

Figure 95 shows the price trends for allowances for forward[44] contracts with a maturity in December 2024 (product of EUA on EEX). The average price in the observed period was around 66 EUR per tonne of CO_2, which is 22% lower compared to the average price of allowances in 2023 for forward contracts matured in December 2023.

The lowest clearing price for allowances was reached at the end of the trading day on 3 January 2024 (77.35 EUR per tonne of CO_2). The first quarter of 2024 saw a strong downward correction in prices, mainly due to a milder winter and low gas and coal consumption. The EUA price fell from an initial level of around EUR 75 per tonne to a low of around EUR 58 per tonne in March. EUA prices fell from an initial level of around EUR 75 per tonne to around EUR 58 per tonne in Q1 2024.

The EUA price averaged 66.45 EUR/t in 2024 and did not exceed EUR 80 EUR/t throughout the year. The fall in the EUA price in 2024 was due to a combination of lower demand, increased supply and macroeconomic factors affecting energy markets and financial flows.

On the demand side, the economic slowdown in the EU, in particular in Germany and Italy, where industrial production declined, played an important role. High interest rates and uncertainty in financial markets have further contributed to lower speculative interest in EUAs as a financial instrument. Speculators have had a significant impact on price movements in recent years. Still, in 2024, increased uncertainty, regulatory pressures and a downward price trend have led many financial investors to withdraw from the market, further reducing demand and stabilising the price at a lower level.

On the supply side, EU regulatory measures related to REPowerEU have played a key role, launching additional auctions of emission allowances. At the same time, the shift towards renewable energy sources continued, reducing the use of fossil fuels for electricity generation and thus the need for emission allowances. From January 2024, the EU Emissions Trading Scheme (EU ETS) was extended to the maritime sector. Although this increased the demand for allowances in the long term, it caused uncertainty and volatility in the market in the short term. The impact is somewhat limited in the year, as full integration is not expected until 2027. In the following months, a recovery of the market followed, as buyers looked for a favourable entry point. Demand was further boosted by forecasts of lower volumes in the coming years due to the tightening of the rules and structure of the European Emissions Trading Scheme (EU ETS). The price stabilised in a range between 63 and 70 EUR/t.

In the second half of the year, the market stabilised. Low energy consumption in the summer months and a mild autumn and early winter kept demand at a low level. Combined with a persistent supply of coupons, the EUA price stabilised by the end of the year and ended the year at around 63 EUR/t.

40 Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814

41 Commission Implementing Regulation (EU) 2019/1842 of 31 October 2019 laying down rules for the application of Directive 2003/87/EC of the European Parliament and of the Council as regards further arrangements for the adjustments to free allocation of emission allowances due to activity level changes

42 Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system

43 Data on surrendered allowances will only be available in October 2024. As a result, the analysis of emissions trading is shortened compared to previous years.

44 Forward contracts are long- and short-term. Long-term forward contracts mature in a period 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 shorter than one year (for example, the forward supply contract for December 2024)

FIGURE 95: PRICE TRENDS OF ALLOWANCES (EUA) IN THE EEX EXCHANGE FOR 2024

SOURCE: MONTEL

Market Transparency

Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (hereinafter the REMIT Regulation) is key to ensuring the integrity and transparency of the energy market. Together with Commission Implementing Regulation (EU) No 1348/2014 of 17 December 2014 on data reporting implementing Article 8(2) and (6) of Regulation (EU) No 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency (hereinafter Implementing Regulation (EU) No 1348/2014) and the Energy Act (EZ-2, until 8 May 2024 EZ-1) it represents a comprehensive regulatory framework for monitoring and supervising the European electricity and natural gas wholesale markets. REMIT 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.

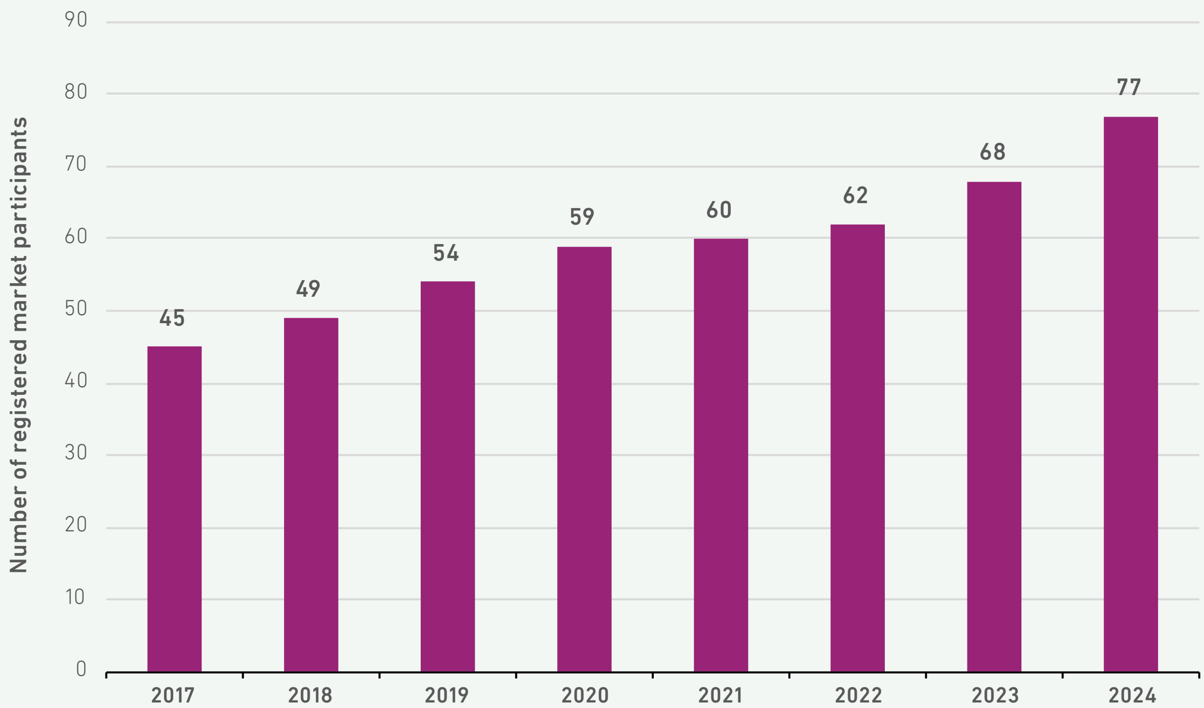
Monitoring the market based on the REMIT includes monitoring all wholesale energy products, including orders to trade, regardless of the place of trading. It also provides basic information on the availability of the energy infrastructure. The type and method of reporting information are specified in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

On 17 April 2024, Regulation (EU) 2024/1106 of the European Parliament and of the Council of 11 April 2024 amending Regulations (EU) No 1227/2011 and (EU) 2019/942 with regard to improving the Union's protection against market manipulation in the wholesale energy market was published in the Official Journal of the European Union. This Regulation is also known as the REMIT II.[45]

Under REMIT, market participants are required to register with the national regulatory authority in the Member State in which they are established or resident; if they are neither established nor resident in an EU Member State, they must register in the Member State in which they are active. By 31 December 2024, 77 participants had registered with the Agency. At the beginning of November 2024, the Energy Agency transferred the management of the registration of market participants directly to the Central European Registry for Energy Market Participants (CEREMP), which is managed by ACER. CEREMP replaced the existing national registry NAREMP, which has reached the end of its technical and economic lifetime. The migration to CEREMP thus ensured compliance with the latest REMIT II requirements.

45 https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=OJ:L_202401106

FIGURE 96: REGISTRATION OF MARKET PARTICIPANTS IN SLOVENIA IN THE 2017–2024 PERIOD



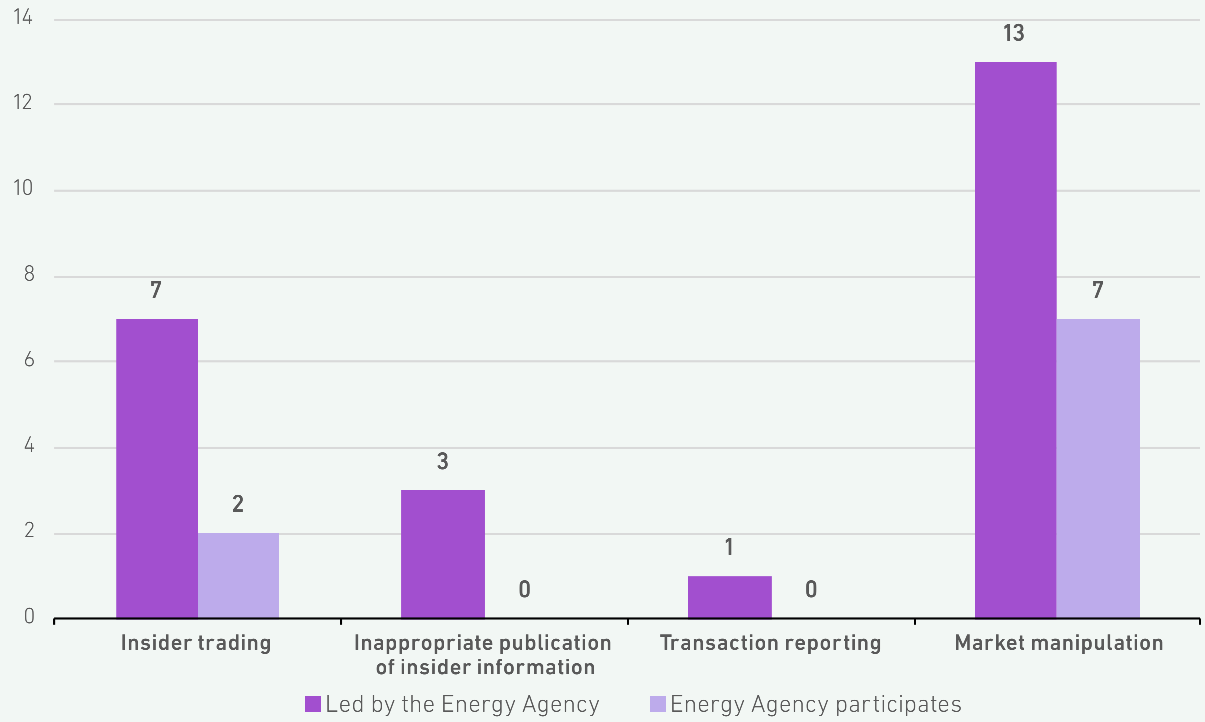
SOURCE: ENERGY AGENCY

The Energy Agency managed 22 cases in the context of monitoring wholesale energy markets under REMIT in 2024, and cooperated with foreign national regulators on nine more cases in the context of mutual assistance. The number of cases handled by the Energy Agency may vary from year to year if cases are settled or taken over by another national regulator due to a change of jurisdiction, which usually occurs at an early stage of an investigation based on newly identified facts. In 2024, the Energy Agency closed one case.

The Energy Agency is handling 22 cases of alleged breaches of REMIT

The type of infringements in the investigations conducted by the Energy Agency is shown on the left side of the chart, and the investigation is conducted independently or jointly with foreign national regulators, as shown in Figure 97. Several types of infringements (i.e., insider trading (IT), improper publication of IT, transaction reporting, and market manipulation) may be investigated in a single case, so the total number of infringements investigated is greater than or equal to the number of cases dealt with. The same figure also shows a number of infringements that are the subject of investigations by foreign national regulators, where the Energy Agency provides expert assistance.

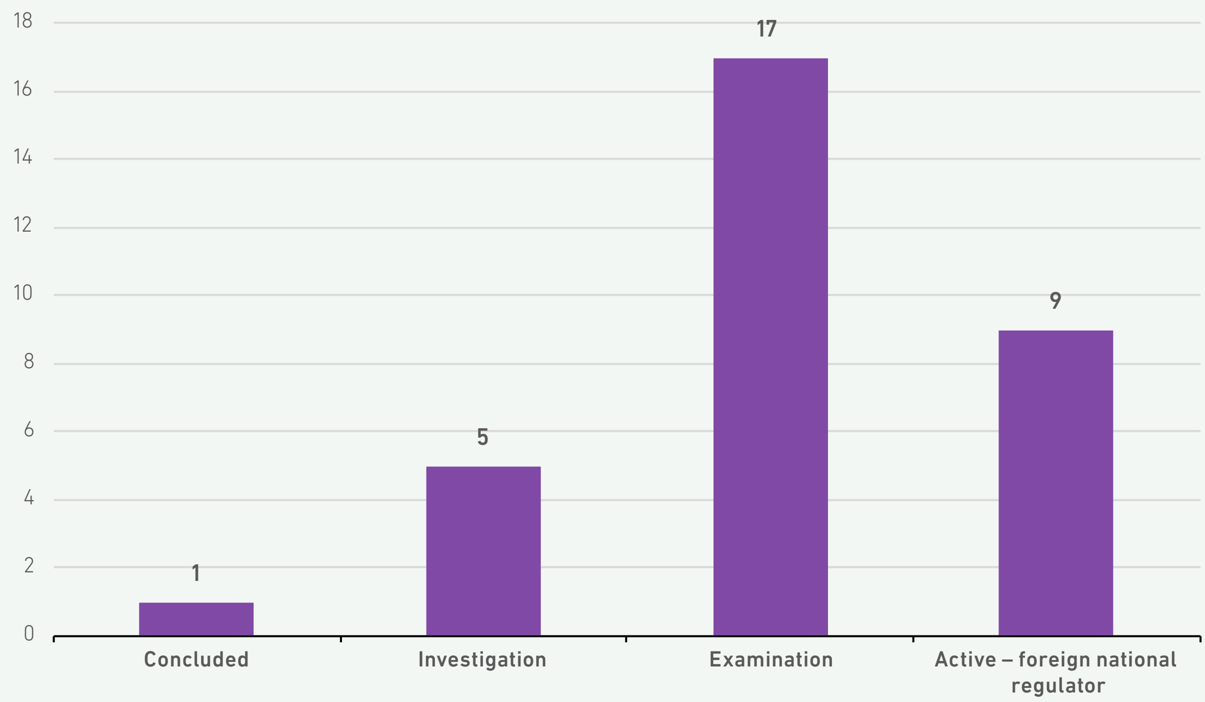
FIGURE 97: NUMBER OF VIOLATIONS BASED ON THE TYPES OF VIOLATIONS ALLEGED AGAINST MARKET PARTICIPANTS IN PROCEEDINGS INVOLVING THE ENERGY AGENCY



SOURCE: ENERGY AGENCY

An overview of the status of the cases is shown in Figure 98. With one case closed, the Energy Agency had five investigations in 2024 and 17 cases under review. The review aims to gain a deeper understanding of suspicious practices by gathering additional information. At this stage, the Energy Agency determines the circumstances in which the alleged infringement took place and takes a decision on whether there are grounds to suspect that prohibited practices have been committed. If there are sufficient grounds, the Energy Agency initiates an investigation. In nine cases where the Energy Agency provides expert assistance, the procedures are at least at the review stage.

FIGURE 98: INVESTIGATION STATUSES



SOURCE: ENERGY AGENCY

ACER initiated five of the 22 cases handled by the Energy Agency based on a signed cooperation agreement. The proceedings were initiated following reports of suspicious transactions or alerts raised by ACER's market manipulation and abuse monitoring system.

Persons who, in the course of their activities, negotiate transactions in wholesale energy products directly reported 17 cases to the Agency. Article 15 of REMIT requires these persons to immediately notify the national regulatory authority if they have reasonable grounds to suspect that a transaction on the wholesale market constitutes a violation of the prohibition of trading based on inside information or that such a transaction constitutes market manipulation. One case was initiated based on a self-report by a market participant.

In handling all cases, the Energy Agency cooperates closely with foreign regulators in the region and with ACER, which ensures a coordinated approach to case handling.

Through this comprehensive and proactive approach, the Energy Agency contributes to ensuring transparency, fairness and stability in the European energy market, which benefits all market participants and promotes confidence in the energy system.

Market Effectiveness

Registration of Closed Contracts and Operational Forecasts

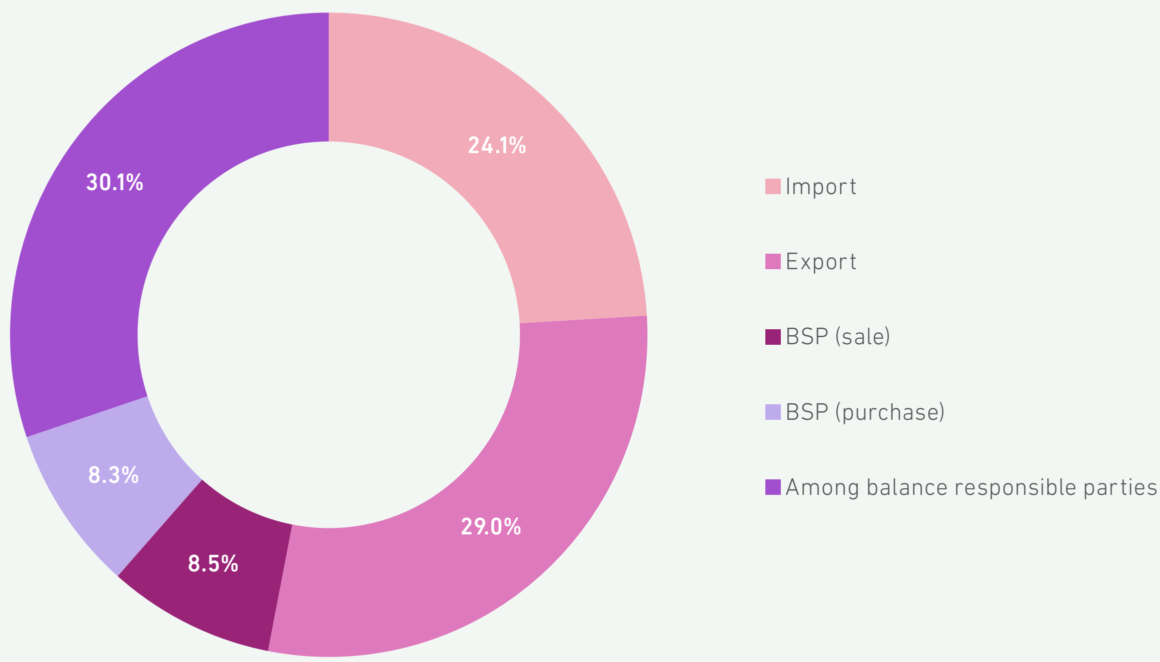
The registration of closed contracts and operational forecasts is carried out by the market operator Borzen. These contracts are the basis for drawing up the trading plans of the members of the balance scheme and for the production of a transmission system operator's schedule, and, after the supply has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

Borzen registers all closed contracts that affect the energy balance of a member of the Slovenian balance scheme. It registers all contracts concluded between members of the balance scheme, contracts concluded on the energy exchange, and import-export closed contracts. Contracts concluded on bilateral markets are part of the 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 2024, the market operator recorded 114,238 closed contracts and operational forecasts with a total volume of 76,627,298 MWh. Compared to the previous year, the total number of closed contracts and operational forecasts recorded in 2024 was 12% higher, and the trading volume increased by 7.6%.

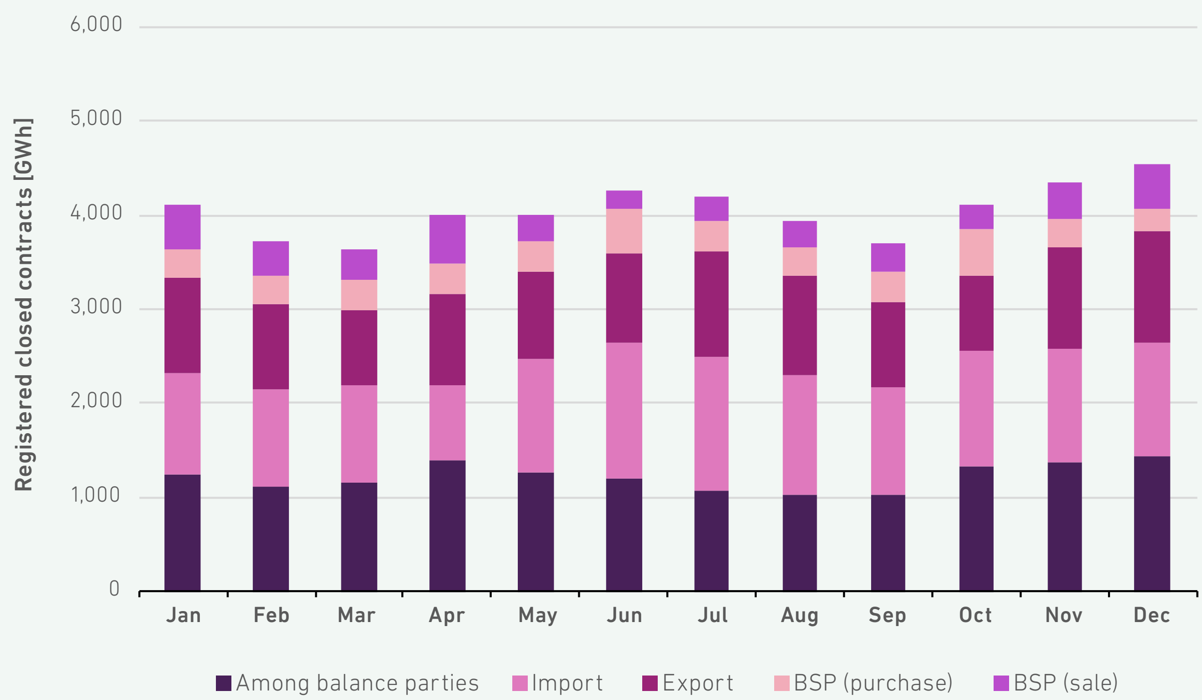
The amount of electricity sold or purchased in 2024 with closed contracts is 48,528,972 MWh. This is an increase of 9.4% compared to 2023, when the total amount of closed contracts was 44,380,977 MWh. The increase in the total amount of closed contracts is due to the higher trading volumes at the boundaries of the regulatory area. The total volume of closed contracts within the country has also increased compared to 2023, with only a decrease in the volume of trading between members of the balancing scheme.

FIGURE 99: STRUCTURE OF THE VOLUME OF REGISTERED CLOSED CONTRACTS



SOURCE: BORZEN

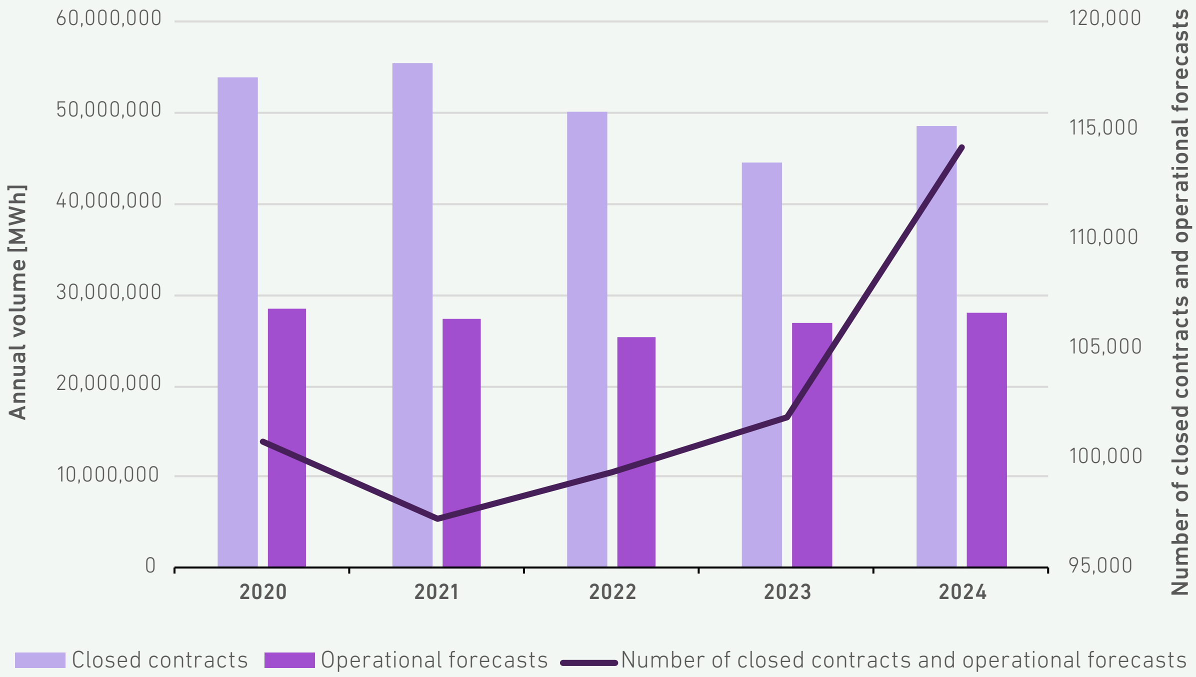
FIGURE 100: AMOUNT OF ELECTRICITY SOLD OR PURCHASED THROUGH CLOSED CONTRACTS PER MONTH



SOURCE: BORZEN

Figure 101 shows the evolution of the annual volume of recorded closed contracts, the annual volume of operational forecasts and the annual number of these two over a five-year period. It can be seen that the volume of closed contracts in 2024 increases by 9.3% compared to 2023.

FIGURE 101: ANNUAL VOLUME OF CLOSED CONTRACTS, OPERATIONAL FORECASTS AND NUMBER OF CLOSED CONTRACTS AND OPERATING FORECASTS IN THE 2020–2024 PERIOD



SOURCE: BORZEN

Day-Ahead Market

Day-ahead trading takes place on the BSP in the form of auction trading. During the trading stage, market participants enter the 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. Also in 2024, market coupling included the borders of the Slovenian bidding zone with the bidding zones of Italy, Austria, Croatia and Hungary. The volume of trading is influenced by numerous factors, most importantly by the quantities of available CZCs.

In 2024, 21 market participants participated in day-ahead trading, five more than in 2023. The majority of participants were domestic.

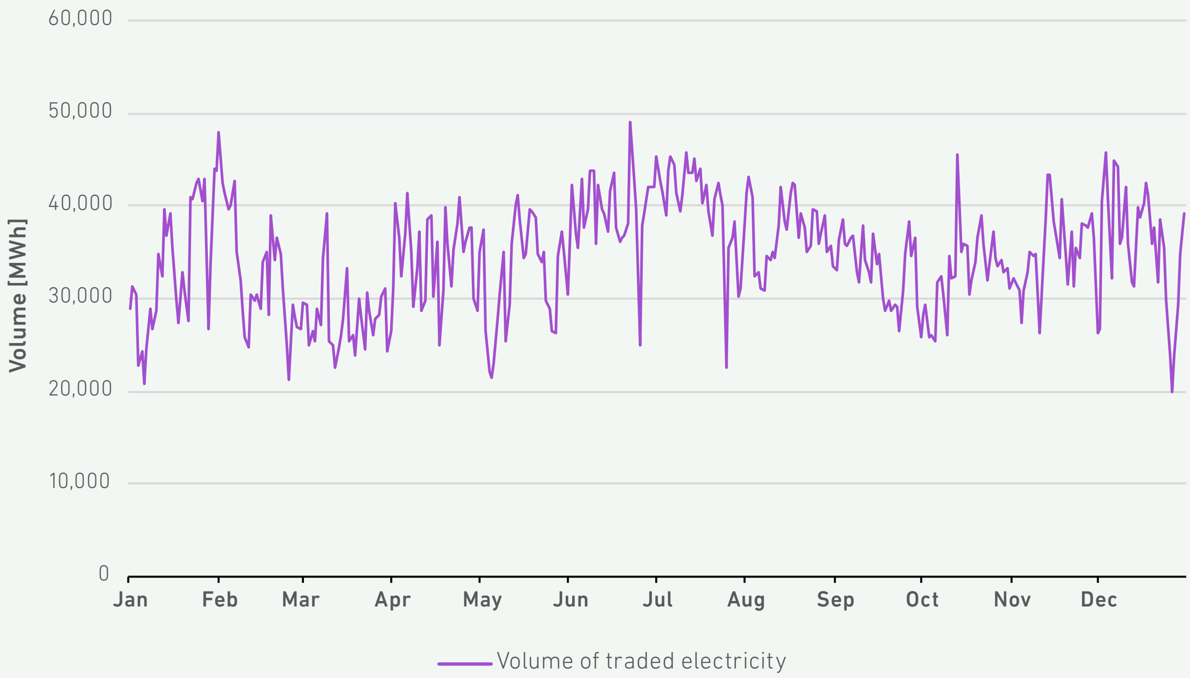
The total trading volume on the Slovenian day-ahead market in 2024 was 12,639 GWh, almost 29% more than in 2023. 8,723 GWh of bids were entered, of which 4,559 GWh were buy bids and 4,164 GWh were sales bids. The volume of bids entered increased significantly by 35% compared to 2023, mainly due to the increased volume of sales bids. The average daily trading volume was 34,501 MWh, and the maximum daily trading volume was 49,105 MWh, which was reached on 22 June 2024 for the delivery day 23 June 2024. To summarise the trading volumes even more clearly, an average of 1.44 GW of capacity was traded for each hour.

29% higher trading volumes on the Slovenian day-ahead market

Strengthening the competitiveness of the Slovenian day-ahead market

The highest monthly trading volume in 2024 was achieved in July, with 1,244,598 MWh. The lowest monthly trading volume was achieved in March, with 861,514 MWh. There was no significant difference in trading volumes between the first and second halves of the year.

FIGURE 102: VOLUME OF ELECTRICITY TRADED IN 2024



SOURCE: BSP

Intraday Market

32% higher intraday trading volumes on the Slovenian stock market

Intraday trading on the Slovenian organised market is conducted on the BSP. As regards intraday coupling, the Slovenian electricity exchange joined the European single intraday market on its borders with Croatia, Austria, Italy and Hungary[46]. On the continuous intraday market, trading is carried out 24 hours per day with hourly, 15-minute and block products[47].

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 with only 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 market participants. As providers of flexibility, they can adjust their generation and/or consumption within a short period of time.

At the end of 2024, 12 domestic and eight foreign market participants were participating in the BSP intraday market. In addition to online trading, market participants are also able to trade intraday in auctions in the context of complementary regional auctions with Italy.

In 2024, compared to 2023, the volume of trading in the intraday spot market segment increased by 14%, while in the intraday auction market segment it increased by 32%.

In 2024, the total volume of intraday trading amounted to 1,634 GWh, which is more than in the previous year, when the volume of intraday trading amounted to 1,434 GWh (see also the section on Intraday Market Prices). A total of 6,267 GWh of bids were entered, of which 2,887 GWh were purchase bids and 3,380 GWh were sale bids. The volume of bids entered in this exchange segment decreased by 6.35% in 2024.

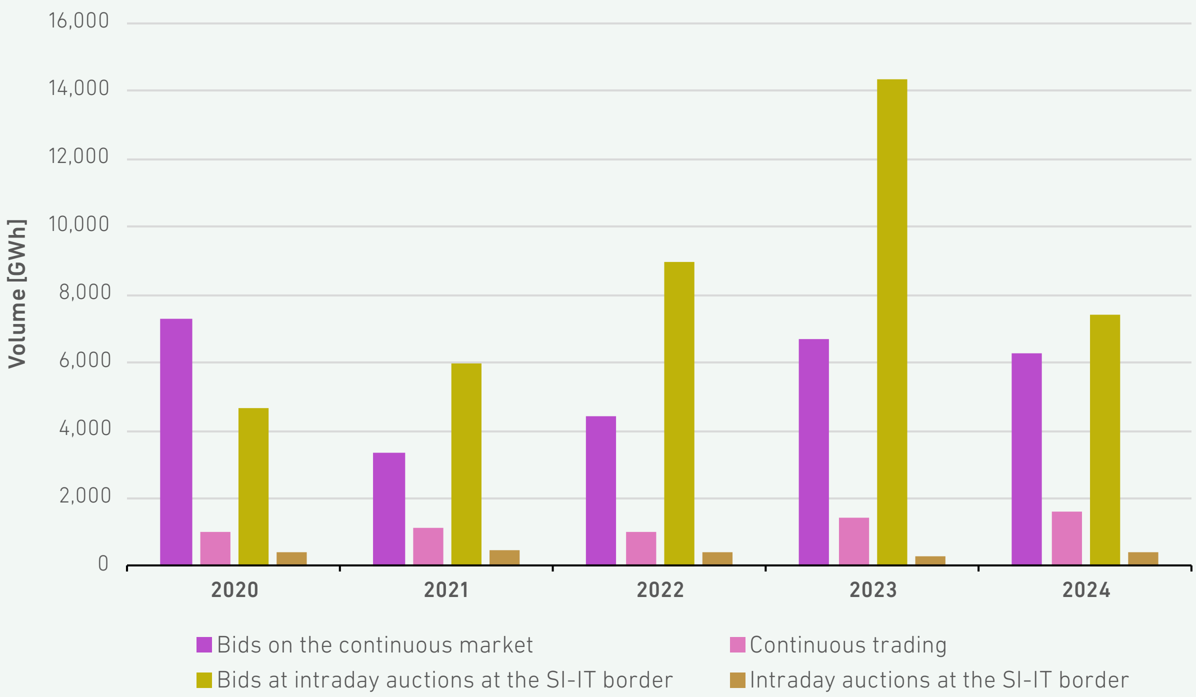
In the total intraday trading volume, the trading volume on the balancing market amounted to 76 GWh. An explanation of why certain quantities in intraday trading are considered quantities on

46 The border with Hungary has also been added to trading on the ID market as of 7 July 2022.
47 A more detailed definition of the products in the intraday spot trading can be found on the official website of BSP So-uthpool at the following link: https://www.bsp-southpool.com/podatki-in-informacije/pravila-borze-in-cenik.html

the balancing market is provided in the following section.

In 2024 the volume of intraday auction trading amounted to 430 GWh (implicit auction MI1, MI2, and MI3 on SI-IT border in IDA[48] auctions), which is 32.30% more than in the previous year, when it amounted to 325 GWh. Bids for 7,440 GWh were submitted, of which 4,053 GWh were purchase bids and 3,387 GWh were sales bids. The volume of bids submitted in intraday auction trading almost halved compared to 2023.

FIGURE 103: VOLUME OF TRADING AND BIDS ON THE INTRADAY POWER EXCHANGE FOR THE 2020–2024 PERIOD



SOURCE: BSP

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 to balance 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 outside of the last hour before the supply, and transactions carried out in the trading stage in the last hour before the supply.

The latter accounts for a very high share of more than 98% (76 GWh) in 2024, 96.2% in 2023 and 99.4% in 2022 of the total volume traded. This means that the TSO is mostly buying or selling electricity in the balancing market of the market operator only in the last hour before delivery. For ease of implementation, the Slovenian balancing market is linked to the intraday market. BSP operates both markets on behalf of the market operator. The same rules apply in both markets, with the principle that trading on the intraday market is closed one hour before the time of delivery and converted into trading on the balancing market. In 2024, 2,290 trades were concluded on the market operator's balancing market for a total volume of 76 GWh. 30 GWh of this volume is purchases of balancing energy, and 46 GWh is sales of balancing energy by the TSO. 27 trades were concluded on

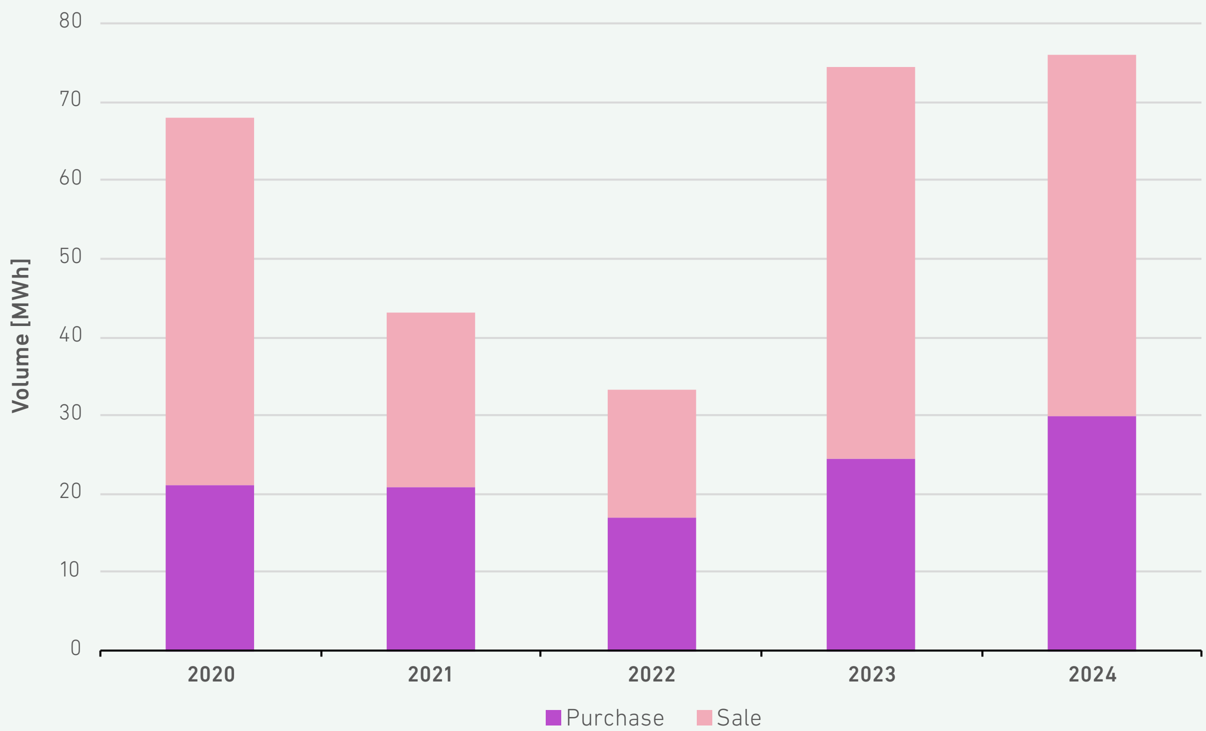
48 IDA are implicit ID auctions. The DA is followed by the three IDA auctions.

the market operator's balancing market in 2024, for a total volume of 76 GWh.

After a period of constant decline in the number and volumes of trades executed on the Market Operator platform between 2020 and 2022, there was a turnaround in 2023, which can be mainly attributed to higher negative and positive deviations of the balance groups in 2023 and a consequent increase in the TSO's activation in all types of activations - including the balancing energy on the Market Operator platform. The volume and number of trades also remain unchanged in 2024 compared to 2023. The volume of trades increased by 2.2% and the number of trades decreased by 6.6%.

The most significant volume of trades was in hourly products, with a total volume of 69.2 GWh of electricity. With 1,642 trades, hourly products were also the most traded product on the balancing market.

FIGURE 104: TRADING VOLUME OF ALL PRODUCTS ON MARKET OPERATOR BALANCING MARKET IN THE 2020–2024 PERIOD



SOURCES: BORZEN, BSP

The balancing market of the Market Operator accounted for 9.8%[49] of the total system balancing in 2024, which is 0.7 percentage points lower than in 2023, when the share of the balancing market in the total system balancing was 10.5%. In addition to the TSO, nine out of the total 33 members participating in the Market Operator Platform participated in trading, which is five more than in 2023. The total number of members increased by one, from 32 to 33 members.

Trading with Balancing Energy on the ELES Ancillary Services Market

The ELES ancillary services market is run by the TSO. Since the beginning of 2020, ELES has used 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 and mFRR offers. The activation of the aFRR energy offers is carried out automatically via the management system, while with mFRR offers, the activation is done 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

49 Share of the sum of FCR, aFRR, mFRR, RR, IGCC, and FSkar volumes

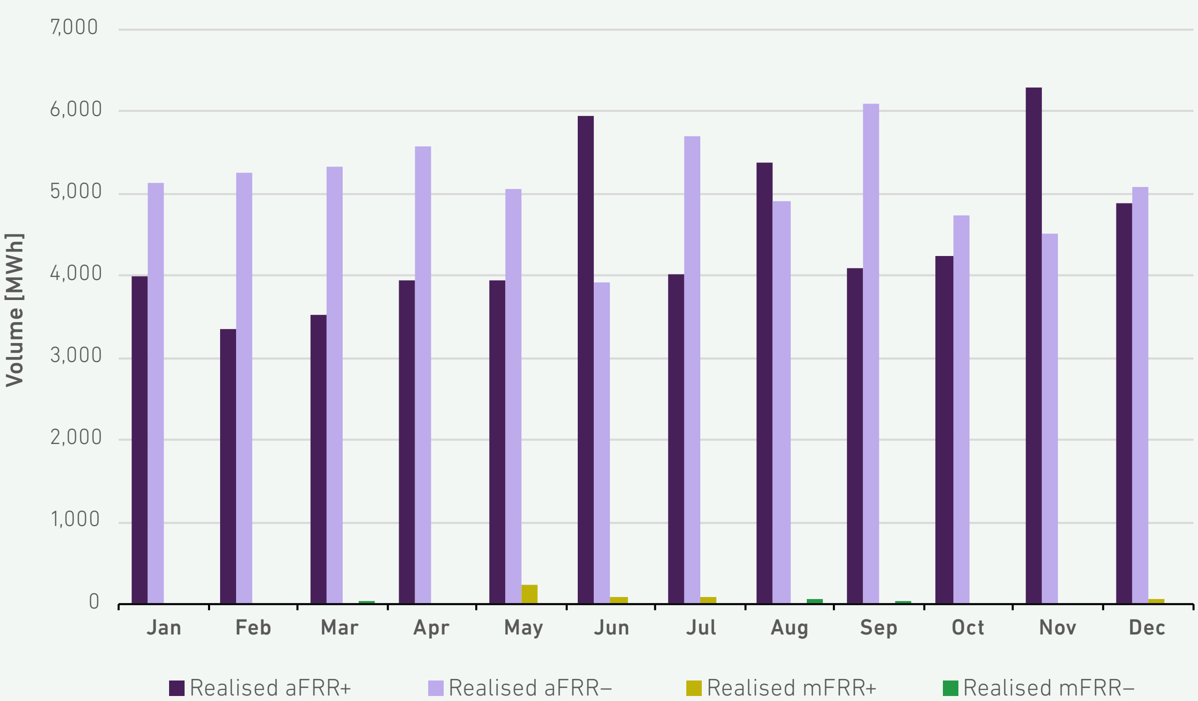
for balancing power and balancing energy, which must also be separated by balancing direction. The provider that was successful in the auction for balancing power must submit mandatory offers for balancing energy with an hourly resolution in line with the quantity and period of collected offers for balancing power. The remaining qualified providers can submit offers for balancing energy voluntarily. According to the order of activation of the balancing energy offers, the most favourable offers on the list, classified according to 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 2024, only two providers bid on the aFRR balancing energy, while bids for the mFRR balancing energy were made by six qualified providers of balancing services. Consequently, there is a very high concentration of the ancillary services market, while competitiveness and liquidity remain low. In 2024, the quantity of bids for the positive balancing direction on the aFRR balancing energy trading platform was 524.2 GWh, and 520.5 GWh for the negative direction.

The activated energy for the positive direction amounted to 53.6 GWh, and 61.4 GWh for the negative direction. The bids for the mFRR+ balancing energy amounted to 1,709.5 GWh, while the bids for the mFRR– balancing energy amounted to 436.9 GWh. Out of this, the activated energy for the positive direction amounted to 497.0 GWh, and for the negative direction 162.0 GWh. The volumes of bids in certain months exceed the minimum volume of ancillary services, which means that bidders have made use of the option to submit voluntary competitive offers. The sum of the bid volumes by month shows that voluntary offers for the aFRR+ balancing energy were definitely submitted in at least all months of the second half of the year[50], but represent only up to 0.2% of the total bid volumes in those months. For mFRR balancing energy, voluntary bids were made in all months of the year, and for positive balancing, they represent around 2.4% of the total bid quantities. In contrast, for negative balancing, they represent around 3.7% of the total bid quantities. The percentage of free quantities offered has increased since the transitional year, when it was only up to 0.005% of the total amounts provided.

The level of competition on the aFRR and mFRR ancillary services market remains unchanged and extremely low

FIGURE 105: REALISED aFRR AND mFRR QUANTITIES

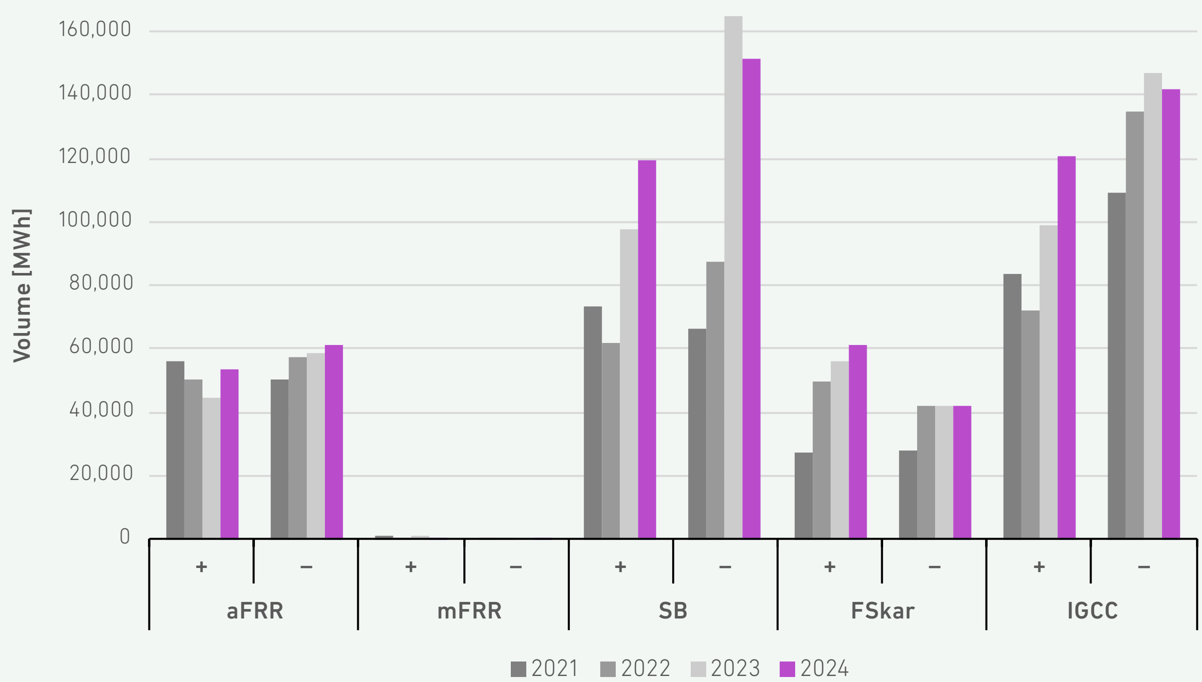


SOURCE: ELES

50 From the aggregated data available, we cannot confirm with certainty the existence of these offers in the other months, as not all suppliers can fully meet the minimum contractual requirements for the provision of services, which consequently reduces the monthly sum of the quantities offered.

The aFRR volumes of 53.6 GWh of positive and 61.35 GWh of negative energy committed mean that ELES committed more positive and more negative energy in 2024 than in 2023, when it committed 44.53 GWh of positive and 58.8 GWh of negative energy. Similar to the imbalance netting, the aFRR service has, for the third year in a row, been dominated by a slightly higher need for regulation in the negative direction than in the positive direction. Thus, in 2024, ELES exported 142 GWh to address positive deviations in the framework of its participation in the IGCC, therefore reducing the need to engage negative aFRR energy, while it imported 120.822 GWh to address negative imbalances, which also reduced the need to engage positive aFRR energy. Slovenia has been participating in the imbalance netting project IGCC since 2019, and the amount of energy exchanged in this process is increasing year on year.

FIGURE 106: AMOUNT OF ACTIVATED POSITIVE AND NEGATIVE ENERGY BY SERVICE IN THE 2021–2024 PERIOD



SOURCE: ELES

As part of the implementation of the mFRR, 497.0 MWh of positive energy was activated in 2024, a decrease from the previous year, when ELES activated 799 MWh of positive energy. On the other hand, ELES contracted 162.0 MWh of mFRR energy from domestic suppliers in 2024, which is 1 MWh less than in the previous year. The majority (128 MWh) of mFRR– energy was activated with Slovenian suppliers, while in August, a foreign transmission system operator, NOS BIH, was activated within the framework of VTL[51] energy exchanges, in the amount of 34 MWh.

In total, there were 41 mFRR activations in 2024, 25 positive and 16 negative, which is more than in 2023, when there were a total of 10 mFRR activations.

In 2024, ELES also purchased part of the energy for balancing on the market operator's balancing market, and part had to be provided to balance unintentional deviations of the electricity system (FSkar). Within the framework of unplanned energy exchanges (FSkar settlement), 61.5 GWh of positive and 42.0 GWh of negative energy were exchanged in 2024.

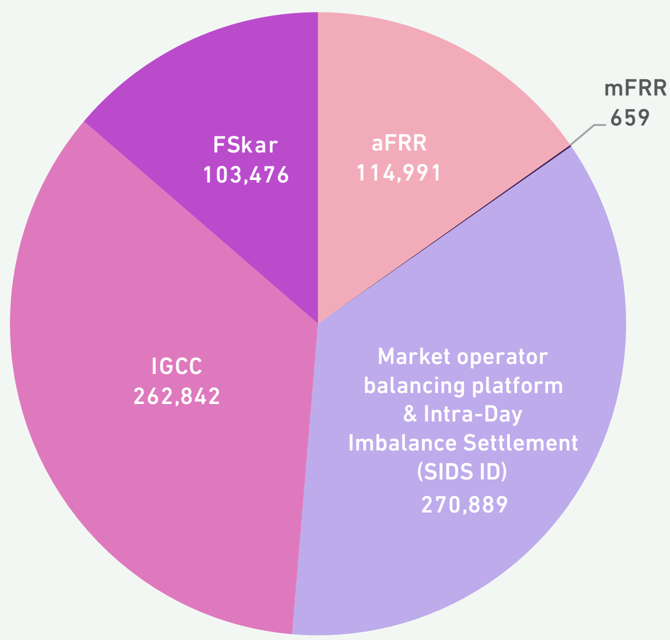
On the intraday market, which includes the market operator's balancing market and the intraday spot market, ELES activated 119.5 GWh of positive energy and 151.4 GWh of negative energy.

Figure 107 shows the distribution of activated absolute quantities (the sum of absolute negative and positive balancing energy) by type of service.

51 Virtual Tie Line is a mechanism used to virtually assign a generation unit to another Load-Frequency Control area (LFC) in which the generation unit is not physically connected.

In 2024, there is still a high level of trading for balancing purposes on the intraday spot market, accounting for as much as 36.0% of the absolute value of the quantities of balancing energy activated. The importance of balancing imbalances with neighbouring transmission system operators for the Slovenian electricity system is also evident, accounting for 34.9% of the absolute value of the quantities of balancing energy committed. The smallest percentage is expected to be tertiary activation, at 0.1% of the absolute value of activated balancing energy.

FIGURE 107: ABSOLUTE VALUES OF ACTIVATED QUANTITIES OF BALANCING ENERGY IN MWh



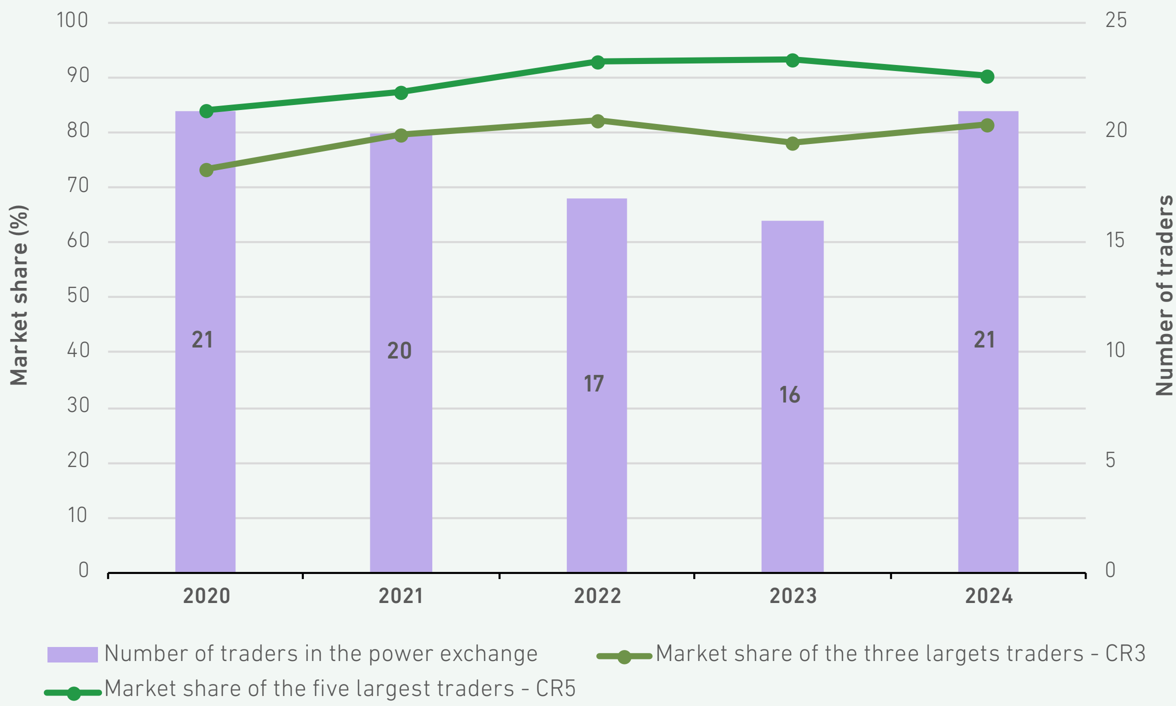
SOURCE: ELES

Market Concentration on the Power Exchange

In 2024, 21 domestic and foreign companies traded on the day-ahead market of the domestic BSP exchange, five more than at the end of 2023. The number of traders has been steadily decreasing in recent years, but in 2024, the number of traders is again comparable to 2020. The combined market share of the top three retailers (CR3) as an indicator of the level of concentration is 81.5% in 2024, an increase of 3.2% compared to 2023. The combined market share of the top five retailers (CR5) is 90.5%, a decrease compared to 2023 when it was 93.2%.

The HHI concentration index, however, decreased by 639 compared to 2023 and stands at 2,814, indicating high concentration in the wholesale market.

FIGURE 108: 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[52]. Figure 109 shows the trends of the index during the five-year period under review.

Wholesale market liquidity remains below the theoretical threshold for satisfactory development for the second year in a row

The value of the »Churn ratio« index in Slovenia in 2024 was 2.72, which represents a slight increase compared to 2023, but remains below the internationally recognised threshold of 3, which is the threshold value of the indicator for achieving satisfactory liquidity of the Slovenian wholesale electricity market[53].

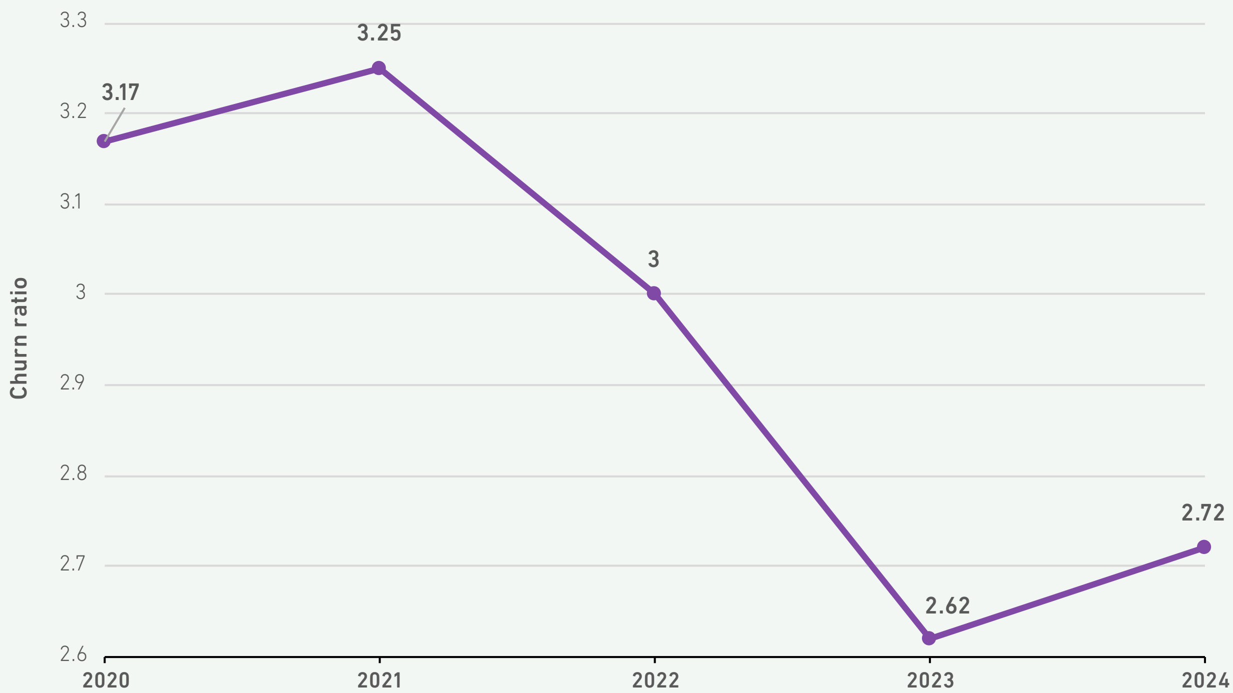
The wholesale market is smaller in size compared to other European markets, but still has a relatively large number of active participants. These are both domestic and foreign, large and small, reflecting the openness of the Slovenian market to new entrants. The market conditions that shape prices are similarly mapped onto the prices of products on the Slovenian market as on foreign markets.

In any case, the reduction of the Churn Ratio below the threshold means that participants in the Slovenian market did not, even in 2024, conclude a comparable number of transactions in volume to participants in liquid foreign markets.

52 The calculation is based on a methodology that takes 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 BSP as well as that traded on the bilateral market.

53 ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity Market in 2015, September 2016, str. 34

FIGURE 109: TRENDS OF THE CHURN RATIO PER YEAR IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

CASE STUDY
Long-term contracts for the purchase of electricity from RES

Power Purchase Agreements (PPAs), or long-term contracts for the purchase of electricity from renewable energy sources, are contractual instruments that enable the direct sale of electricity between a producer and a consumer, who may be either a natural or legal person. The main purpose of a PPA is to ensure long-term price stability, reduce exposure to market risks, and facilitate the financing of renewable energy projects without direct state support. In this way, PPAs contribute to a market-oriented development of renewable energy and increase the participation of private actors in achieving the EU's climate and energy goals. In line with Regulation (EU) 2019/943, and particularly in the context of improving the design of the European electricity market[54] the role of PPAs is emphasized as a tool that strengthens investment signals for renewable energy and protects consumers from market volatility.

A PPA is a contract for the purchase of electricity, which specifies a predetermined or determinable price, the expected quantity, the production schedule, and the duration of the contract. The contract may also include information on the type of renewable source and provisions on measures in the event of non-payment by the consumer. In practice, a wide variety of PPA models exist, differing in terms of duration, pricing formulas, type of energy, and the structure of contracting parties. In recent years, there has been growing interest in PPAs, particularly from large corporations seeking to decarbonize their supply chains. Although PPAs are most commonly defined as long-term contracts for electricity from renewable sources, the market has also seen products based on the sale of nuclear-generated electricity.

These are referred to as nPPAs (»nuclear PPAs«)[55] which share the typical characteristics of conventional PPAs (e.g., a predetermined or determinable price, long-term duration, and a direct contractual relationship between producer and consumer).

Although PPAs provide long-term price stability, encourage private investment, and reduce dependence on direct support mechanisms, their wider adoption is hindered by numerous legal, financial, and market barriers. According to ACER[56], the lack of a standardised contract form is not the main challenge in concluding PPAs; rather, greater obstacles stem from regulatory and administrative barriers, limited access to financing, the insufficient creditworthiness of smaller consumers, and a restricted supply of new renewable projects. Another key challenge is the need to increase legal expertise and understanding of the complexity of PPAs among market participants.

In Slovenia, the legislative framework for PPAs is gradually being developed. The draft of the new Renewable Energy Sources Promotion Act (ZSROVE-1) foresees two key instruments: the systematic removal of regulatory and administrative barriers (Article 69) and the establishment of a central PPA register (Articles 43 and 118). The mandatory registration of all PPAs longer than three years represents an important step toward transparency and a better understanding of market conditions. The anticipated legislative updates will enable improved monitoring, analysis of market trends, and the design of targeted support measures to promote PPA conclusion, while also increasing the legal security of contracting parties. The establishment of the register will contribute to greater market transparency and a better understanding of the dynamics of long-term contracts in the Slovenian energy sector. Currently, however, direct access to the number of concluded PPAs in Slovenia is not provided, which limits the scope of this analysis.

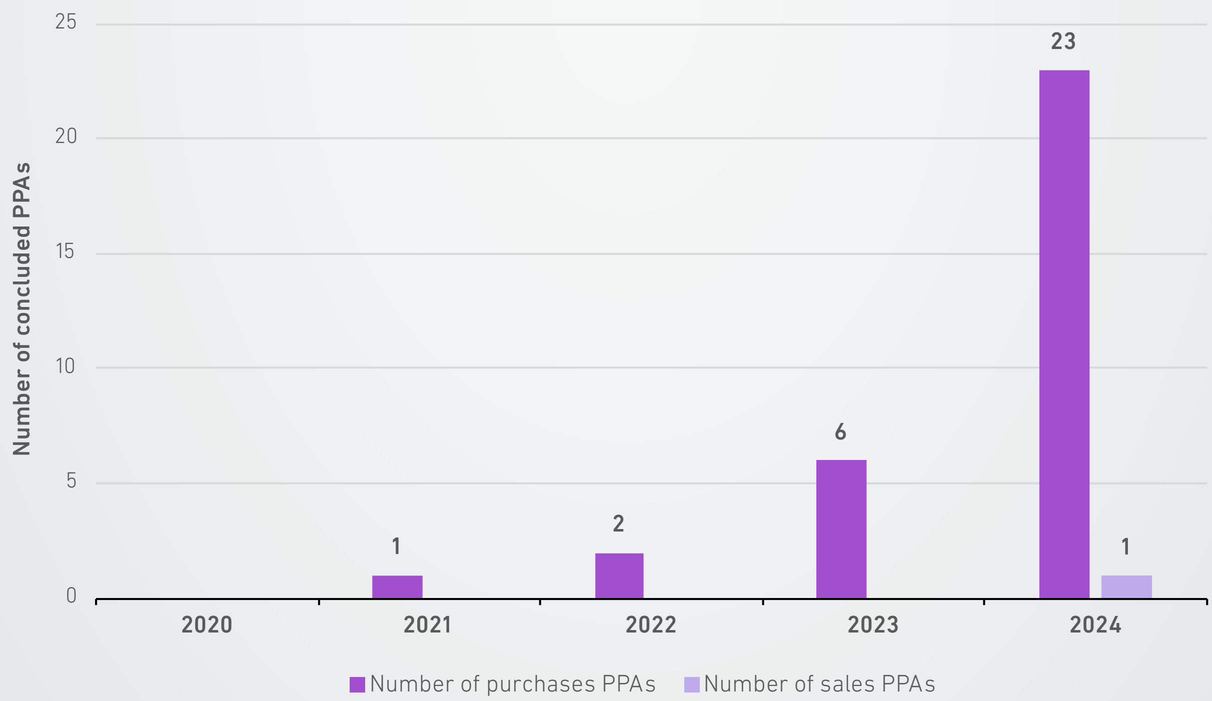
The first review of activities related to PPA conclusion in Slovenia during the period 2020–2024 was conducted by the Energy Agency to gain insight into the level of activity among active electricity suppliers in this area. Although the legal definition of a PPA requires that one of the contracting parties be an electricity producer, for this analysis, the definition was deliberately broadened. We also included cases where the contractual partner is not the direct operator of a production unit but, due to ownership or strategic links with the producer, manages energy from production sources within their portfolio.

54 Directive (EU) 2024/1711 of the European Parliament and of the Council of 13 June 2024 amending Directives (EU) 2018/2001 and (EU) 2019/944 as regards improving the Union's electricity market design
55 Examples of such contracts can be found in the US (e.g., Google) and Slovenia (e.g., GEN energija).
56 ACER, Assessment on the need of ACER's voluntary Power Purchase Agreement contract template(s), 15. 10. 2024

This approach allows for a more detailed insight into the market for long-term electricity supply contracts, where holding companies, umbrella energy firms, or portfolio managers also play a significant role, as they manage energy from specific production sources and are involved in contracts that, in content and purpose, meet the key characteristics of PPAs (duration, identifiable source, pricing mechanism, commitment to purchase). The Energy Agency also considered additional methodological limitations stemming from the defined scope of the analysed contracts. Only contracts concluded by a market participant based in the Republic of Slovenia were included. Only long-term contracts with pre-defined volume commitments were taken into account. Contracts for smaller production units and contracts concluded on an »as produced« basis with indefinite duration were excluded, as they do not meet the criteria defined for long-term PPAs.

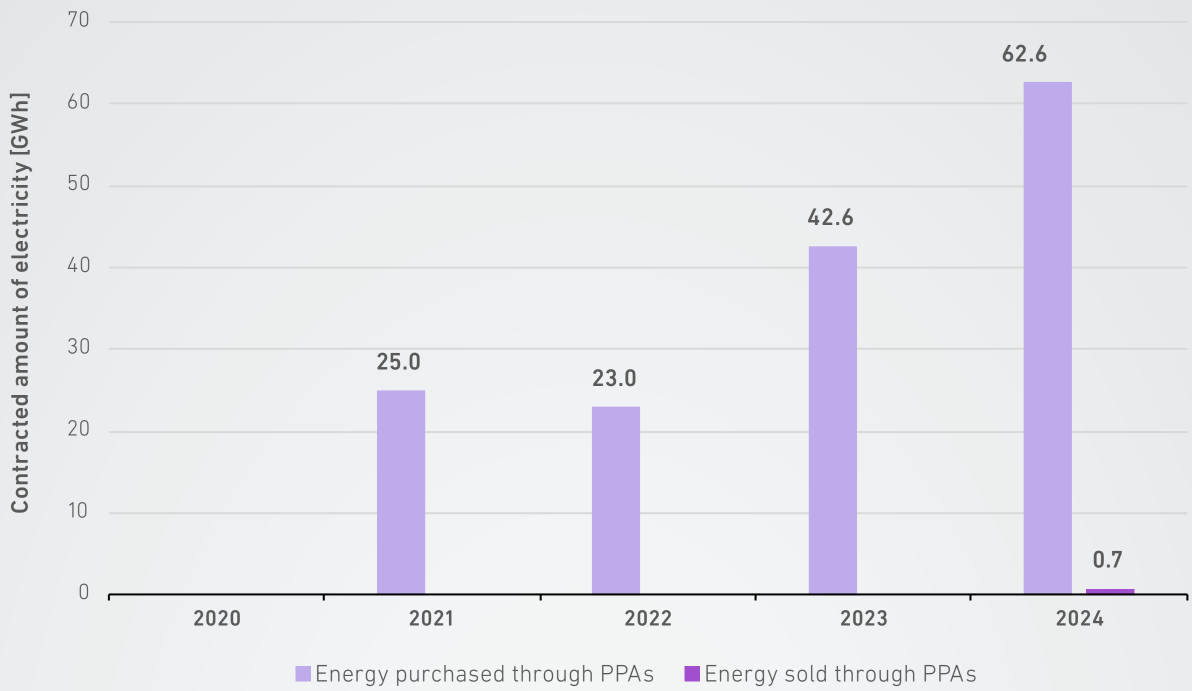
Based on information provided by suppliers, activities were found to be relatively limited but have been increasing recently. Of the 25 companies surveyed, five reported having concluded PPAs for electricity purchases, and three for electricity sales. Among them, only two suppliers were identified as having concluded both purchase and sale agreements. No cross-border PPAs were concluded in the period under review, although some suppliers indicated plans to conclude such contracts in the future. Four suppliers reported that their concluded PPAs included guarantees of origin, three of which were transferred to the buyer. The number of concluded contracts and the total volumes of electricity contracted by year, regardless of the actual delivery year, are presented in Figures 110 and 111, which show a rising trend in PPA activity. However, the presented results do not include nPPA products, since these, due to the use of nuclear energy as a source, do not meet the renewable energy requirement as defined for PPAs. Nevertheless, suppliers reported five concluded nPPAs for sales, totalling 995.42 GWh, and two purchase agreements amounting to 293.62 GWh, which are not included in the visualisations.

FIGURE 110: NUMBER OF PPAS CONCLUDED FOR THE PURCHASE AND SALE OF ELECTRICITY



SOURCES: ENERGY AGENCY, SUPPLIERS

FIGURE 111: AMOUNT OF ELECTRICITY UNDER PPAS FOR THE PURCHASE AND SALE OF ELECTRICITY



SOURCES: ENERGY AGENCY, SUPPLIERS

The reported duration of PPAs for electricity purchases ranges from one to 25 years, while reported sales contracts were concluded for five years. The most commonly cited sources of electricity generation were solar and wind, with some references also to nuclear, hydro, biomass, or a combination of sources. Most contracts were concluded for the physical delivery of electricity, though virtual PPAs and EFET contracts were also noted.

Among the more frequent pricing structures in PPAs, fixed prices predominate, while indexed prices or proprietary methodologies are less common. Additional contractual options exercised in the conclusion of PPAs include early termination rights, hedging against price fluctuations, as well as the possibility of extending contracts or adjusting contracted volumes.

As key barriers to concluding PPAs, suppliers highlighted regulatory ambiguities, limited interest, the unattractiveness of the PPA model, and unclear procedures, which point to a potential immaturity of the Slovenian market for such contracts. Suppliers expect that future PPAs in Slovenia will likely focus on solar power plants, often combined with on-site battery storage. They also expressed a desire for more stable and predictable market conditions. Suggested improvements include clearer legislation, clarification of tax obligations arising from PPAs, and better access to reliable information and market signals.

Retail Market

Suppliers and end-consumers in the Slovenian retail market sign open contracts, in which the quantities of supplied electricity and the time profile of supply are not set in advance.

The retail market in Slovenia has experienced considerable changes in recent years. In the market, the exit of suppliers (mainly in the 2021–2022 period) and ownership changes in major electricity suppliers have increased market concentration and, at least statistically, competition has started to decline.

On the other hand, advances in digitisation have made information more accessible. The energy crisis has made consumers more aware, and new providers and several new services have emerged on the market in 2024.

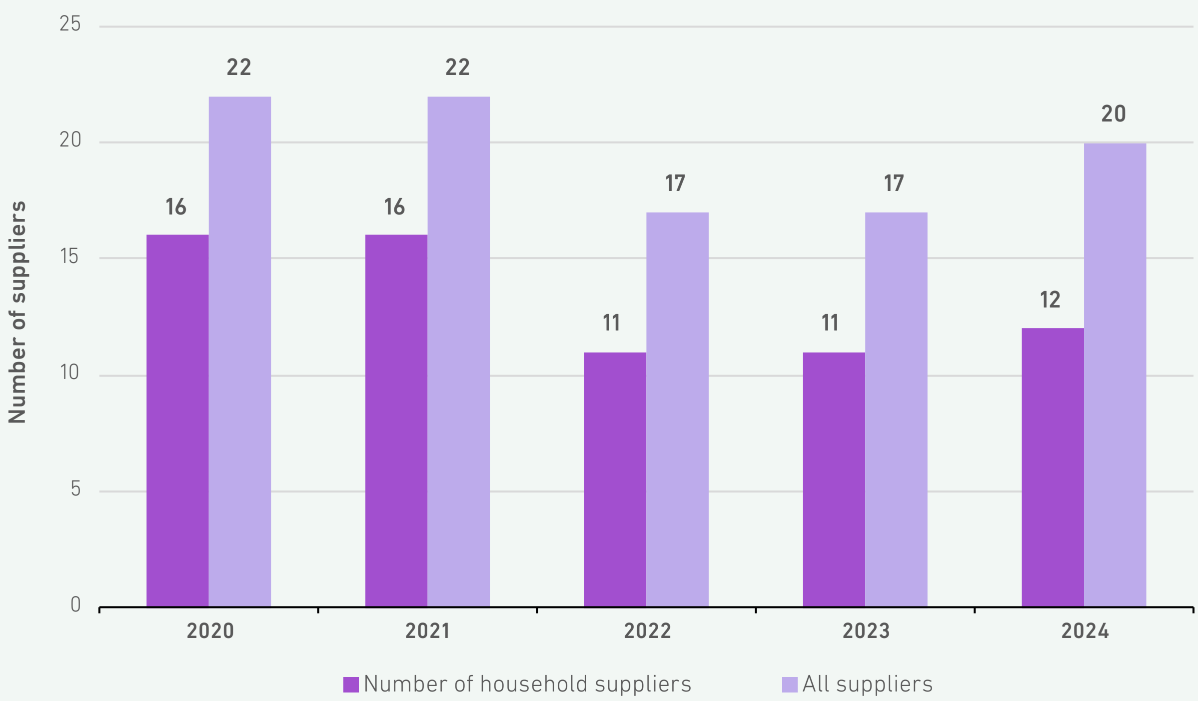
Retail prices for the smallest consumers did not change significantly in 2024 due to the ongoing interventions in the retail market. From 1 November 2024 to 31 October 2024, the Government set a maximum retail price for electricity for 90% of actual monthly consumption for each tariff separately, with the remaining 10% of consumption subject to the price of the electricity supply contract. From 1 November 2024 until 28 February 2025, the Government, using an intervention measure, capped the maximum retail electricity price of the total monthly consumption on a tariff-by-tariff basis. Both decrees set a maximum retail electricity price for household consumers and consumption in common areas of multi-apartment buildings and common areas in mixed multi-apartment buildings. The price cap has also significantly affected the indicators monitored by the Energy Agency in the context of its continuous monitoring in 2024, which are presented below.

Three new suppliers entered the electricity retail market

Three new suppliers entered the market in 2024, namely FLEXGRID, KOLEKTOR sETup and Bisol Energija. The latter also started supplying energy to households from March 2024 onwards.

At the end of the year, 20 electricity suppliers were active on the retail market, 12 of them supplying electricity to household consumers.

FIGURE 112: TRENDS IN THE NUMBER OF SUPPLIERS IN THE SLOVENIAN RETAIL MARKET IN THE 2020–2024 PERIOD[57]



SOURCE: ENERGY AGENCY

57 Supplier statistics include the number of suppliers that supplied electricity on the last calendar day of each year.

The business models of suppliers remain diverse. Some supply electricity only to households, others only to business consumers, and most to both.

Prices

In 2024, the Slovenian Government has taken several measures to regulate electricity prices to mitigate the impact of energy price increases on households and certain vulnerable groups. The Regulation on electricity pricing sets a maximum retail electricity price for household consumers and for consumption in common areas of multi-apartment buildings and common areas in mixed multi-apartment and commercial buildings. Table 29 shows the validity of each Regulation:

TABLE 29: ELECTRICITY PRICE REGULATION MEASURES

Government Decree	**Regulation Period**	**Scope of Regulation**	**Higher Tariff (HT)** [EUR/kWh]	**Lower Tariff (LT)** [EUR/kWh]	**Flat tariff (FT)** [EUR/kWh]	**RES+CHP Contribution**
Official Gazette RS, No. 107/23	1 Jan 2024–31 Oct 2024	90% of consumption (10% at market price)	0.118	0.082	0.098	Exempt
Official Gazette RS, No.96/24	1 Nov 2024–28 Feb 2025	100% of consumption	0.084	0.07	0.077	Exempt

SOURCES: DECREE ON SETTING ELECTRICITY PRICES (OFFICIAL GAZETTE OF THE REPUBLIC OF SLOVENIA, NO. 107/23) AND DECREE ON SETTING ELECTRICITY PRICES (OFFICIAL GAZETTE RS, NO. 96/24)

The two measures arose from different underlying causes: the first, though wholesale prices had stabilised, remained tied to the effects of the energy crisis; the second stemmed from an increase in the final supply costs, driven mainly by higher network charges at the start of the high season.

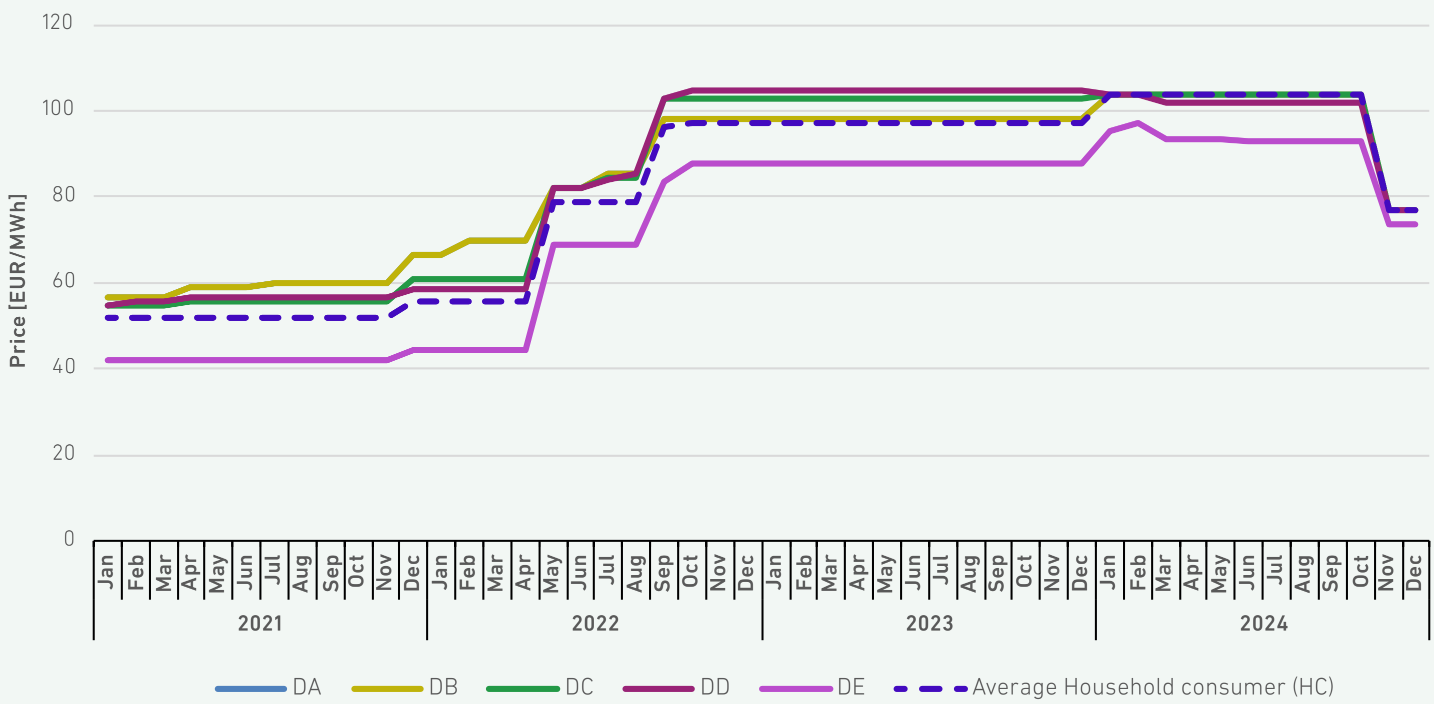
Retail Price Index for Typical Household Consumers

Based on monitoring the retail market for household consumers, the Energy Agency determines retail price indices (RPI). The RPI is based on the lowest offer in the retail market that 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 113 shows the trends of the RPI for standard consumer groups DA, DB, DC, DD, DE and the average Slovenian household consumer[58] in Slovenia in the 2021–2024 period. In the retail market, most consumers (except those with contracts containing contractual penalties) can secure their electricity supply at the price reflected in MPI by switching supplier or product (offer) with their current supplier.

58 Consumption profile of an average household consumer in Slovenia: billed capacity 8 kW, annual consumption 1,996 kWh (peak tariff) and 2,100 kWh (off-peak tariff)

FIGURE 113: RPI IN THE 2021–2024 PERIOD



SOURCE: ENERGY AGENCY

Figure 113 shows that the MPI is relatively constant across all consumer groups during the period of the cap of 90% of the retail price in accordance with the Government regulation on setting electricity prices. Only the consumer group DE experienced a small price spike at the beginning of the year, which then stabilised from March onwards. The MPI value for the average GO consumer and the DB group has risen to the level of the DC and DD consumer groups. A significant drop in the price can be seen in November, when the 100% cap on electricity prices came into force through the Regulation on the fixing of the electricity price[59].

Electricity prices were partially or fully capped throughout the year – the only differences arose from various surcharges and flat-rate fees

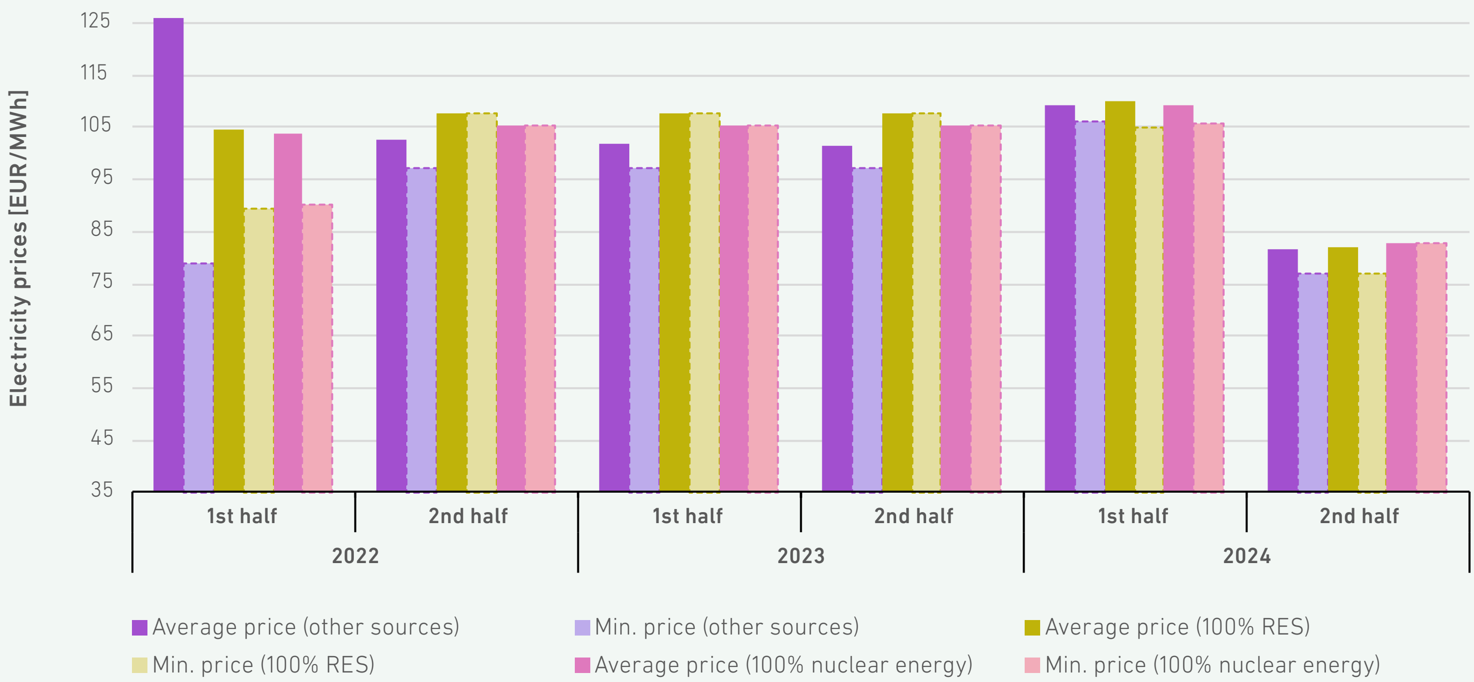
Analysis of Price Dynamics in the Green and Low-Carbon Energy Supply

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

Figure 114 shows the trends in the average prices of electricity[60] based on offers from 100% RES, 100% nuclear energy, and other offers from suppliers, and the trends in the lowest price of electricity, based on offers from 100% RES, 100% nuclear energy, and other offers from suppliers available in the market for a typical household consumer[61] in the 2022–2024 period.

59 Official Gazette of the Republic of Slovenia, No. 96/24
60 The energy price also includes flat-rate operating costs and other surcharges that are slightly more common in green offers.
61 Consumption profile of an average household consumer: billed capacity 8 kW, annual consumption 1,996 kWh (peak tariff) and 2,100 kWh (off-peak tariff)

FIGURE 114: PRICE TRENDS OF OFFERS FROM 100% RES, 100% NUCLEAR ENERGY, AND OTHER AND OTHER ENERGY SOURCES FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2022–2024 PERIOD



SOURCE: ENERGY AGENCY

From January 1, 2024, to October 31, 2024, the Government of the Republic of Slovenia limited 90% of the price of electricity for household consumers by the Decree on the determination of electricity prices.[62] In the first half of 2024, average prices for all offers were around 109.5 EUR/MWh, with the lowest prices for all offers also very close at around 105.5 EUR/MWh.

Even lower electricity prices in the second half of 2024 were influenced by the new Decree on the determination of electricity prices[63], which was in force from November 1, 2024, to February 28, 2025, whereby the Government of the Republic of Slovenia capped 100% of the price of electricity. The average and lowest price of offers consisting of 100% nuclear energy were the same and amounted to 82.65 EUR/MWh. The lowest price of bids composed of 100% RES was 18% lower in 2024 compared to 2023 as a result of the measure mentioned above by the Government of the Republic of Slovenia.

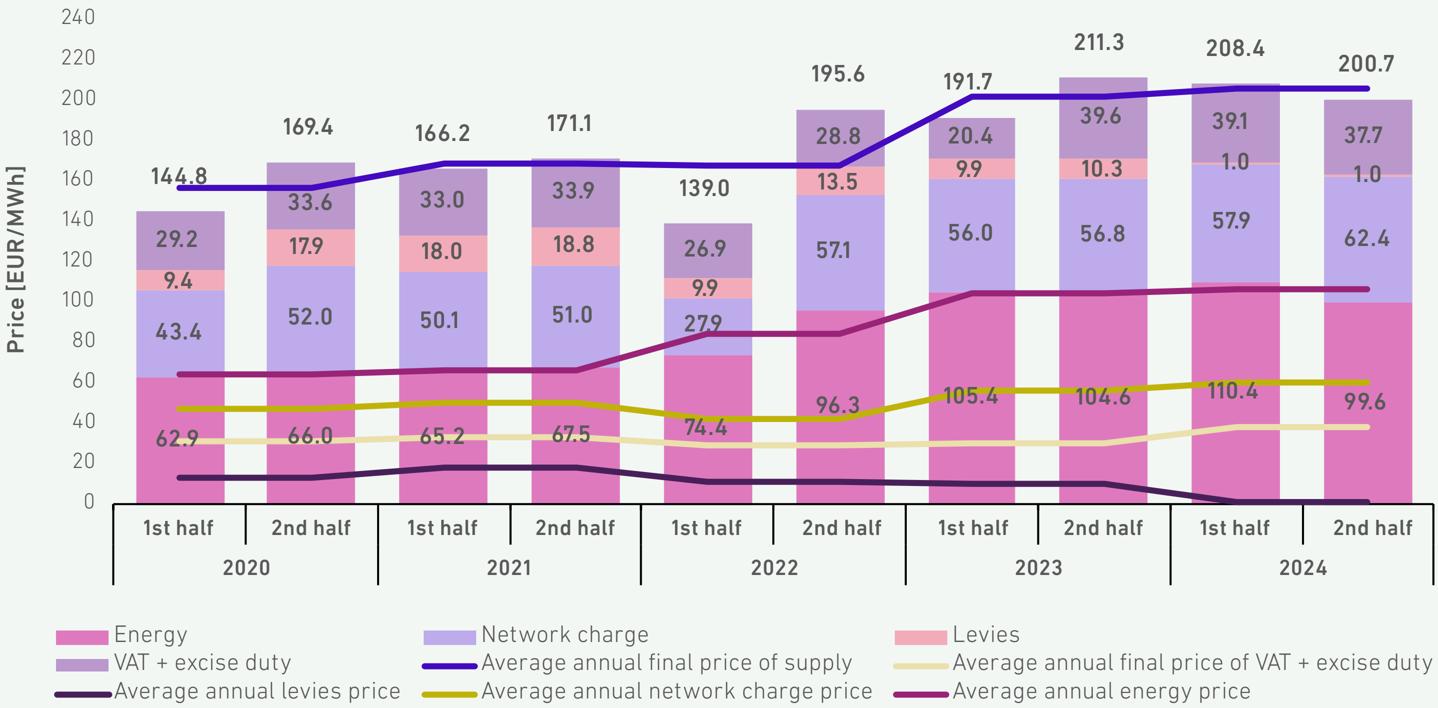
Final Electricity Prices for Household Consumers

An analysis of the structure of the final prices of electricity supplied to household consumers from the standard consumer group DC[64] is presented below. The final electricity supply price for consumers consists of:

- electricity price, which has been capped upwards in 2024;
- network charges:
  - network charges for the transmission and
  - network charges for the distribution network;
- contributions:
  - contribution for supporting electricity production with high-efficiency cogeneration and renewable electricity (RES);
  - the energy efficiency contribution, and
  - contribution for the operation of the market operator;
- excise duties and
- value-added tax (VAT).

62 Official Gazette of the Republic of Slovenia, No. 107/23
63 Official Gazette of the Republic of Slovenia 96/24
64 The standard consumer group DC includes household consumers with an annual consumption of between 2,500 and 5,000 kWh.

FIGURE 115: TRENDS OF THE FINAL ELECTRICITY SUPPLY PRICE IN SLOVENIA FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY, SURS[65]

The average annual final price increases by 2.2% in 2024. To mitigate the energy crisis, a cap on the maximum electricity price for household consumers, including multi-apartment buildings, was in place in 2023. For 2024, electricity price regulation for households was extended, but only for 90% of consumption, while the remaining 10% of consumption was subject to market prices. In the period from November 2024 to February 2025, the Government further capped the electricity prices for households so that they were regulated for the whole consumption. This measure was taken to mitigate high electricity bills in the 2024/2025 winter season. For the whole of 2024 and until 30 June 2025, an exemption from RES and CHP contributions for household consumers was in force.

2.2% increase in the average annual final supply price for a typical household consumer

The average annual energy price increased by 1.3%. In addition, there was a 6.7% increase in the network charge[66], a 27.7% overall increase in VAT and excise duties and a 91.0% decrease in the RES and CHP contribution, mainly due to the measures taken by the Government of the Republic of Slovenia - the termination of the RES contribution and the expiry of the lower excise duty at the end of 2023.

The share of the network charge in the final price of electricity supply for a typical household consumer in 2024 was 29.4%, the share of energy 51.3%, the share of contributions 0.5% and the share of VAT and excise duty 18.8%.

65 SURS / STAT – methodological explanation: https://www.stat.si/StatWeb/File/DocSysFile/8130

66 The increase in the network charge is due to the seasonal design of the new methodology and the inter-annual application of the new methodology (Q4 2024; only one-eighth of the low season and half of the high season are taken into account in the determination). If the new methodology had been in use for the whole year 2024, the network charge for the considered consumer would have decreased.

Final Electricity Prices for Business Consumers

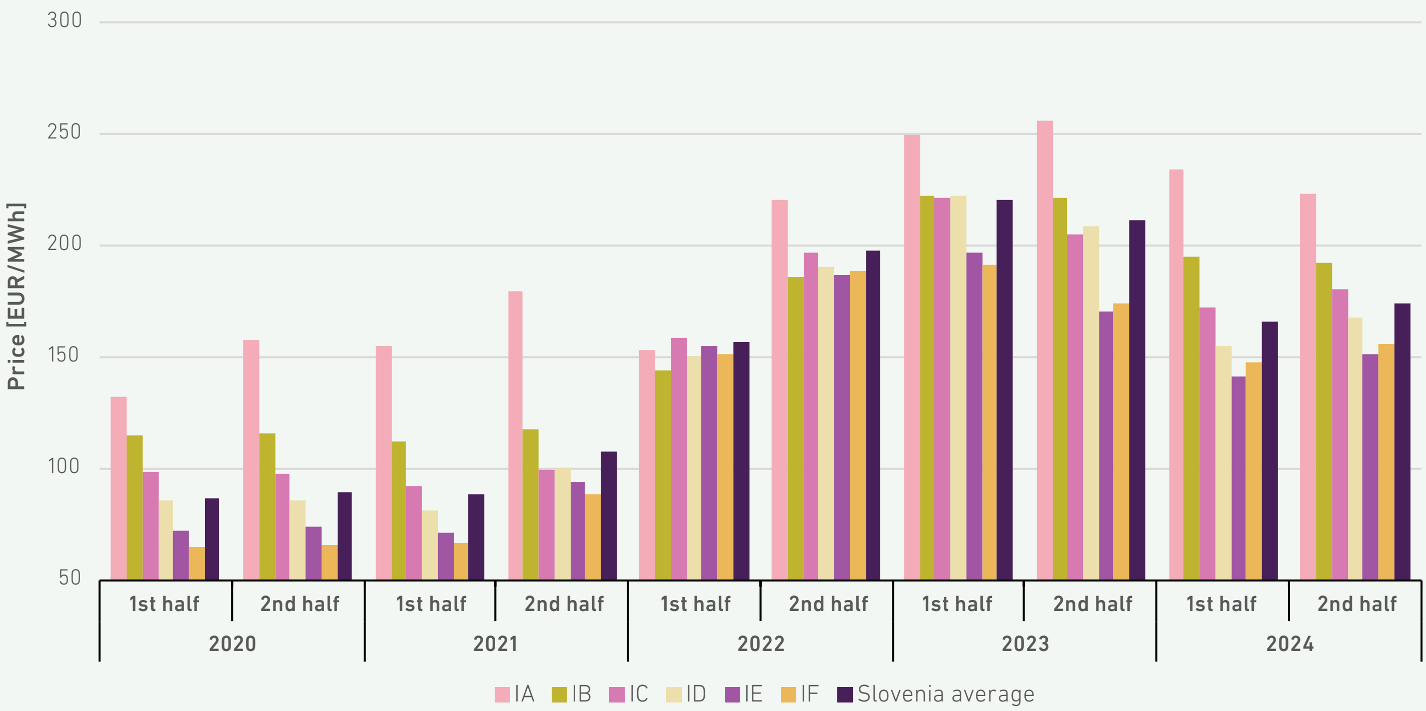
The final electricity supply price for an average business consumer, comprising the average of the prices of the first and second half of the year, excluding VAT[67], was 169.8 EUR/MWh in 2024, a decrease of 21.4% compared to 2023[68]. The final supply prices decreased for all consumer groups.

The largest reduction was for the customer group ID, for which the average annual final supply price in 2024 was 25.1% lower compared to 2023. The smallest reduction was for the smallest customer group IA, for which the average annual final supply price in 2024 was 9.5% lower compared to 2023.

21.4% reduction in final electricity supply prices for the average business consumer

The evolution of the final electricity supply price in Slovenia for typical business customers by half-year from 2020 to 2024, and a comparison with the average final supply price for business consumers in Slovenia is shown in Figure 116.

FIGURE 116: TRENDS OF THE FINAL ELECTRICITY SUPPLY PRICE IN SLOVENIA FOR A TYPICAL BUSINESS CONSUMER IN THE 2020–2024 PERIOD



SOURCE: SURS

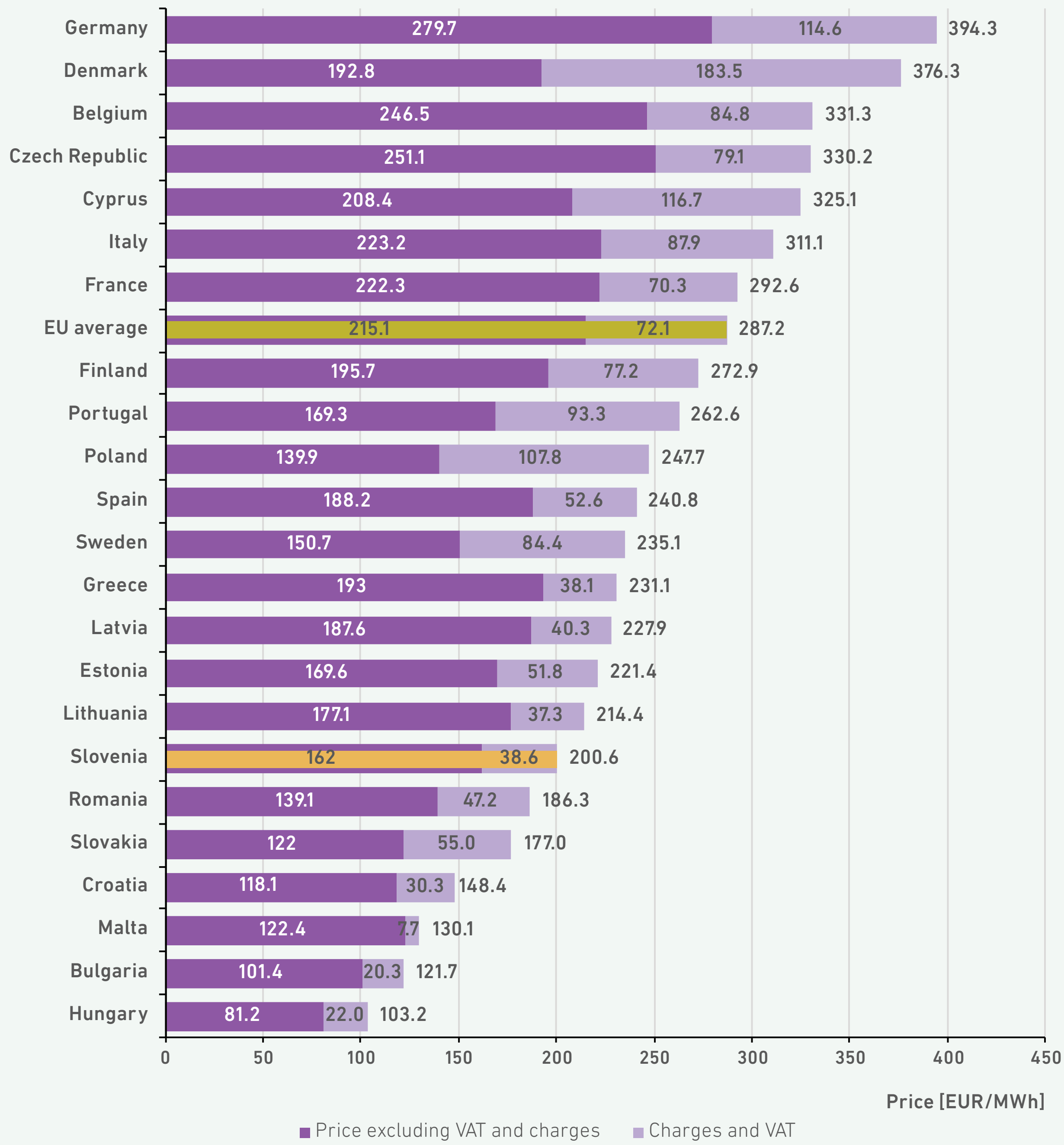
Comparison of the Final Electricity Prices in the EU Member States

Figure 117 and 118 show a comparison of final electricity supply prices in EU countries for the second half of 2024 for typical household and business consumers selected according to the Eurostat methodology.

Taxes and levies include contributions, excise duty and VAT, while the price excluding taxes and levies consists of the energy price and the network charge.

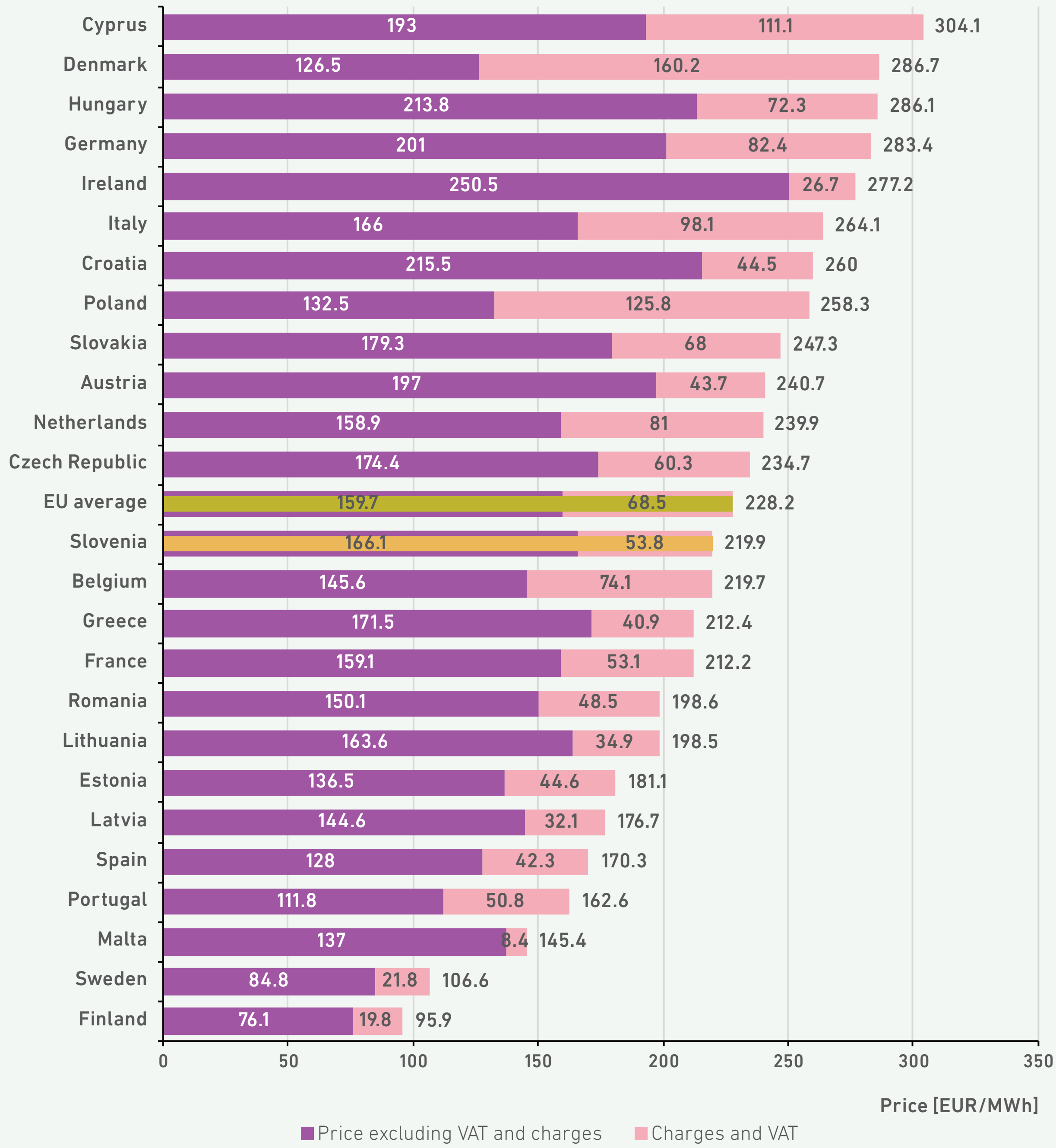
67 VAT is not taken into account to ensure comparability with the Eurostat methodology.
68 The difference is rounded to one decimal place.

FIGURE 117: COMPARISON OF THE FINAL ELECTRICITY SUPPLY PRICES FOR A TYPICAL HOUSEHOLD CONSUMER WITH AN ANNUAL CONSUMPTION OF BETWEEN 2,500 kWh AND 5,000 kWh (DC) IN THE EU MEMBER STATES AND SLOVENIA IN THE SECOND HALF OF 2024 IN EUR/MWh



SOURCE: EUROSTAT

FIGURE 118: COMPARISON OF THE FINAL ELECTRICITY SUPPLY PRICES FOR A TYPICAL BUSINESS CONSUMER WITH AN ANNUAL CONSUMPTION OF BETWEEN 20 MWh AND 500 MWh (IB) IN THE EU MEMBER STATES AND SLOVENIA IN THE SECOND HALF OF 2024 IN EUR/MWh

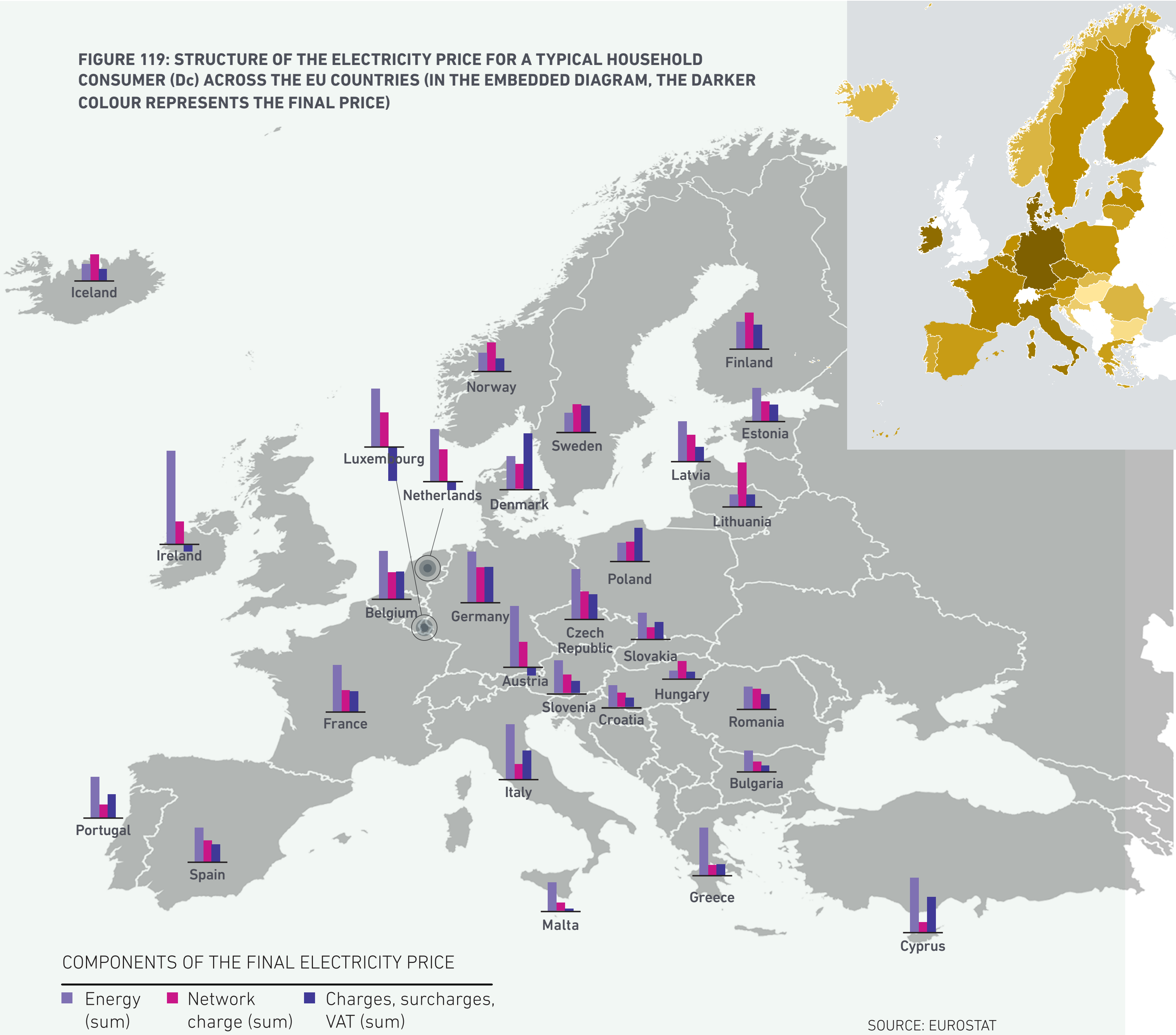


SOURCE: EUROSTAT

In the internal electricity market, retail electricity prices are market-determined in most EU countries, while regulated retail electricity prices can also be observed in some EU countries. The retail price depends on the structure of generation resources and the availability of neighbouring markets and market activities.

For a typical household consumer in Slovenia, the final supply price was nominally at a level significantly below the EU average, but also lower than in Austria and Italy and higher than in Croatia and Hungary. The final electricity supply price for a typical business consumer in Slovenia is just below the EU average in nominal terms. Compared to neighbouring countries, it is lower than in Austria, Italy, Hungary, and Croatia.

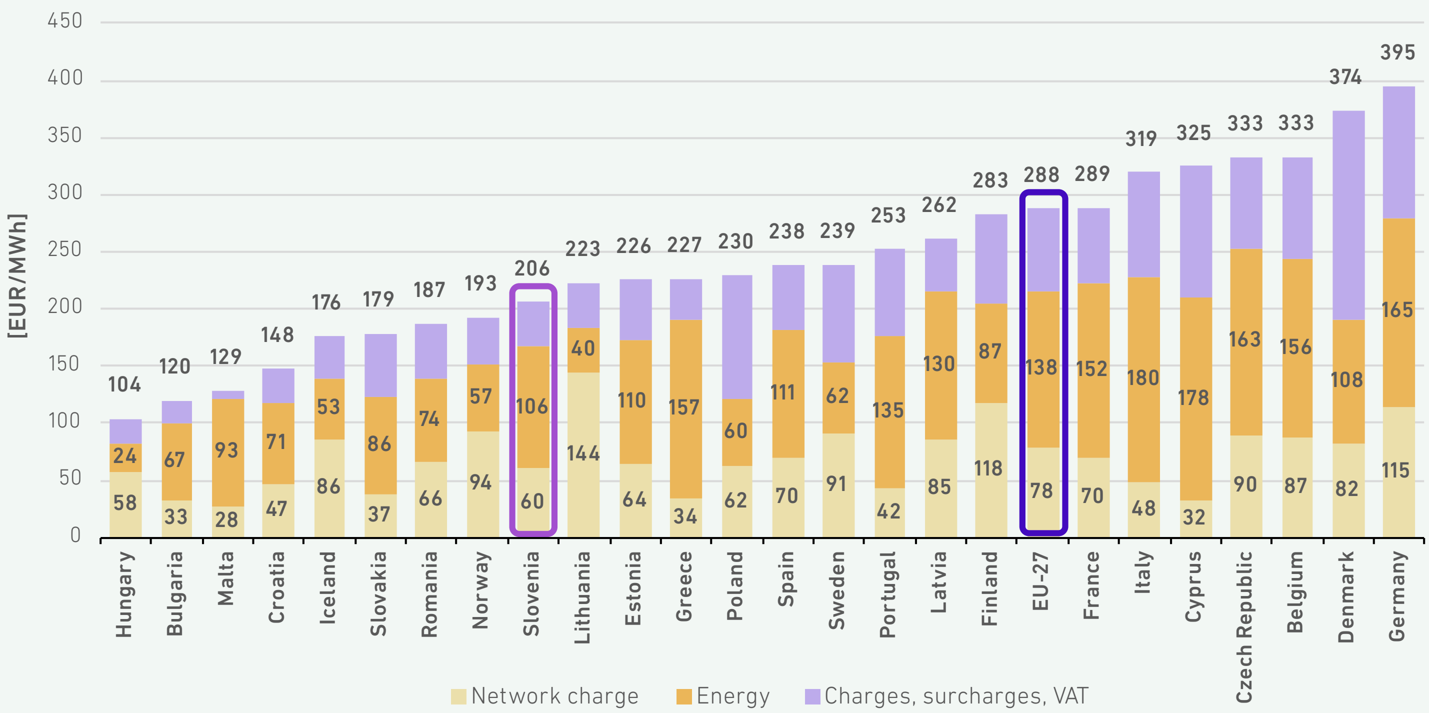
FIGURE 119: STRUCTURE OF THE ELECTRICITY PRICE FOR A TYPICAL HOUSEHOLD CONSUMER (Dc) ACROSS THE EU COUNTRIES (IN THE EMBEDDED DIAGRAM, THE DARKER COLOUR REPRESENTS THE FINAL PRICE)



SOURCE: EUROSTAT

Well-connected markets with cross-border interconnections and uniform trading rules between countries suggest that prices across countries have largely stabilised, but remain at levels still higher than before the 2022 energy crisis (Figure 119). In the period after the energy crisis, it is possible to identify various factors that have contributed to maintaining prices and affecting welfare. These include various subsidies, changes in tax policy and also changes in the cost of network charges. In addition to the average 7% price increase at the EU level in 2024 compared to 2023, taxation accounted for the largest part of the increases (25%), followed by the cost of network charges (17%). The gaps between the shares of the individual components in the total cost of supply remain large (Figure 120). In Slovenia, according to Eurostat, prices for a typical household consumer increased by 23%, driven by higher energy prices and network charges. The latter accounted for only 29% of the total supply price in 2023 (28% in 2023), while higher electricity prices accounted for only 29% of the total supply price. The supply of electricity to the typical household consumer in Slovenia remains below the EU average, but due to lower purchasing power, Slovenian households bear a higher burden of electricity costs compared to households in countries with higher purchasing power.

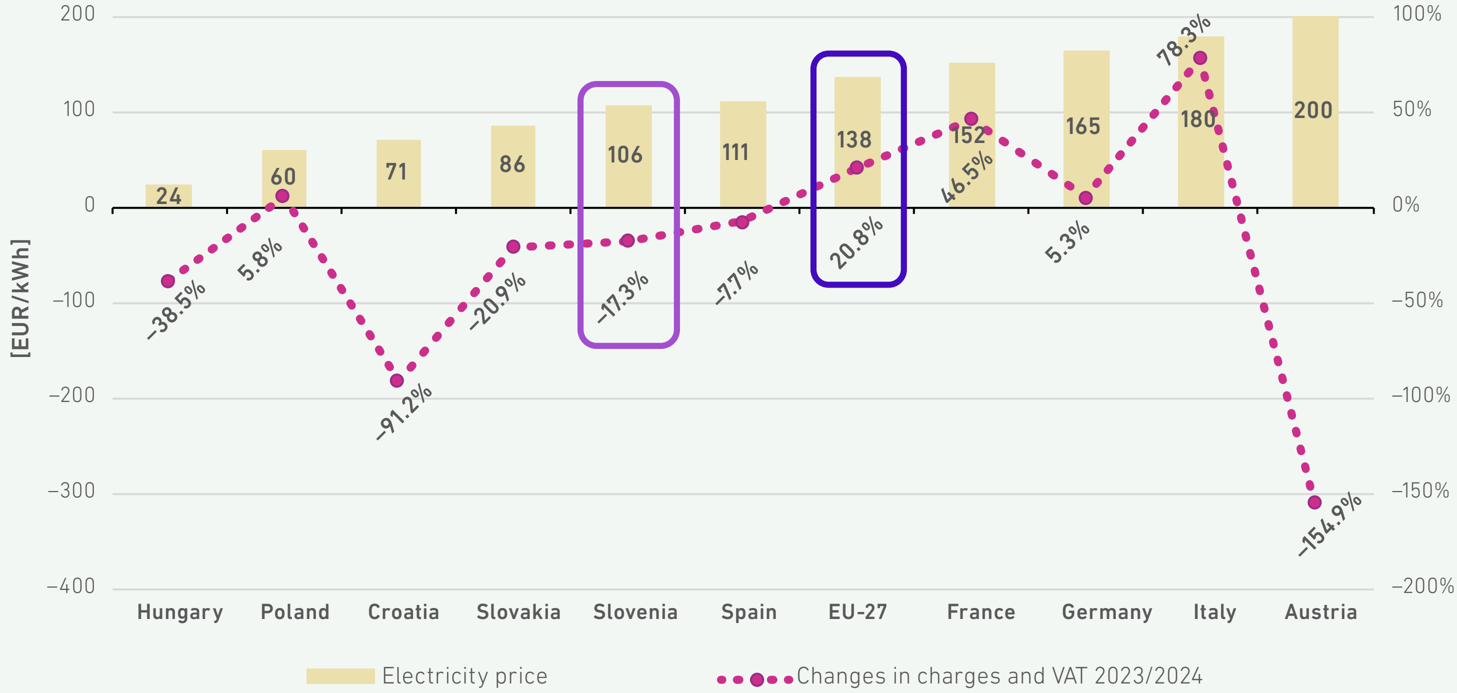
FIGURE 120: COMPARISON OF SHARES IN THE FINAL PRICE OF THE ELECTRICITY SUPPLY FOR A TYPICAL HOUSEHOLD CONSUMER IN EU MEMBER STATES



SOURCE: EUROSTAT

To make the mitigation of electricity price increases for household consumers acceptable, most countries intervened primarily in the regulation of charges and levies. The measures were in line with EU legislation, which allowed Member States to temporarily regulate retail electricity prices in exceptional circumstances, such as the energy crisis, to protect households and small businesses. In addition to the price regulation itself, when the Government of the Republic of Slovenia set the maximum permitted tariff rates for electricity, Slovenia also introduced a full exemption from the RES and CHP contribution, adopted at the end of 2023 and extended until mid-2025. The measures across the EU thus illustrate significant differences in regulatory approaches, while the European Commission additionally encourages a gradual and carefully managed withdrawal of such measures to avoid social shocks or market instability. The differences in the status of measures across Member States are shown in Figure 121.

FIGURE 121: INTER-ANNUAL CHANGES IN THE FINAL PRICE AND ELECTRICITY PRICES FOR A TYPICAL HOUSEHOLD CONSUMER IN EU COUNTRIES

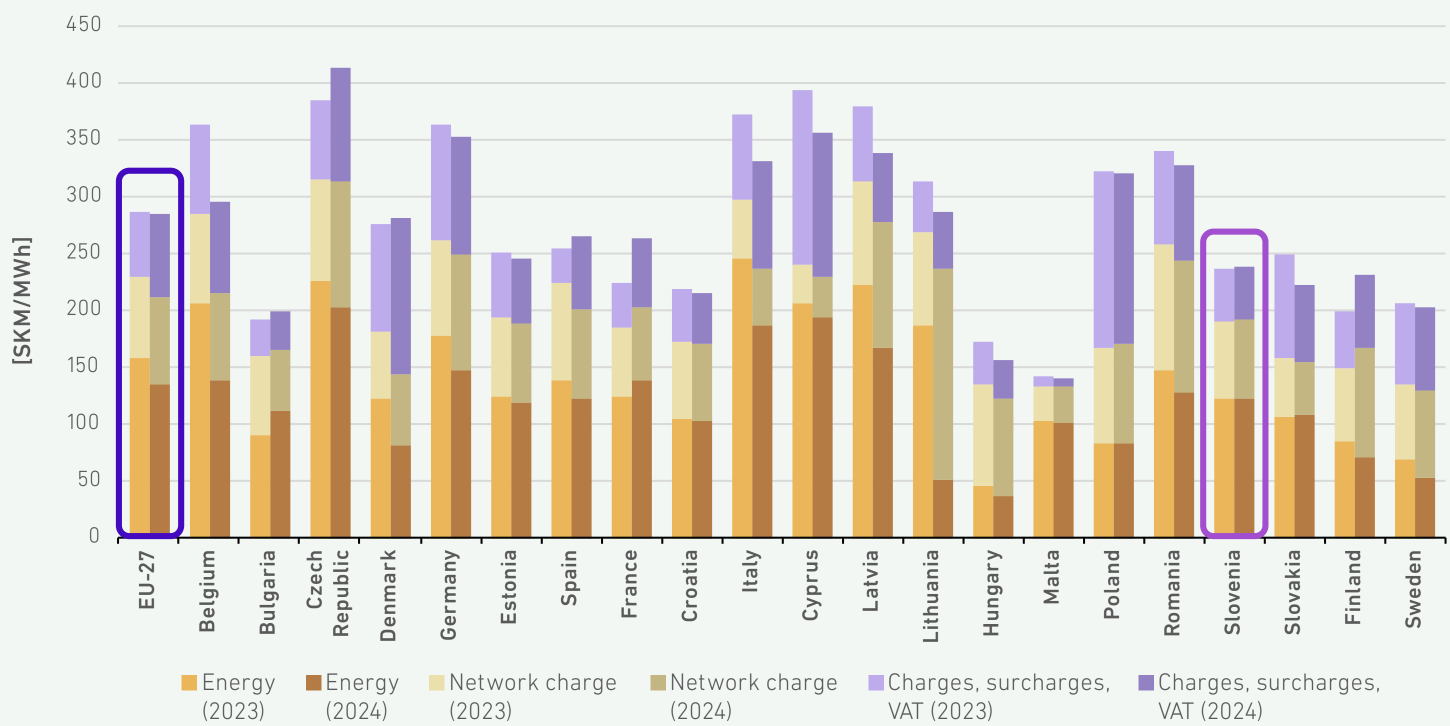


SOURCE: EUROSTAT

Figure 122 illustrates the changes in costs relative to consumers' purchasing power (purchasing power standard) by individual electricity components in the EU. Despite the well-functioning internal market, significant differences between countries remain.

Due to the energy crisis mitigation measures, the supply price remained below the EU average in 2024 as well

FIGURE 122: INTER-ANNUAL COMPARISON OF THE COMPONENTS OF THE TOTAL ELECTRICITY SUPPLY PRICE FOR A TYPICAL HOUSEHOLD CONSUMER IN THE EU MEMBER STATES ACCORDING TO THEIR PURCHASING POWER STANDARD IN 2023 AND 2024



SOURCE: EUROSTAT

Margin and Responsiveness of Retail Prices

The analysis of the correlation or linkage between wholesale prices and the energy component of retail prices for household customers is an estimate of the gross margin of suppliers, but also shows the degree of responsiveness of retail prices to price changes on the wholesale market. The analysis shows aggregate indicators for Slovenia and does not compare the margins of individual suppliers.

The margin is only a theoretical indicator, as a positive margin does not mean a profit for the suppliers, as they have other costs in addition to the purchase of electricity related to the overall supply. A negative margin, on the other hand, is likely to be an unfavourable operating result if it is limited to the context of profit.

In this context, the margin represents the difference between the price on the energy bills of a typical household consumer with annual consumption between 2,500 kWh and 5,000 kWh (consumer group DC) and the estimated cost of procuring this energy. To estimate the energy procurement costs, we use a wholesale price index weighted in such a way as to approximate the optimal procurement strategy on forward and day-ahead wholesale markets[69].

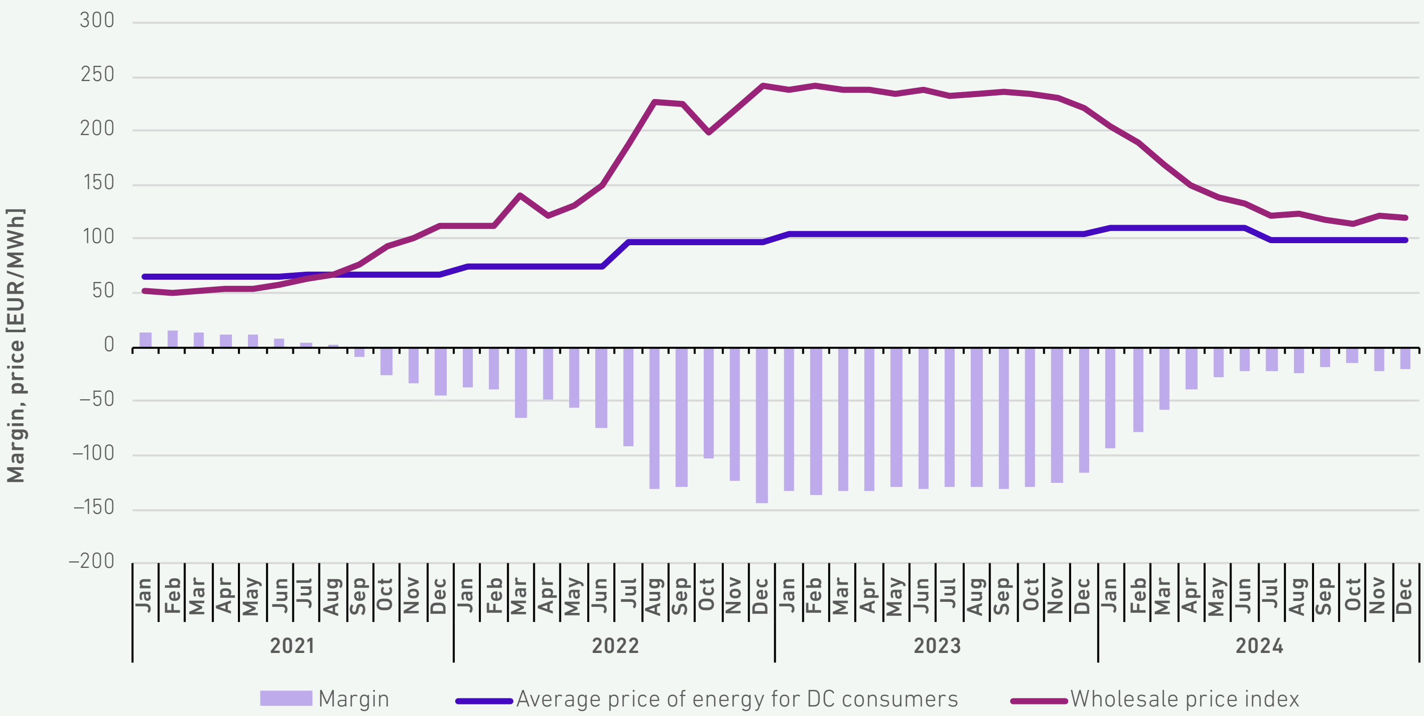
The degree of alignment between the energy component of retail prices and wholesale prices over a longer period can be used as an additional indicator of the efficiency and competitiveness of the retail market.

Compensating suppliers for negative margins on electricity supply - a government measure

In 2024, the average retail margin amounted to –36.71 EUR/MWh, representing an improvement compared to 2023, when it stood at –128.78 EUR/MWh. The impact of rapidly rising wholesale prices in both the spot market and the long-term forward market, combined with the slow adjustment of retail prices for household consumers, began to emerge as early as the last quarter of 2021 and led to a sharp increase in negative margins in the first half of 2022. From September 2022 onwards, the Government introduced retail price caps through decrees setting the maximum allowed tariff rates. The combination of these retail price caps with adverse wholesale market conditions was a key factor in maintaining negative margins during the 2022–2024 period. Consequently, the market did not operate fully, as retail prices could not adjust to wholesale market developments due to administrative restrictions, meaning that the margin depended solely on wholesale price movements. Even as wholesale prices gradually decreased by March 2024, retail margins remained negative, since their value was determined exclusively by wholesale market conditions rather than by retail market equilibrium.

69 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.

FIGURE 123: MARGIN AND RESPONSIVENESS OF THE ENERGY COMPONENT OF RETAIL PRICES



SOURCES: ENERGY AGENCY, SURS

The Government of the Republic of Slovenia introduced a compensation scheme for electricity suppliers who incurred financial losses due to price regulation. This measure, established by the Decree on Compensation for Electricity Suppliers, was implemented to ensure the stability of the electricity market and to prevent disruptions in supply resulting from suppliers' financial difficulties, and it remained in force throughout 2024. By capping retail prices, the government caused economic damage to suppliers, as prices were limited to a level lower than what suppliers would have set themselves based on their procurement and production costs or retail and wholesale market conditions, as also indicated by the Energy Agency's theoretical margin analysis. The compensation amount was calculated as the product of the electricity supplied to regulated customers and the difference between the average procurement price and the regulated retail price. Suppliers with their own electricity generation or affiliated with producers were eligible for compensation only for volumes exceeding their generation. For such volumes, a specific methodology for calculating compensation is applied.

Negative retail price margin over the last three years

In 2024, retail electricity prices for household consumers remained at the same level as in the previous year, while the wholesale price index decreased by 39.6%. The correlation coefficient between the monthly levels of these two price components over the past year was 0.77, indicating a strong alignment, reflecting the predominantly upward price trend observed for some time.

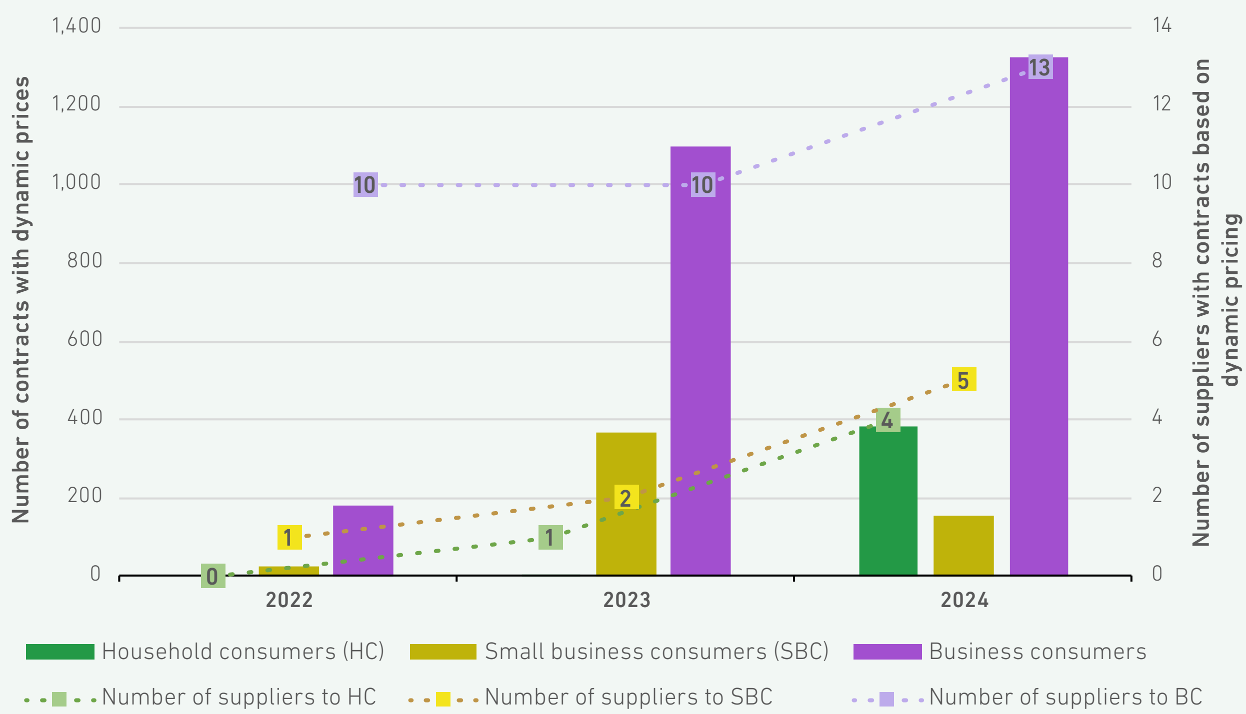
Dynamic Prices

Contracts based on dynamic prices have been a regular feature of the business consumption segment of the Slovenian retail market for several years, but were first introduced in the household and small business consumption segment in 2022, following the implementation of Directive (EU) 2019/944 in the Electricity Supply Act (ZOEE). The ZOEE Act addresses dynamic prices in Article 17, which defines the right to contracts with dynamic electricity prices. Every supplier that concludes electricity supply contracts with over 100,000 final consumers must offer contracts with dynamic electricity prices. At the same time, every final consumer with an installed advanced meter can require that a contract with dynamic prices be concluded.

In 2024, five suppliers served more than 100,000 cosnumers each. In alphabetical order, these suppliers were: E 3, ECE, Elektro Energija, Energija Plus, and GEN-I. Within the framework of continuous market monitoring, supervisory procedures, and supplier reporting, it was found that most suppliers had not established an appropriate offer with a dynamic pricing structure in the previous period, which constituted non-compliance with legal obligations. At the beginning of 2024, suppliers were called upon to establish or update their dynamic contract offers for the relevant final consumers, in accordance with Article 17 of the Electricity Supply Act (ZOEE). In response, the obligated parties made the necessary adjustments to their price lists, conditions, and business policies in the first half of 2024, thereby addressing all previously identified irregularities. The Energy Agency then carried out a final assessment and confirmed that all obligated parties had fully aligned their offers with the law. Consequently, by the end of 2024, all supervisory proceedings were concluded with formal closure decisions, following prior warnings but without sanctions. This outcome confirms the effectiveness of supervisory dialogue and the importance of proportionate action in exceptional circumstances.

Figure 124 shows the number of contracts concluded on the basis of dynamic pricing in the period 2022–2024 for household consumers (HC), small business (SB) and business consumers (BC). The energy crisis and the associated sharp increase in wholesale electricity prices and price volatility have limited the interest in and demand for the supply of this type of product in 2022, which is reflected in the very low number of contracts concluded, especially for households where no contracts have been concluded yet. In the following years, the number of contracts for household and business consumers increased markedly, while for small business consumers it slightly decreased after a peak in 2023. At the same time, the number of suppliers with contracts has gradually increased for all three consumer groups, reflecting the development and expansion of the market. In 2024, four suppliers have dynamic pricing contracts with 385 household consumers, five suppliers with 154 small business consumers and 13 suppliers with 1,325 business consumers. Notwithstanding the positive trends, the number of consumers supplied on a dynamic pricing basis remains small and still represents an insignificant segment of the retail market.

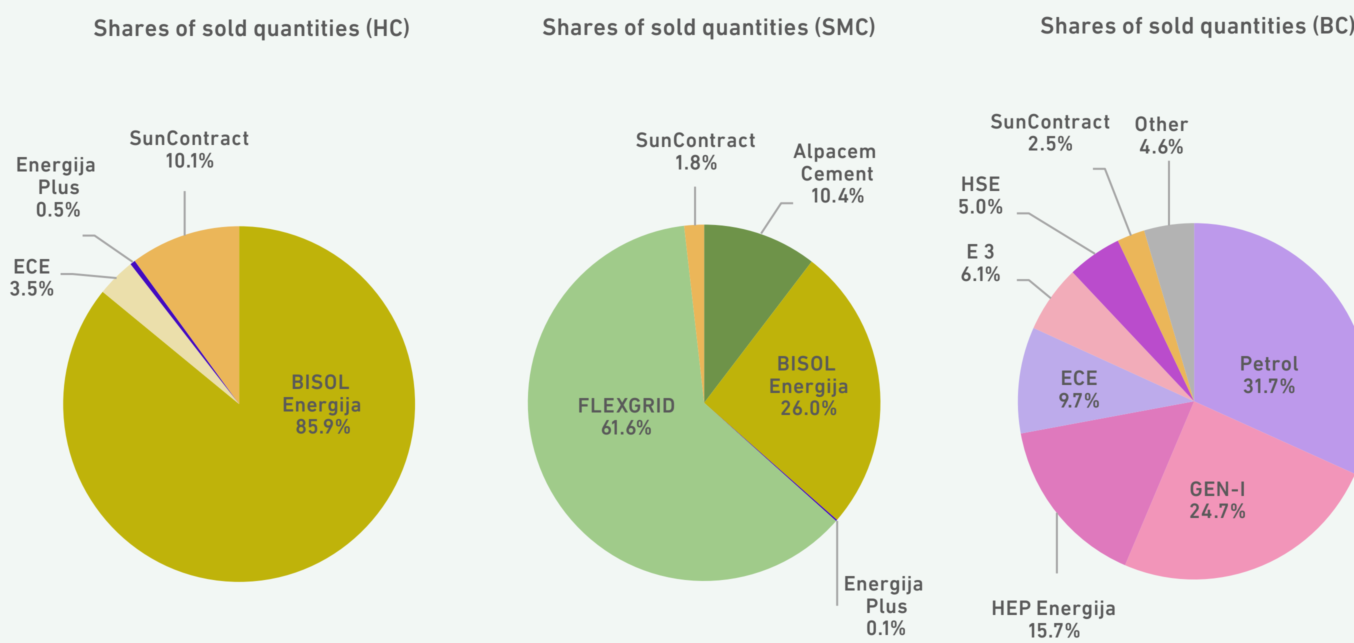
FIGURE 124: NUMBER OF CONTRACTS CONCLUDED BASED ON DYNAMIC PRICING AND THE NUMBER OF SUPPLIERS WITH WHOM CUSTOMERS CONCLUDED THESE CONTRACTS IN THE 2022–2024 PERIOD



SOURCES: ENERGY AGENCY, SUPPLIERS

The total amount of electricity supplied to customers with dynamic pricing contracts in 2024 was 841.17 MWh for household consumption (on average 2.18 MWh per household consumer), 1.322.87 MWh for small business consumption (on average 8.59 MWh per small business consumer) and 2.85 TWh (on average 2,154.56 MWh per business consumer). The amount of energy supplied under dynamic contracts developed differently between 2022 and 2024 according to the different customer groups. For households, it was zero in 2022, only 1 MWh the following year, and a marked increase in 2024. Small business customers saw more than a threefold increase between 2022 and 2023 (206.5% increase), but the number of contracts signed and the volume supplied almost halved in 2024 (49.8% decrease in the volume supplied compared to 2023). The amount of electricity provided to business consumers doubled in 2023 compared to 2022 (113.3% increase), while it remained almost constant in 2024 (0.94% increase). The distribution of the amount of electricity supplied under dynamic pricing contracts by the supplier for the different customer groups is shown in Figure 125. The data show that BISOL Energija is the leading supplier among household consumers, accounting for 85.9% of the electricity supplied. For small business consumers, FLEXGRID accounts for the largest share of energy supplied (61.6%), while in the case of business consumers, the supply structure is spread across several suppliers, with no clear dominance of a single supplier, indicating a higher degree of competition in this part of the market.

FIGURE 125: SHARES OF ELECTRICITY SOLD UNDER DYNAMIC PRICING CONTRACTS BY SUPPLIER IN 2024[70]



SOURCES: ENERGY AGENCY, SUPPLIERS

Most of the available offers based on dynamic prices were linked to the SIPXhourly electricity index (EUR/MWh) on the electricity exchange market in Slovenia (BSP Southpool). An exception is the supplier who indicated that they use a combination of long-term leasing and spot market pricing, where they lease about 70% of the volumes in advance through forward contracts, and procure the remainder on the day-ahead or intra-day markets. The descriptions of the dynamic pricing of the available offers provided by the suppliers are mainly free of price caps, except for one supplier, which caps all negative prices at EUR 0/MWh to protect itself from paying consumers for the electricity supplied in the event of negative prices. The absence of the possibility to cap electricity prices represents a significant risk for consumers as it exposes them to the price volatility of the wholesale market and may have a disincentive effect on the interest in such offers.

Suppliers have mostly added markups to dynamic prices, which are either fixed according to wholesale market developments, or fixed and quoted in EUR/MWh, or quoted as a relative markup added to the hourly index value.

70 The difference between the total and the sums is due to rounding to one decimal place.

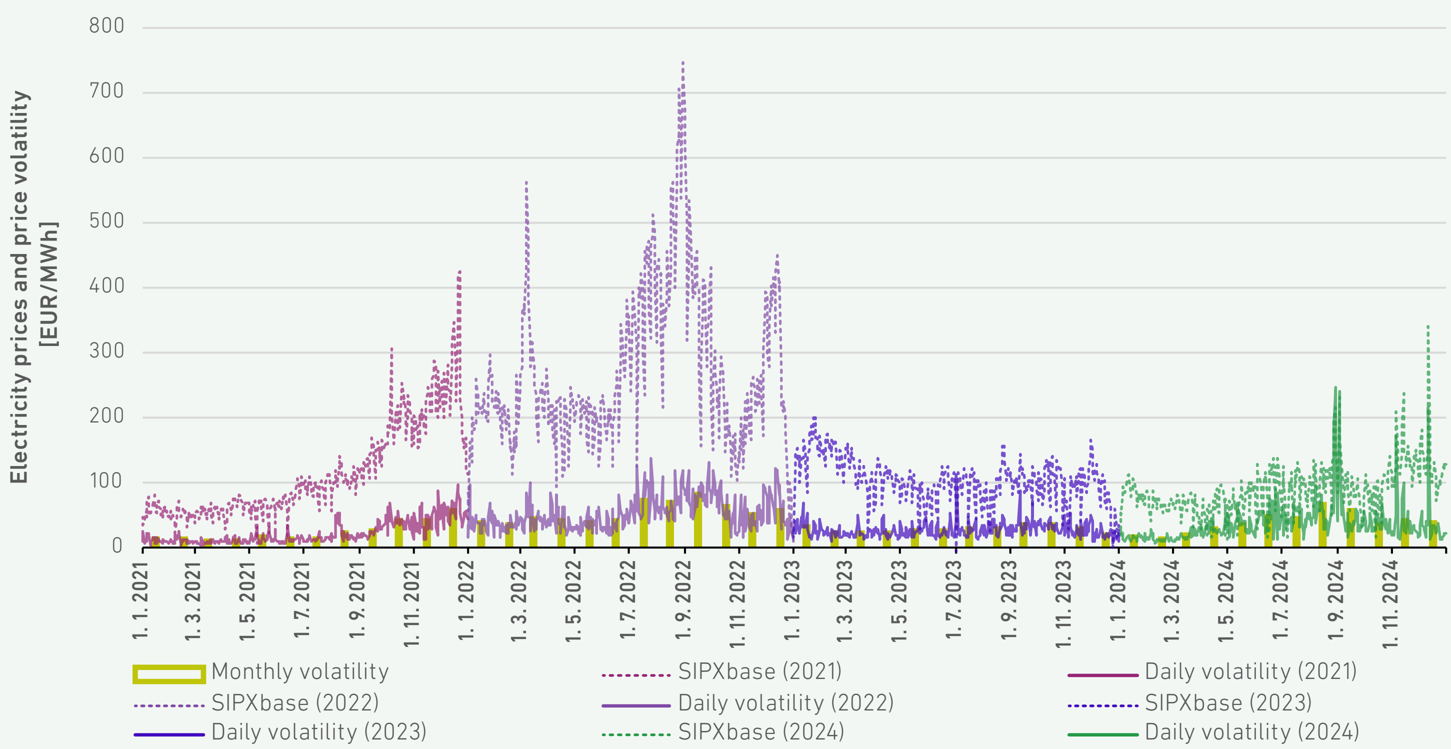
The relative markup values, according to the suppliers, range between 8% and 12% of the hourly index value, while the fixed markup values added to each SIPX hourly index range between 13 and 14 EUR/MWh. The markups included the operational costs of the seller for forecasting and energy management, the costs of deviations of the actual consumption from the forecasted consumption of the customer, the costs of managing the metering point, monitoring the consumption and managing the energy according to the customer's needs. The Agency did not observe any surcharges linked to the amount of energy supplied. Similar to the other electricity supply offers, the offers based on dynamic prices included various support and lump-sum costs and, in addition, a premium to cover deviations.

Price Volatility

According to Article 53 of Energy Act-2, the Energy Agency is also required to monitor the degree of volatility, i.e. price volatility, on the electricity market, in particular in the context of the impact of price volatility on end-users' bills. The volatility of wholesale electricity prices represents one of the primary sources of risk in the conclusion of contracts with dynamic pricing. As the supply of such products in Slovenia in 2024 was somewhat limited and linked to prices on the spot wholesale markets, we provide below an analysis of price volatility on the day-ahead market on the Slovenian energy exchange BSP SouthPool in the 2021–2024 period.

The analysis of electricity price volatility has been made through the evaluation of the standard deviations of electricity indices SIPXhourlyi from the value of the SIPXbase, where the index i represents the hour of the day[71]. SIPXbase is an electricity index on the electricity exchange market in Slovenia and represents the average daily price for transactions concluded in hour i on the Slovenian electricity exchange market[72]. The evolution of the average daily electricity prices (SIPXbase) and the daily volatility values over the 2021–2024 period is shown in Figure 126.

FIGURE 126: PRICE TRENDS AND PRICE VOLATILITY ON THE SLOVENIAN ENERGY EXCHANGE



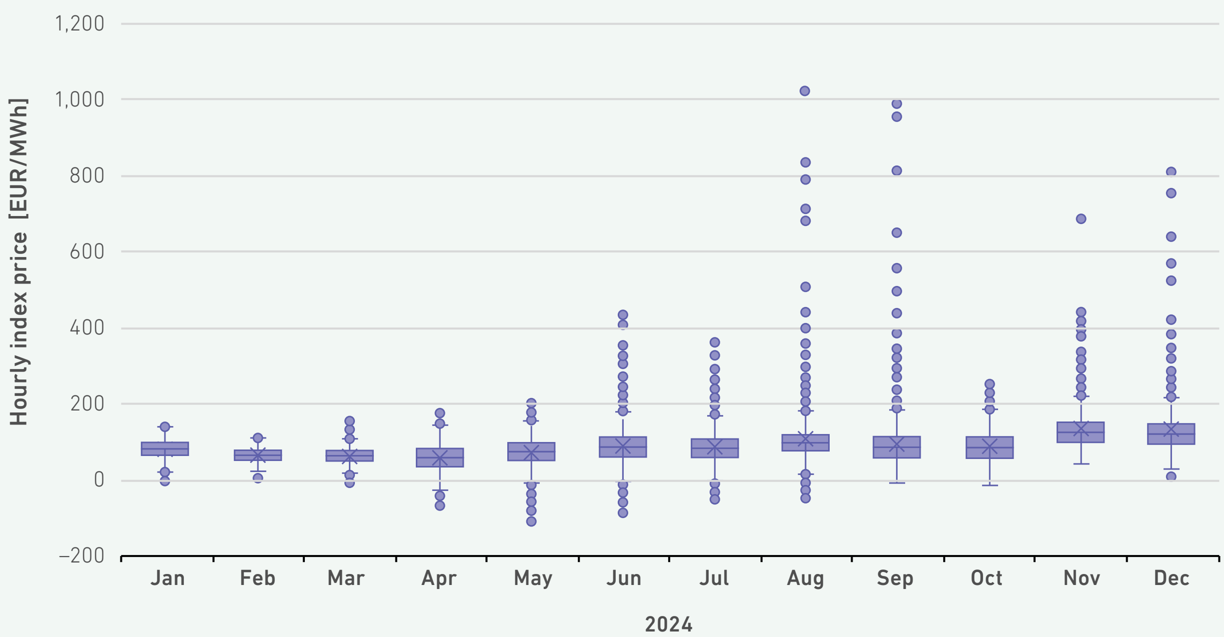
SOURCES: ENERGY AGENCY, BSP

71 The methodology for the evaluation of price volatility is presented in the State of the Energy Sector in Slovenia 2023 (Energy Agency, 2024), in the case study Analysis of the Level of Volatility of Electricity Prices in the Day-Ahead Market Over the 2021–2024 Period, pp. 102-104

72 BSP SouthPool Energy Exchange, Slovenski borzni indeks [dostop 6. 5. 2025] Slovenski borzni indeks - BSP SouthPool Energetska Borza (bsp-southpool.com)

In 2024, we noticed an increase in the level of day-ahead price volatility on the market, reaching levels comparable to those of 2022, i.e. the time of the energy crisis, in certain periods. Despite the market stabilisation in 2023, new peaks in price volatility are recorded in August and September 2024, indicating a renewed increase in market uncertainty, in terms of a higher incidence of both sharply high and negative prices, both of which are strongly linked to the stochastic nature of the operation of renewable electricity sources. In the context of dynamic contracts related to the spot market, price volatility represents a vital market risk for final consumers. The following Figure 127 shows the distribution of wholesale electricity prices in the day-ahead market and compares it with retail electricity prices that were capped in 2024.

FIGURE 127: DISTRIBUTION OF HOURLY VALUES OF DAY-AHEAD WHOLESALE ELECTRICITY PRICES ON THE SLOVENIAN ENERGY EXCHANGE BSP SOUTHPOOL



SOURCES: ENERGY AGENCY, BSP

CASE STUDY
Evaluating the competitiveness of a dynamic retail product during a period of price regulation

For the period from 1 January 2024 to 31 October 2024, the Government of the Republic of Slovenia, by the Decree on Setting Electricity Prices[73] had limited the electricity price to 90% of the actual monthly consumption for household consumers and for consumption in common areas of multi-apartment buildings and common areas in mixed multi-apartment and commercial buildings. The maximum allowed tariff rates for 90% of actual monthly consumption were capped at 118 EUR/MWh for the higher daily tariff rate and 82 EUR/MWh for the lower daily tariff rate until October 2024. For the remaining 10% of the consumers' consumption, the market price of the electricity supply contract was applied. In the last two months of 2024, the Government set new price cap values for the total amount of electricity supplied, namely 84 EUR/MWh for the higher daily tariff rate and 70 EUR/MWh for the lower daily tariff rate, in a new Decree on Setting Electricity Prices[74] However, the price cap did not apply to contracts based on dynamic prices.

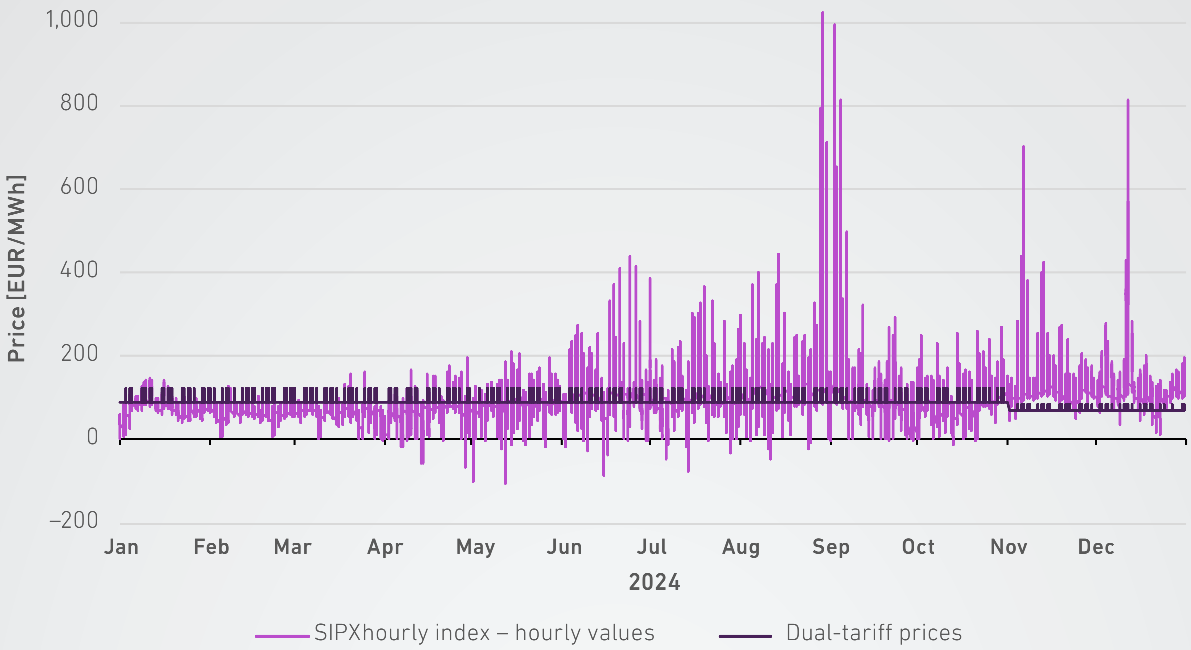
To compare the dynamic and the capped two-tariff retail product in 2024, an analysis of the hourly market prices (SIPXhourly) and the capped two-tariff items (two-tariff price) as defined by the government decrees was carried out. Based on the day of the week and the time of the day, each hourly rate is assigned a corresponding tariff rate value (HT or MT), using a weighted combination of the regulated and the market price[75] (90/10) in the period January-October, and only the regulated price in November and December. It is noted that the dynamic prices based on the hourly prices on the BSP exchange are only a theoretical indicator showing the lowest possible supply prices based on the dynamic price offers. It differs from actual supplier bids in that it is the bare exchange price without the markups that are part of suppliers' bid.

Figure 128 compares the hourly values of the dynamic electricity price (SIPXhourly index) and the corresponding capped two-tariff hourly rates. In the first half of the year, the hourly dynamic prices were often lower than the two-tariff prices, with an increased incidence of negative price values. However, from the summer onwards, the volatility of the dynamic prices is evident, with pronounced peaks in August and September, where individual hourly prices exceeded the value of 1,000 EUR/MWh.

Figure 129 provides a comparison between the dynamic and the two-tariff product on a monthly basis. It can be seen that in the first ten months of the year, the share of hours in which dynamic prices were higher than two-tariff prices increases. The individual monthly shares of hours ranged from 1.9% in March to a maximum of 51.5% in August. During this period, except August, the average hourly product differential was negative, meaning that dynamic prices were on average lower than two-tariff prices, while at the same time, the average product differential was decreasing during this period. The situation changes significantly in November and December, when, due to the increase in wholesale electricity prices and the additional reduction of the two-tariff capped rate, the share of hours with higher dynamic prices exceeds 90% and the average differential becomes strongly positive. On average, in November and December, dynamic prices were around 60 EUR/MWh higher than two-tariff prices.

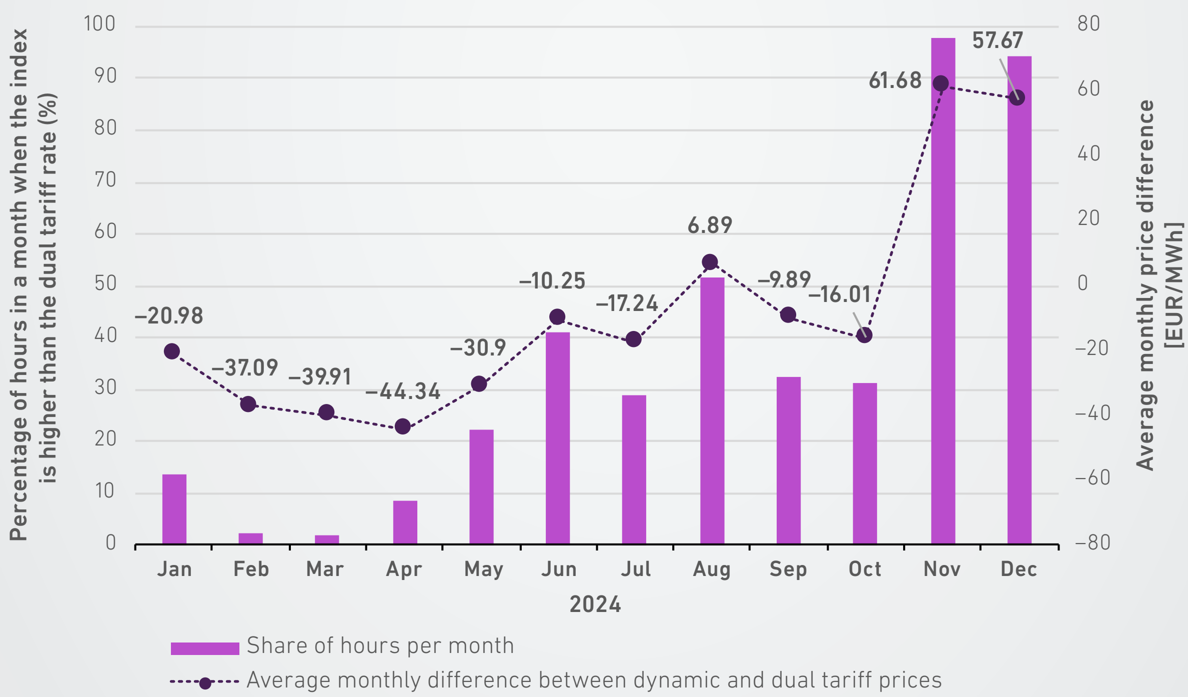
73 Decree on Setting Electricity Prices (The Official Gazette of the Republic of Slovenia, No. 107/23)
74 Decree on Setting Electricity Prices (The Official Gazette of the Republic of Slovenia, No. 96/24)
75 The market price is selected based on the average value of the bids reviewed in the first half of 2024, and thus the selected market value for the higher tariff is EUR 168.45/MWh and for the lower tariff, 145.9 EUR/MWh.

FIGURE 128: COMPARISON OF HOURLY VALUES BETWEEN THE DYNAMIC AND CAPPED DUAL-TARIFF PRODUCTS



SOURCES: ENERGY AGENCY, BSP

FIGURE 129: MONTHLY SHARE OF HOURS WITH HIGHER DYNAMIC PRICE AND AVERAGE DIFFERENCE COMPARED TO DUAL TARIFF BILLING

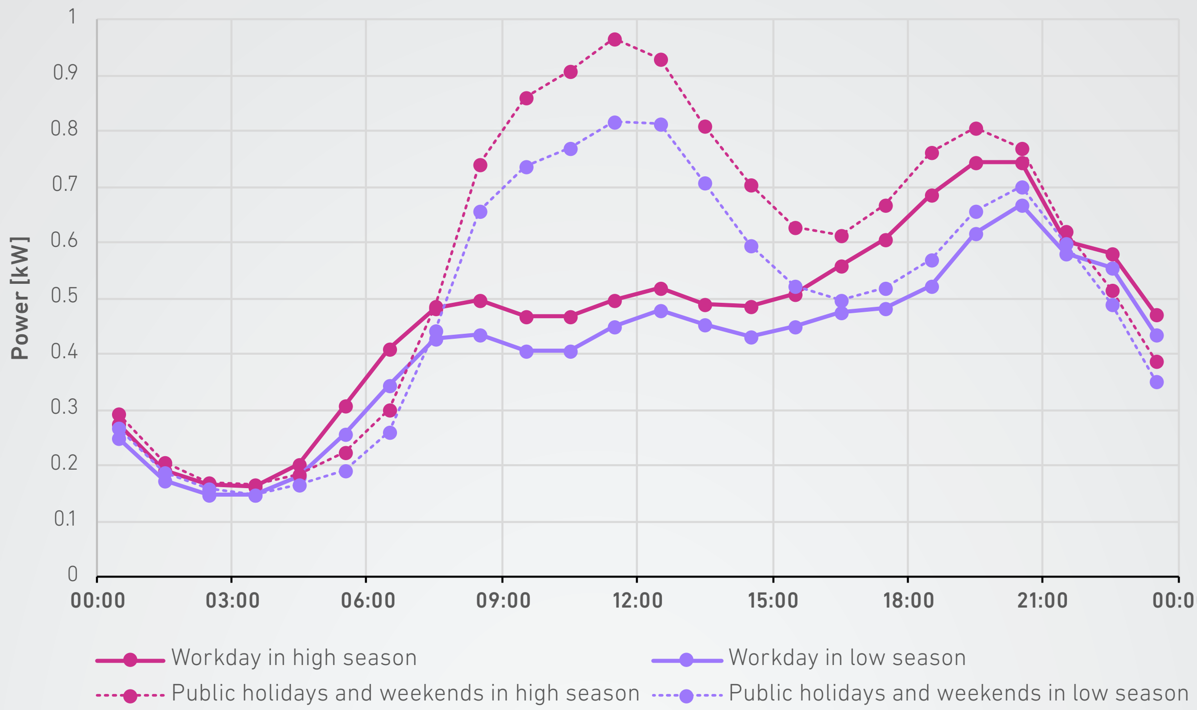


SOURCE: ENERGY AGENCY

Based on a synthetic consumption profile typical of a household consumer with a connection power between 7 and 14 kW and an annual consumption between 2,500 and 5,000 kWh, an estimation of the cost of electricity for 2024 has been carried out. The comparison includes the regulated two-tariff retail price and a dynamic pricing model based on the hourly values of the SIPX hourly index, with or without a 12% markup.

The average daily consumption profiles for the high and low seasons (weekday and non-working day) are normalised to a household consumer consuming 4,000 kWh of electricity per year. The profiles are slightly different in shape for the high season (November–February) and the low season (March-October), as shown in Figure 130.

FIGURE 130: SYNTHETIC PROFILE OF A VIRTUAL HOUSEHOLD CONSUMER

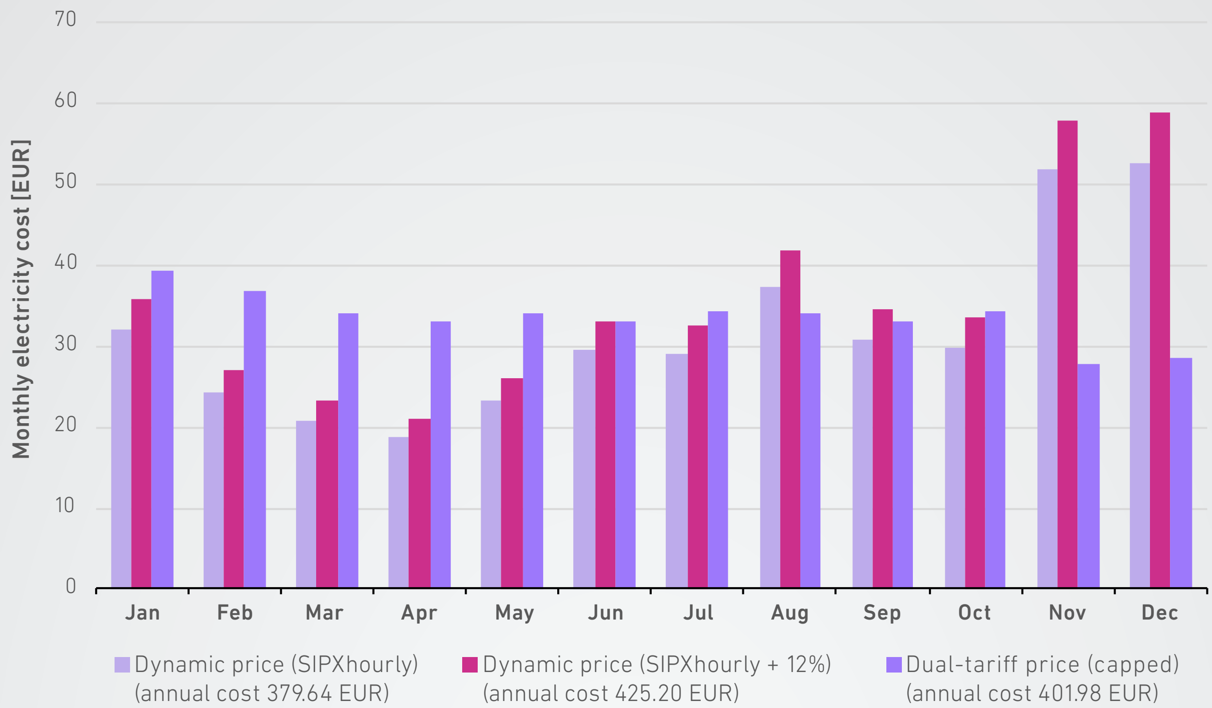


SOURCE: ENERGY AGENCY

Based on the evolution of electricity prices on the day-ahead exchange in Slovenia, taking into account the different markups of suppliers (0% and 12%), the differences between the costs of electricity supplied in 2024 are estimated. The results of the benchmarking of the electricity costs for a virtual household consumer show that the annual costs in 2024 would be the lowest when using a dynamic product linked to the net values of the SIPXhourly index, namely EUR 379.64. When taking into account the 12% markup, the costs would rise to EUR 425.20, which exceeds the costs of a traditional two-tariff (VT/MT) offer, which amount to EUR 401.98.

It should be noted that the most favourable option, based on the 'naked' value of the wholesale index without markups, does not represent a realistic market offer. It is a theoretical price which does not include the usual price premiums (e.g. costs for imbalances, margins, business risk, etc.) which in practice form an integral part of the final price to the end consumer. This value serves mainly as a lower cost limit. An illustration of the monthly costs for a typical household consumer is shown in Figure 131 which shows the deterioration of the wholesale markets in November and December 2024.

FIGURE 131: MONTHLY ELECTRICITY SUPPLY COSTS WITH A DYNAMIC OR DUAL-TARIFF PRICING



SOURCE: ENERGY AGENCY

Transparency

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

Electricity market participants are required by the Companies Act (ZGD-1) to provide annual reports, which ensures suitable financial transparency in the field of electricity supply. The consolidated annual reports must give a true and fair view of the financial position and operating result of the group of companies and are audited by independent auditors and submitted to AJPES for public release.

The framework legislation in this area continued to ensure a minimum level of transparency in 2024, despite the absence of a specific normative framework. The suppliers' bills thus showed separately the costs for electricity, network charges, contributions, excise duties and value added tax. In addition, the bill contained information on the share of the composition of the primary sources of electricity generation, carbon dioxide emissions and radioactive waste generated. In June 2024, due to the time lag in the application of the new net metering methodology, an updated »Act on the method for presenting information on electricity bills and in the additional explanatory note« entered into force on 1 October 2024, ensuring an adequate systemic regulation of the transparency of electricity invoices, which adequately regulates the manner of displaying information related to the reform of the net metering methodology.

The implemented reform of the tariff system for the network charges brings a somewhat greater complexity to the tariff for the use of the network. The requirements of the Clean Energy for All Europeans package, which are implemented in the ZOEE Act, oblige certain suppliers on the retail market to provide end-users with supply products based on dynamic energy prices linked to wholesale prices, e.g. day-ahead market prices, which, however, entails a significant increase in the complexity of the bills, especially when it comes to joint bills for the network charge and the supply of energy, as the dynamic tariff rates vary within the day on an hourly basis. Other, innovative energy services may contribute to the further complexity of the information on the bill. These novelties represent a new challenge for suppliers, who are especially concerned with how to design combined bills for electricity supply and network use, to ensure the transparency and clarity of the bills. It can be expected that in cases of energy supply based on dynamic pricing products or other innovative energy supply products, suppliers will most likely no longer issue a joint invoice. Instead, the consumer will receive separate invoices for the use of the network and for the more innovative energy supply service.

In any case, the current technology allows for new, more modern approaches to the provision of information to consumers: it is thus also possible and advisable to provide detailed information about the services subject to charges for suitable electronic data services via the national data hub or suppliers' web applications. This way, suitably structured information can be provided, along with the necessary tables and charts, which will enable final consumers to gain clear information and a detailed analysis of the charged quantities.

Suppliers to household and small business consumers were also obliged in 2024 to provide transparent information on their electricity supply offers and related price lists, as well as the general terms and conditions of the supply service they offer to customers, by publishing it on their website. In addition, for product offers based on dynamic pricing, they are obliged to adequately inform consumers of the risks that may be realised as a result of such energy supply.

The above publicly available information is an input for the comparative cost of electricity and natural gas supply services provided by the Energy Agency under the law.

Guarantees of Origin

A guarantee of origin is a document issued by the Energy Agency at the request of an electricity producer. This document enables traceability and serves as the proof of provenance of certain electricity. Guarantees of origin are significant for consumers since they prove the origin of the supplied electricity. They are also important from the suppliers' point of view, because they use them to demonstrate the origin of electricity supplied to the consumers, and they are mandatory for electricity from RES. However, guarantees of origin can also be issued to producers for other, conventional sources. Each guarantee is equipped with an ID number enabling the traceability of the producer and the origin of the electricity. Additionally, it includes data on the origin of electricity and the quantities of produced electricity for which the guarantee is being issued, the data on the producers, the production facility and information about the support for the produced electricity and the production period. The guarantees of origin and transactions, including their cancellation, are issued electronically in the register of guarantees of origin. With its cancellation, the guarantee of origin is used and serves suppliers and consumers as proof of the source of electricity supplied.

For electricity generated in 2024, 14,120 GWh of certificates of origin were issued, of which 5,389 GWh were for electricity generated from RES, and 5,551 GWh were for electricity generated from nuclear energy (certificates of origin are issued for the total amount of electricity generated by NEK). The remaining certificates were issued for energy generated from fossil energy sources.

To prove the origin of electricity on the domestic market, 4,278 GWh of certificates of origin were cancelled, of which 1,758 GWh were for RES. 6,021 GWh of certificates were transferred to other EU Member States (of which 4,857 GWh were for electricity produced from RES), and 2,284 GWh of certificates were transferred from other EU Member States to Slovenia (of which 1,263 GWh were for electricity produced from RES). 2,284 GWh of certificates were transferred from other EU Member States to Slovenia (of which 1,263 GWh were for electricity produced from RES).

Ensuring Retail Market Transparency

The transparency of the retail market, in which a large number of players are active and which, in normal circumstances, forms an extensive and diverse range of services, is ensured in particular through the public publication of all the necessary information. Suppliers and aggregators publish information on their websites about their offers and products, and the terms and conditions of their cooperation.

Following the implementation of the EU's Clean Energy for All Europeans package, the conditions are in place for an accelerated development of the retail market and for a significant increase in consumer choice, which was threatened by the regulation of retail prices in 2024, in the form of intervention measures by the Government of the Republic of Slovenia to mitigate the consequences of the energy crisis. The retail market in 2024 saw the emergence of a few innovative business models incorporating flexibility on the demand side, as well as the introduction of dynamic pricing supply products as a result of the Energy Agency's control measures. Despite the growth in the number of contracts concluded under dynamic pricing electricity supply products for the smallest customers, interest in such products remained very limited in 2024. The results of the analysis show that in 2024, with the current retail price regulation in place, suppliers would have achieved higher revenues in most months by offering static (two-tariff) products. Exceptions could be August, November and December, when wholesale prices on the day-ahead market in Slovenia were significantly increased and the regulated retail price was further reduced from November onwards. In addition, most suppliers did not offer products with a dynamic pricing structure at all in the past period, which limited their visibility and understanding among customers. In contrast, those that did offer them generally did not actively market them. Another critical barrier to the wider take-up of dynamic products is the risk they pose to consumers, especially those who do not adapt to price signals in the market.

The still small share of electromobility in terms of volume in 2024 has not stimulated the development of new business models based on the shared supply model. The diversity of supply is expected to increase after the end of retail price regulation, and new entrants can be expected to enter the market.

Despite the hindered development, the volume of information that is important from the perspective of transparency and needs to be processed remains extensive, while the data itself is highly fragmented. Transparency under the applicable law is ensured by the Energy Agency and the market operator Borzen.

The Energy Agency monitors the retail market based on public and other data obtained from persons with the 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. The Energy Agency contributes to transparency by publicly publishing information and services at its single point of contact, 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[76]), 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.).

In accordance with Article 20(1) of the ZOEE Act, free access to the comparison tool for comparing

76 https://www.agen-rs.si/web/emonitor

suppliers' offers is limited to household and micro-enterprise consumers with an expected annual consumption of less than 100,000 kWh. The law addresses household and small business consumption in terms of additional protection, the latter of which, according to available analyses, very rarely reaches a consumption of 100,000 kWh, so in practice the comparison tool fulfils the legal requirements[77].

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 under the Act concerning the method of electronic data reporting for valid regular tariff comparison of electricity and natural gas suppliers for household and small business consumers[78]. In the domain of comparison services, the Energy Agency has discontinued the web application »Check monthly billing«[79] and the web application »Calculation of the cost of network use«[80]. The latter has already been replaced by the new web application »Network Charge Comparator« at the end of 2023.

Comparison of Energy Supply Offers – Electricity Supply Costs Comparator

Providing an independent comparison of all offers on the market in one place certainly contributes significantly to increasing the transparency of offers on the retail market.

The Energy Agency provided the comparison service in 2024 with two solutions - the old solution, which was based on a design dating back to the time of full market opening in 2007 and whose technological lifetime expired on 12 October 2024, was replaced by a new solution based on a retail market monitoring system.

In 2024, the Energy Agency provided a comparison of the entire retail market offer with individual exceptions - only individual offers from suppliers whose design or characteristics (supply products) did not ensure a minimum level of comparability or would distort the comparison, or whose design was so specific that they could not be included in the comparison due to system constraints, were excluded. In a year of capped prices, the market supply of such products was even more limited, so their absence from the benchmarking calculation did not have a significant impact on the integrity of the benchmarking calculation.

Number of electricity supply cost benchmarking calculations reduced to an insignificant level

An analysis of the number of comparisons and bill checks carried out (Figure 132) confirms the insignificant interest of users in carrying out comparative calculations in 2024 (until 12 October 2024): the number of comparative calculations carried out has decreased by a further 86% (electricity supply) and 92% (gas supply) compared to 2023. At the same time, the number of consumers using the benchmarking services in electricity supply decreased between 90% (invoice verification) and 91% (benchmarking), and in gas supply between 88% (invoice verification) and 93% (benchmarking). The number of analyses of the costs of using the electricity network has, as expected, decreased to the quite insignificant level of a few hundred calculations performed (in the figure below »CUO - EE analysis«, 96% year-on-year decrease.

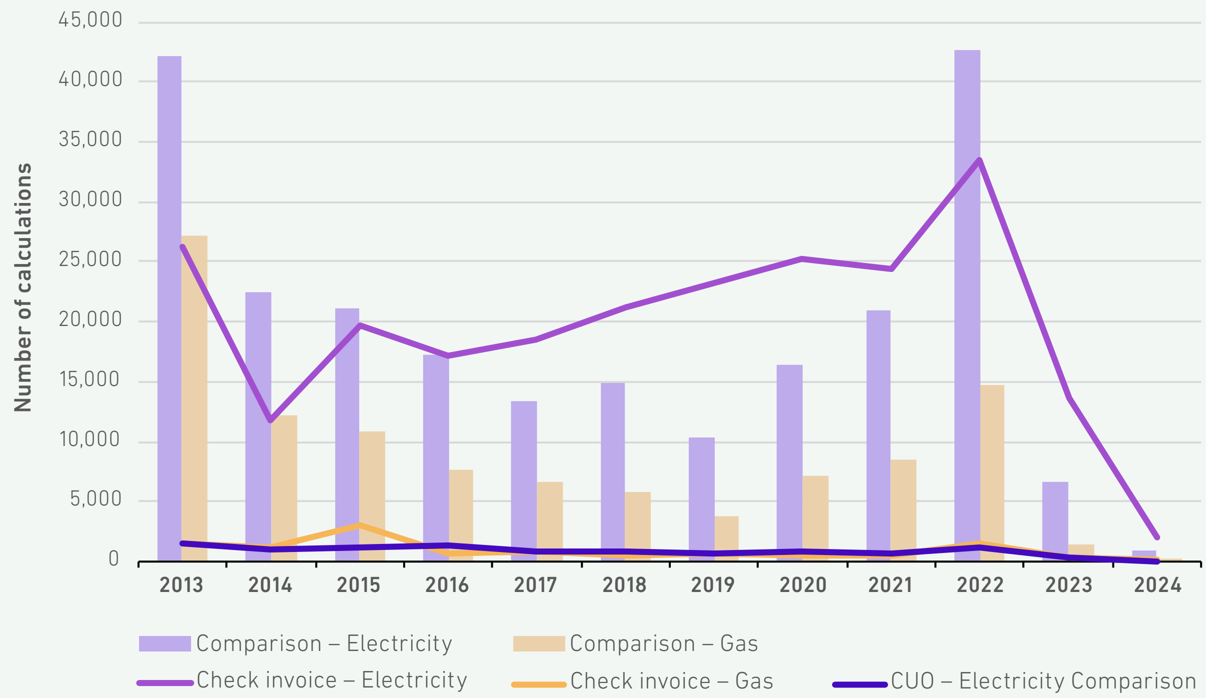
77 This suggests that free access to the benchmarking tool should also be made available to certain final consumers who, while not meeting the definition of a small business consumer, nevertheless qualify as micro-enterprises. Considering that an electricity supplier submits a supply offer for a consumption profile which cannot be adequately captured by representative synthetic profiles, and does so separately for each such final consumer, it cannot reasonably be expected that suppliers, following Article 15(8) of the ZOEE, would design standard supply products and related price lists for these final consumers and make them publicly available, as is the case for household and small business customers. Consequently, this also does not meet the condition for including such offers in comparator services.

78 In 2024, suppliers provided data based on the Act on the Method of Electronic Transmission of Data for the Comparison of Price Lists of Electricity and Natural Gas Suppliers for Household and Small Business Consumers, which has been updated and implemented in 2025 under a slightly amended title.

79 The Act enables users to verify the accuracy of their monthly electricity bill in line with the supplier and offer they have chosen, taking into account their consumption characteristics.

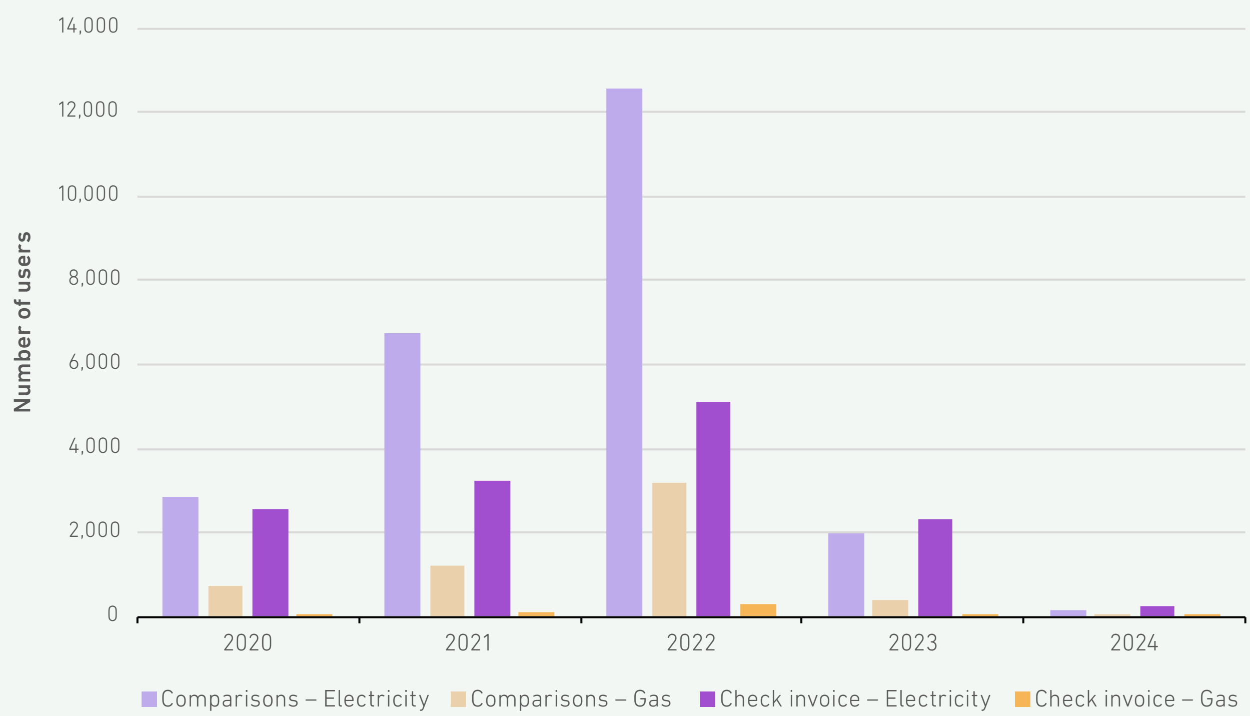
80 It enables the comparative calculation of the network-use charges or network charges across all consumer groups according to the user's consumption profile.

FIGURE 132: ANALYSIS OF THE NUMBER OF COMPARISONS CARRIED OUT AS PART OF THE ENERGY AGENCY'S SERVICE (FROM 2013 TO 12 OCTOBER 2024)



SOURCE: ENERGY AGENCY

FIGURE 133: NUMBER OF USERS OF DIFFERENT COMPARISON SERVICES BY YEAR (2024 – UP TO 12 OCTOBER 2024)



SOURCE: ENERGY AGENCY

Since the introduction of the price cap in autumn 2022 for all consumers with a connection capacity of up to 43 kW, interest in comparator services is expected to decline sharply, reaching negligible volumes by 2024. This significant drop in demand for comparator services in the field of energy supply coincides with the very limited dynamics of the retail market, as reflected in markedly reduced switching rates. The market, previously dominated by innovative players with only minor market shares who capitalised on market rigidities by engaging consumers willing to play a more active role, could not have all their products included in benchmarking services due to their specific features.

With the expiry of the technical lifetime of the previous application, the Energy Agency carried out the final phase of the planned renewal of benchmarking services to ensure compliance with the Clean Energy for All Europeans package and CEER recommendations to the greatest possible extent. In addition to addressing the shortcomings and limitations of the previous solution and improving the user experience, the redesign also incorporated adjustments to the new method of calculating network charges.

The key innovation and challenge in comparator services lies in supporting the comparison of offers based on multiple tariff products with dynamic tariffs. Further upgrades are foreseen to enable comparisons of various tariff products for time-differentiated supply, separate from the network charge, and later also for flexibility products.

The new solution generated strong consumer interest, but only temporarily, due to the Government's new intervention in the market

The new solution, launched on 12 October 2024, does not yet enable separate monitoring of statistics by segment for the two energy products due to its design. Nevertheless, it has generated strong customer interest: in November alone, almost 9,500 users carried out more than 10,000 benchmarking calculations. However, following the Government's intervention in mid-November 2024 with a new regulation to mitigate high electricity bills for household consumers during the 2024/2025 winter season — which capped the energy price for the entire consumption volume — interest in the comparator service dropped sharply again in December.

CASE STUDY
New Web Application »Supply Costs Comparator«

On 12 October 2024, the Energy Agency launched a new comparison service in the field of electricity and gas supply and aggregation for residential and small business consumers. The new benchmarking services are based on a continuous monitoring system for the retail market and comprise several web-based applications that allow users to make comparative calculations.

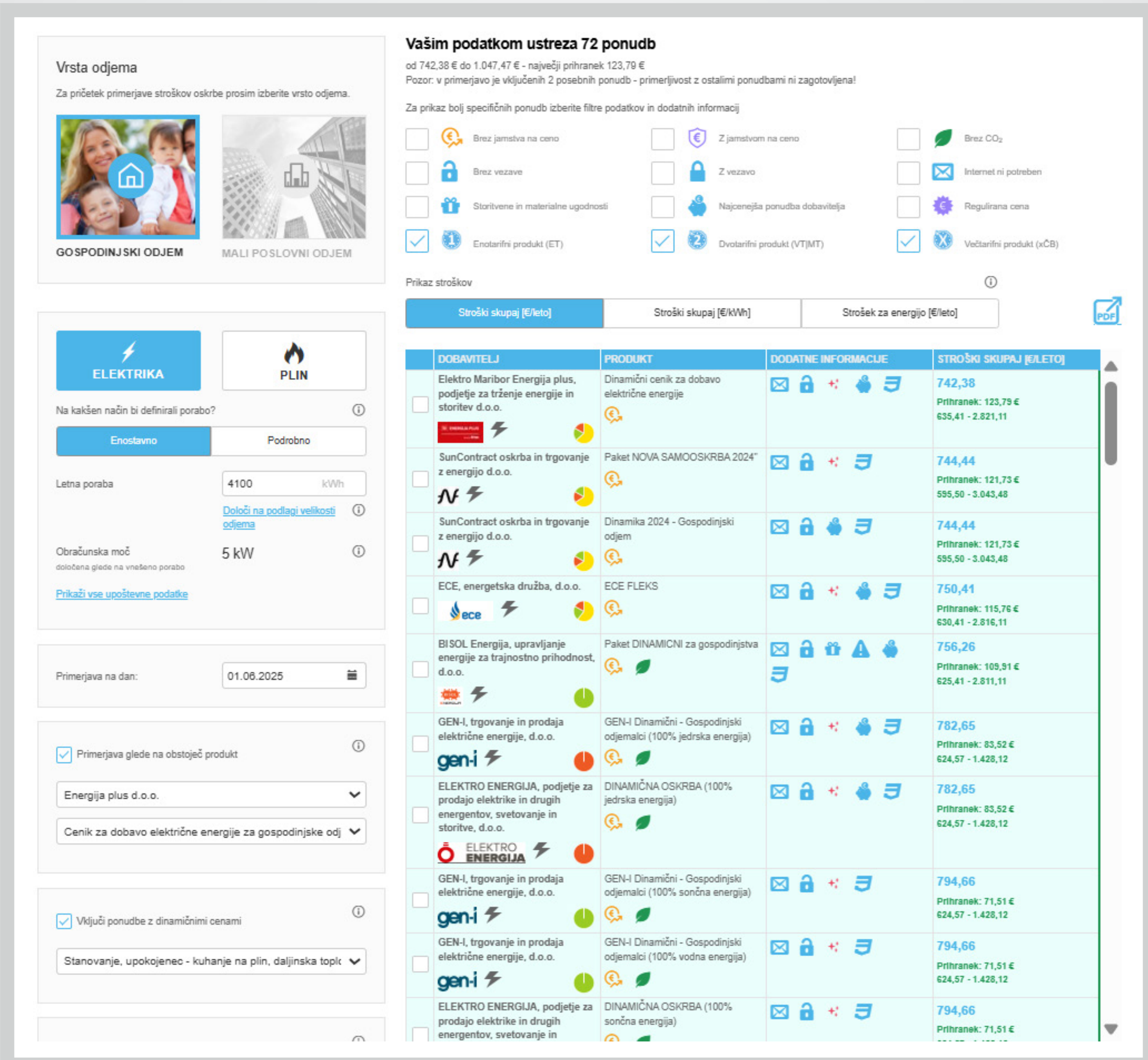
The new web application »Supply Cost Comparator« ensures maximum coverage of the electricity and gas retail market, offers a better user experience and follows the implementation recommendations and guidelines at the EU level. The new solution complies with the requirements of the EITI and allows for comparison of offers based on dynamic prices.

New features include the variant inclusion of a single offer in the calculation - if a price list has several tariff options, all those enabled by the selected metering method are included in the calculation[81]. The new solution allows efficient filtering of the comparison results, a detailed overview of each offer and printing of the results. It provides the user with an interactive customisation of the cost display with different ways of normalising the costs or displaying the comparison based only on the energy supply costs, which are the only influential component of the total cost from a comparison perspective. Based on user input, the application dynamically adjusts the list of service providers.

81 E.g. 15-minute metering allows billing under all variations of time differentiated tariffs, while two-tariff metering also allows for single-tariff billing.

On request, conditional and special offers can also be included in the comparison, which are excluded from the comparison by default, as their characteristics do not provide the minimum conditions for an undistorted comparison.

FIGURE 134: GRAPHICAL USER INTERFACE: SUPPLY COSTS COMPARATOR: COMPARISON RESULTS



SOURCE: ENERGY AGENCY

A Brief Overview of the Basic Pricing Models in Comparative Calculations

Product without a price guarantee over time

The vast majority of household customers and most small business customers still have an electricity or gas supply contract under this model. The energy price in cents/kWh is a fixed part of the contract. Suppose the supplier changes the price or increases it. In that case, the customer has the right to withdraw from the contract and may switch supplier within one month of being notified, irrespective of any tie-in periods, but in the meantime must be supplied with energy by the existing supplier at the same price.

Product with a price guarantee over time

Despite the right to withdraw from a contract due to a price increase, many consumers are concerned that the supplier may increase the price shortly after the customer joins, and the customer will then pay the same or even a higher amount than before. This is why many people decide not to switch suppliers, even though they could save a lot of money by doing so. Many suppliers therefore offer price guarantees to customers for a certain period, which is an important feature of retail products. The supplier will not increase prices during the guarantee period, but the reverse is also true: during the guarantee period, suppliers will not reduce prices for these products.

Product with a regulated price

This product enables the inclusion of regulated-price offers in the comparative calculation. The calculation of costs under the price cap established by the applicable Government Decree on Setting Electricity Prices is based on the ratio between the share of consumption covered by the capped price (e.g. 90%) and the share for which the price is set on a market basis (e.g. the remaining 10%).

Conditional Products

These are primarily products that are conditional upon switching suppliers (price lists for new customers), self-supply, or other similar conditions.

Products based on dynamic prices

There are two types of dynamic pricing products, namely:

1. Products with automatic price adjustment (monthly),
2. Products with a link to the spot market.

The first type of product is very rare and is only supported if the adjustment is based on standardised monthly wholesale forward products. The second type of products, i.e. products with a link to the online market, is much better represented on the Slovenian retail market.

What are spot products?

In the day-ahead spot market, electricity volumes are traded on an hourly basis for physical delivery the following day. As a result, a price index for each hour of the next day's delivery is determined in the market after the close of trading. In this type of product, the hourly electricity exchange prices are passed directly from the supplier to the customer. The supplier acts as an intermediary and retains a specific commission for brokering the purchased electricity. The supplier charges this remuneration in the form of a markup (surcharge), which may depend on the quantity.

The exchange price for these products shall be defined by the suppliers in the contract, price list, or 'Cost of supply comparator'. Examples of exchanges where day-ahead products are traded are the Slovenian electricity exchange BSP, the Austrian EXAA, the German EEX and the Hungarian HUPEX.

These products require a smart meter as the energy supplied is billed on an hourly basis. For each hour, the actual consumption and the current exchange price are used.

Important information on how the products compare on the basis of dynamic prices in the Supply Cost Comparator:

In the »Cost of supply comparator«, we compare the same products on the wholesale spot market based on the markups that the supplier must pay to pass on the exchange price to the customer.

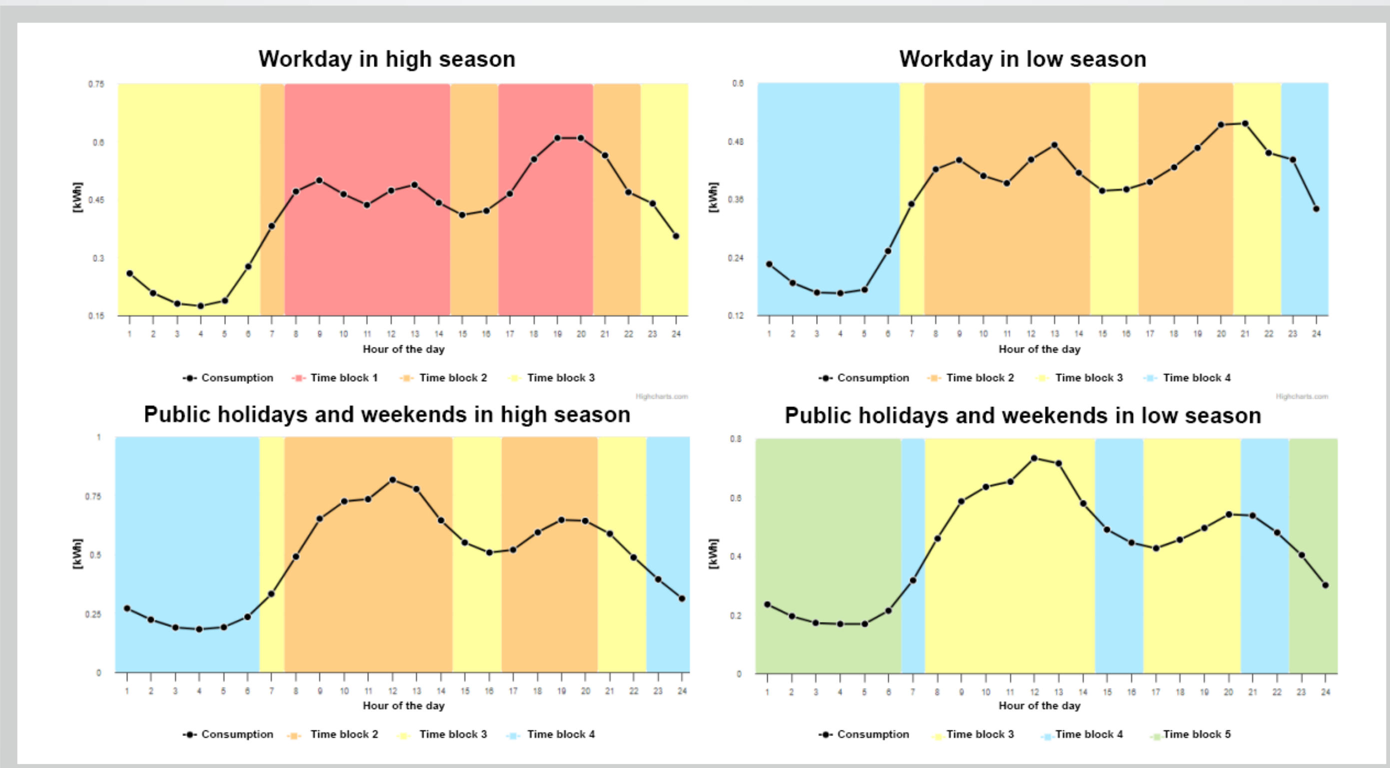
This total surcharge may consist of a flat rate in EUR/year and a volume-dependent surcharge in cents/kWh. The surcharges include hedges against the risk of price spikes - e.g. the supplier may offer a price cap (upwards - ceiling) for a certain additional monthly payment. If the energy price on the stock exchange rises above this value, the capped price is used for billing. These products are provided with the necessary information in the tariff calculator, and more detailed information is available in the reference price list and the supplier's general terms and conditions. Alternatively, products based on dynamic prices linked to different wholesale products may be included in the comparison. In this case, the comparison depends both on markups and on the spot prices themselves, which differ from each other for the same hour.

Calculation of costs based on dynamic prices

The Cost of Supply Comparator calculates the cost of supplying energy on the basis of dynamic prices using:

- the selected hourly synthetic profile of the consumer (user choice);
- the actual energy price included in the comparison represents the average hourly price of the last month of the wholesale product concerned.

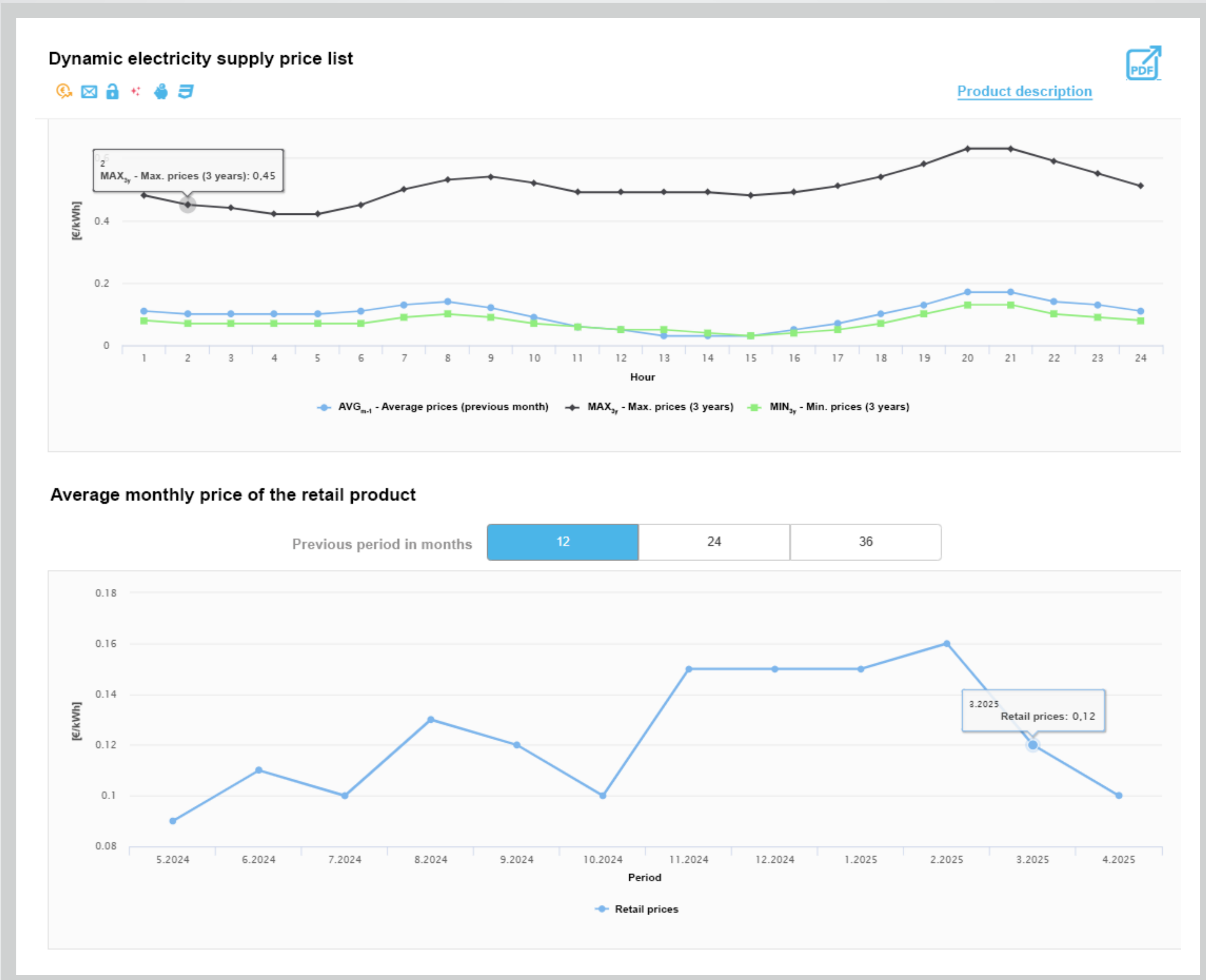
FIGURE 135: SYNTHETIC LOAD PROFILE OF A VIRTUAL HOUSEHOLD CONSUMER WITH A 3 × 25 A FUSE AND ANNUAL CONSUMPTION BETWEEN 2.5 MWh AND 5 MWh (VISUALIZED WITH APPLICABLE NETWORK TARIFF TIME BLOCKS)



SOURCE: ENERGY AGENCY

However, the actual prices taken into account for the billing based on the dynamically priced product will only be determined in the future. As stock exchange rates are highly dynamic and depend on many factors, we cannot predict future rate movements with sufficient accuracy. As the calculation based on the above assumption is for information only, the annual costs based on the maximum and minimum hourly prices over the last three years are also calculated and displayed to the user. Generally speaking, prices in warmer months are lower than in colder months, which also affects the comparison, especially if fixed-price products are included in the comparison.

FIGURE 136: SUPPLY COST COMPARISON: VISUALIZATION OF VARIOUS WHOLESALE PRICE LEVELS TO SUPPORT USERS IN MANAGING THE RISKS LINKED TO SUPPLY UNDER DYNAMIC PRICING



SOURCE: ENERGY AGENCY

Product with special offer status

These are supply products tailored to target consumer groups or target electricity use (charging an electric vehicle, using a heat pump, etc.) that are not fully comparable to standard but not necessarily conditional products. They also include highly specific ones, such as cross-sell products and products linked to membership fees, which are also conditional products.

Given the expected development of new static retail products based on a more detailed time differentiation of energy supply tariffs, different from the time differentiation of network tariffs, the Energy Agency will continuously upgrade the solution.

Comparison of Network Charge Costs – »Network Charge Comparator«

The Energy Agency has supported the reform of the network charging methodology by providing a benchmarking service whereby all final consumers can calculate their estimated annual costs for using the network based on the new method and compare these with the costs they would have incurred if the current charging system had remained in place. The comparison of network charge costs before and after the reform of the billing methodology allowed final consumers to analyse the effects of the changes and to prepare in advance for a more efficient use of the network. The web application »Network Charge Comparator«[82] also allows calculations based on the adjustment of the contracted capacity, in cases where the consumption is adjusted accordingly and for cases where the final consumer does not provide the consumption adjustment and therefore the excess power is charged. In addition, consumers are provided with an analysis of the peak loads that their use imposes on the network. The comparison is subject to the use of a 15-minute load diagram exported by the user from the My Electro portal for their delivery points and to the sufficient availability of 15-minute metering data within this load diagram.

The application was used by more than 5,000 customers during the year, who performed more than 8,000 calculations, most of them in September and October, before the start of the new methodology or before the beginning of the high season. Significantly more customers used the application than adjusted their agreed billing capacity in the last quarter and thus entered active demand based on network price signals.

The »network charge cost comparator« supported the preparation of active consumers for the new method of calculating network charges

Other measures to ensure transparency

Borzen provides the Sustainable Energy web portal[83] to establish an information hub, a contact point for access to information on the efficient use of energy and RES in Slovenia. It brings together, simply and transparently, 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 of 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 and helps with decisions on investing in RES, storage devices, energy-saving devices or smart devices.

Market Effectiveness

Market Shares and Concentration in Retail Markets

Electricity Supply to all Consumers

Table 30 shows the market shares of suppliers on the basis of electricity supplied, taking into account the supply in the whole retail market, which includes large final consumers connected to the transmission system and the CDS. An HHI above 2,000 indicates a highly concentrated retail market, while an HHI below 2,000 indicates a market with a low level of concentration.

Compared to 2023, when the HHI was 1,376, it decreased by 0.6% to 1,368 in 2024.

82 https://www.agen-rs.si/web/primerjalnik-stroskov-omrezninehttps://www.agen-rs.si/web/primerjalnik-stroskov-omreznine
83 https://www.trajnostnaenergija.si/

TABLE 30: MARKET SHARES AND HHI OF SUPPLIERS TO ALL FINAL CONSUMERS[84]

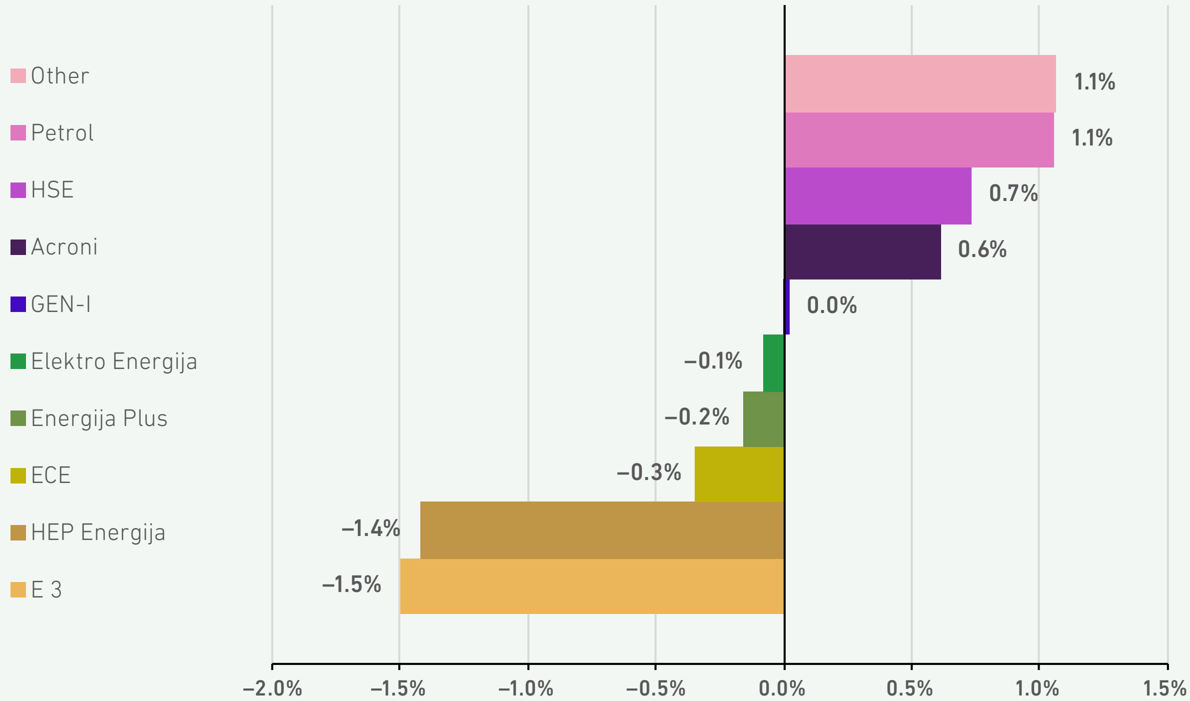
Supplier	Supplied electricity [GWh]	Market share
GEN-I	2,530.1	21.6%
Petrol	1,969.9	16.8%
ECE	1,853.0	15.8%
Energija Plus	1,541.2	13.2%
E 3	873.7	7.5%
HEP Energija	858.2	7.3%
Other	611.1	5.2%
Elektro Energija	582.3	5.0%
HSE	543.8	4.6%
Acroni	332.2	2.8%
TOTAL	**11,695.5**	**100.0%**
HHI of suppliers to all final consumers	**1,368**	

SOURCE: EPOS PORTAL

Structural changes with an impact on market concentration are in absolute terms in the order of up to 1.5%. In 2024, Petrol had the largest increase in market share compared to the previous year. Market share also increased in the 'Other' segment, which includes all suppliers whose market share in terms of volume of energy supplied is less than 2%. In 2024, 11 suppliers belonged to this category, three more than in the previous year. On the other hand, E 3 lost the largest part of its market share. In terms of the magnitude of change, the market shares of the other suppliers in 2024 did not deviate too significantly from previous years, so that the market positions of suppliers did not change significantly, as shown in Figure137.

84 Energy supplied and market shares are rounded to one decimal place. The difference between the total and the sums is due to rounding to one decimal place..

FIGURE 137: CHANGES IN THE MARKET SHARES OF SUPPLIERS TO ALL FINAL CONSUMERS IN 2024 COMPARED TO 2023[85]



SOURCE: EPOS PORTAL

Electricity Supply to Business Consumers

The market shares of electricity suppliers on the retail market for business customers in 2024 are shown in Table 31. The retail market for business consumers continued to show a low level of concentration in 2024.

The HHI value was 1,330, an increase of 0.4% compared to 1,325 in 2023.

85 The changes in the market shares of suppliers in 2024 compared to 2023 are rounded to one decimal place. A direct comparison with last year's figures may result in a difference of +/– 0.1% due to rounding.

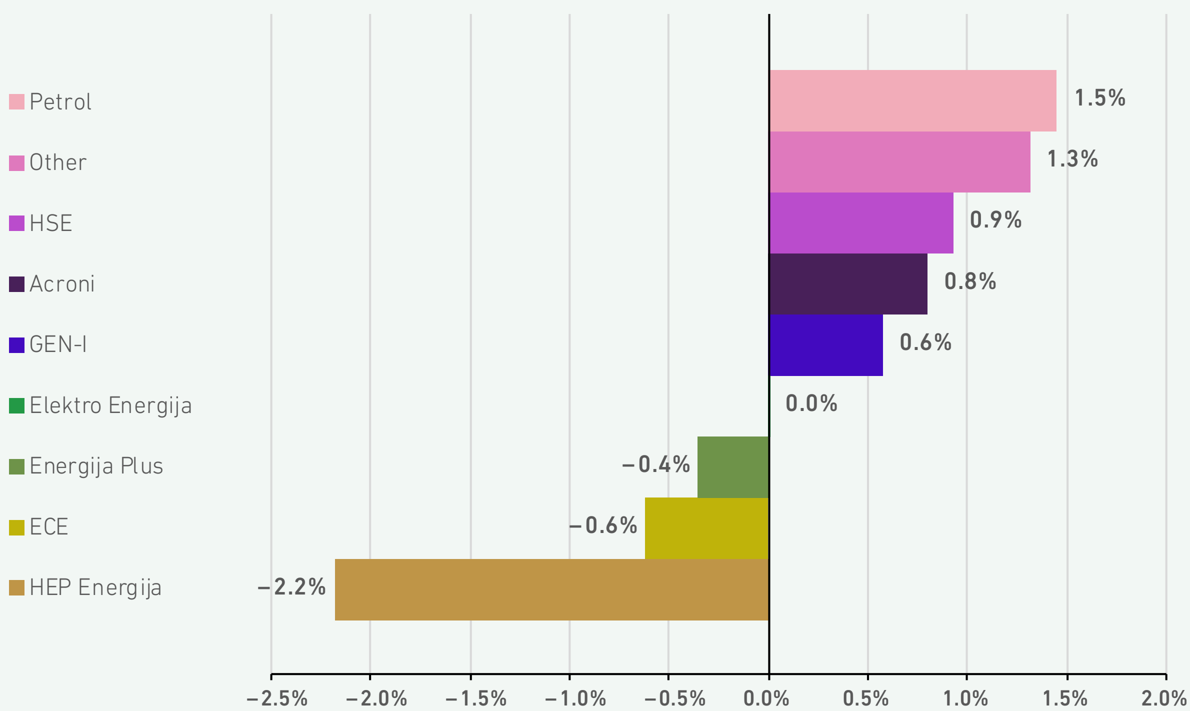
TABLE 31: MARKET SHARES AND HHI OF SUPPLIERS TO BUSINESS CONSUMERS

Supplier	Supplied electricity [GWh]	Market share
Petrol	1,653.6	19.6%
GEN-I	1,370.9	16.3%
ECE	1,368.4	16.2%
Energija Plus	1,131.7	13.4%
HEP Energija	858.2	10.2%
Other	589.1	7.0%
HSE	543.8	6.5%
E 3	406.3	4.8%
Acroni	332.2	3.9%
Elektro Energija	174.7	2.1%
TOTAL	**8,428.9**	**100.0%**
HHI of suppliers to all final consumers	**1,330**	

SOURCE: EPOS PORTAL

As can be seen in Figure 138, Petrol and the »Others« segment have gained the largest market share in this part of the market compared to 2023, which is attributed to the three new suppliers in the market. However, HEP Energija lost the largest market share compared to 2023. This market also shows minor structural changes with an impact on market concentration.

FIGURE 138: CHANGES IN MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN 2024 COMPARED TO 2023[86]

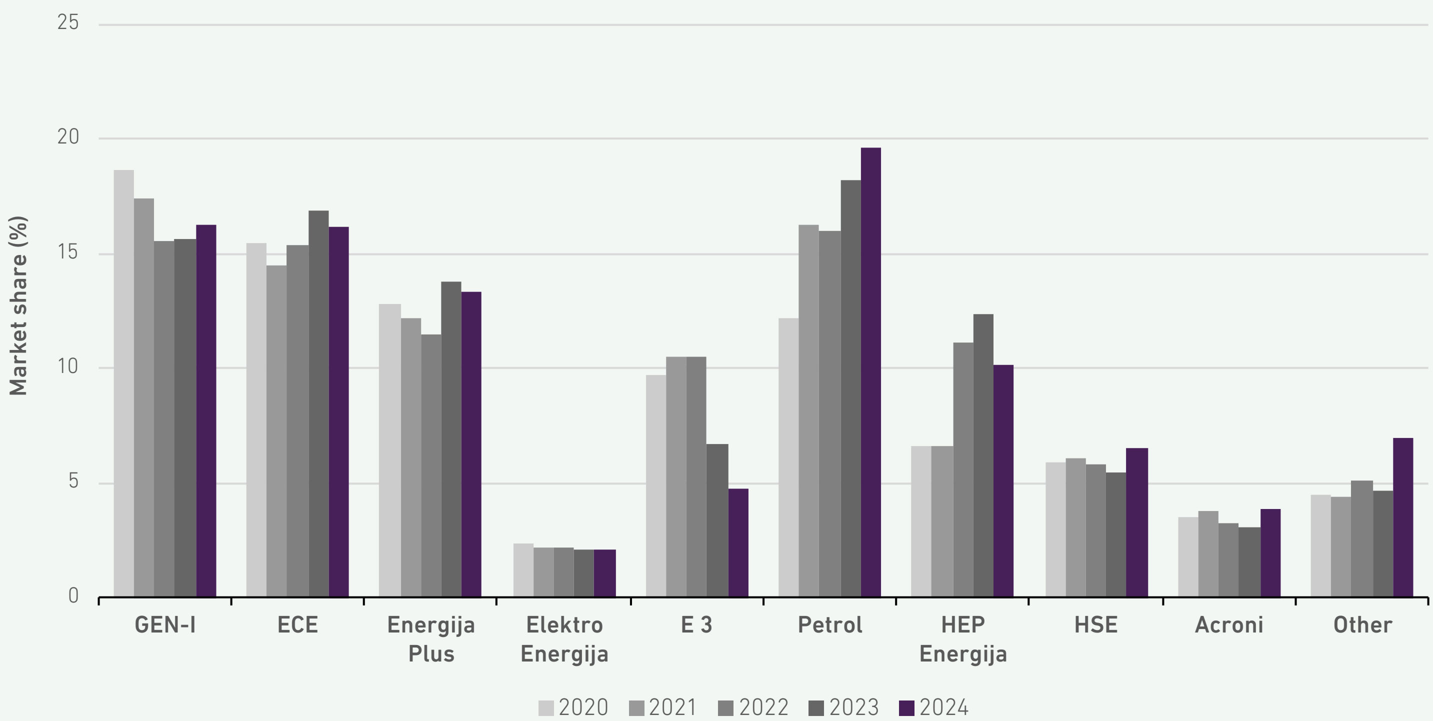


SOURCE: EPOS PORTAL

86 The changes in the market shares of suppliers in 2024 compared to 2023 are rounded to one decimal place. A direct comparison with last year's figures may result in a difference of +/– 0.1% due to rounding.

Figure 139 shows the five-year evolution of the market share of suppliers to business customers. After three consecutive years of market share gains from 2020 to 2023, ECE's market share declined in 2024, while E3 has almost halved its market share in the last two years. Petrol and GEN-I continue the trend of increasing market share in the previous three years. The increase in market share in the »Other« segment indicates an increase in the number of suppliers with a market share below 2%.

FIGURE 139: COMPARISON OF THE MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN THE 2020–2024 PERIOD



SOURCE: EPOS PORTAL

Electricity Supply to Household Consumers

In the retail market for household consumers in 2024, the degree of market concentration indicates a highly concentrated market. The HHI exceeded 2,000 for the third year in a row and stood at 2,091 in 2024. Compared to 2023, the HHI decreased by 1.2% in 2024.

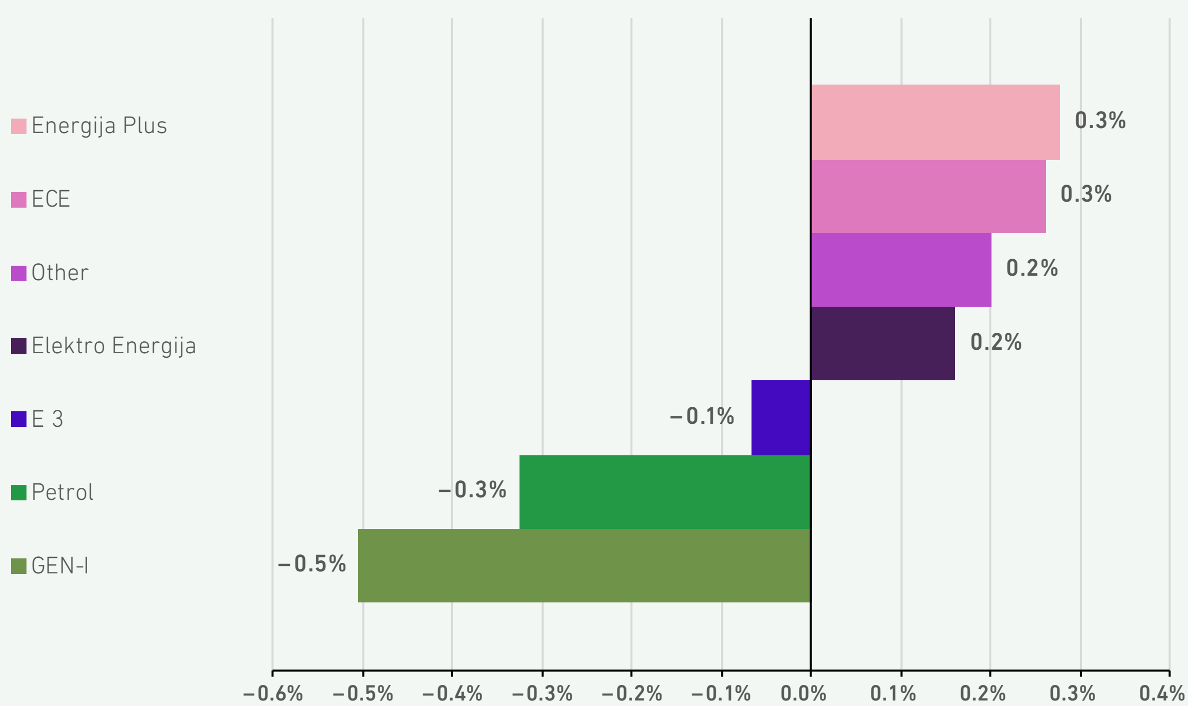
TABLE 32: MARKET SHARES AND HHI OF SUPPLIERS TO HOUSEHOLD CONSUMERS

Supplier	Supplied electricity [GWh]	Market share
GEN-I	1,159.2	35.5%
ECE	484.6	14.8%
E 3	467.4	14.3%
Energija Plus	409.5	12.5%
Elektro Energija	407.6	12.5%
Petrol	316.4	9.7%
Other	22.0	0.7%
TOTAL	**3,266.7**	**100.0%**
HHI of suppliers to all household consumers	**2,091**	

SOURCE: EPOS PORTAL

As can be seen from Figure 140, the structural changes with an impact on market concentration are in absolute terms in the order of up to 0.5%. The largest market share gains in 2024 compared to 2023 in the residential segment were made by Energija Plus and ECE. The market share of the three largest suppliers amounted to 64.6% and decreased by 0.3 percentage points compared to 2023. The decrease is linked to the decline in the market share of GEN-I, which, for the first time since the opening of the market to household consumers, has seen a 0.5% drop in market share.

FIGURE 140: CHANGES IN MARKETS SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS[87]



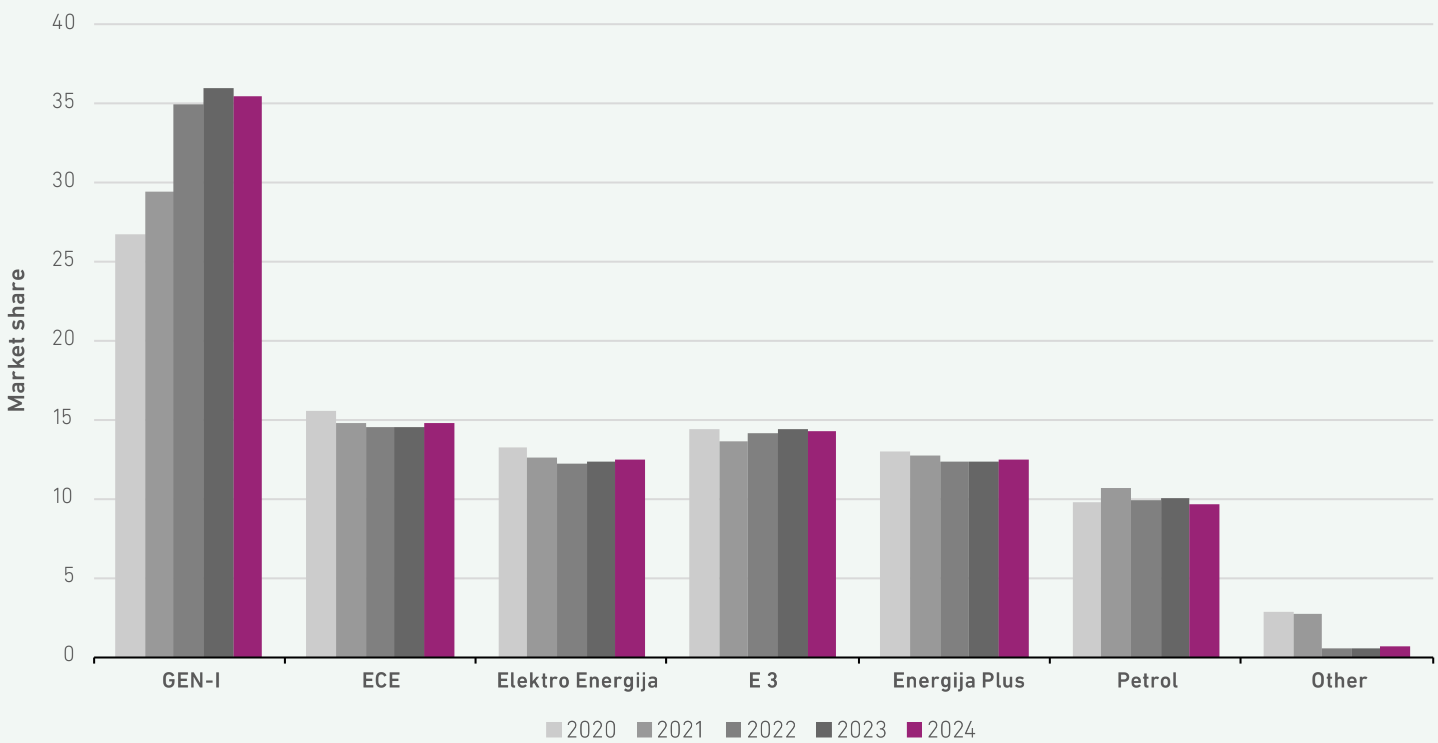
SOURCE: EPOS PORTAL

87 The changes in the market shares of suppliers in 2024 compared to 2023 are rounded to one decimal place. A direct comparison with last year's figures may result in a difference of +/– 0.1% due to rounding.

Figure 141 shows the market shares of suppliers to household consumers. In terms of the magnitude of change, the market shares of suppliers have not deviated significantly since 2023. GEN-I remains the clear market dominator. In terms of the ownership structure of suppliers, GEN-I has a market share of 48%, HSE 27.4% and Petrol 24%.

Market concentration in the retail electricity market for household consumers remains high

FIGURE 141: COMPARISON OF THE MARKET SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS IN THE 2020–2024 PERIOD



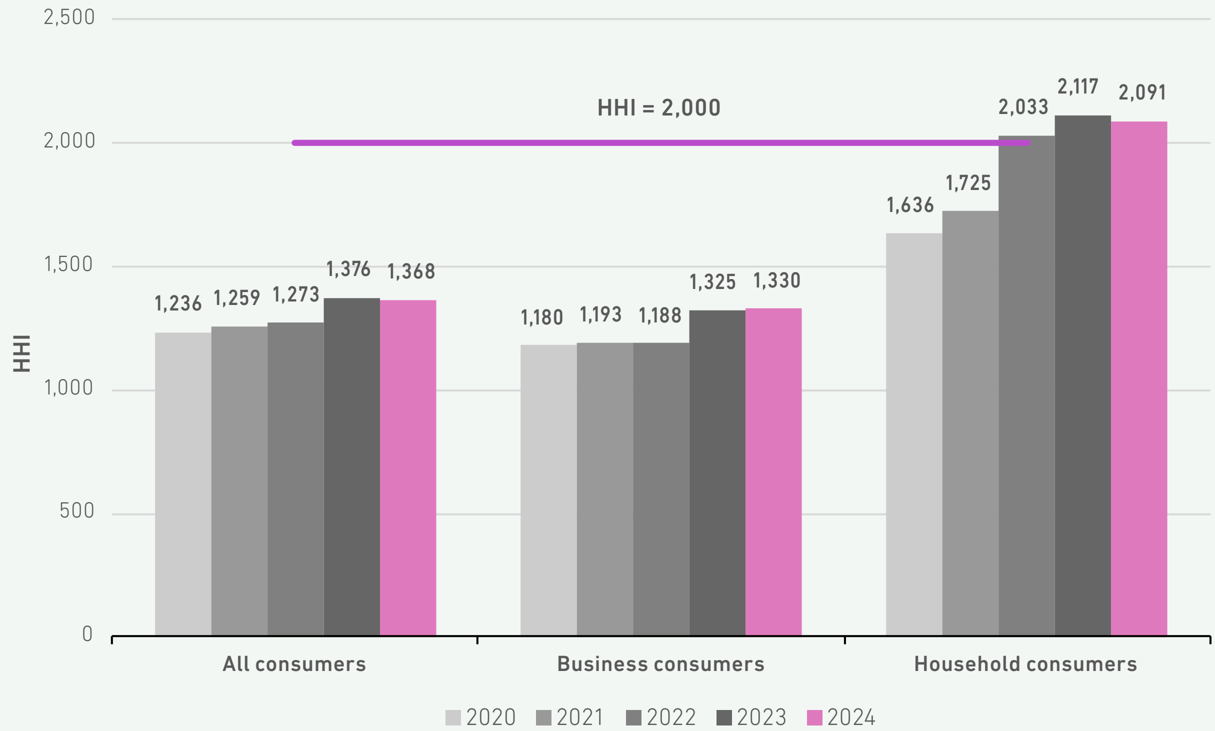
SOURCE: EPOS PORTAL

Comparison of concentrations in the relevant markets

When evaluating the market power on the basis of market shares, we need to be cautious and take into account the limitations of the indicators. A high market share does not automatically imply that there are competition problems and is not in itself prohibited. It is always assessed in the light of the position of the direct competitors. The European Commission identifies concentrations that must be subject to a more detailed assessment – this is carried out for concentrations above 40%, while concentrations above 60% are only admissible in exceptional circumstances. The US and UK competition authorities, on the other hand, assess based on the HHI. For them, it is the difference in the HHI before and after the concentration that is important - in the case of a moderately concentrated market (HHI between 1,000 and 1,800), a 100-point difference can lead to a more detailed assessment. In contrast, in a highly concentrated market, a difference of as little as 50 points can be decisive.

As can be seen from Figure 142, the HHI in 2024 has increased in the supply segment to business consumers. In the segment of supply to household consumers the HHI decreased by 1.2% compared to the previous year, and in the segment supplying all consumers, it decreased by 0.6%.

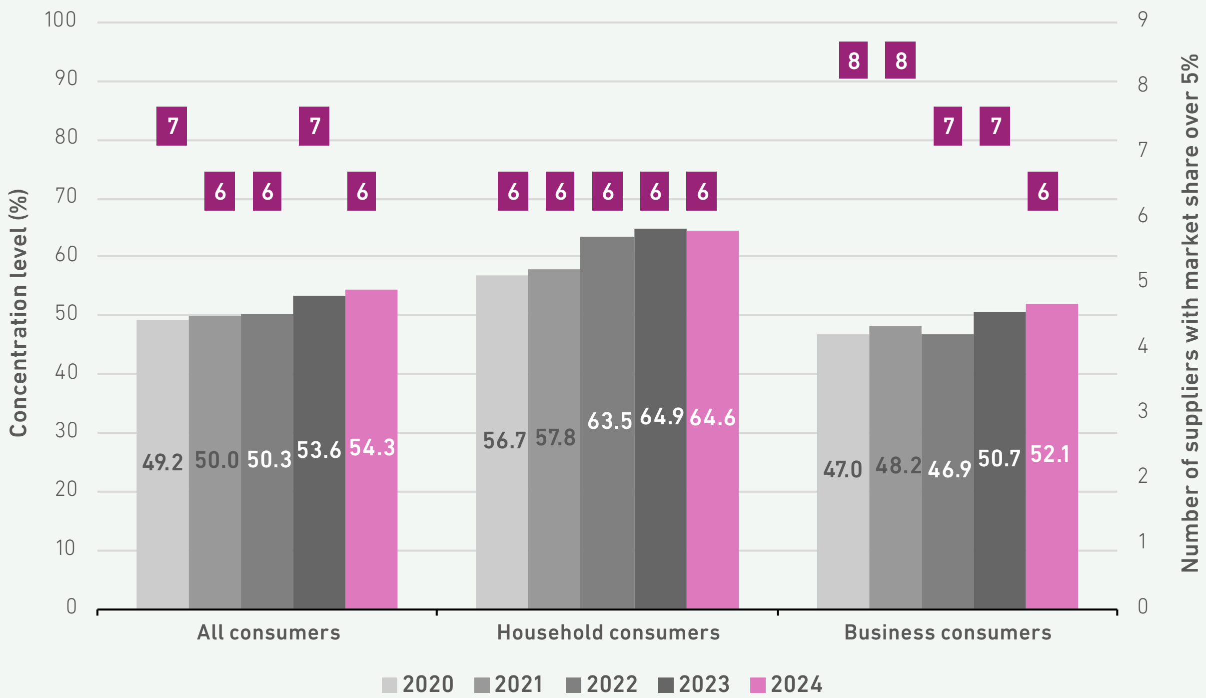
FIGURE 142: HHI EVOLUTION IN RETAIL MARKETS IN THE 2020–2024 PERIOD



SOURCE: EPOS PORTAL

A concentration ratio (CR) is a standard indicator of market concentration according to market shares. For this report, CR3 is shown, which measures the total market share of the three largest suppliers in the market. Figure 143 shows the CR3 indicator and the number of suppliers with market shares bigger than 5%. Compared to 2023, the CR3 increases in 2024 in the supply to all consumers and in the supply to business consumers. In the supply to household consumers segment, CR3 remained at approximately the same level as the previous year. The total number of suppliers to all consumers with a market share above 5% decreased by one supplier - Elektro Energija, which reduced its market share by 0.1 percentage points compared to 2023, thus falling just below the 5% threshold.

FIGURE 143: CONCENTRATION (CR3) IN THE RETAIL MARKETS AND NUMBER OF SUPPLIERS WITH OVER 5% OF MARKET SHARE IN THE 2020–2024 PERIOD



SOURCE: EPOS PORTAL

Taking ownership links into account, the Energy Agency presented the level of market concentration in the Report on the State of the Energy Sector in 2023. In the retail market for household consumers, the CR3 ratio reached a value close to 100%, while the market share of a virtually dominant, ownership-linked supplier amounted to almost 50%. From the perspective of this type of concentration, the situation has not changed significantly in 2024.

High concentrations in the household market require appropriate attention by the competent authorities in the area of market power evaluation

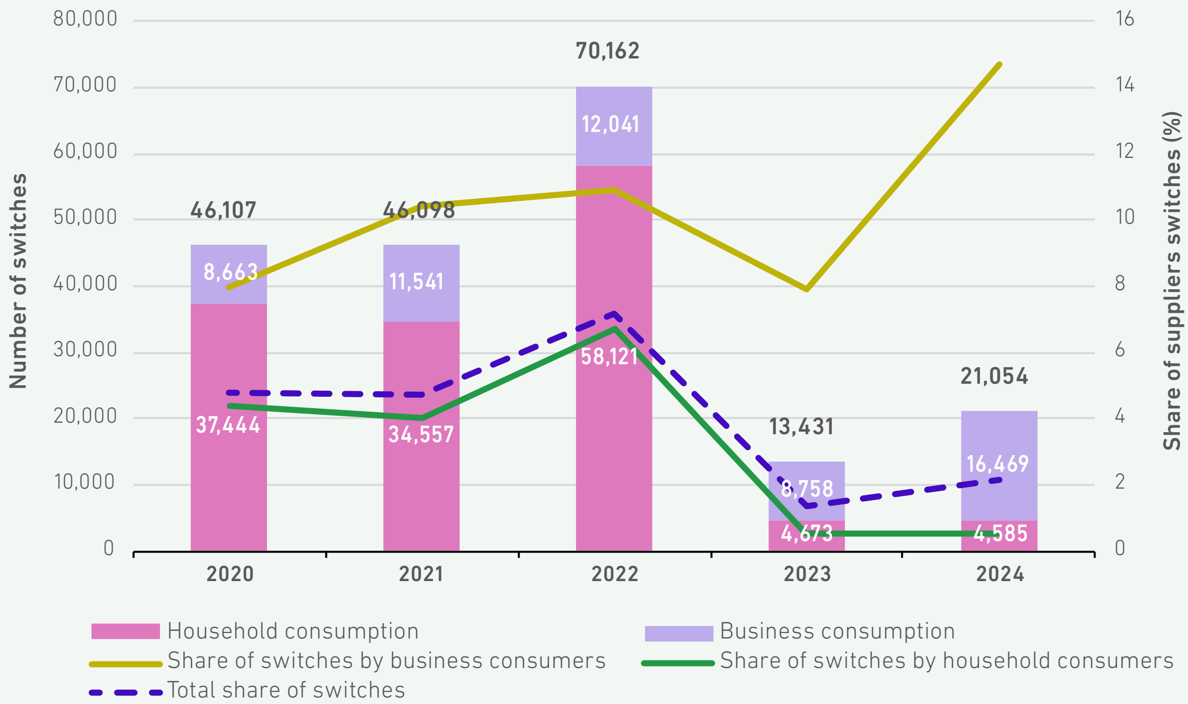
Switching Suppliers

In 2024, 21,054 consumers switched electricity supplier, 4,585 households and 16,469 business customers, representing a 57% increase in switching compared to the previous year. On average, 382 households and 1,372 commercial customers switched electricity suppliers per month.

Record low number of household switching due to the effects of the Government's price cap

The Government's Decree on electricity price setting, which capped the maximum retail price of electricity, has significantly reduced the price differentials between suppliers, and we are seeing a record drop in switching for household customers in 2023 and 2024. In 2024, the Government stopped capping prices for small business consumers, thus enabling the conditions for this market segment to operate normally. Business consumers are seeing the highest number of switches in the last five years. Figure 144 shows the trend in the total number of switches by type of customer and the share of switches by household and business consumers over the 2020–2024 period.

FIGURE 144: TRENDS IN THE NUMBER OF SUPPLIER SWITCHES IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, ELES

Increasing dynamics in the business segment due to the end of Government's price capping

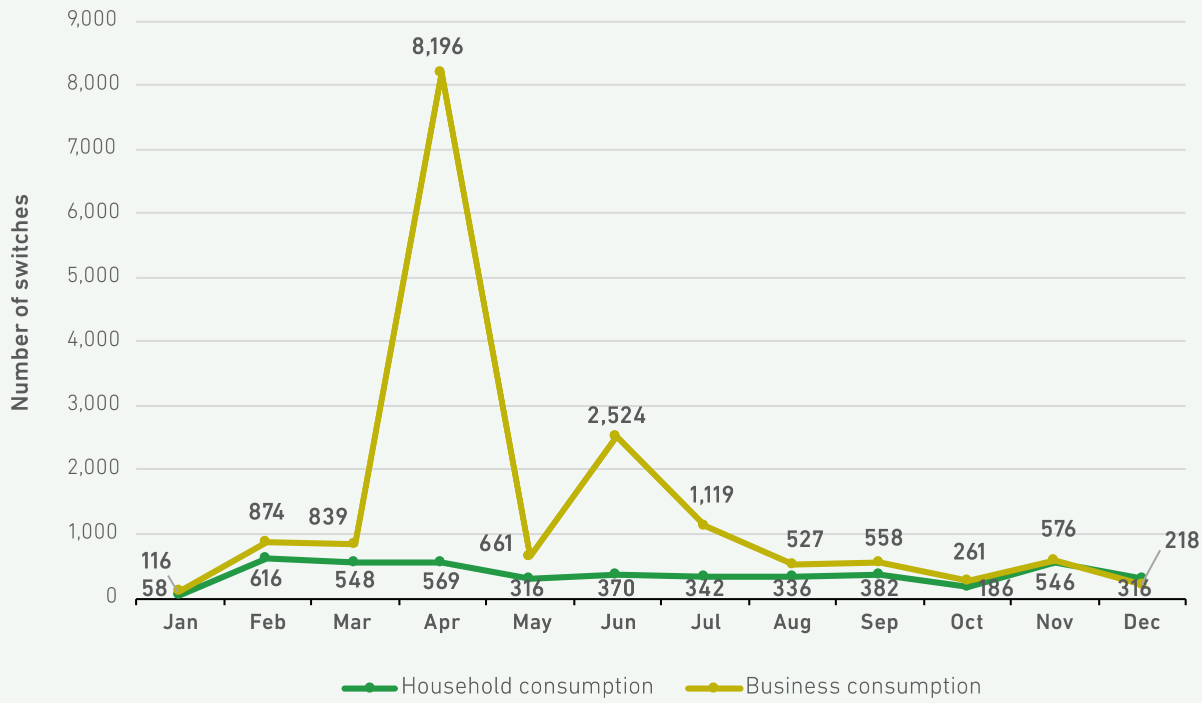
The switching rate of household consumers in 2024 is 0.5%, unchanged from the previous year. Such a market is defined as a »dormant market[88]«, where switching exists only »in theory«. While such markets are officially open to competition, customers have the right to choose. However, in practice, only the larger customers have the incentive or ability to do so. Competitors may not have the ability to compete on price, and in general, there are not satisfactory market conditions for genuine competition. Government price caps cause this market situation in 2023 and 2024. In 2023, 19 EU countries had a higher share of switching by household customers than Slovenia, with Spain exceeding 20%, and eight had a share higher than 10%[89]. Only the share of switching in Slovakia and Poland in 2023 is comparable to Slovenia's share in 2024, which did not exceed 1%.

In Slovenia, competition in the household sector is becoming increasingly weak, which is also influenced by ownership links between suppliers. The switching rate of business customers in 2024 is 14.7%, up 6.8 percentage points from the previous year. For small business consumers, electricity price regulation ended at the end of 2023. As a result, these companies faced market prices, which may have contributed to the increase in switching at the beginning of 2024 as they sought better deals.

Figure 145 shows the number of switches in 2024 by month, with April standing out as the month with the highest number of switches. Compared to the previous year, 1.9%[90] fewer switchings are recorded for households and 88.0% more for businesses. The highest number of switches for business consumption is recorded in April[91]. The record number of switches in 2024 for business consumption can be attributed to the end of price regulation for small business consumption and the switch to market prices, which has encouraged companies to seek better deals from other suppliers. Competitive offers and price reductions from some suppliers, increased market activity, and ease of switching are among the reasons..

88 World Energy Retail Market Rankings 2012, Utility Customer Switching Research Project, VaasaETT
89 ACER/CEER Energy Retail and Consumer Protection 2024 Market Monitoring Report, september 2024, figure 34
90 Changes in switching rates in 2024 compared to 2023 are rounded to one decimal place.
91 In April, a detailed analysis shows a massive switch of > 6,500 business customers between the two suppliers.

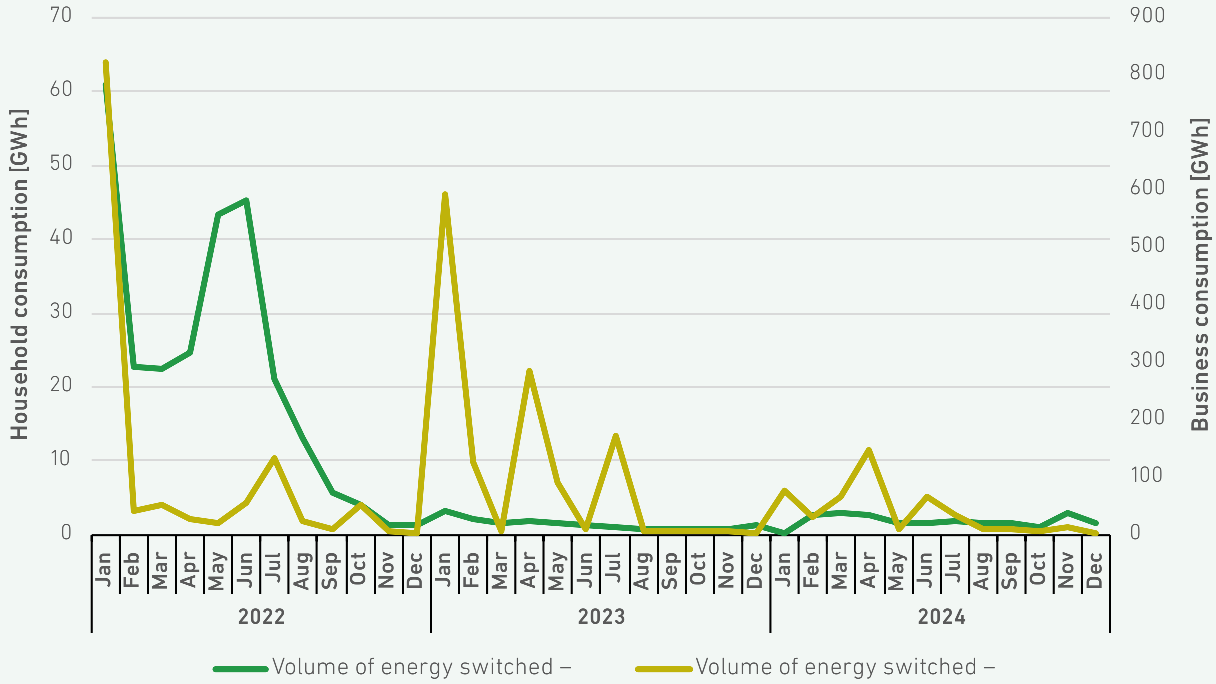
FIGURE 145: DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES IN 2024 BY CONSUMPTION TYPE



SOURCES: ENERGY AGENCY, ELES

Figure 146 shows the trend in the amount of energy switched over the period 2022–2024. The amount of energy switched is closely correlated with the number of switches. The amount of energy switched is the amount of energy consumed by the customer in one year, which will be affected by an increase in energy consumption with another (new) supplier due to a switch of supplier. Therefore, typically, when the number of switches of commercial and household consumers is higher, the amount of energy switched is also higher. The figure shows very clearly the jump in the amount of energy switched by business customers at the beginning of 2024. For household consumers, the amount of energy switched in 2024 is 30.5% higher compared to a year earlier, with a 0.7% share of the amount of energy switched. On the other hand, for business customers, the amount of energy displaced in 2024 is 63.1% lower compared to the previous year, with a displacement ratio of 5.7%, a decrease of 10.4 percentage points compared to 2023.

FIGURE 146: VOLUMES OF SWITCHED ELECTRICITY BY CONSUMPTION TYPE



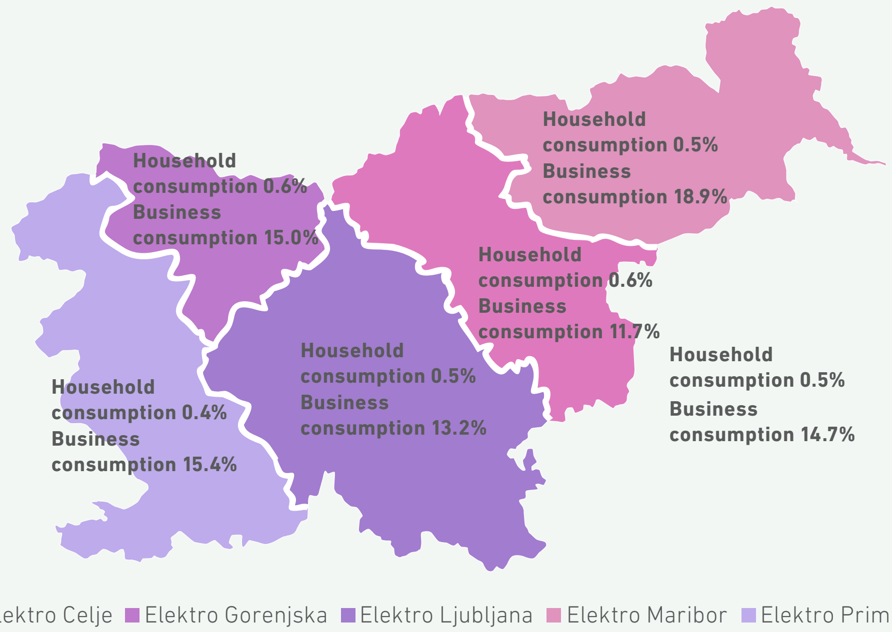
SOURCES: ENERGY AGENCY, ELES

In the continuation, an analysis of the switching behaviour of residential and commercial customers in the individual geographical areas defined by the distribution zones will be conducted to identify possible deviations from the national average. The choice of consumer (supplier, product) is not location-specific[92]. However, the areas are economically and demographically developed differently. There are still active suppliers on the market who historically originated from electricity distribution companies, i.e. the owners and contractual operators of the networks in the individual distribution areas, and who are the so-called original suppliers, but who[93] are no longer majority-owned by the companies carrying out the activities of the public services of the TSO or DSOs. In general, higher or lower switching shares in individual DSO areas may be the result of higher or lower price elasticity of that area on the demand side. Switching rates are also influenced by higher customer activity, targeted advertising of suppliers, affiliation to suppliers that are or have been integrated with the distribution company, brand trust, etc. With the same level of consumer engagement in the whole area of Slovenia, i.e. only in theory, the number of switching rates would be proportional to the total number of household consumers connected in each area of the distribution system. Consequently, the switching rates would be the same.

The actual data for 2024 shows different switching rates, as can be seen in Figure 147.

92 All electricity suppliers supply energy throughout Slovenia, so all consumers have the same choice.
93 Suppliers that were linked to the service of general economic interest before the complete opening of the market in 2007 (»incumbent supplier«).

FIGURE 147: SHARE OF SUPPLIER SWITCHES MADE BY HOUSEHOLD AND BUSINESS CONSUMERS IN THE AREAS OF INDIVIDUAL DISTRIBUTION COMPANIES



SOURCES: ENERGY AGENCY, ELES

The analysis showed that the switching rates of household consumers practically do not differ between the distribution areas and are around an insignificant 0.5%. For business consumers, the highest switching rates were in the Elektro Maribor area, which increased by 11% compared to the previous year. It is followed by Elektro Gorenjska with a 15% share of exchanges, up 8.8% compared to 2023. The lowest number of exchanges was in the area of Elektro Celje, 11.7%, up 2.9% compared to the previous year.

92.6% of household consumers have not switched supplier in the last three years

An analysis of the share of consumers who have not switched supplier over three years,[94] shows very limited activity in household consumption. The total number of consumers represents the average number of consumers over the last three years. The result is shown in Table 33.

TABLE 33: NUMBER AND PERCENTAGE OF CONSUMERS WHO DID NOT SWITCH SUPPLIER IN THE 2022–2024 PERIOD

	2022–2024	
	By number	Share
Household consumption	871,849	92.64%
Business consumption	111,357	72.70%
Total	**983,206**	90.38%

SOURCE: ENERGY AGENCY

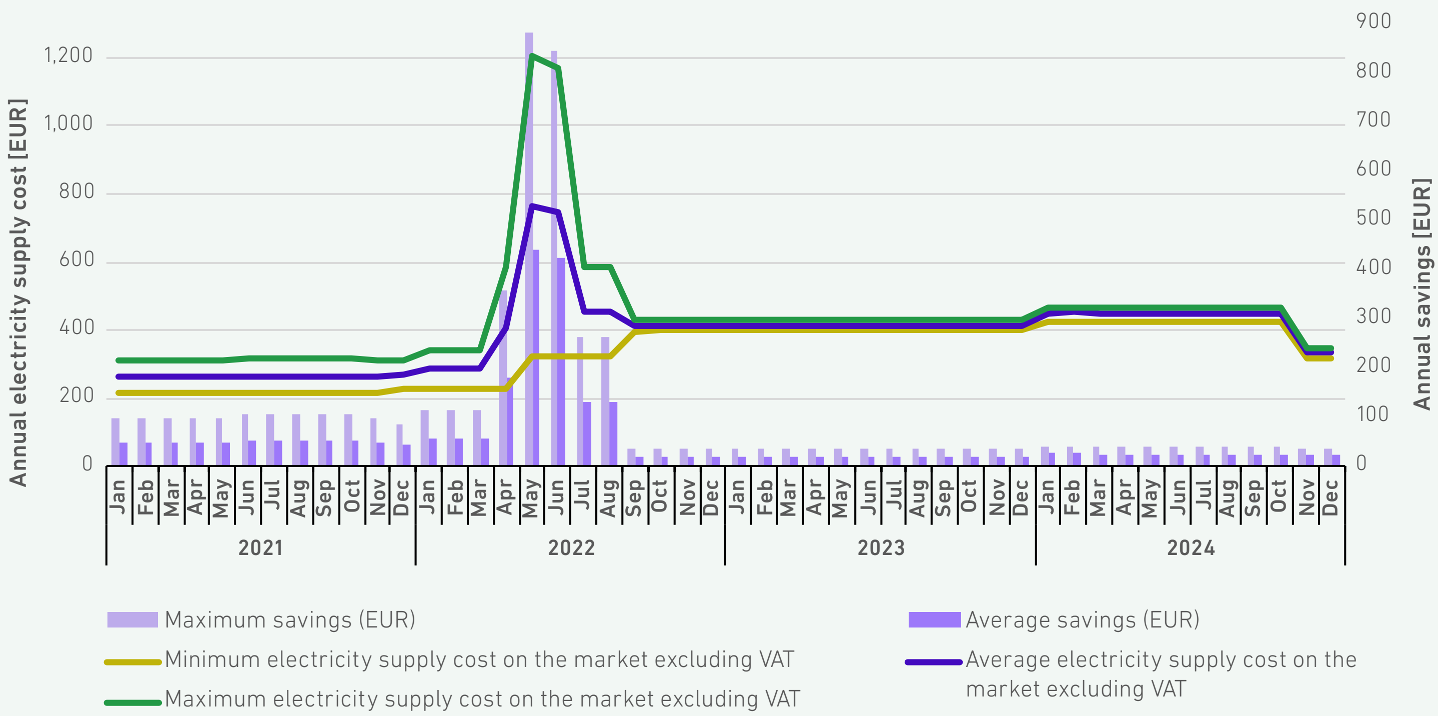
94 Multiple switches are counted only once.

Assessment of the Potential Benefits of Switching Suppliers

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

Figure 148 shows trends in the minimum, maximum and average costs of a typical Slovenian household consumer[95] for electricity supply in the retail market on an annual basis without the network charge, levies, excise duty and VAT, stemming for the offers published in the Supply Cost Comparator – a web application for comparing electricity supply costs.

FIGURE 148: POTENTIAL ANNUAL SAVING BY SWITCHING SUPPLIER BASED ON THE DIFFERENCE BETWEEN THE MOST EXPENSIVE AND THE CHEAPEST AND BETWEEN THE MOST EXPENSIVE AND THE AVERAGE SUPPLY



SOURCE: ENERGY AGENCY

The maximum (annual) costs consider the most expensive offer for electricity supply in the retail market[96]. The minimum (annual) costs consider the cheapest offer published in the Supply Cost Comparator and available to any consumer. The average (annual) cost of electricity supply is calculated on the basis of the average between the most favourable and the most expensive offer in the retail market, based on which the supply of energy to consumers was affected. At the level of the individual month, the difference between the maximum and minimum annual costs is taken into account in the determination of the potential maximum saving, while the difference between the average and minimum annual costs is taken into account in the determination of the potential average saving.

95 Consumption type: capacity charges 8 kW, annual consumption 2,100 kWh (MT) and 1,996 kWh (VT)

96 According to the suppliers' information, the share of household consumers supplied under this offer was higher than 0.03%.

From the beginning of 2024, the Decree on Setting Electricity Prices[97] became applicable, which set 90% of the allowed retail electricity price, the remaining 10% being the market price of the individual offer, which can be seen in the graph as a price increase in early 2024 compared to 2023, when 100% of the retail price was capped, with the same tariffs.

The Decree was in force until 31 October 2024, when the new Decree came into force[98] with a 100% retail price cap again, with even lower tariffs. The Decrees have led to a marked reduction in the difference between the most expensive and the most advantageous offer on the retail market, resulting in lower potential maximum and average potential savings. During the period that the Decrees were in force, all suppliers who had retail prices below the maximum allowed by the Government raised their prices again to practically the maximum allowed. Thus, during this period, the difference between the most favourable and the most expensive offer on the retail market was only caused by the minimal price difference due to the impact of a single offer on the market and the flat-rate costs charged by suppliers to each other for individual offers.

Government intervention measures have significantly reduced the expected benefits of switching

Measures for Promoting Competition

The Energy Agency monitors the retail electricity market and, in doing so, cooperates with 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.

In ordinary circumstances, 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.

Justified deviations from this methodology are possible during a state of emergency in the market. In 2024, the price of last resort supply changed twice. In January 2024, the price of last resort supply for household consumption was still 191.85 EUR/MWh, followed by a price adjustment to market conditions: from 1 February 2024 to 31 December 2024, the price was 155 EUR/MWh. The time-weighted average price of last resort supply in 2024 was thus 158.07 EUR/MWh. This price was slightly lower than the average market retail price of the seven largest suppliers, which was estimated at 158.81 EUR/MWh. Such price ratios point to a distortion of the price of last resort supply, since, despite its regulated nature and by the provisions of the ZOEE, it did not achieve its primary deterrent purpose. The lower price compared to market offers did not provide consumers with a price incentive to substitute last resort supply with regular products on the market, which reduces the efficiency of the system and undermines the functioning of market competition.

Effective Data Exchange in Key Market Processes

As part of the measures it is taking under its competences to harmonise the most important data exchange processes at national and regional level, the Energy Agency has been guiding market participants towards the use of open standards and the reuse of the generic EU DSO[99] ter modelov ENTSO-E v največji možni meri.

ENTSO-E models to the maximum extent possible to establish efficient data exchange between market participants.

New EU regulations and the vision for the development of energy networks by 2050 envisage the integration of energy networks (electricity, gas, heat) and the full involvement of consumers (development of a flexible market). Harmonising data exchange processes using open standards in energy markets is becoming even more important and is key to removing certain barriers to entry for new market participants and reducing entry costs. Data exchange is becoming increasingly complex and is mostly required in near or real time.

97 The Official Gazette of the Republic of Slovenia, No. 107/23
98 The Official Gazette of the Republic of Slovenia, No. 96/24
99 Recipient of the results of the work ebIX®

In retail markets, too, the development of new business models and energy services based on access to detailed metering data there is a clear need to harmonise access to and exchange of consumption and production data, as access to this data must be provided centrally or locally (at the metering device) to authorised parties (aggregators, suppliers, energy service providers, etc.) based on the customer's authorisation.

Legislative frameworks must ensure sufficient levels of data protection and privacy to support the green transition, empowerment tools and incentives for active consumption, a non-discriminatory environment and a level playing field for all stakeholders, a technology-neutral regulatory framework, recognising the new roles of traditional actors. In addition to requirements for efficient and secure data exchange, Directive (EU) 2019/944 also defines the context for ensuring interoperability. EU countries are expected to enable full interoperability of energy services in the EU in order to promote competition and avoid excessive administrative costs. The primary objective is also to protect consumers further and empower them through digitalisation to become more active in the energy transition. The EC's strategy is to ensure harmonisation through the implementation of a process reference model[100], into which national practices and specificities can be largely integrated.

Directive (EU) 2019/944 requires the Commission to adopt interoperability requirements and non-discriminatory and transparent procedures for access to metering data, consumption data, and data necessary for customer switching, demand response, and other services. The first step is Commission Implementing Regulation (EU) 2023/1162 of 6 June 2023 on interoperability requirements and non-discriminatory and transparent procedures for access to metered data and consumption data[101]. The requirements and procedures implemented in accordance with this new secondary legislation will ensure that a single common reference model is used for the exchange of metering data and consumption data in EU countries. Based on the aforementioned implementing regulation, customers will be given easy access to their metering data. They will be able to consent to the use of their energy consumption or production data by third parties in ways that benefit them. This could include, for example, receiving tailored assessments of which contract would be best and cheapest to meet their energy needs, information on the installation of renewable energy sources, or energy savings assessments. The implementing regulation is the first of a series of regulations expected to be established in the coming years to facilitate the interoperability of customer energy data in accordance with Article 24 of Directive (EU) 2019/944 and is one of the key deliverables of the EU Energy Digitalisation Action Plan.

Subsequent regulations will focus on data related to supplier switching, demand response, and other services. The scope of demand response flexibility will be governed at the EU level by a dedicated EU network code. In May 2024, ACER received a proposal from electricity system operators (EU DSOs and ENTSO-E) for a draft of this network code, including amendments to three related electricity regulations. ACER reviewed the draft and consulted on it in autumn 2024. Following final amendments, ACER submitted its proposal to the European Commission, and the code is expected to enter into force in 2025.

The new interoperability rules are an important factor for the European Green Deal and REPowerEU, as they empower consumers to actively participate in the energy transition and give them access to more affordable energy. For businesses and transmission and distribution system operators, these rules will facilitate their operations in the internal market and enable the easy, secure, and efficient flow of data to those who need it. On the other hand, this will help operators improve existing processes and encourage the development and provision of new energy services, such as energy sharing and demand response.

The implementation of data exchange between electricity market participants in Slovenia largely follows the relevant reference models (e.g., the harmonised energy market role model ENTSO-E/ebIX/EFET[102] etc.) In 2024, stakeholders continued to adapt their processes to the updated market model, which is based on the introduction of a metering point[103], supports the development of secondary metering and, among other things, enables the use of the shared supply concept[104] and the development of flexibility services. This eliminates inconsistencies with the reference model at the national level and maximises opportunities for the development of energy services and the strengthening of competition in the retail market.

100 A set of reference procedures for data access describing the exchange of information between roles (not stakeholders). It includes a semantic model of the data to be exchanged, as well as a description and integration of the systems and procedures used to control, access and exchange this data.
101 https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32023R1162
102 The latest version of the model is 2023-01 as of 21 September 2023
103 Implementation of »Metering Point« in accordance with the reference model.
104 See the USEF report.

The design of the mojelektro.si national data hub's online data portal for centralised data access ensures compliance with the proposal for an implementing act on access to consumption data (B2C segment). Non-compliance in the area of ensuring interoperability at the local data access level (I1 interface on smart meters) was actively addressed in 2024 on the basis of a consultation process conducted by the Energy Agency and corrective measures imposed by the agency on the electricity operator. The implementation of data exchange in the area of flexibility is in its initial phase, with deviations from the reference models still present, e.g., in the implementation of roles and responsibilities. As this area is evolving and will be harmonised with the EU's dedicated network code, the non-compliance is of a transitional nature.

The Act also ensures interoperability in the identification of entities in electronic data exchange between participants in the electricity and natural gas markets, which obliges market participants to use standardised identifiers for key data entities in electronic data exchange on the market. Standardised identifiers must identify all key data entities in electronic data exchange based on a general act of the Energy Agency, which is a prerequisite for efficient data processing.

The Energy Agency implemented its harmonisation strategy through public consultations, bilateral activities, and participation in expert platforms such as the IPET Section.

The year 2024 was marked by intensive work by the IPET Section in the field of data exchange, adaptation of processes to the requirements of the new network act, and improvements in the quality of data for balance settlement (BO). The IPET Section played an interdisciplinary role as a link between energy market stakeholders: operators, producers, suppliers, service providers, and regulators.

The section's primary topics were:

- Introduction of a new network charging: The section worked closely with stakeholders (EDP, suppliers, Borzen, Informatika, ELES, and the Energy Agency) in a total of 33 coordination meetings. The preparation of new billing mechanisms took place simultaneously with the introduction of contributions and a 15-minute interval, which required extensive technical and content adjustments.
- Transition of household and self-supply consumers to metered balance settlement: On January 1, 2024, household consumers became part of metered consumption in the balance system, followed by self-supply users on February 1, 2024. In accordance with the legislation and changes to the rules, appropriate methodologies and upgrades to information systems were prepared.
- Improvement of data quality for balance settlement: The average delay in submitting data for settlement in 2024 was 4.3 working days, which is a deterioration compared to 2023 (2.67 days). Emphasis was placed on automating procedures, introducing filters to protect against interference, and using the POMP portal and CEEPS as the main channels for data distribution.
- Supplier issues: The need for timely and standardised delivery of data on quantities produced by power plants was highlighted on several occasions. The section supported the proposal for automated data transmission by EDCs via the CEEPS portal.

The year 2024 was the first year after the termination of the European ebIX forum, of which the IPET section was a long-standing member. Nevertheless, the section continues to develop solutions and cooperate at the national level, taking into account the guidelines set out in this informal standard for the harmonisation of the electricity market.

Last year, the IPET section also laid the foundations for the 2025 work plan, which includes an analysis of new consumption models (communities, sub-metering, shared use), data quality optimization, and recommendations for improvements.

Providing Standardised Data Services

The Government Decree on measures and procedures for the introduction and interoperability of advanced electric power metering systems (hereinafter the Decree)[105] 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.).

Based on the regulation, the DSO has established a single point of access to advanced metering data, which is implemented as a central system for accessing metering data (single entry point of the national data hub (EVT). The system provides data services for the exchange of data with beneficiaries in the B2B and B2C domains, and there are plans to extend the scope of data exchange to the B2G segment.

The EVT is a hub ensuring the exchange of data among distributors and suppliers of electricity, final consumers and their authorised representatives (e.g. aggregators and ancillary services providers) and at the same time the central data hub for the exchange of data in the electricity market. The EVT allows access to available metering data independently of the electricity distribution area or supplier.

The following EVT modules are relevant for data processing purposes:

- **The MojElektro Portal** – an online user portal intended for all end-consumers and their authorised representatives who can access all the metering points and metering and accounting data they are entitled to, regardless of their supplier or distribution area. It includes the »Flexibility« service for the collection of flexibility offers from active distribution system users and entry into the temporary register of flexibility of electricity distribution companies;

- **CEEPS 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 end-users, carrying out the supplier switching process in line with the SONDSEE requirements, access to accounting data, management of all the changes at the metering points, etc. All electricity suppliers, Borzen, the Centre for RES/CHP support, the closed distribution systems and the distribution system operator are registered on the portal;

- **Massive data – B2B Type – 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, addition of new measuring points to the daily transmission and specific inquiries for the available 15-minute metering data;

- **WS/REST-API** – data access services for the Distribution System Operator (WS) and planned restAPI services for accessing end-user or proxy data without having to register on the MyElektro portal. The rest API services are under development and will allow the further development and usability of the data from the advanced metering system in consumption monitoring and in analysis carried out for the purpose of the new tariff systems;

- **Web services** for the transmission system operator to provide real-time generation data and structural data on metering points.

These modules utilise the functionalities of the new intermediate layer of the NMS architecture, i.e., the platform for centralised management, validation, and replacement of detailed measurement data (POMP). The POMP intermediate layer enables the NMS operator to take a unified approach to ensuring the quality of measurement data at the highest application layers, i.e., at the level of the national data hub (Moj Elektro, CEEPS, etc.). The methodological and technological concepts introduced by POMP enable Informatika d.o.o., as the central IT service provider for EDC, to perform all necessary data processing for network charge billing. In addition, they ensure a high degree of digitisation of business processes and advanced integration mechanisms, while also enabling the introduction of flexible business models. With the introduction of advanced data and flow solutions, POMP enables scalable processing and storage of massive amounts of data, which can also be used in a direct and useful way in numerous scenarios based on advanced data analytics and machine learning.

The POMP platform is designed to enable integration with various additional interfaces, ensuring system flexibility and scalability. The transfer of measurement data from the lower architectural layer, consisting of the HES (Head End System) of electricity distribution companies, to the POMP platform takes place in two ways:

105 Official Gazette of the Republic of Slovenia, No. 79/15 in 172/21 – ZOEE; this Regulation, which ceased to apply on the date of entry into force of the ZOEE, shall continue to apply until the entry into force of the Government regulation referred to in the fourth paragraph of Article 31 of the ZOEE.

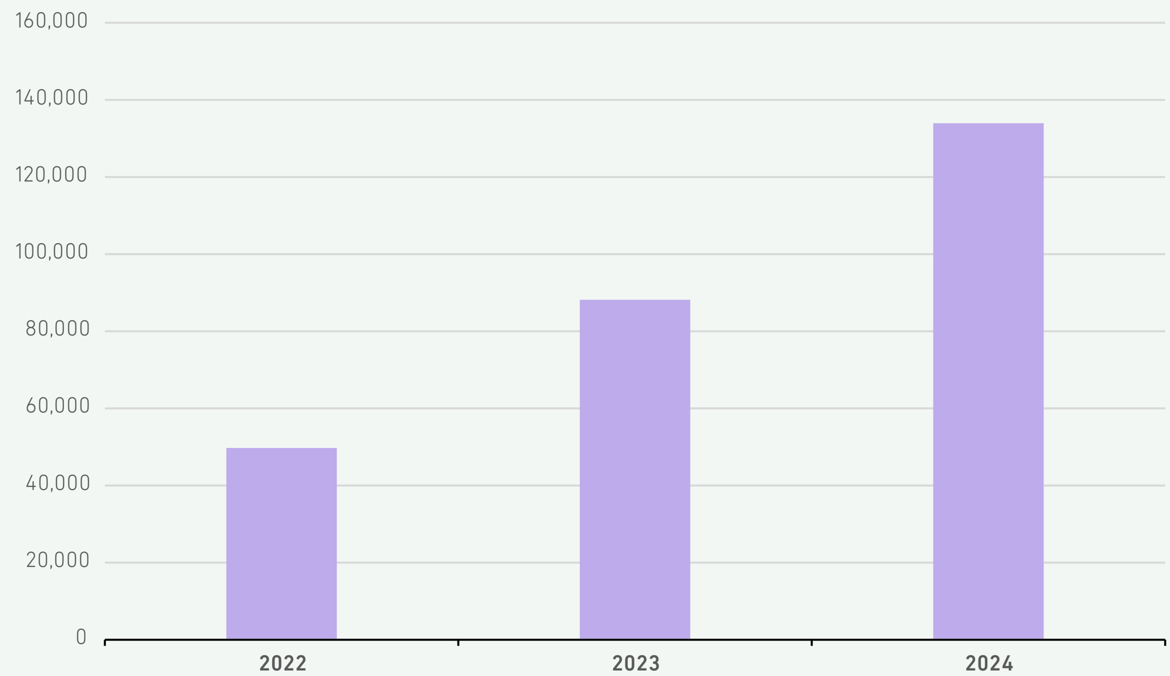
- by pushing data (push mechanism) and
- by retrieving historical data.

POMP includes integration with three key systems of the national data hub, which is the highest layer of the NMS architecture: the eIS information system, the Moj elektro portal, and the CEEPS (Central Electric Energy Portal of Slovenia) portal. With the introduction of advanced data and flow solutions, POMP enables scalable processing and storage of big data, which can also be used in a direct and useful way in numerous scenarios based on advanced data analytics and machine learning.

The EVT includes all metering points and each metering point owner or their authorised representative, who can access the data via the EVT. Depending on the equipment of the MM and the scope of the metering data, all available data is already being transferred to the system. Development activities continued at the EVT level in 2024, including support for the new network charge calculation methodology.

As a result, the number of users of the Moj Elektro portal is constantly growing. At the end of 2024, almost 134,000 metering points were registered on the Moj Elektro portal (52% more than in the previous year).

FIGURE 149: DEVELOPMENT OF THE NUMBER OF REGISTERED METERING POINTS IN THE MOJELEKTRO.SI PORTAL



SOURCES: ELECTRICITY DISTRIBUTION COMPANIES

The rapid growth is mainly due to consumers' awareness through the implementation of the Energy Agency's communication strategy on the reform of network charging.

Based on the adequate equipment of metering points of generation sources above 100 kW (more than 750 metering points with a total capacity of 420 MW) of installed capacity, which ensures the transmission of 15-minute data in near real time to the TSO. Solar and hydro dominate this exchange of near real-time data on RES generation, with other sources together accounting for less than 20%.

The definition of the set of standardised data services provided by the DSO to system users free of charge or for a fee has finally been satisfactorily defined with the new version of SONDSEE. In 2024, following a consultation process and corrective actions by the Agency, the electricity operator addressed key shortcomings in the area of efficient local access to real-time metering data (on the I1 interface of the smart meter) for all customers equipped with smart meters.

Scope and Quality of the Data Provided in the Framework of the AMS

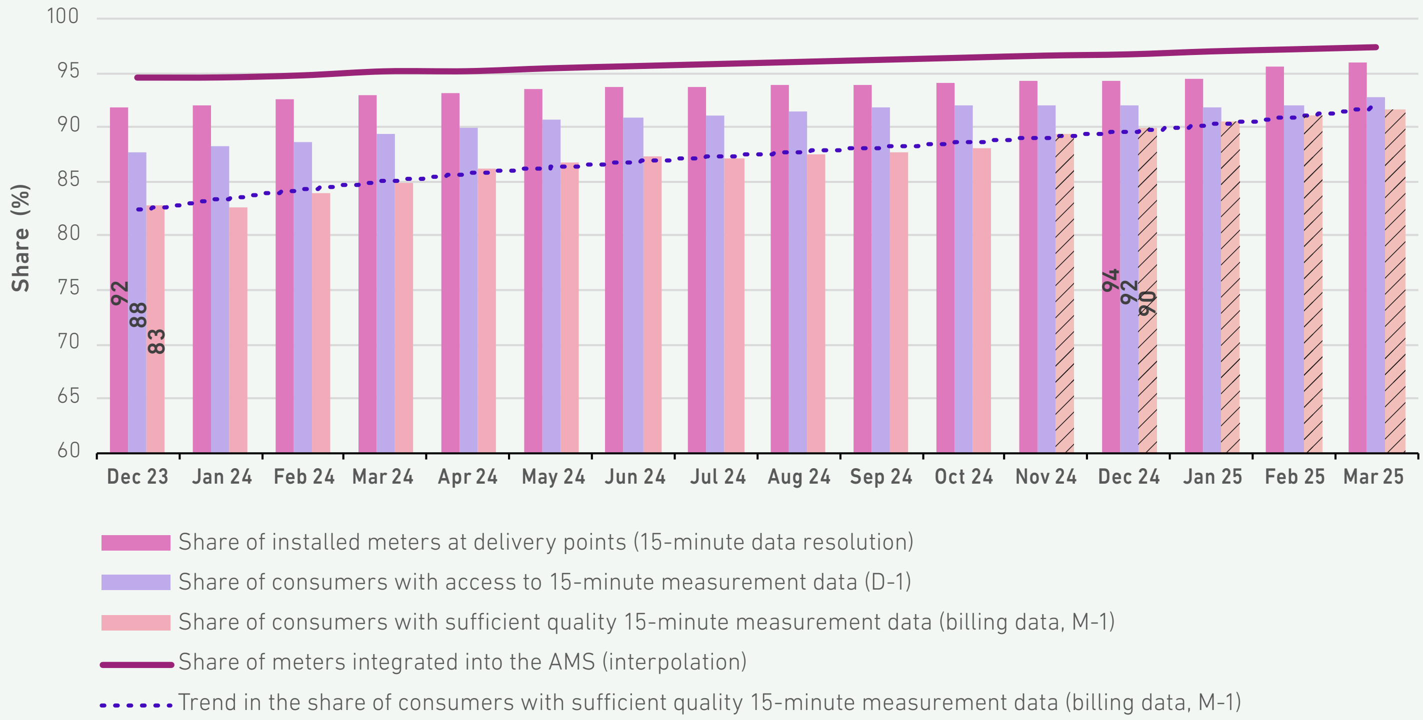
On the basis of the Regulation and the regulatory supervision related to this task, the Energy Agency monitors the scope and quality of the provision of metering data within the advanced metering system (AMS) on the basis of more than 20 different key performance indicators (KPIs). With these KPIs, the Energy Agency monitors progress in the rollout of the AMS in terms of the share of advanced meters installed and integrated into the NMS, access to different volumes of metering data of different types (e.g., 15-minute metering data for the previous day (D-1) and for the previous month (M-1), validated/unvalidated) at the level of the transfer point, metering point, and metering point and user, the share of metering devices by individual communication technologies, etc.

Selected key performance indicators related to this issue:

#	KPI
1	**The share of installed meters at the point of delivery** (15-minute resolution): the share of metering equipment capable of providing the data necessary for the billing of the network charge and other services
2	**The share of users with guaranteed access to 15-minute mtering data (D-1):** user access to unvalidated 15-minute data on use/production for the previous day at the national data hub level (mojelektro.si)
3	**The share of users at the point-of-delivery with 15-minute data of sufficient quality (M-1):** user access to validated 15-minute data on use/production for the previous month (with the substitution of missing values) at the national data hub level (mojelektro.si) – accounting data (15-minute profiles)
4	**The share of built-in meters included in the AMS:** the share of meters with adequate communication facilities included in the AMS whose data is processed in accordance with the range of standardised services of the AMS (this share also includes meters that record measurements with a resolution of more than 15 minutes)

The new network charge methodology is based on the use of 15-minute accounting data on consumption or achieved capacity. The new methodology is fairer in the allocation of costs between the different user groups and mostly results in lower network charges for LV-connected final consumers. It is therefore essential that the largest possible share of consumers is provided with adequate metering to enable billing and ensuring that users enjoy the full benefits of this methodology, which is CEP-compliant and designed to support the green transition.

FIGURE 150: TRENDS OF THE SELECTED KEY INDICATORS IN THE AMS[106]



SOURCES: ENERGY AGENCY, ELES

Significant deviations due to unsatisfactory data processing in the measurement centres or unsatisfactory implementation of the data »cleaning« process due to sensitivity to interference[107], and inefficiencies related to inappropriate interpretation of EU legislation in terms of the use of detailed measurement data in the AMS[108] are no longer observed in 2024.

The upward trend in data quality improvements observed in the previous year continues in 2024. The percentage increase in improvements in the quality of measurement data, as detected in the trend curve for the time-equivalent comparison period of the previous year (Sept. 23-Apr. 24), has further increased. For the comparative period, the growth gradient has further increased by approximately. 3%. This is also indicated by the projection curve of the proportion of users with adequate 15-minute data quality in Figure 150. The progress trend indicates that the process of »data cleansing« - via the POMP platform with other supporting actions by the Meter Data Manager at the distribution level is effective. We estimate that further improvements are still possible despite technological limitations (e.g. also by using the FCC frequency range on G3 PLC communication links and targeting critical PPMs with other, disconnected from the meter, communication technologies). As already noted in the previous report, due to the specificity of the distribution area networks and the maturity of the management of the communication weaknesses of the PLC technology, the achieved levels of data quality vary between individual distribution companies as well as across the areas within them, but the trends indicate an improving trend. The results of the progress monitoring suggest that the stagnation and degradation in quality assurance relative to the volume of users observed in 2022 are no longer problematic. The Energy Agency's assessment that the proportion of adequate metering installations and the proportion of transmission and collection points with the required quality of metering data could be fully converged in 2025 is being realised. At the same time, this optimistically meets the requirements of the Regulation. The application of the new network charging methodology based on 15-minute billing data necessitates continued efforts to improve the maturity of data quality management. It is also necessary to improve the maturity of metering data processing processes to make them available as soon as possible for the processes of stakeholders that either supply energy or provide aggregation services.

106 Columns with a hatched pattern indicate poor data quality or other anomalies.
107 Due to technical limitations in the use of Power Line Communication (PLC)
108 The data services associated with these data have been inadequately prioritised and not provided for many years.

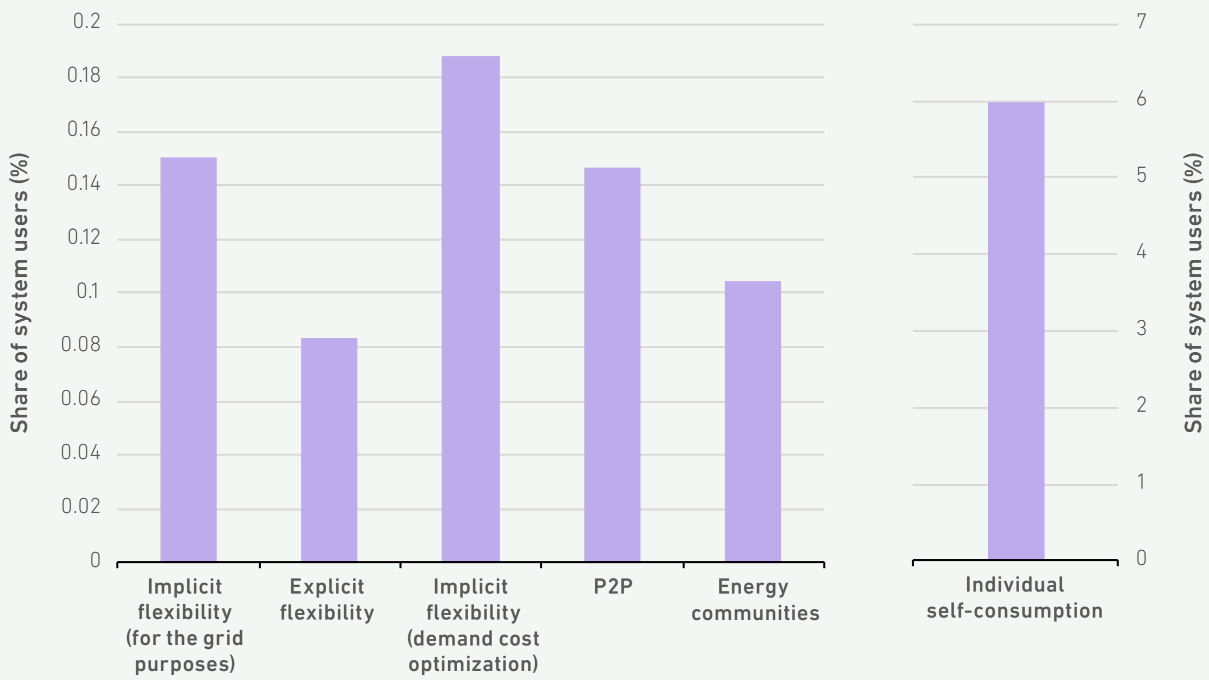
Other Measures

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 positions on the market in companies operating on the electricity market in 2023.

Active Consumption, Flexibility Market and Other Development-Related Aspects

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 and the electrification of heating and traffic, while still ensuring an appropriate level of cost-effective supply quality. Active consumers 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.

FIGURE 151: INDICATIVE SHARES OF DIFFERENT TYPES OF ACTIVE CONSUMPTION



SOURCES: ENERGY AGENCY, AGGREGATORS, ELECTRICITY DISTRIBUTION COMPANIES

In May 2024, ACER received a proposal for new network codes on demand response[109], prepared by EU DSOs and ENTSO-E in cooperation with TSOs and DSOs, which also includes amendments to three related electricity network codes on: system balancing, system operation, and consumer connection. ACER supplemented the draft and conducted a public consultation in October 2024. ACER submitted the final proposal for the new code to the European Commission on March 7, 2025.

109 Demand response basically means a change in electricity consumption when consumers (individually or collectively) respond to a market signal, such as a change in electricity prices or a financial incentive to increase/decrease/shift the timing of their electricity consumption. In the context of these framework guidelines, only active participation in demand response in electricity markets is covered.

At the same time, the area of flexibility is developing in a more or less harmonised manner and with varying intensity in the EU and also in Slovenia. Numerous research projects and studies are underway, and the first implementations are already taking place. The absence of a network code for demand response, which will also form the basis for the planned implementing regulations in the field of interoperability, particularly in the area of data exchange, represents a certain obstacle to progress further.

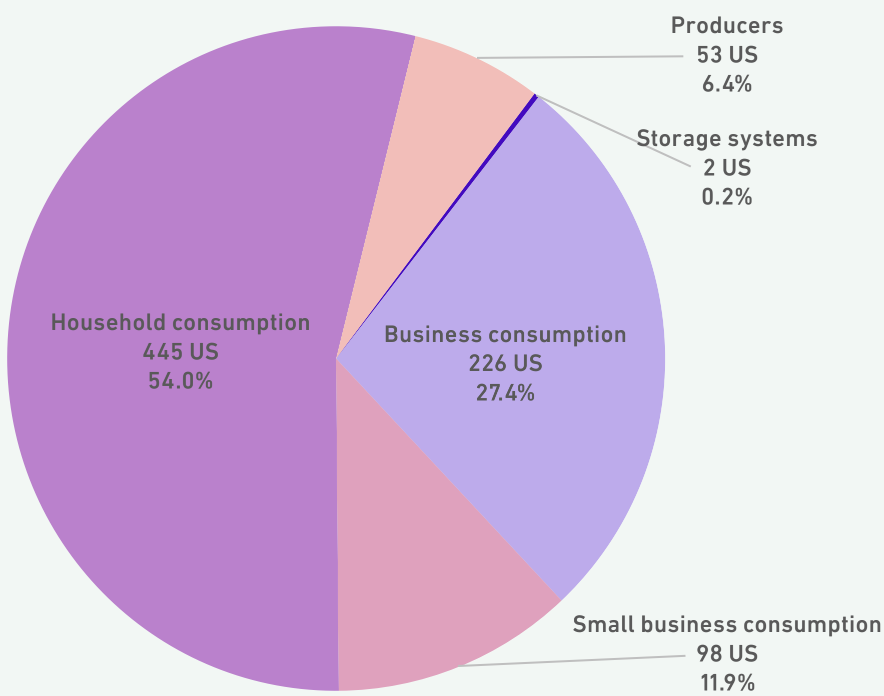
Within the framework of standardised data services, the »Flexibility« service is available on the MojElektro and CEEPS portals to collect flexibility offers from active distribution system users and enter them in the temporary register of electricity distribution companies' flexibility. In the area covered by Elektro Ljubljana, a contract was concluded through this service to provide flexibility for congestion management services with a natural person, i.e. without an aggregator as an intermediary in providing flexibility. In 2024, the flexibility[110], offered by this source on the distribution network was used.

Successful use of flexi-bility in distribution through the »Flexibility« service in MyElektro

Aggregation

In 2024, the aggregators' portfolios included 824 system users in addition to their flexibility resources. A given user can be included in several portfolios at the same time. Aggregators estimate that system users contributed a total of 9.49 GWh of flexibility energy, representing 5.21% of the aggregators' total traded energy.

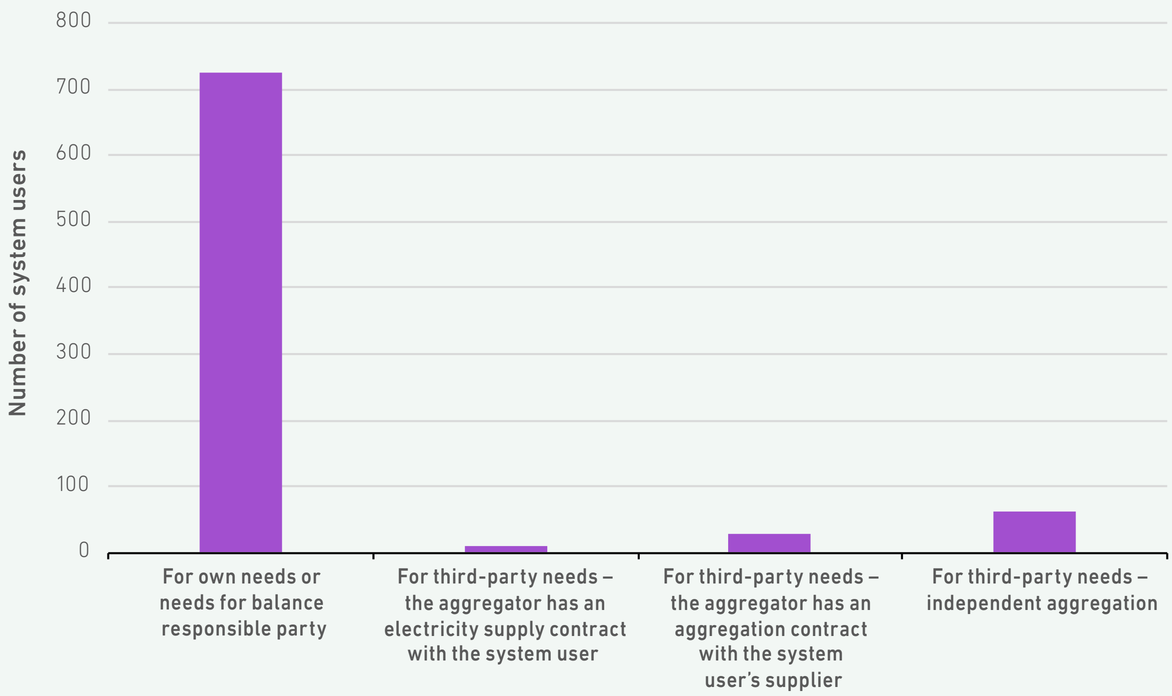
FIGURE 152: STRUCTURE[111] OF CONSUMERS (C) IN THE AGGREGATION, WHERE STORAGE AND GENERATION DEVICES MAY ALSO BE LOCATED CONNECTED BEHIND THE DELIVERY POINT OF THE USER



SOURCES: AGGREGATORS

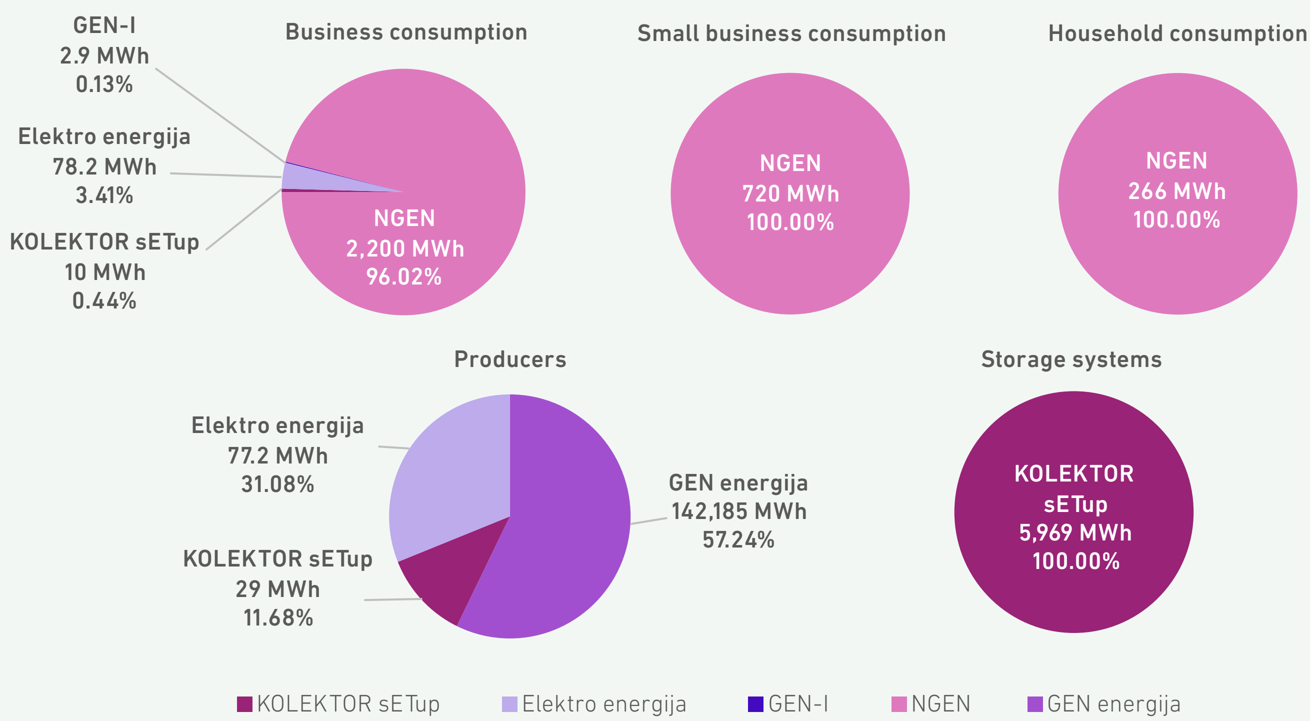
110 The average price achieved for adjusted energy was 600 EUR/MWh (https://www.elektro-ljubljana.si/proznost) with a price cap of EUR 800/MWh.
111 The difference between the total and the sums of the individual shares is due to rounding.

FIGURE 153: NUMBER OF CONSUMERS IN PORTFOLIOS COVERING VARIOUS NEEDS, WHERE A USER MAY BE INCLUDED IN SEVERAL PORTFOLIOS



SOURCES: AGGREGATORS

FIGURE 154: ESTIMATED SHARES OF ENERGY FLEXIBILITY OF FOREIGN SOURCES BY AGGREGATORS AND TYPES OF SYSTEM USERS

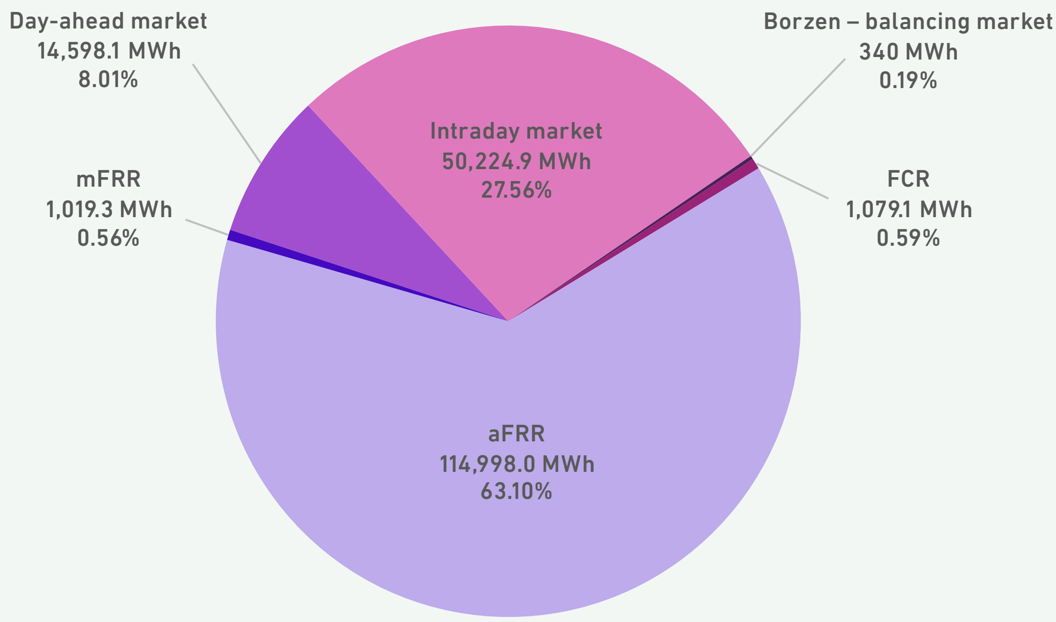


SOURCES: AGGREGATORS

Aggregators traded on all Slovenian wholesale markets. In Figures 155 to 157 the shares of energy by individual markets or services are calculated as the sum of the purchase of energy (or reduction in generation and/or increase in consumption) and the sale of energy (or increase in generation and/or reduction in consumption) on the markets indicated. The total amount of energy traded by aggregators is determined as a sum across all markets and amounted to 182 GWh in 2024.

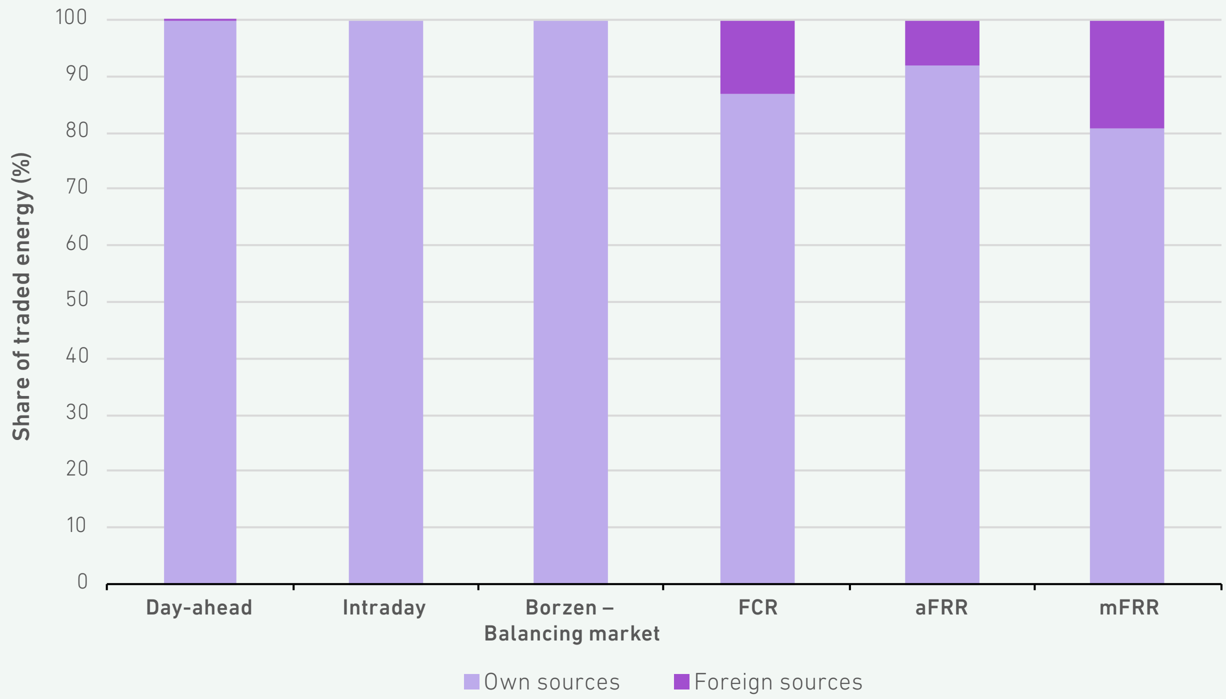
182 GWh of aggregators' traded energy

FIGURE 155: STRUCTURE[111] OF TRADED ENERGY FROM AGGREGATION BY MARKET OR SERVICE AND THE CORRESPONDING SHARES



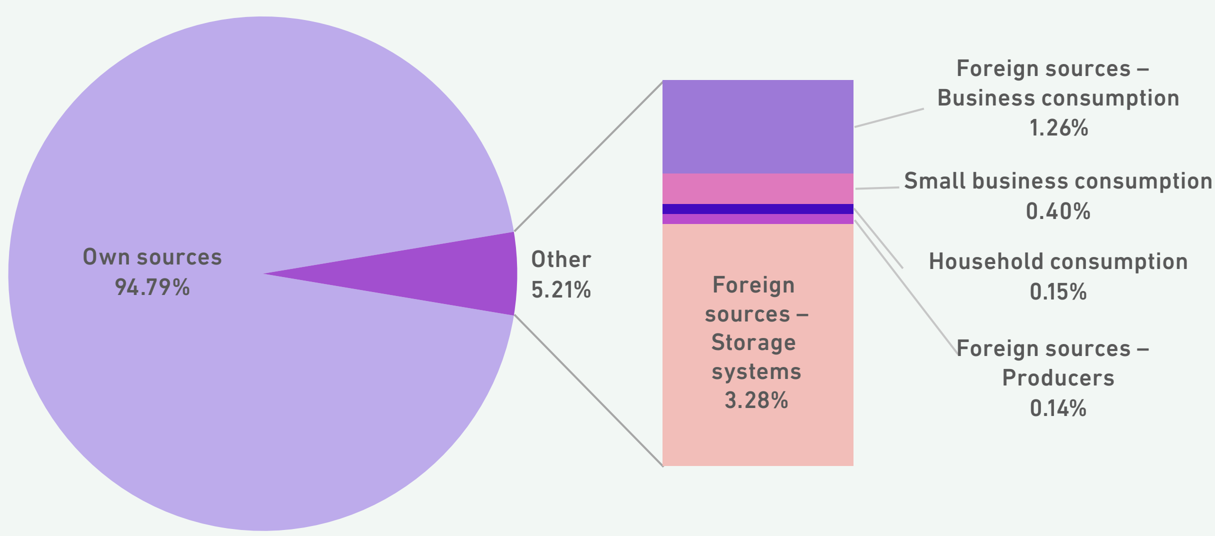
SOURCES: AGGREGATORS

FIGURE 156: MARKET SHARES OF TRADED ENERGY ACCORDING TO THE OWNERSHIP OF RESOURCES



SOURCES: AGGREGATORS

FIGURE 157: STRUCTURE[111] OF THE SOURCES OF TRADED ENERGY FROM AGGREGATION IN TERMS OF THE 182 GWh TOTAL



SOURCES: AGGREGATORS

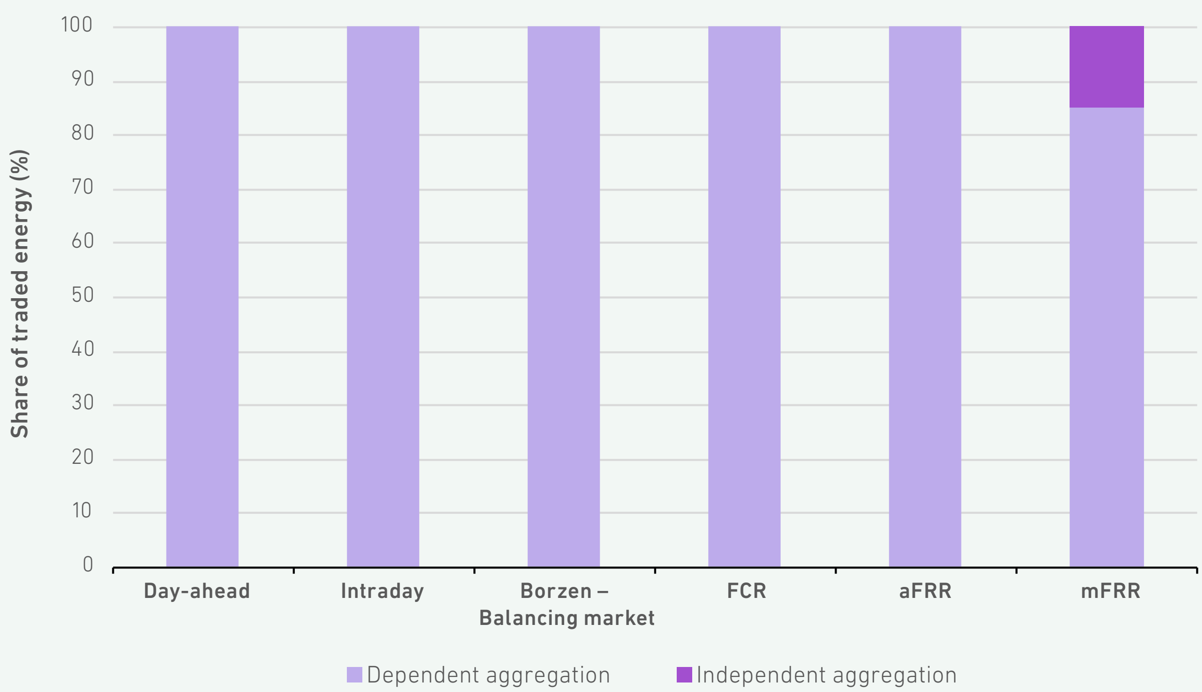
The role of an aggregator in the electricity market can be performed by an independent aggregator or taken over by the electricity supplier. At the end of 2024, there were seven[112] aggregators active on the Slovenian electricity market, which were also acting as electricity suppliers. The quantities of independent aggregation shown in Figure 158 are therefore the aggregated quantities of flexibility resources to which the aggregator itself did not supply electricity and the aggregator did not have a contractual relationship with the electricity supplier of these flexibility resources for the aggregation activity and the aggregator was not in an ownership or management relationship with the electricity supplier of these flexibility sources.

Seven active aggregators on the Slovenian market

A small share of independent aggregation

Data on the included consumers and independent aggregation show that despite the operation of seven aggregators in the market and a regulatory framework that is consistent with the Clean Energy for All Europeans legislative package, only a small part of traded energy flexibility is offered through independent aggregation, namely only 14.7% as part of mFRR. When reserving capacity for the provision of balancing services, only 23.4% of the mFRR capacity is offered through independent aggregation, which suggests that the engagement of independent aggregation has not reached the level of maturity yet.

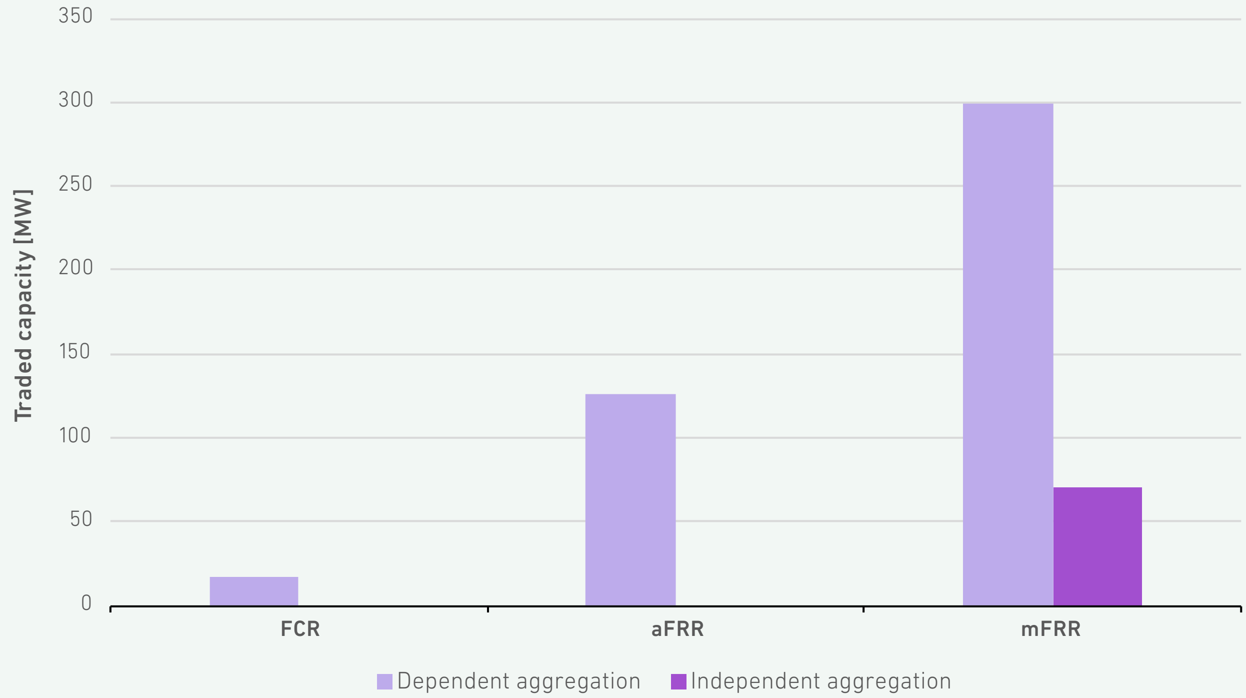
FIGURE 158: MARKET SHARES OF TRADED ENERGY ACCORDING TO THE CONNECTION BETWEEN THE AGGREGATOR AND THE SUPPLIER



SOURCES: AGGREGATORS

112 GEN energija, KOLEKTOR sETup, Elektro Energija, GEN-I, HSE, NGEN, Petrol

FIGURE 159: TRADED CAPACITY ACCORDING TO THE CONNECTION BETWEEN THE AGGREGATOR AND THE SUPPLIER



SOURCES: AGGREGATORS

Energy communities

Another key factor that would reduce greenhouse gas emissions and increase the share of RES in the end-use of energy are different forms of energy communities, which include: community self-supply in accordance with Article 72 of the Act on the Promotion of the Use of Renewable Energy Sources (ZRSOVE), self-supply of multi-dwelling buildings, self-supply of communities for supplying energy from RES in accordance with Article 37 of the ZSROVE, and the Energy Community of citizens in accordance with Article 24 of the ZOEE.

Electricity suppliers report that in 2024, they supplied electricity to a total of 573 final consumers[113], who were included in 126 communities[114]. This represents an increase of 22.7% in the number of final consumers included in communities compared to the previous year and an increase of 16.7% in the number of communities compared to the previous year.

190% increase in supply and 88.4% increase in the purchase of electricity in the community area

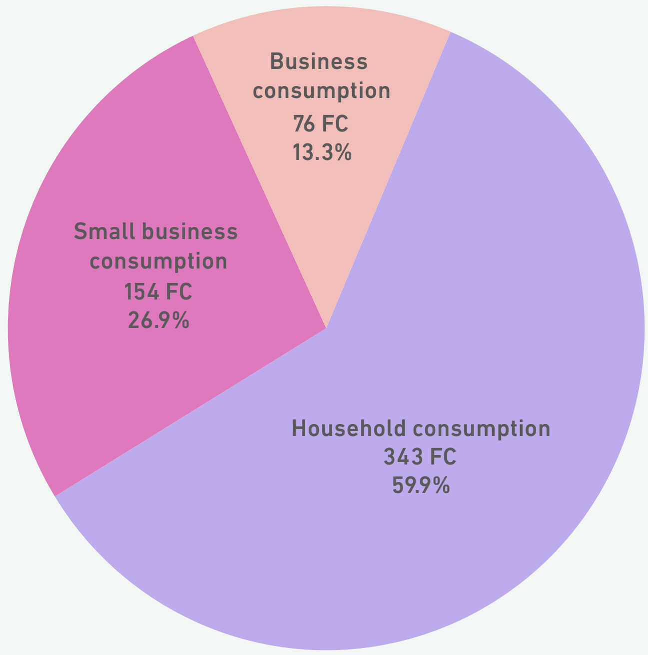
The total amount of electricity supplied to final consumers in communities[115] was 10.2 GWh (190% increase compared to the previous year). Suppliers purchased a total of 876 MWh of electricity from the communities (88.4% increase), while the total amount of electricity taken free of charge from the communities was 169 MWh (26.2% increase). The significant increase in electricity supply and purchase can be attributed to the significantly higher integration of business consumption in the communities compared to the previous year.

113 Data from suppliers and EDCs differ due to the different level of realisation of specific communities and the different data sources used in the companies' internal processes. EDPs report that at the end of 2024, all communities together included 1,680 points for off-take and 337 PPMs for energy supply to the the grid. The total number of off-take points does not correspond to the total number of final consumers, so it is not possible to compare the two figures.

114 Final consumers were connected to community self-supply under Article 72 of the ZSROVE, which allows annual netting, as well as to self-supply of multi-apartment buildings and community self-supply for energy from renewable sources in accordance with Article 37 of the ZSROVE.

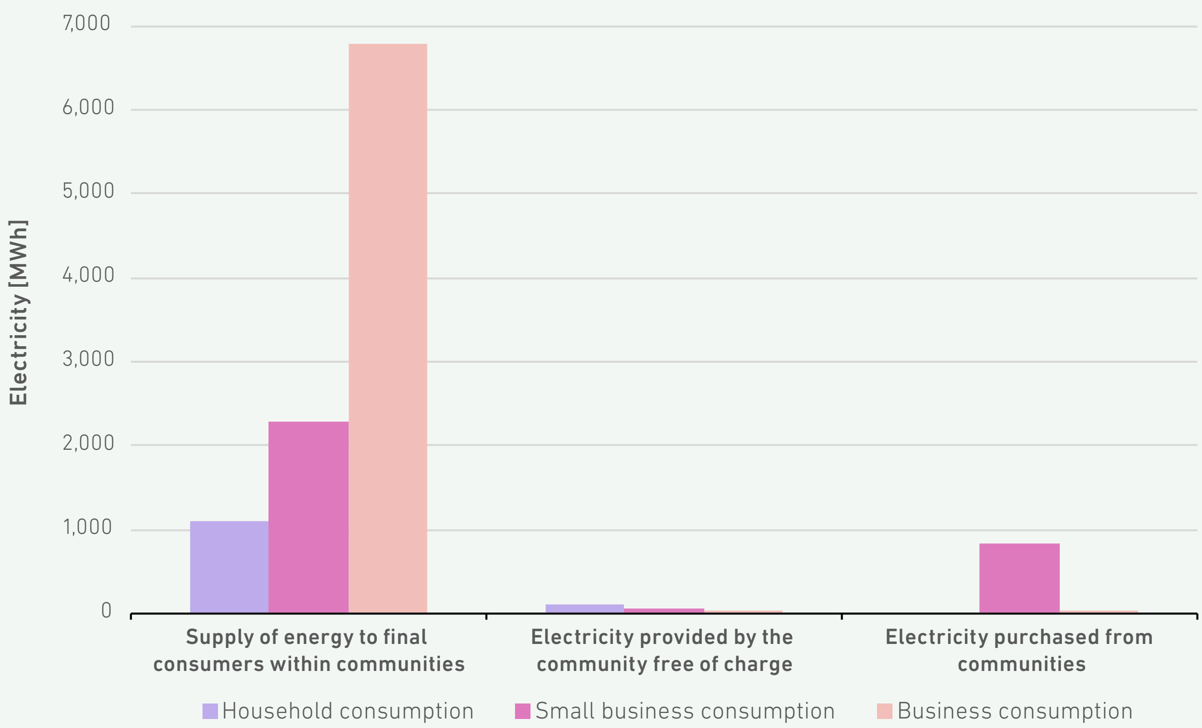
115 The data for the total amount of electricity supplied to final customers in the communities, based on the suppliers' reported data, matches the corresponding data based on the EDC's reported figures, under the assumption that the energy supplied to the communities equals the difference between the energy taken from the grid and the energy fed into the grid at the communities' delivery points.

FIGURE 160: STRUCTURE[111] OF FINAL CONSUMERS INCLUDED IN COMMUNITIES



SOURCES: SUPPLIERS

FIGURE 161: A COMPARISON OF AGGREGATED ELECTRICITY SUPPLIED TO CONSUMERS IN THE COMMUNITIES, ELECTRICITY PURCHASED FROM COMMUNITIES, AND ELECTRICITY TAKEN FROM THE COMMUNITIES FREE OF CHARGE

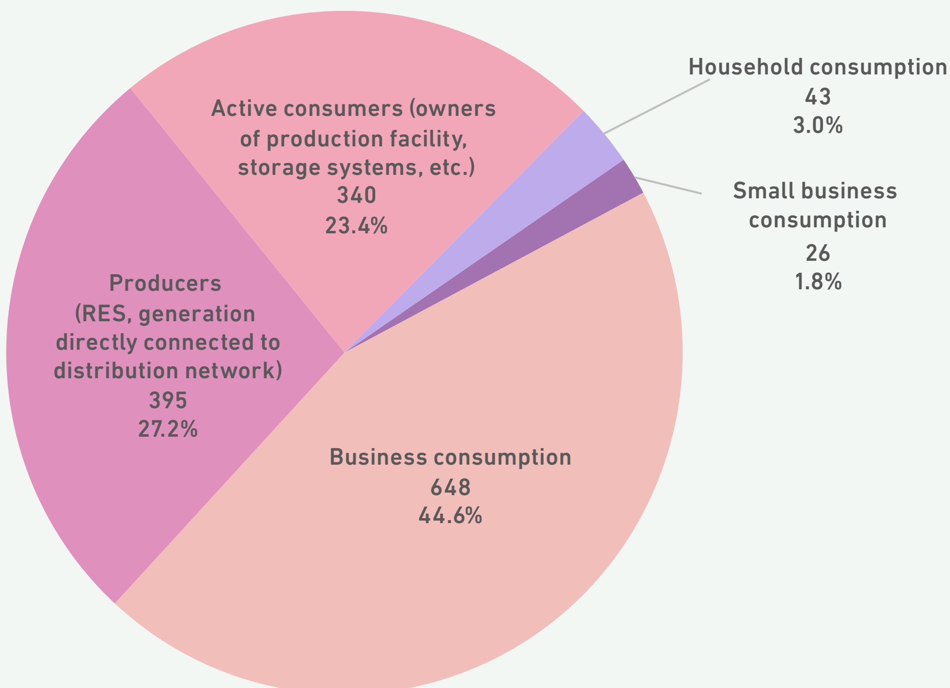


SOURCES: SUPPLIERS

Peer-to-Peer (P2P) Energy Exchange

For the purpose of electricity exchange between active consumers within the same balancing group, one platform was operational in 2024, managed by the company SunContract[116]. SunContract has developed a marketplace that enables energy exchange between customers who are also supplied by the company. The supplier covers any potential shortfalls in energy to meet the required electricity supply quantities. The volume of such peer-to-peer trading[117] within the respective balancing group amounted to 21.9 GWh. The structure of system users who participated in this trading is shown in Figure 162.

FIGURE 162: STRUCTURE OF SYSTEM USERS IN PEER-TO-PEER ELECTRICITY EXCHANGE WITHIN THE SAME BALANCING GROUP



SOURCES: SUPPLIERS

The companies FLEXGRID and NGEN report that they enable the transfer of surplus electricity between metering points within the same balancing group based on their internal records. However, this process is not classified as a peer-to-peer electricity exchange between active consumers as defined by the ZSROVE (Act on the Promotion of the Use of Renewable Energy Sources). A total of 187 network users participated in this type of surplus transfer, with a combined transferred volume of 1.2 GWh of electricity.

Electromobility

The Energy Agency monitors the development of electromobility from the perspective of electricity market development. As e-mobility booms, electric vehicles can be expected to join the flexibility market with so-called smart charging, where charging parameters can be adjusted according to the needs of the vehicle's user, as well as those of the electricity system. With the help of bi-directional charging technology, which we address in the last part of this sub-chapter, we can expect an even tighter integration of EVs into the electricity system and the flexibility market.

116 https://suncontract.org/si/elektricna-trznica-proizvajalce-odjemalce-energije/
117 Sum of purchase and sale

In Slovenia, a total of 19,549[118] electric vehicles were registered in 2024. Battery Electric Vehicles (BEVs) were the main contributor, with the number of vehicles in the passenger car category (M1) increasing by 4,279, an increase of 37.1% compared to the previous year. The number of plug-in hybrids (PHEVs) in the same category increased by 700 vehicles or 27.7% compared to the previous year. The number of light commercial BEVs (N1 category) increased by 73 vehicles, an increase of 21.4% compared to the year before.

19,549 registered electric vehicles

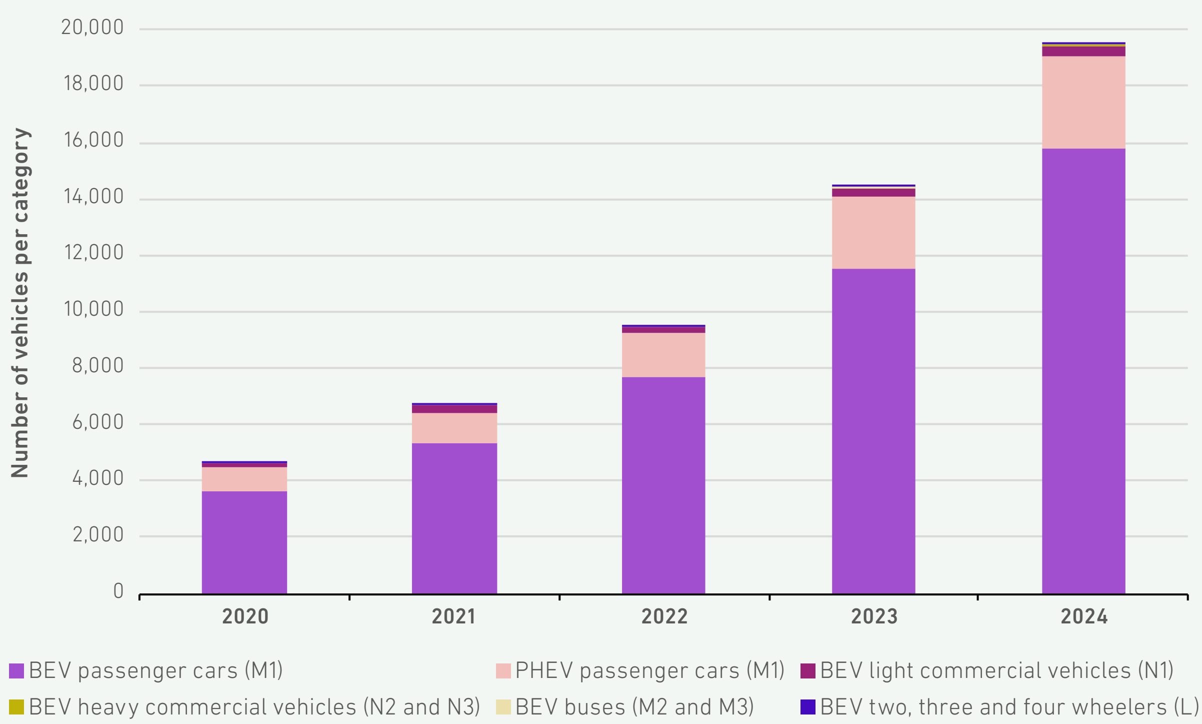
35.2% increase in the total number of electric vehicles

The number of light BEVs, i.e. two-, three- and four-wheel vehicles (category L), amounted to 56 vehicles, representing an increase of 64.7% compared to the previous year. The number of BEV buses (categories M2 and M3) increased by five vehicles, a rise of 19.2% compared with the year before. The number of heavy commercial BEVs (categories N2 and N3) increased by seven vehicles, an increase of 116.7% compared to the previous year.

The figures show a continuous increase in the number of electric vehicles in the Slovenian vehicle fleet. Despite a slightly less intensive growth in the total number of vehicles, certain specific segments show a more intensive growth (categories N2 and N3 and category L) than in the previous year.

Taking into account the figure of 1,322,325[119] of all M1 and N1 vehicles in Slovenia, the overall share of electric vehicles in these two categories in Slovenia is 2.03%. At the EU level, the comparable figure is 6.17%, while for Sweden, which had the highest share of electric vehicles among EU countries in 2024, the figure is 11.25%.

FIGURE 163: NUMBER OF REGISTERED ELECTRIC VEHICLES IN SLOVENIA



SOURCE: EAFO

118 Data as of 16 May 2025 (Source: EURopean Alternative Fuels Observatory - EAFO)
119 Data as of 16 May 2025 (Source: EAFO)

EAFO data[120] shows, that at the end of 2024, there was a total[121] of 2,156 public[122] recharging points in Slovenia[123].

Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure and repealing Directive 2014/94/EU (hereinafter Regulation (EU) 2023/1804) requires, as of 2024, the adequacy of recharging infrastructure for electric vehicles to be ensured on the basis of the cumulative achievement of output power targets for publicly accessible recharging stations for light-duty electric vehicles (categories M1 and N1), in proportion to the uptake of such vehicles in the fleet of each Member State (Article 3 of Regulation (EU) 2023/1804). In terms of adequate coverage of the TEN-T road network within the territory of a Member State, the Regulation further requires a minimum coverage of the road network with publicly accessible recharging hubs, based on their mutual distance and minimum charging power, with different requirements applying to recharging infrastructure for light-duty electric vehicles (Article 3 of Regulation (EU) 2023/1804, vehicle categories M1 and N1) and heavy-duty electric vehicles (Article 4 of Regulation (EU) 2023/1804, vehicle categories M2, M3, N2 and N3). The TEN-T road network coverage targets are to be met by the end of 2025.

Taking into account the number of electric vehicles of the relevant categories[124] in Slovenia, and in line with the output power requirements set out in the first paragraph[125] of Article 3 of Regulation (EU) 2023/1804, the cumulative output power target for Slovenia by the end of 2024 can be calculated at 21.09 MW for BEVs and 2.58 MW for PHEVs, amounting to a total of 23.67 MW. Based on the available data, the assessment of target achievement under this Regulation may be approached from several perspectives.

2,156 public recharging points – the recharging infrastructure complies with the output power requirements in line with the EU legislative framework

a) The total installed capacity of publicly accessible recharging points directly connected to the electricity grid[126] amounts to 25.3 MW, exceeding the minimum requirements set out in the Regulation mentioned above and already fulfilling the mandatory targets. It should be noted, however, that a considerable number of recharging points are connected to private internal networks of end users and are therefore not reflected in the above figure.

b) In addition, when applying the lower bound of recharging capacities derived from the EAFO data presented in Figure 164 a highly conservative estimate of the total recharging capacity in Slovenia reaches approximately 58.4 MW, which equally complies with the prescribed targets.

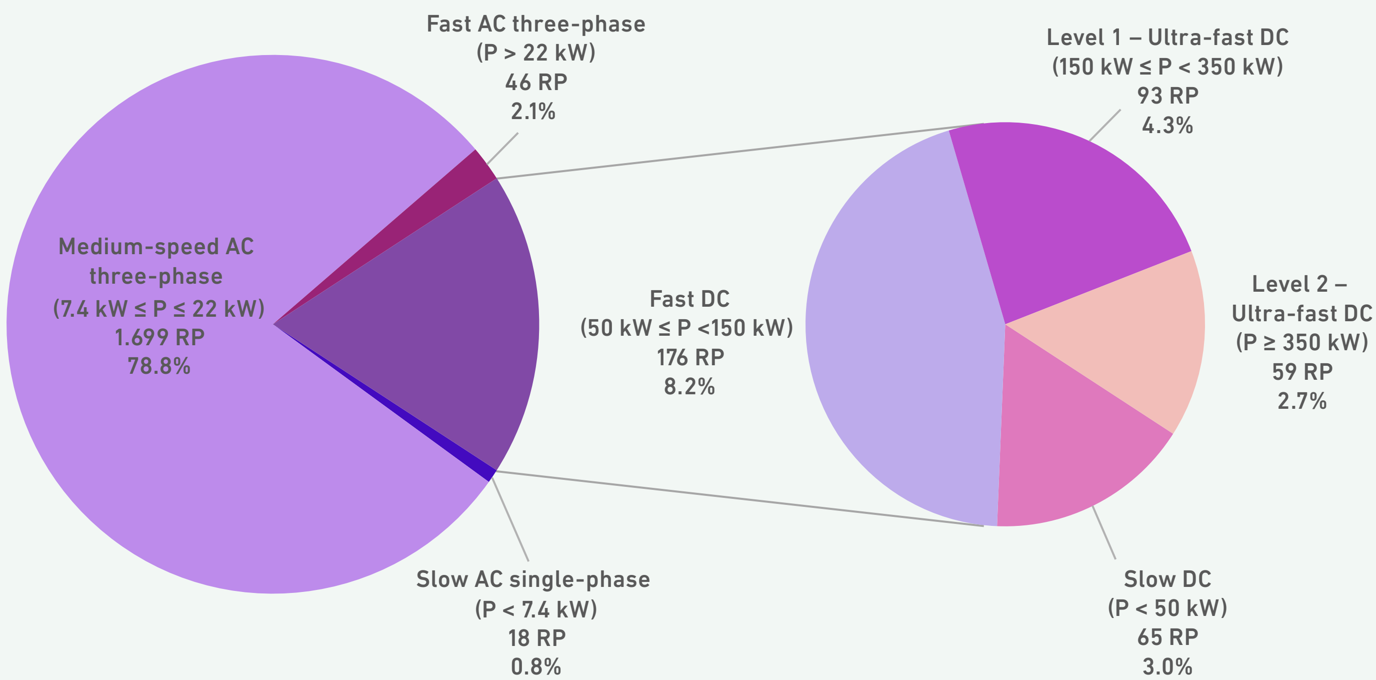
c) It is also noteworthy that, according to the survey referred to in the final part of this subsection, only four out of more than 25 charging point operators (CPOs) or charging infrastructure managers active in Slovenia in 2024 reported a total connected capacity of approximately 84.2 MW for their recharging stations in Slovenia, which likewise fulfils the prescribed targets.

120 European Alternative Fuels Observatory
121 Data as of 16 May 2025 (Source: EAFO)
122 The data show that 78.4% of recharging points are accessible without restrictions (unrestricted 24/7 access for all users), while the remaining 21.6% are subject to certain access limitations, where specific but non-discriminatory access restrictions apply (for example, limited hours of operation – such as recharging points located at large retail car parks, hotels, and hospitality establishments).
123 Due to changes in the methodology used to count the number of recharging points for electric vehicles, it is not possible to provide a consistent overview of the development of recharging point numbers over time. Furthermore, the Energy Agency's analytical work in monitoring the development of electromobility in Slovenia is hindered by the volatility of data in the reference databases, where several years of monitoring have shown retroactive revisions and updates to past data.
124 Vehicle data as of 16 May 2025: 15,812 BEV M1, 414 BEV N1, 3,223 PHEV M1, 0 PHEV N1 (Source: EAFO)
125 Member States shall ensure that publicly accessible recharging stations for light-duty electric vehicles are deployed on their territory in proportion to the uptake of light-duty electric vehicles and that these vehicles are provided with sufficient output power. To this end, Member States shall ensure that, by the end of each year, starting in 2024, the following cumulative output power targets are met: (a) at least 1.3 kW of total output power at publicly accessible recharging stations for each registered light-duty battery-electric vehicle; and(b) at least 0.80 kW of total output power at publicly accessible recharging stations for each registered light-duty plug-in hybrid vehicle.
126 Electricity distribution companies have data on the installed capacity of these stations, as it is included in the connection agreement. On the other hand, they do not have data on recharging stations connected to the customer's internal network (for the delivery point).

In view of the above considerations, it is evident that the targets established for 2024 under Regulation (EU) 2023/1804 have been fully met and, in fact, significantly exceeded.

Figure 164 provides a detailed breakdown of recharging points in Slovenia by maximum charging power (P). 18.2% of recharging points enable direct current (DC) high-power recharging, while 81.8% are designed for alternating current (AC) recharging[127]. By comparison, the share in the EU stands at 15.7% DC and 84.3% AC, while in Sweden the respective shares are 15.9% DC and 84.1% AC. Figure 165 further illustrates the structural differences in the distribution of recharging points across Slovenia, the EU, and Sweden. The most pronounced divergence concerns the significantly higher share of slow recharging points (≤7.4 kW) and, more broadly, of all normal recharging points[128] (≤22 kW). Notwithstanding these structural differences, the overall share of high-power recharging points[129], in Slovenia remains comparable, ensuring sufficient transit recharging capacity.

FIGURE 164: STRUCTURE[111] OF THE NUMBER OF RECHARGING POINTS (RP) FOR ELECTRIC VEHICLES IN SLOVENIA BY MAXIMUM CHARGING POWER (P)



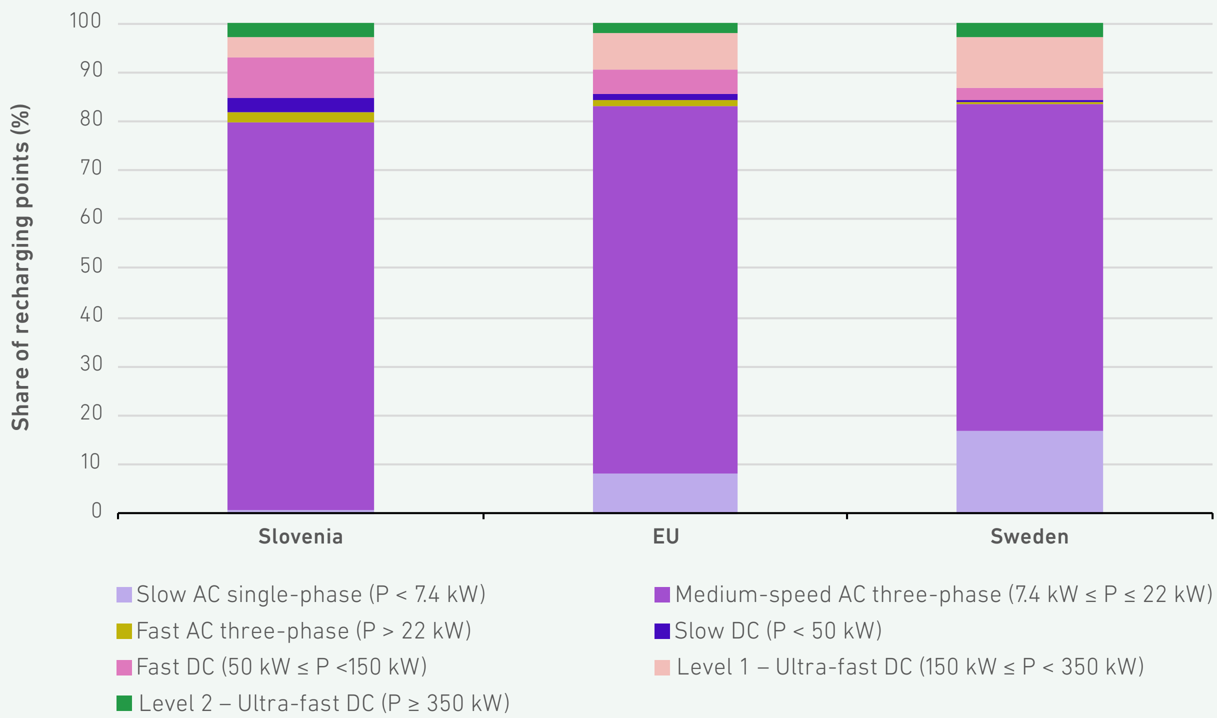
SOURCE: EAFO

127 For example, a 22 kW recharging session allows an electric vehicle with an average consumption of 14.5 kWh per 100 km to recharge for a 100 km range in approximately 40 minutes at maximum charging power. At higher charging power, the charging time is proportionally shorter.

128 A »normal recharging point« is a recharging point capable of transferring electricity to an electric vehicle at a power level less than or equal to 22 kW, except for devices with a power level less than or equal to 3.7 kW installed in private households or devices not initially intended for charging electric vehicles and not accessible to the public (Act on Alternative Fuels Infrastructure and the Promotion of the Transition to Alternative Fuels in Transport (ZIAG), Official Gazette of the Republic of Slovenia, No. 62/23).

129 »High-power recharging point« means a recharging point with a power output of more than 22 kW for the transfer of electricity to an electric vehicle. (ZIAG)

FIGURE 165: STRUCTURE[111] OF THE NUMBER OF RECHARGING POINTS FOR ELECTRIC VEHICLES IN VARIOUS COUNTRIES BY MAXIMUM CHARGING POWER (P)



SOURCE: EAFO

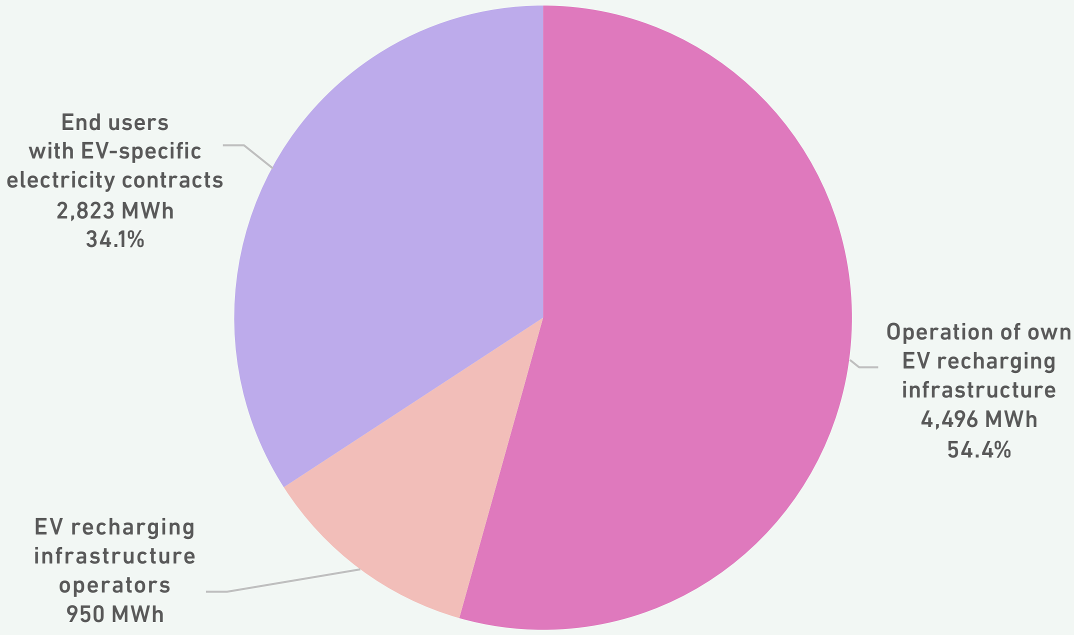
A comparison of the above-mentioned data with the sectoral strategy and related documents[130] indicates a slower uptake of electromobility than foreseen under the sectoral approach, both in terms of the deployment of electric vehicles and of the associated recharging infrastructure, which is expected to evolve in line with the growth in the use of electric vehicles.

A 188.8% increase in the supply of electricity associated with retail electromobility products

In the field of electricity supply specifically for electromobility purposes, seven suppliers were active in 2024. These either operated their own recharging infrastructure, supplied electricity to charging infrastructure operators, or concluded energy supply contracts with end-users for whom ownership or use of an electric vehicle constituted a condition for entering into such a contract. According to the suppliers' data, a total of approximately 8.03 GWh of electricity was supplied for electromobility needs, representing an increase of 188.8% compared with the previous year. The distribution is shown in Figure 166. Of this, suppliers delivered 2.82 GWh, corresponding to 35.2%, to final customers under electricity supply contracts tailored explicitly to energy consumption linked to the use of electric vehicles.

130 Market Development Strategy for the Establishment of Adequate Alternative Fuel Infrastructure in the Transport Sector in the Republic of Slovenia of (12 October 2017), Action plan for alternative fuels in transport for 2022 and 2023 (23 December 2021), Report on the implementation of the Action plan for alternative fuels in transport in 2023 (22 April 2024), Review of the Situation and Activities in the Field of Alternative Fuels in Transport in 2024 (February 2025)

FIGURE 166: STRUCTURE OF ELECTRICITY SUPPLY FOR ELECTRIC MOBILITY PURPOSES



SOURCES: SUPPLIERS

Recharging of electric vehicles requires relatively high power, which can significantly reshape electricity consumption patterns and, if not properly managed, place substantial loads on the power grid. Nevertheless, the batteries of electric vehicles, which provide considerable energy storage capacity, offer a remarkable opportunity for grid management optimization, particularly due to the long periods when vehicles remain parked.

Energy Agency and ELES carried out an analysis of the state of play and opportunities in the field of bidirectional charging (V2G)

Bidirectional charging of electric vehicles is currently one of the untapped opportunities of the green transition. Compared to smart charging, the main distinction lies in the fact that with bidirectional charging, electricity can also flow from the vehicle battery back to the grid (Vehicle-to-Grid, V2G), a building (Vehicle-to-Building, V2B), a home (Vehicle-to-Home, V2H), or directly to a load (Vehicle-to-Load).

Under the fourth paragraph of Article 15 of Regulation (EU) 2023/1804, the Energy Agency carried out in 2024 assessments of the potential contribution of bidirectional charging to reducing costs for users and for the electricity system, as well as of the related increase in the share of renewable energy in the system.

In addition to this task set out in the Regulation, the Act on Alternative Fuels Infrastructure and the Promotion of the Transition to Alternative Fuels in Transport stipulates in the second paragraph of Article 6 an evaluation of the potential for establishing and operating digitally connected recharging points. Such points would enable users of electric vehicles not only to contribute to demand-side response but also to the provision of flexibility services for the electricity system as a whole.

To ensure a comprehensive treatment of these closely interrelated topics, the Energy Agency, in cooperation with ELES, conducted an analysis of the current situation and opportunities regarding the deployment of electric vehicles, focusing on Vehicle-to-Grid (V2G) technology and related issues. This analysis also included a survey of Charge Point Operators (CPOs) and electric vehicle dealers and importers.[131] Based on the information collected on the availability of vehicles with bidirectional charging functionality and the state of the infrastructure for bidirectional charging, the interest of various stakeholders and users in applying V2G solutions was assessed. Not all aspects foreseen by the legislation could be covered at this stage, given the unavailability or very limited diffusion of V2G technology in Slovenia. Consequently, a reliable quantitative assessment of impacts has not yet been feasible[132]. The complete analysis of the state of electromobility and V2G has been published on

131 Only 15 out of more than 130 companies responded to the questionnaire
132 These constraints have also been identified by other national regulators, as can be seen in the work of the CEER WG DS

the Energy Agency's website[133]. At the same time, the following section presents only a short excerpt of some of the most relevant findings.

The limited response from survey participants indicates that Slovenia shows potential for the introduction of V2G, but measures are needed to move from the theoretical framework to practical implementation. The actual deployment of V2G technology in Slovenia is currently extremely low (limited to demonstration projects). CPOs do not use the existing bidirectional recharging stations for V2G operation. Most vehicles do not support V2G. Only a very small share of dealers or importers offer vehicles with V2G capability. Despite the low current use, V2G technology is recognized as an important opportunity. Respondents highlighted its potential contribution to the stability of the power system and the use of EV batteries as storage units, for example, for temporarily storing surplus renewable energy. They also pointed to a number of barriers to V2G adoption, including limited technology availability, the cost of charging infrastructure and vehicles that support V2G, the lack of regulatory frameworks, uncertain economic viability, and other obstacles. Regarding the future of bidirectional charging, most respondents expressed the view that the technology will primarily develop in the form of niche or specialized solutions.

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 in 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 under 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 the consumers do not feel the consequences of a disturbance, which is eliminated without jeopardising the system's integrity.

The required level of security of the 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. The TSO has already determined the value of the VOLL in 2018, and in 2022, in cooperation with external institutions, they calculated the cost of new entry for generation or the adjustment of consumption and the reliability standard. The calculation shows that the LOLE reliability standard for Slovenia is 0 hours/year, mainly due to the excellent interconnection of the Slovenian electricity system with those of the neighbouring countries. At the end of 2024, the TSO, in line with the legislative requirements for the periodic updating of reliability indicators, prepared a new assessment of the Value of Lost Load. According to the damage cost assessment method, the value amounts to 17,233 EUR/MWh while according to the willingness-to-pay method, it stands at 633 EUR/MWh.

At the EU level, under the provisions of Regulation (EU) 2019/943, the European Resource Adequacy Assessment (ERAA) is conducted regularly. It is based on state-of-the-art methodologies and probabilistic evaluations, and its results provide policymakers with appropriate signals regarding resource adequacy and the needs related to ensuring the security and reliability of electricity system operation. ERAA also serves as an essential tool in support of strategic decision-making, such as the introduction of capacity mechanisms. The most recent European resource adequacy assessment, prepared by ENTSO-E in 2024, indicates, in the scenarios considered for the years beyond 2025, an increased risk to the adequacy of electricity generation, primarily due to the economic non-viability of fossil-fuel-based generation. The reliability standard assessment for Slovenia rises, under one scenario, to 0.2 h/year by 2028, and under another scenario to as much as 2.9 h/year by 2035.

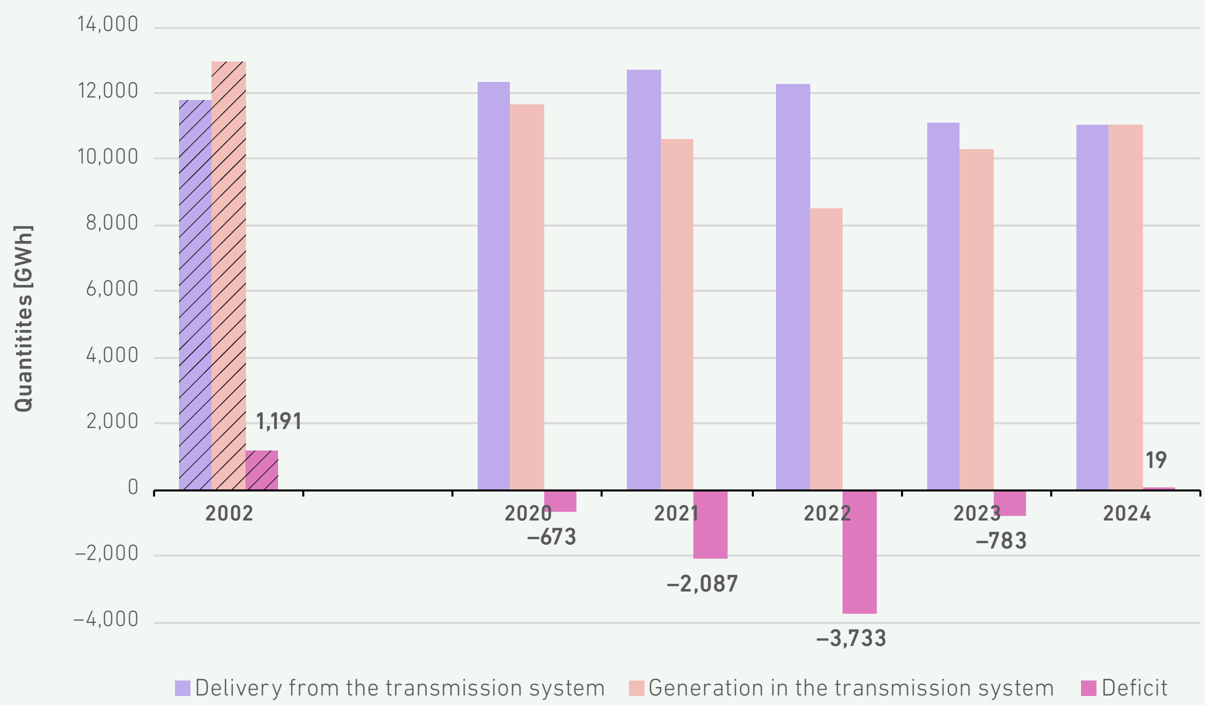
133 https://www.agen-rs.si/documents/10926/37376/AnalizaStanjaInPrilo%C5%BEnosti_V2G_VFinal.pdf/754318da-f361-49f6-9138-99fb0580854e

Monitoring the Balance Between Generation and Consumption

The electricity consumption from the transmission system decreases by 0.5% in 2024 compared to the previous year. Taking into account half of the nuclear generation, the electricity generation on the transmission system is 7.3% higher in 2024 compared with the year earlier, due to higher generation from all power plants, with 14.3% higher generation from thermal power plants, 4.9% higher generation from hydropower plants and 4.1% higher generation from nuclear power plants. For the first time since 2002, domestic electricity generation on the transmission system was higher than the transmission system's electricity off-take, excluding losses.

In 2024, the highest level of electricity consumption coverage from domestic sources recorded since 2002

FIGURE 167: ELECTRICITY CONSUMPTION AND GENERATION IN THE SLOVENIAN TRANSMISSION SYSTEM WITHOUT TAKING INTO ACCOUNT LOSSES IN THE 2020–2024 PERIOD AND COMPARISON WITH 2002



SOURCE: ELES

Monitoring Investment in Generation Capacities to Ensure a Reliable Supply

All scenarios up to 2032 show a shortfall in domestic generation to cover the consumption of electricity from the transmission system

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. 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.

To develop the forecast of the coverage of the consumption of electricity from the transmission system, the TSO obtained data from the producers on planned new production units and shutdowns of existing production units and divided them into four scenarios according to the likelihood of their implementation. Scenario 1 is the most pessimistic, only taking into account 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 due to siting problems, and scenario 3 is very ambitious and in addition to the construction of hydropower plants on the Sava river, also envisages considerable investments in wind farms and solar power plants in the transmission system. Scenario 4 is as ambitious as scenario 3, except that it provides for certain hydropower plants and the second unit of the Krško NPP to be built beyond the ten-year development period. None of the scenarios foresee any HPP being constructed on the Mura River by 2032, and the construction of other hydropower facilities is also highly uncertain due to siting problems and opposition from environmentalists.

TABLE 34: CHANGES TO THE GENERATION FACILITIES IN THE TRANSMISSION SYSTEM BY 2032

	Installed capacity [MW]	Expected year of change	Scenario
Hydropower plants			
HPPs on the Drava			
Kozjak PSHPP	420	2031	4
HPPs on the Sava River			
Mokrice	28	2025	1, 2, 3, 4
Suhadol	44	2030	3
Trbovlje	36	2032	3
Thermal power plants			
Šoštanj TPP			
TEŠ Block V	–305	2028	
Šoštanj TPP PT 51	–42	2028	
Šoštanj TPP PT 52	–42	2028	
TEŠ PPE1	151	2028	
Brestanica TPP			
PB 1	–23	2026	
PB 2	–23	2026	
PB 3	–23	2026	
TPP TOL			
Unit III, coal	–45	2032	

SOURCE: ELES

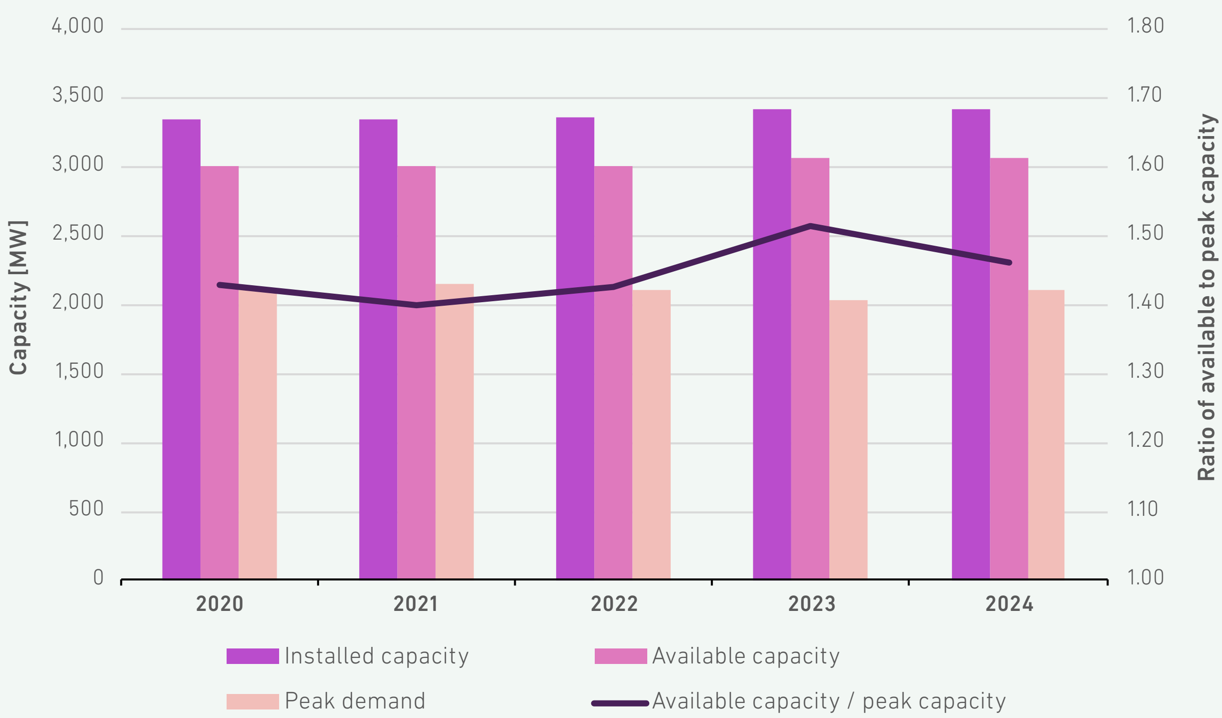
Inadequate market signals and environmental acceptability severely hamper investments in new conventional generation sources. On the other hand, mainly due to the opposition of local communities, there is also a high level of uncertainty in the forecast for the construction of alternative sources, notably larger wind and solar farms. The timelines for the implementation of the investments in generation capacity shown in Table 34 are highly questionable, as they are based on the data from the previous development plan of the TSO for the period 2023–2032. Among the more significant changes in the meantime, the planned shutdown of CHP Unit VI in 2033 and the delay of the construction of the Mokrice HPP due to the administrative procedures for granting the construction permit stand out.

Measures to Cover Peak Demand and Shortages of Electricity

One of the indicators providing information on the sufficiency of production sources is the ratio between the installed or available capacity of production sources and peak load. 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. In 2024, the ratio between the capacity available and the peak load in the transmission system has slightly deteriorated compared to the previous year, mainly due to a somewhat higher peak load of consumption with practically unchanged installed or available power of the generating units. Although the actual availability of production units depends on weather conditions for RES, and market signals for thermal power plants, the supply of electricity to final consumers in 2024 was not compromised, as the Slovenian electricity system is well connected to neighbouring countries through cross-border interconnections, and there was sufficient electricity available on the market.

The excellent cross-border interconnection allows for the import of electricity shortages

FIGURE 168: 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 2020–2024 PERIOD



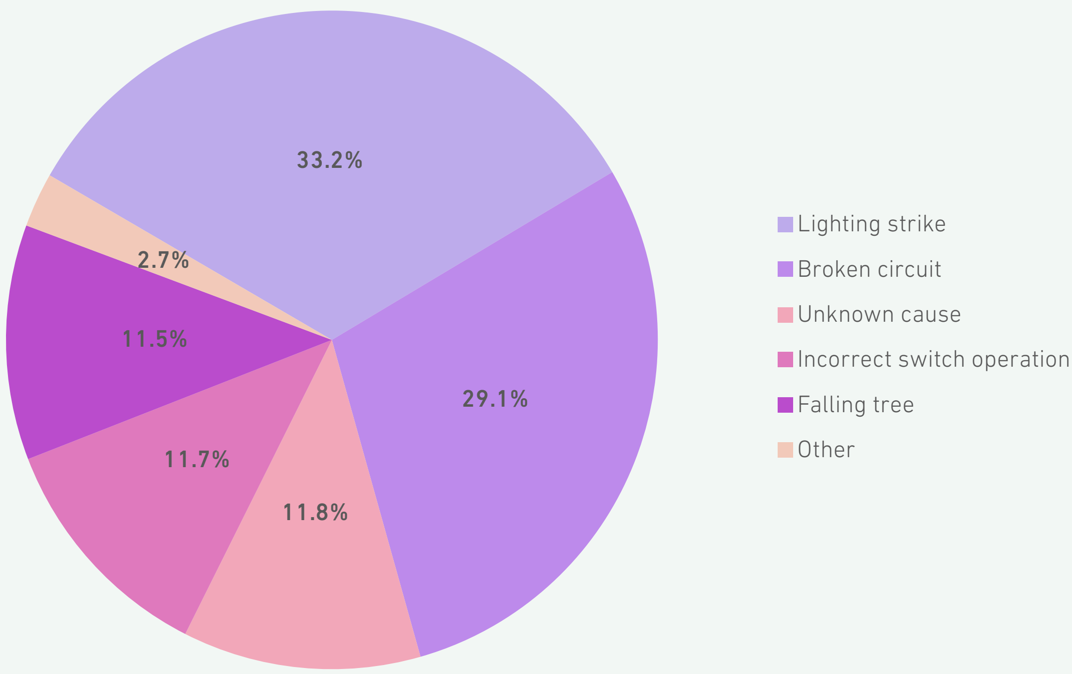
SOURCE: ELES

Extreme weather events or grid-related incidents can result in power interruptions. Undelivered energy refers to the electricity that could have been supplied by the system had the power outage not occurred.

Following three consecutive years of a sharp increase in non-dispatched energy – from 10.3 MWh in 2021 to 220.8 MWh in 2023 – the year 2024 recorded only 7.45 MWh of non-dispatched electricity. The largest share of undelivered energy was attributable to the outage of the 110 kV Murska Sobota–Mačkovci transmission line due to a lightning strike (2.47 MWh), followed by an outage caused by a broken current arc on the Dravograd–Železarna Ravne line (2.17 MWh), and an outage resulting from a tree fall on the 110 kV Metlika–Črnomelj line (0.86 MWh). The remaining undelivered energy stemmed from several minor interruptions caused by switching manipulation errors, storms, storm surges, and one event of unknown origin.

The calculation of energy not supplied is carried out in accordance with the Act on the Rules for Monitoring the Quality of Electricity Supply. Accordingly, the actual amount of undelivered energy may be lower than indicated, since a significant share of customers in the affected areas may be supplied via the medium-voltage network.

FIGURE 169: ELECTRICITY NOT SUPPLIED FROM THE TRANSMISSION SYSTEM IN 2024 ACCORDING TO CAUSE



SOURCE: ELES

GAS

The cleanest fossil fuel

11%
LESS GAS TRANSPORTED

90%
LESS GAS TRANSPORTED TO OTHER TRANSMISSION SYSTEMS

SLOVENIA HAS LOST ITS ROLE AS A TRANSIT COUNTRY FOR GAS

1,078
FEWER CONSUMERS ON DISTRIBUTION SYSTEMS THAN IN 2023

7.7%
HIGHER CONSUMPTION
BY DOMESTIC GAS CONSUMERS THAN IN 2023

AVERAGE CONSUMPTION OF HOUSEHOLD CONSUMERS ALMOST THE SAME AS IN THE PREVIOUS YEAR

SIGNIFICANTLY DECREASED INVESTMENT IN TRANSMISSION AND DISTRIBUTION SYSTEMS COMPARED TO THE PREVIOUS YEAR:

44%
LESS INVESTMENT IN TRANSMISSION SYSTEMS

53%
FEWER NEW GAS DISTRIBUTION PIPELINES

30%
LESS INVESTMENT IN DISTRIBUTION SYSTEMS

37% decline
IN CONNECTIONS TO DISTRIBUTION SYSTEMS COMPARED TO 2023

SHARE OF LONG-TERM CONTRACTS DOWN

TO JUST **9%** – LOWEST EVER

95% FROM AUSTRIA, AGAIN, 95% OF ALL IMPORTED GAS

TWO-THIRDS MORE GAS SOLD ON THE FREE MARKET

18% LESS GAS SOLD ON THE TRADING PLATFORM, NUMBER OF TRANSACTIONS DOWN 15%

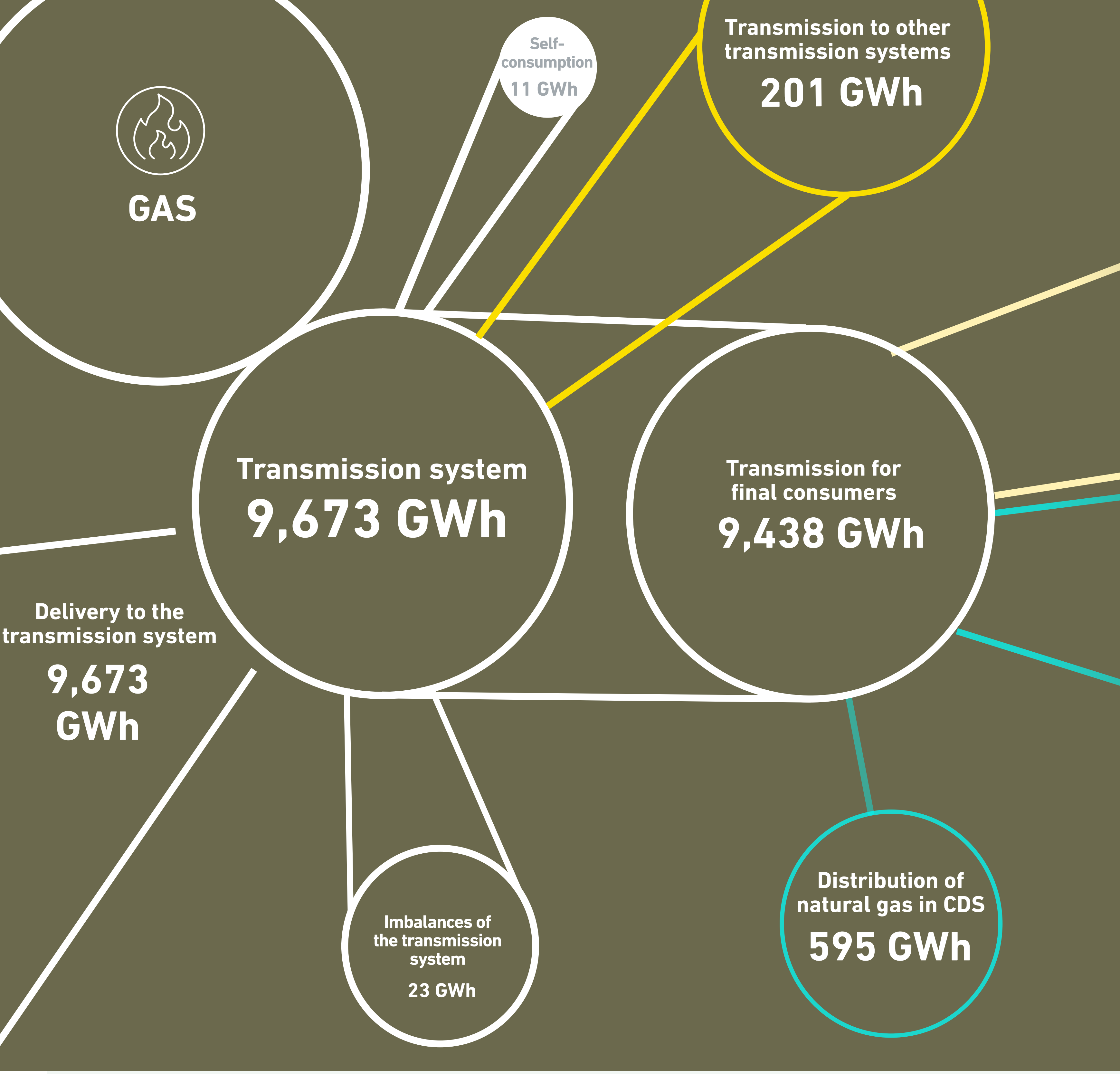
FALLING GAS PRICES FOR ALL CONSUMER GROUPS

GAS PRICES FOR HOUSEHOLD CONSUMERS LOWER BY MORE THAN 10% – 20% LOWER THAN THE EU AVERAGE

GAS PRICES FOR BUSINESS CONSUMERS LOWER BY 12.6% TO 22.4%

LOWEST NUMBER OF SUPPLIER SWITCHES SINCE 2012 – **only 1.5%** OF ALL CUSTOMERS SWITCHED SUPPLIERS

THE RETAIL GAS MARKET WILL REMAIN HIGHLY CONCENTRATED IN 2024



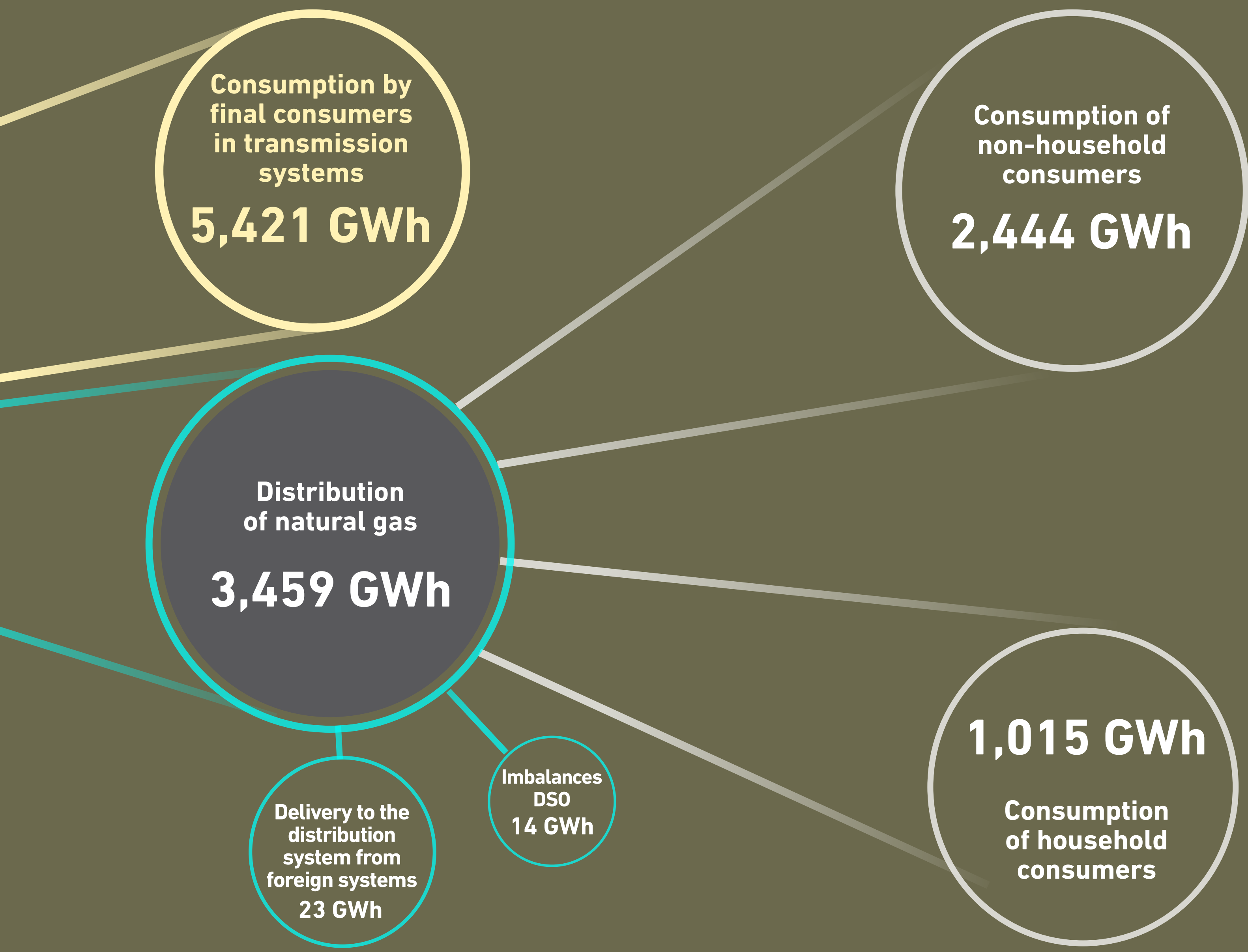
GAS

Supply of and Demand for Gas

In 2024, 9,673 GWh of gas[134] were transported through the system, a decrease of almost 11% compared to the previous year. The decrease in total volumes transported is due to lower volumes transported to neighbouring transmission systems, while the volumes transported to meet the

134 For the purposes of this document, the term »gas« shall be understood as an umbrella term referring to any gaseous energy commodity transported through a transmission or distribution system, including mixtures of gases of renewable and/or fossil origin, with methane constituting the predominant component.

FIGURE 170: BASIC DATA ON THE QUANTITIES OF NATURAL GAS TRANSFERRED, DISTRIBUTED AND CONSUMED [GWh]



SOURCE: ENERGY AGENCY

needs of domestic business consumers increased. 9,438 GWh or 7.6% more than in the previous year were transferred to serve domestic consumers, while only 201 GWh were transferred to other transmission systems, which is 90% less than in the last year and 96% less than in 2022. This is the lowest volume since the start of gas transmission data monitoring. The volume of transmission to other transmission systems is down 97% compared to the annual average of the previous decade.

The difference of 34 GWh between quantities taken and handed over is due to system differences and self-consumption of the transmission system.

11% less gas transported due to decreased transmission to other transmission systems

90% less gas transported to other transmission systems

The total consumption of domestic gas consumers amounted to 9,475 GWh, 675 GWh or 7.7% higher than the year before. Gas consumption in 2024 was 16% above consumption in 2014.

7.7% higher consumption by domestic gas consumers than in 2023

Consumption by household consumers decreased by 1.3%. Consumption on closed distribution systems (CDS) was 8.8% higher, while consumption by consumers on the transmission system was 11% higher than in 2023. Consumption by non-household consumers on distribution systems was also higher, consuming 4.3% more gas than in the previous year. Data on gas transmission and consumption by type of consumer from 2020 to 2024 can be seen in Table 135.

TABLE 35: TOTAL TRANSFERRED QUANTITIES OF GAS AND CONSUMPTION BY NATURAL GAS CONSUMERS ACCORDING TO THE TYPE OF CONSUMPTION DURING THE 2020–2024 PERIOD

Total consumption of gas	2020	2021	2022	2023	2024
Delivery to the transmission system [GWh]	16,783	12,015	13,527	10,835	9,673
Transmission to other transmission systems [GWh]	7,137	1,829	4,484	2,028	201
Consumption by business consumers in the transmission system [GWh]	5,382	5,527	4,868	4,884	5,421
Consumption by business consumers in CDSs [GWh]	581	650	622	547	595
Consumption by business consumers in the distribution systems [GWh]	2,446	2,673	2,329	2,341	2,444
Consumption by household consumers [GWh]	1,175	1,313	1,193	1,028	1,015

SOURCE: ENERGY AGENCY

The total number of active delivery points has decreased for the third consecutive year. There were 1,078 fewer active delivery points on the distribution and closed distribution systems at the end of the year, and two fewer on the transmission system. The total number of active consumers fell by 0.8%, compared with 1% a year earlier. The fall in the total number of active consumers is probably due to the number of disconnections because of still relatively high gas prices for most consumers, as well as the energy policy objectives of phasing out fossil energy sources, which has encouraged individual consumers to look for alternative sources of supply.

At the end of 2024, 133,192 final consumers were connected to the gas transmission, distribution and closed distribution systems. Gas distribution activities were carried out by 12 DSOs and five CDSs.

TABLE 36: NUMBER OF CONSUMERS ACCORDING TO CONSUMPTION TYPE IN 2023 AND 2024

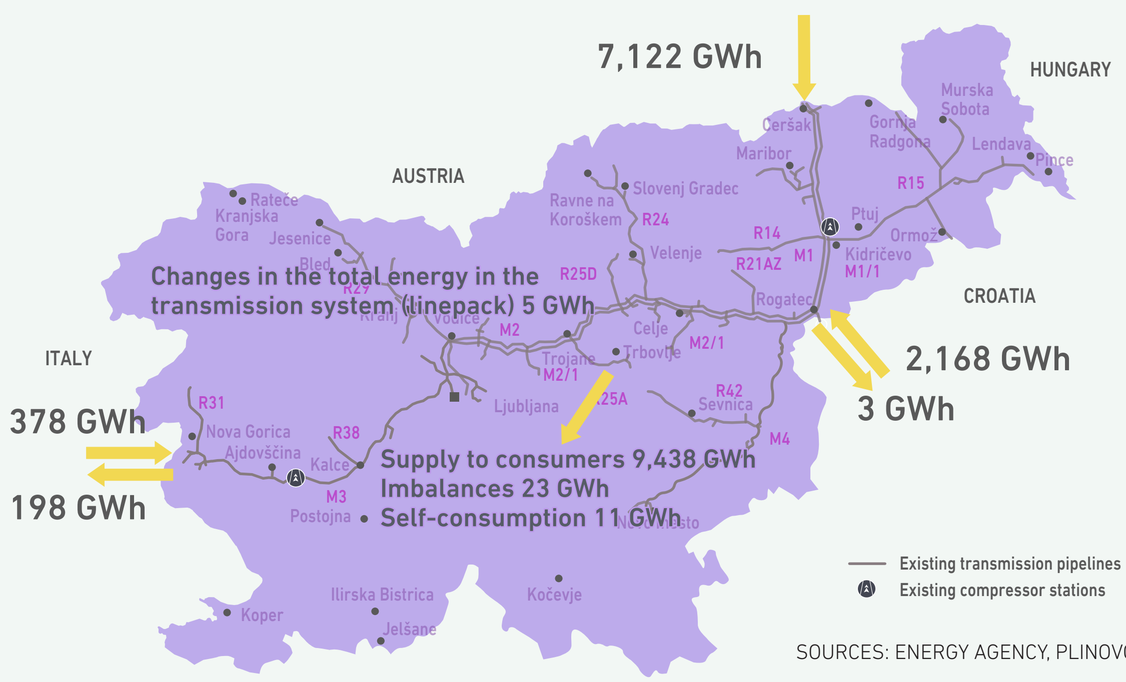
Number of consumers according to consumption type	**2023**	**2024**	**Index**
Business consumers connected to the transmission system	155	153	98.71
Business consumers connected to the distribution systems	14,296	14,110	98.70
Business consumers in CDSs	50	50	100.00
Household consumers	119,771	118,879	99.26
Total	**134,272**	**133,192**	99.20

SOURCE: ENERGY AGENCY

Transmission of Gas

The transmission system is owned and operated by the transmission system operator, Plinovodi. It consists of 1197 kilometres of pipelines, including 989 kilometres of high-pressure pipelines with a nominal pressure above 16 bar and 208 kilometres with a nominal pressure below 16 bar. The transmission network also consists of 213 metering and regulating stations (MRP), 46 metering stations (MP), eight reduction stations and compressor stations in Kidričevo and Ajdovščina. There are no gas storage facilities in Slovenia. 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 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 of gas on the wholesale market takes place at a virtual point. No natural gas, biomethane or synthetic methane production sources were connected to the transmission system in 2024. No hydrogen has been added to the transmission system.

FIGURE 171: GAS TRANSMISSION SYSTEM AND TRANSFERRED QUANTITIES OF GAS AT THE ENTRY AND EXIT POINTS IN 2024



SOURCES: ENERGY AGENCY, PLINOVODI

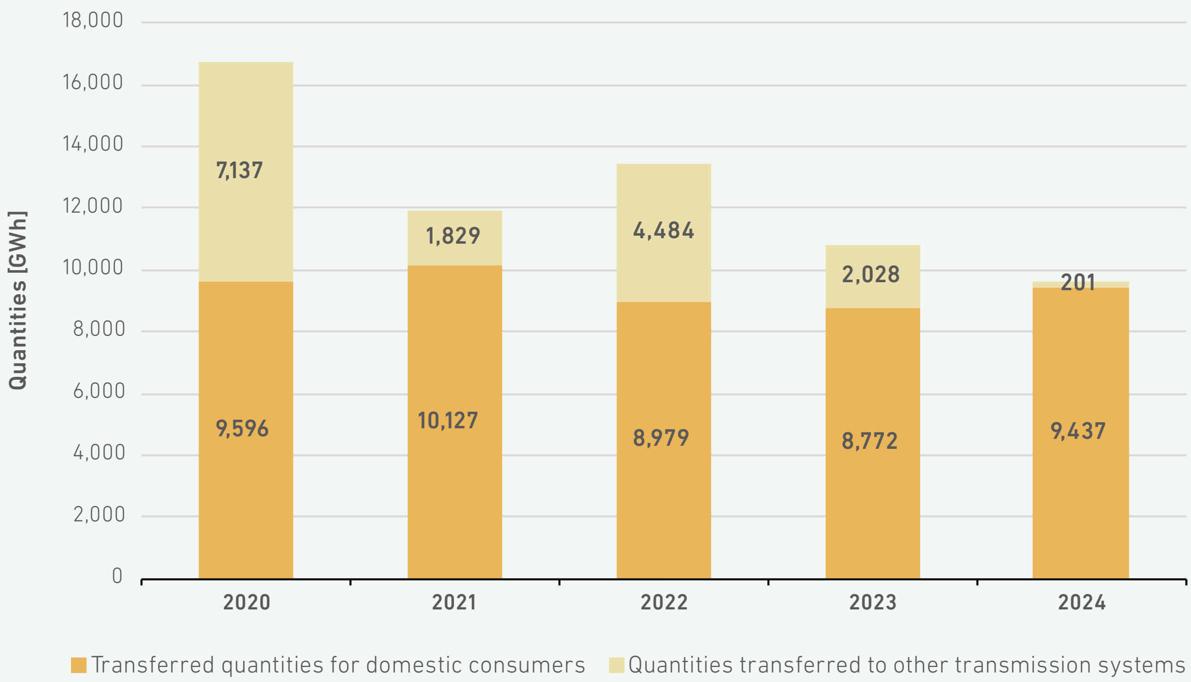
In 2024, gas consumption by Slovenian consumers was 7.6% higher than the previous year. Gas consumption of Slovenian consumers has fluctuated over the last five years. However, the volumes of gas transferred to other transmission systems were ten times lower in the last year than in the previous year. Figure 173 shows gas consumption by Slovenian consumers and volumes transferred to other transmission systems over the period since 2006. The long-term trend in gas consumption by Slovenian consumers is expectedly to be negative (due to decarbonisation policies, improved energy efficiency and energy switching). However, the trend in gas volumes transferred to other transmission systems is significantly more negative. Slovenia has thus lost its role as a country with a large share of gas transit over the last

High volatility in the gas consumption of Slovenian consumers in recent years

Slovenia lost its role as a transit country for gas

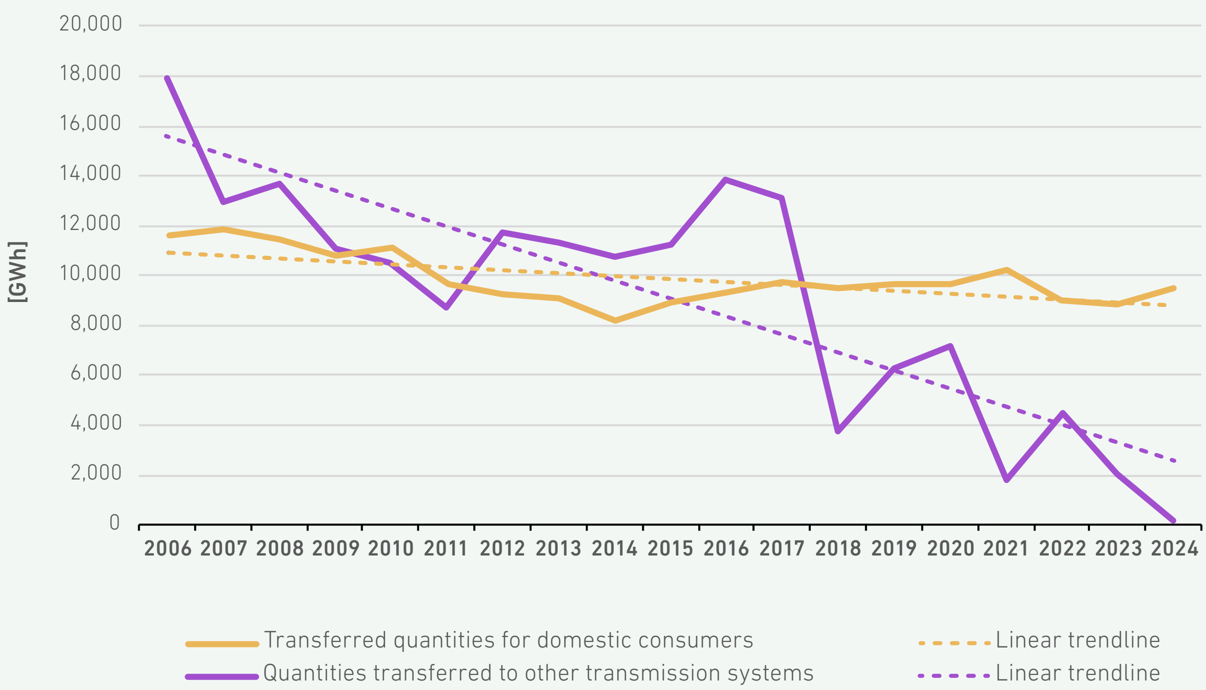
twenty years. The main reason for this is the significant reduction in gas transmission to Croatia, since with the construction of the LNG terminal at Krk, Croatia no longer needs gas from the Austrian gas hub. The overall decrease in gas consumption and the changed gas flows in the region are also the reason for lower gas transmission to neighbouring transmission systems.

FIGURE 172: QUANTITIES OF NATURAL GAS TRANSFERRED IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

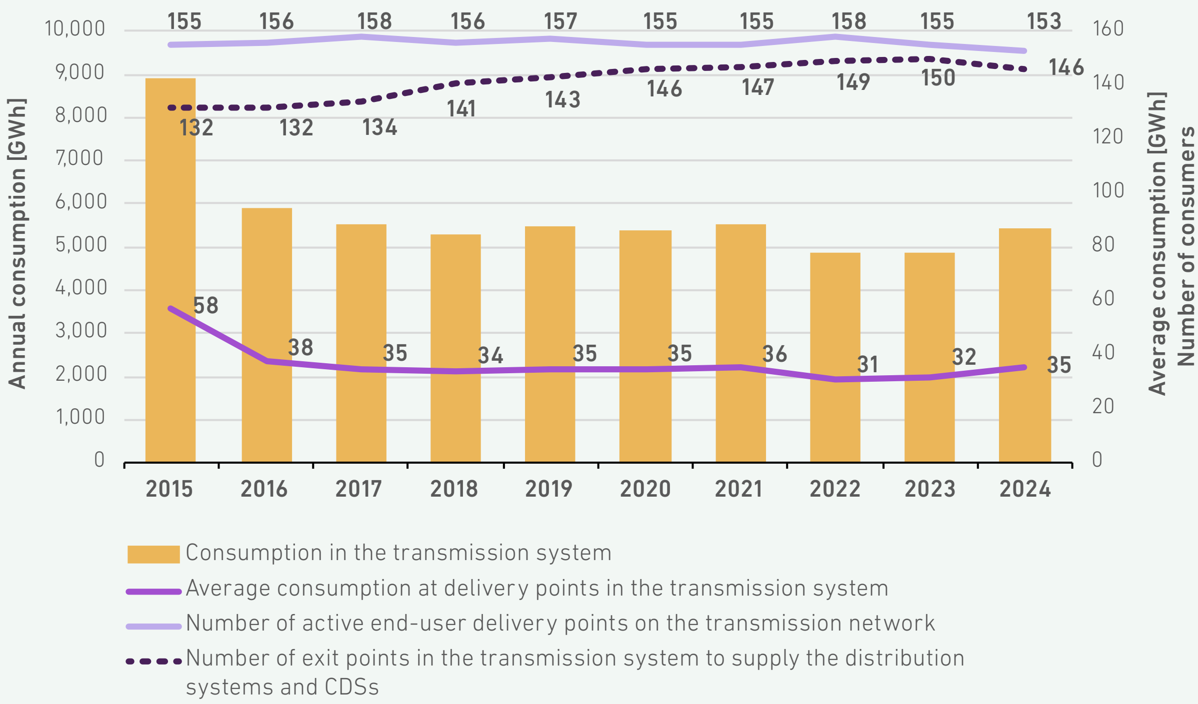
FIGURE 173: TREND OF GAS CONSUMPTION BY SLOVENIAN CONSUMERS AND VOLUMES OF GAS TRANSMITTED TO OTHER TRANSMISSION SYSTEMS OVER A LONGER TIME PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The number of final consumers decreased by two and amounted to 153.

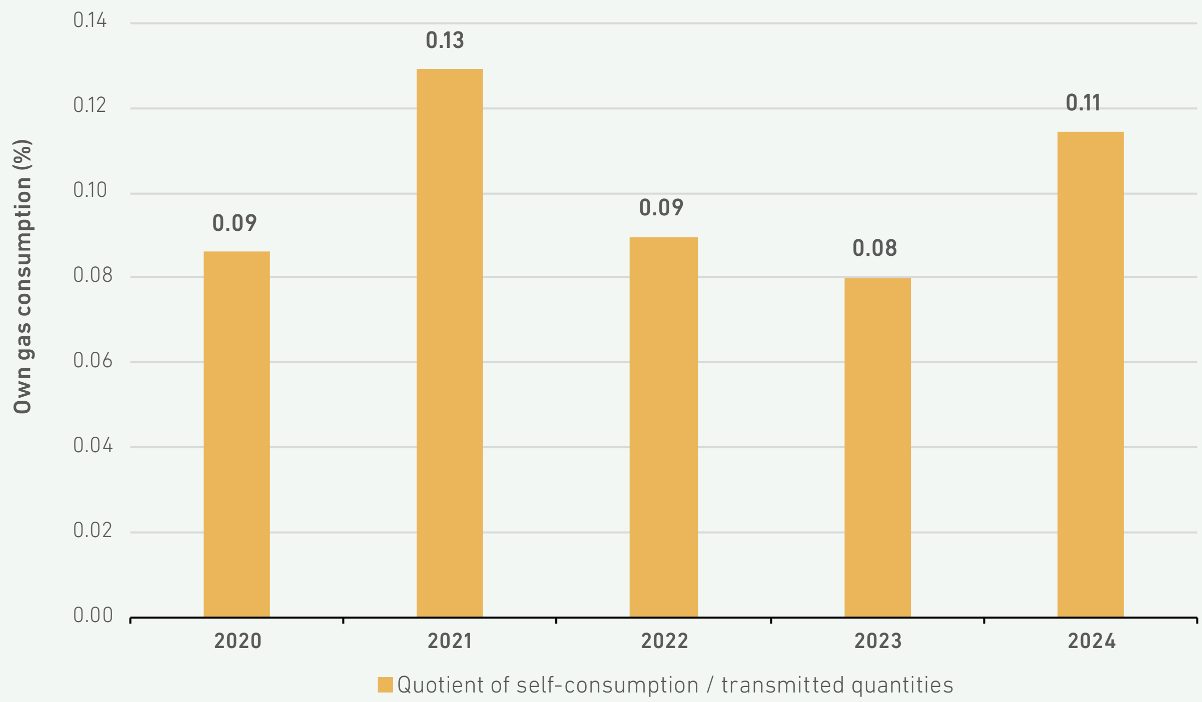
FIGURE 174: TOTAL AND AVERAGE CONSUMPTION PER CONSUMER'S DELIVERY POINT IN THE TRANSMISSION SYSTEM AND NUMBERS OF FINAL CONSUMERS', DISTRIBUTION SYSTEM OPERATORS' AND CLOSED DISTRIBUTION SYSTEM OPERATORS' DELIVERY POINTS IN THE NATURAL GAS TRANSMISSION SYSTEM IN THE 2015–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

Own use of natural gas, required for the operation of compressors and gas heating at metering and regulating stations, amounted to 11.1 GWh, representing an increase of 27.3% compared to the previous year. The specific own consumption of gas also rose; it is defined as the ratio between the quantity of gas used for own consumption and the amount of gas transmitted at the cross-border entry points.

FIGURE 175: SELF-CONSUMPTION, CALCULATED BASED ON TRANSFERRED GAS QUANTITIES IN THE 2020–2024 PERIOD

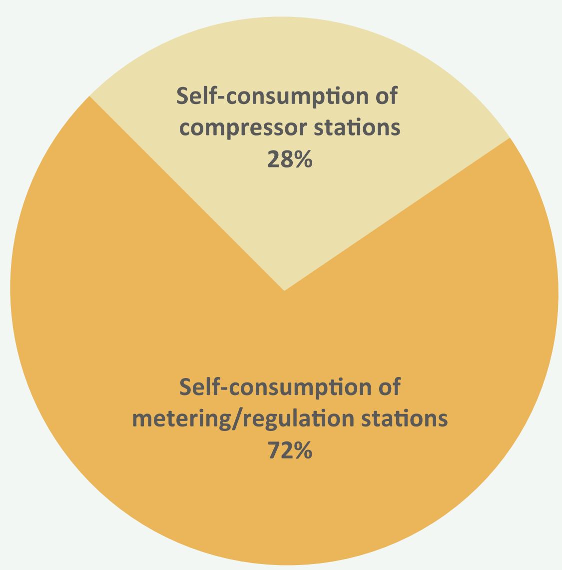


SOURCES: ENERGY AGENCY, PLINOVODI

The compressor stations consumed 28% of the gas for their use, and the remaining gas was consumed at the metering and control stations. In the previous year, only 4% of the captive gas was used in compressor stations. The higher use of gas in compressor stations is due to the increased and, in particular, more frequent transfer of gas from Slovenia to Italy.

Own use of gas at compressor stations was 9.1 times higher than in the previous year

FIGURE 176: THE RATIO BETWEEN THE SELF-CONSUMPTION OF GAS IN THE COMPRESSOR STATIONS AND IN THE METERING AND REGULATION STATIONS IN 2024



SOURCES: ENERGY AGENCY, PLINOVODI

Distribution of gas

The distribution of 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 business consumers in the CDS areas.

The content and data below, unless explicitly stated to refer to the CDS, describe the distribution areas with an organised optional local service of general economic interest. All distribution and closed distribution system operators have carried out distribution without interruption and have provided a safe and reliable supply to final consumers. In 2024, gas distribution as a local service of general economic interest was provided in 87 municipalities in most of the urban areas of Slovenia, except for Primorska. In 2024, gas distribution was not newly established in any municipality. In 2024, gas distribution as a local service of general economic interest was provided by 12 DSOs. In 2024, gas distribution as a local service of general economic interest was provided by 12 DSOs. In 72 municipalities, this activity is organised through a concession relationship between the concessionaire and the local community, and in 14 local communities, public undertakings carry it out. In one, a local service of general economic interest is carried out as an investment of public capital in the activity of private law entities. In Šenčur and Hrastnik, two distribution system operators performed the local service of general economic interest based on 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 the connection to the transmission system is not yet possible.

Gas distribution as a local service of general economic interest is carried out by 12 distribution system operators in 87 municipalities

FIGURE 177: OVERVIEW OF GAS DISTRIBUTION SYSTEMS BY DELIVERED QUANTITIES

SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

In 2024, DSOs distributed 3,459 GWh of gas, which is 2.7% more than the previous year and 4.2% less than the average for the five years 2019–2023. The decrease in distributed volumes is likely to be due to several factors, including the plans adopted at the EU level to extend the requirement for voluntary reductions in gas consumption by 15%, the still relatively high prices of natural gas supplies, the decrease in the number of customers, and the unseasonably cold weather.

According to the operators' data, household consumption fell by almost 1.3% in 2024, while non-household consumption increased by 4.3% compared to the previous year. The number of household customers decreased by 892 (1%), while the number of non-household customers on the distribution network also decreased by 186 (0.75%). At the end of 2024, 118,879 households and 14,110 non-household consumers were registered.

The most significant decrease in the number of consumers is registered in consumption groups from CDK3 to CDK5, which consume between 5,000 kWh and 50,000 kWh of gas per year. These consumers are, in many cases, also the most flexible when switching to another energy source due to their lower consumption. For larger consumers, switching is in many cases more challenging because of the larger investments involved, which require more sophisticated planning and thus a longer time needed to switch to a competing technology or energy source.

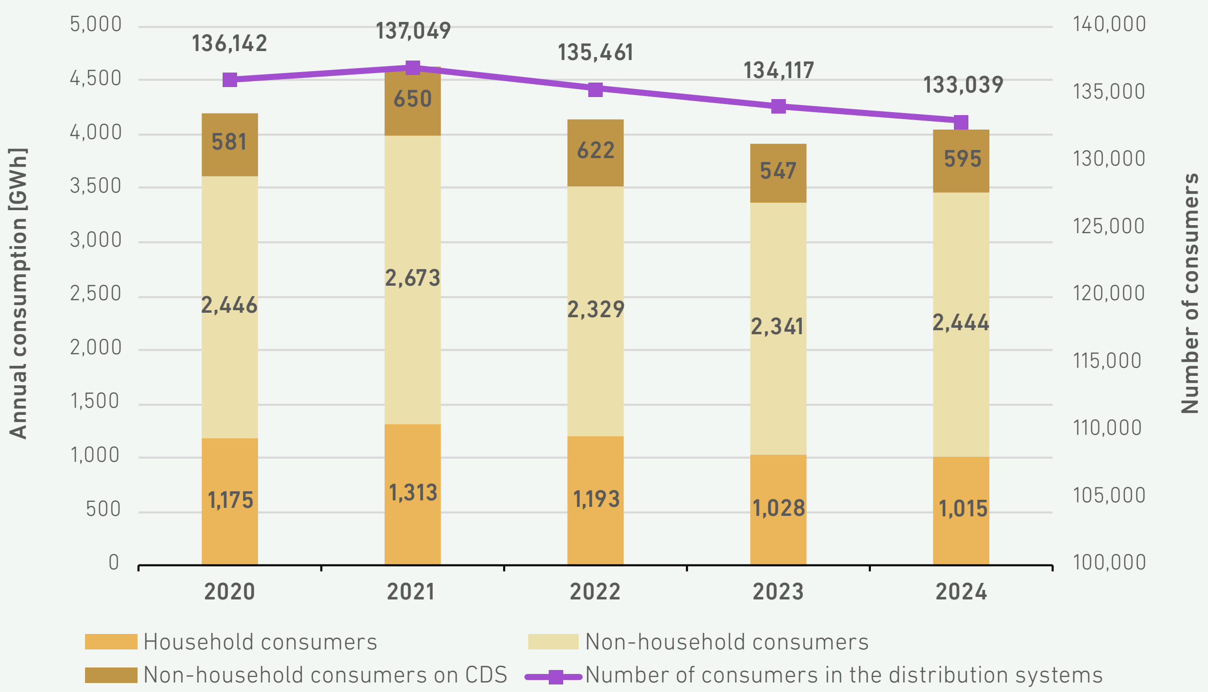
Consumers connected to the distribution network consumed 3,459 GWh of gas, which is 2.7% more than in 2023 and 4.2% below the average of the preceding five years

1,078 fewer consumers on distribution systems than in 2023

In the five CDS areas of Jesenice, Kranj, Kidričevo, Štore and Anhovo, 50 consumers were registered at the end of 2024, the same as the previous year. In these closed distribution areas, gas distribution is not provided as a local service of general economic interest. Access to the CDS is only granted to consumers within the defined geographical area of these systems. The CDS operators distributed 595 GWh of gas in these areas. Compared to 2023, consumption was 8.8% higher.

The consumption of household and non-household consumers on distribution systems and CDSs, and their number by consumption type and system type for the five years, is shown in Figure 178.

FIGURE 178: CONSUMPTION IN THE DISTRIBUTION SYSTEM AND CDSS BY THE TYPE OF CONSUMERS AND THE NUMBER OF ACTIVE CONSUMERS IN THE 2020–2024 PERIOD



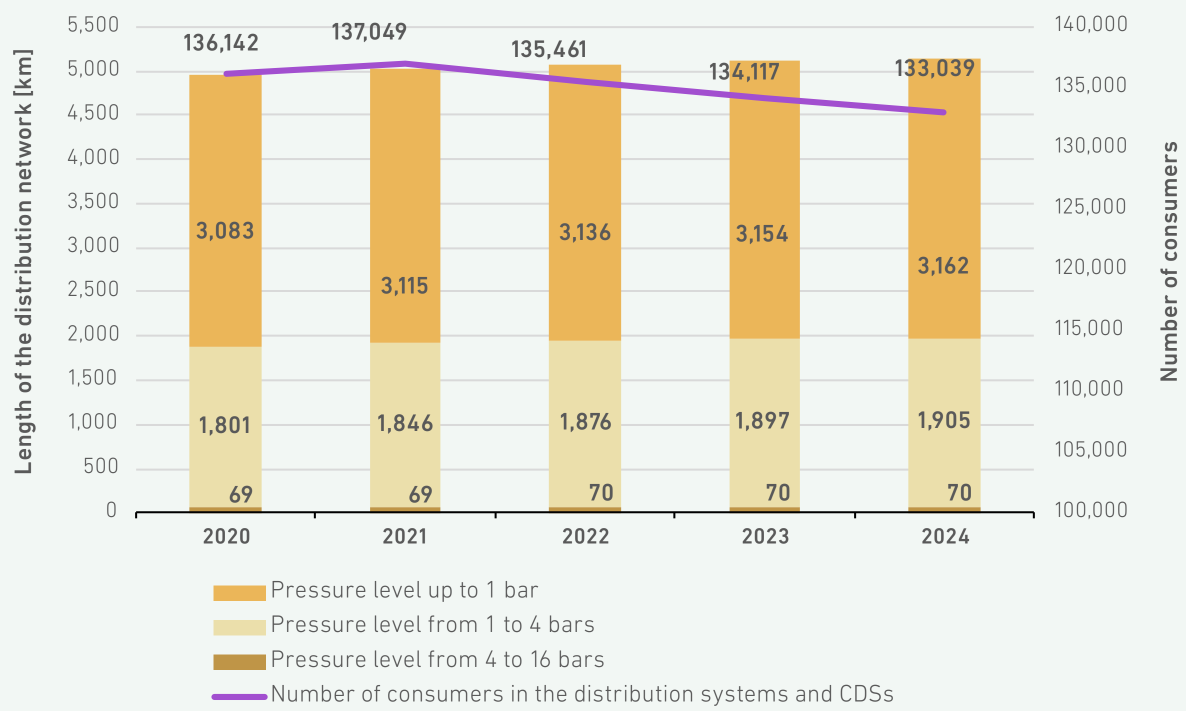
SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

At the end of 2024, the total length of active lines in distribution systems and CDSs was 5,137 kilometres, an increase of 0.3% compared to the previous year. Distribution lines and associated infrastructure are mainly owned by DSOs.

In the five CDS areas, 18.1 kilometres of gas pipelines were registered, including 8.3 kilometres of pipelines with a pressure level of 4 to 16 bar, about 7.6 kilometres with a pressure level of 1 to 4 bar and 2.2 kilometres with a pressure level of up to 1 bar. The distribution network has been extended by 3.7% over five years.

The length breakdown of the distribution system network and the DSO by pressure level, the extension of pipelines including connections and the number of active off-take points in the period 2020–2024 is shown in Figure 179.

FIGURE 179: LENGTH OF THE DISTRIBUTION NETWORKS AND CDSs, AND THE NUMBER OF ACTIVE CONSUMERS IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

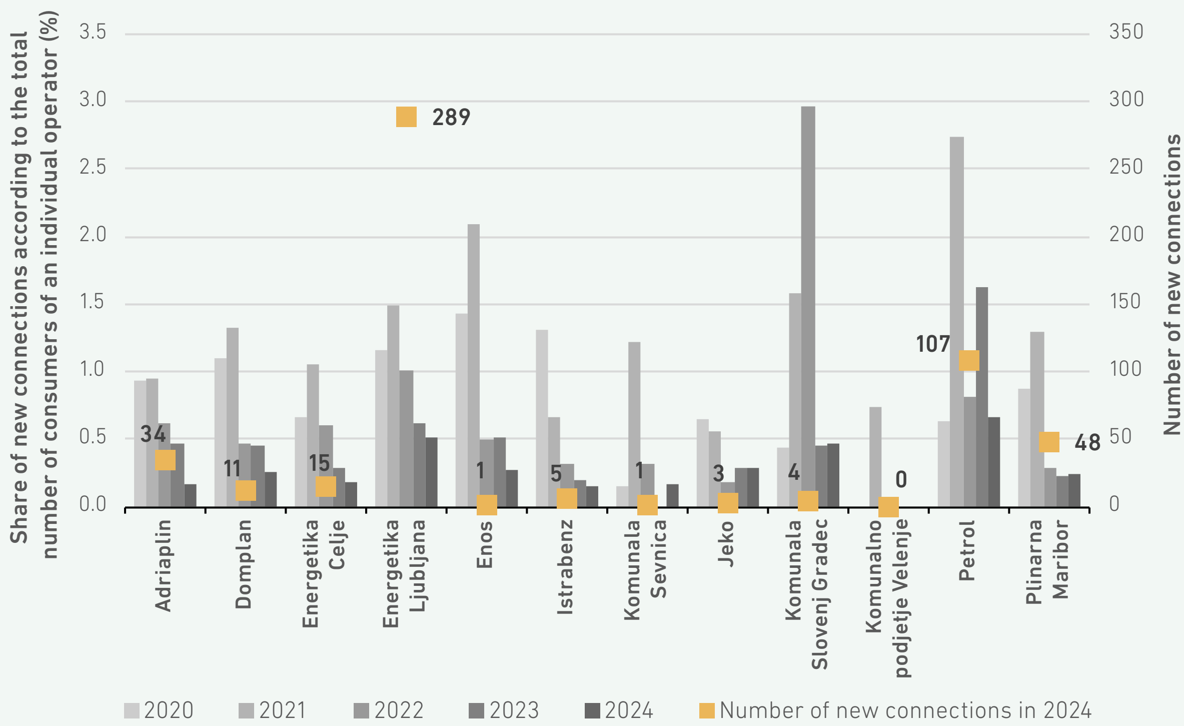
Just under 37% fewer new connections to distribution systems than in 2023

Gas DSOs connected 518 new customers to their distribution networks, the lowest level in the last decade. The number of new connections fell by almost 37% year-on-year, with the third consecutive year of decline. Until 2022, an increase in the number of active consumer connections was recorded. In 2022, for the first time, a significant decrease in the number of customers was recorded, and this trend continued in 2023 and 2024.

The total number of consumers connected to the distribution systems, taking into account new connections and simultaneous disconnections, decreased by 1,078. At the end of 2024, 132,989 final customers were connected to the distribution systems. The data collected shows that 1,596 disconnections from the grid took place in 2024. The number of customers was reduced in 61 local authorities and 62 in 2023.

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 Figure 180. Two new customer connections were made to the CDS in 2024.

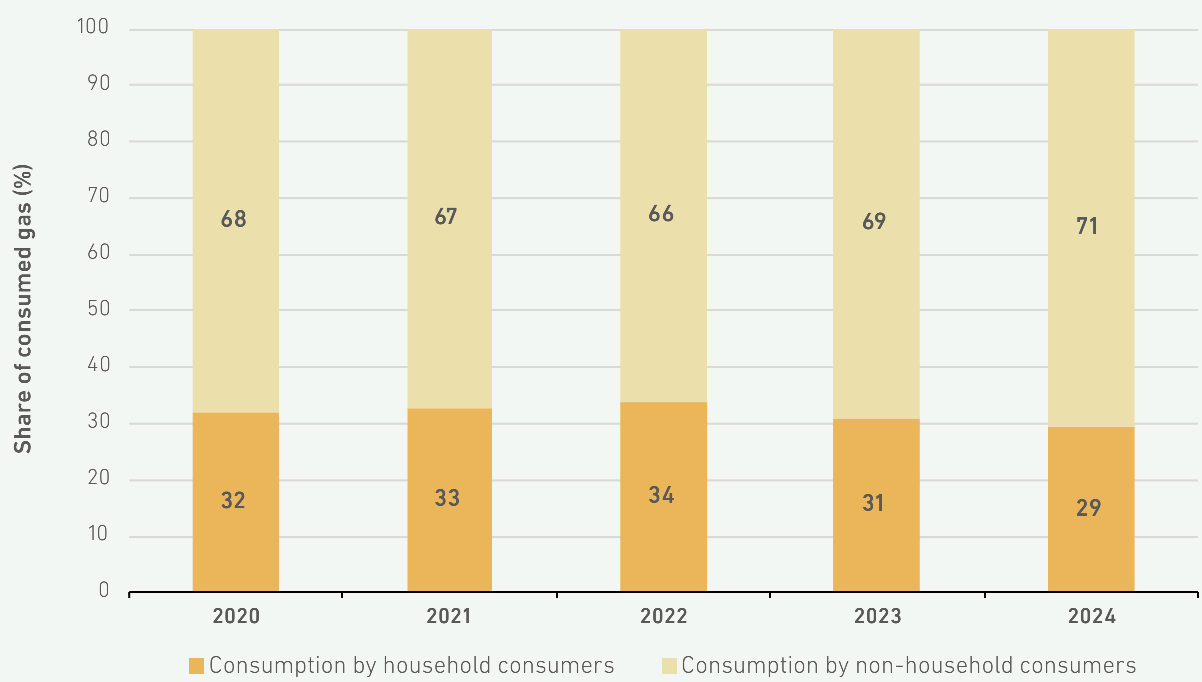
FIGURE 180: SHARE AND NUMBER OF NEW CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

The structure of consumers remains unchanged. In terms of numbers, household consumers accounted for almost 90% of all consumers on the distribution systems. The data on gas volumes distributed in 2024 do not show any significant changes in the share of household and non-household consumers compared to previous years.

FIGURE 181: SHARE OF CONSUMED NATURAL GAS FROM THE DISTRIBUTION SYSTEMS BY HOUSEHOLD AND NON-HOUSEHOLD CONSUMERS IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

In 2024, 92% of all consumers on distribution systems consumed less than 25,000 kWh of gas at the point of consumption, which covers 96% of household and 63% of non-household consumers.

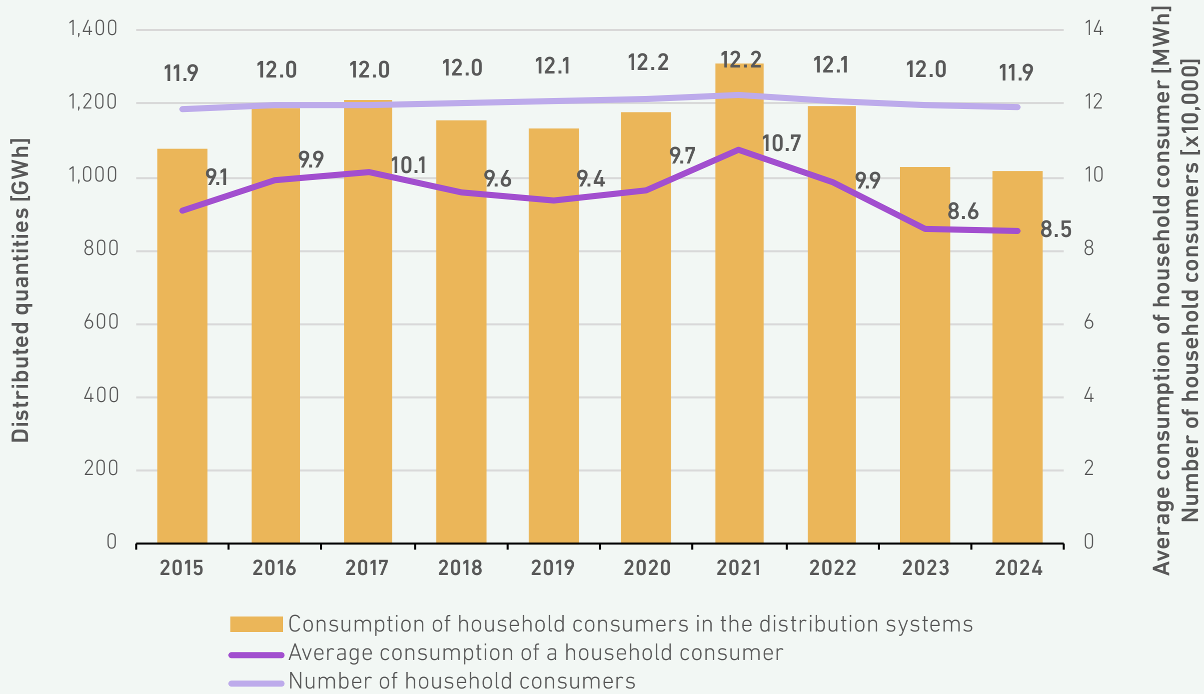
Household consumers use gas mainly for space heating and domestic hot water, and to a lesser extent for cooking.

The average annual consumption of household consumers was almost the same, decreasing by only 1.1%.

Average consumption of household consumers almost the same as the previous year

The total and average gas consumption of household consumers and the number of household consumers in each year of the period 2015–2024 are shown in the following Figure.

FIGURE 182: TOTAL AND AVERAGE CONSUMPTION OF HOUSEHOLD CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2015–2024 PERIOD



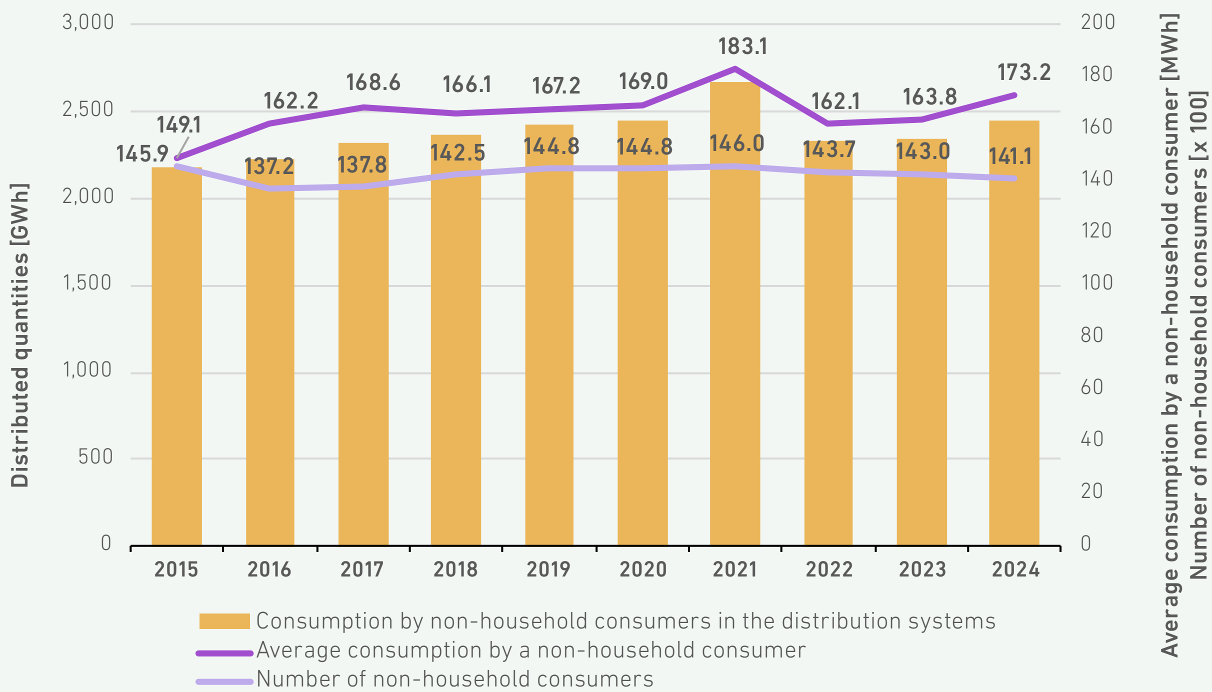
SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

In addition to heating, non-household consumers used gas for technological and production processes, cooling and other activities. At the end of 2024, 186 fewer non-household consumers were connected to the distribution system than the year before.

Non-household consumption in 2024 is 2.5% higher than the average for the five-year period 2019–2023, while the average annual consumption of non-household consumers increased by 5.8% compared to 2023. The evolution of consumption and the number of non-household consumers is shown in the following graph.

Number of non-household consumers decreased by 186, while average gas consumption per consumer increased by 5.8% compared to the previous year

FIGURE 183: TOTAL AND AVERAGE CONSUMPTION BY NON-HOUSEHOLD CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2015–2024 PERIOD



SOURCES: ENERGY AGENCY, DISTRIBUTION SYSTEM OPERATORS

In none of the five CDSs did the operators supply household consumers. The average annual consumption of natural gas consumers connected to the DSOs was 11.9 GWh. Most of the consumption in the CSO areas is for technological and production processes of industrial consumers, while a negligible part of the consumption is accounted for by small business consumers, who use gas mainly for space heating and domestic water.

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 of the distribution systems.

Distribution systems are still without connected generating sources

Other Energy Gases from Distributions Systems

Distribution of other energy gases (energy gases used as an energy fuel other than natural gas) from distribution systems not directly or indirectly connected to the gas transmission system was carried out by four distribution companies in Slovenia in 2024. Propane and propane-butane mixtures were primarily distributed as other energy gases. Other energy gas distribution activities were carried out from 515 distribution systems in 119 Slovenian municipalities. In 113 municipalities, distributors from 463 distribution systems supplied as a commercial activity, while in the remaining 52 distribution systems in nine municipalities, the supply took the form of a service of general economic interest.

8.7% lower consumption of other energy gases

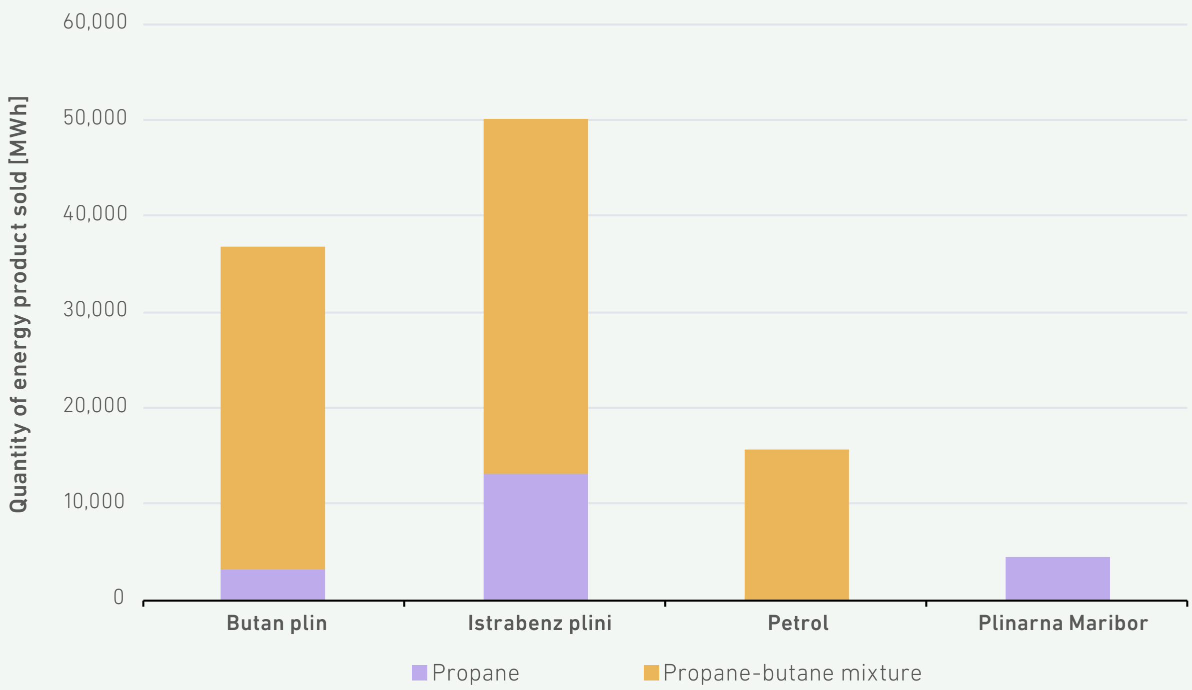
In 2024, 6,548 consumers were supplied from the distribution systems of other energy gas, a 6.4% decrease compared to the previous year, and the distributed energy value of[135] gases reached 107.1 GWh, an 8.7% decrease compared to the previous year.

135 Due to corrections to the 2023 data received from reporters after the publication of last year's report, the comparative changes between 2024 and 2023 may differ from the data presented in last year's report.

The average annual consumption in 2024 was 16.4 MWh, a 2.6% decrease compared to the previous year. The number of consumers connected to the distribution systems in each municipality ranged from two to 1,568, with an average of 13 consumers per distribution system.

The total length of distribution systems decreased by 0.2% compared to 2023 and amounted to 114.2 kilometres. Figure 184 shows distributors by type and volume of other energy gas.

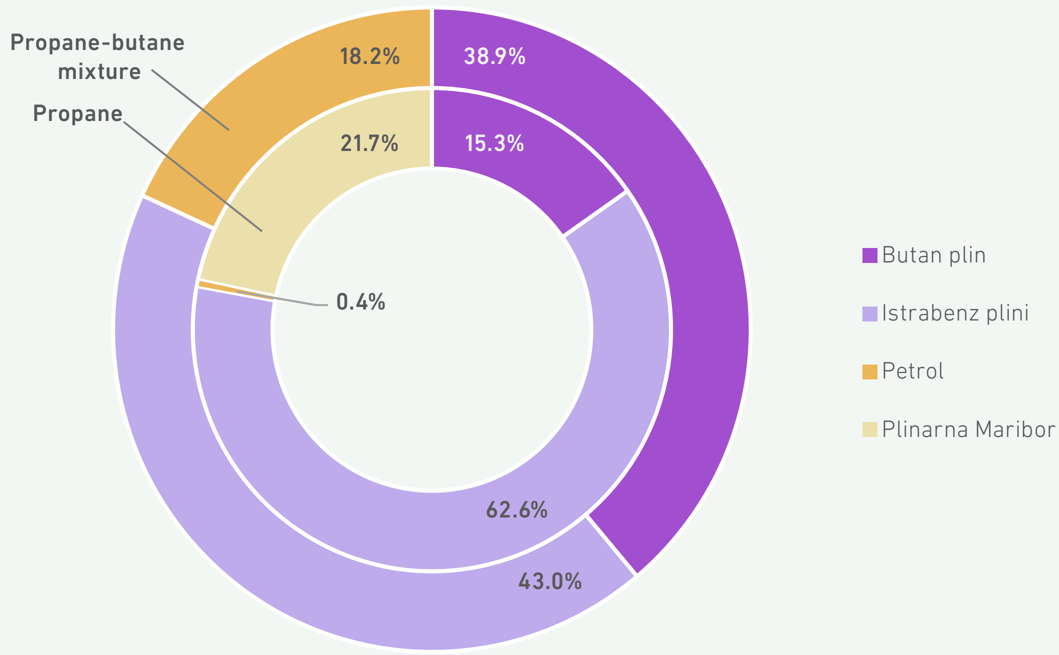
FIGURE 184: DISTRIBUTED QUANTITIES OF OTHER ENERGY GASES BY DISTRIBUTORS AND THE TYPE OF GAS



SOURCE: ENERGY AGENCY

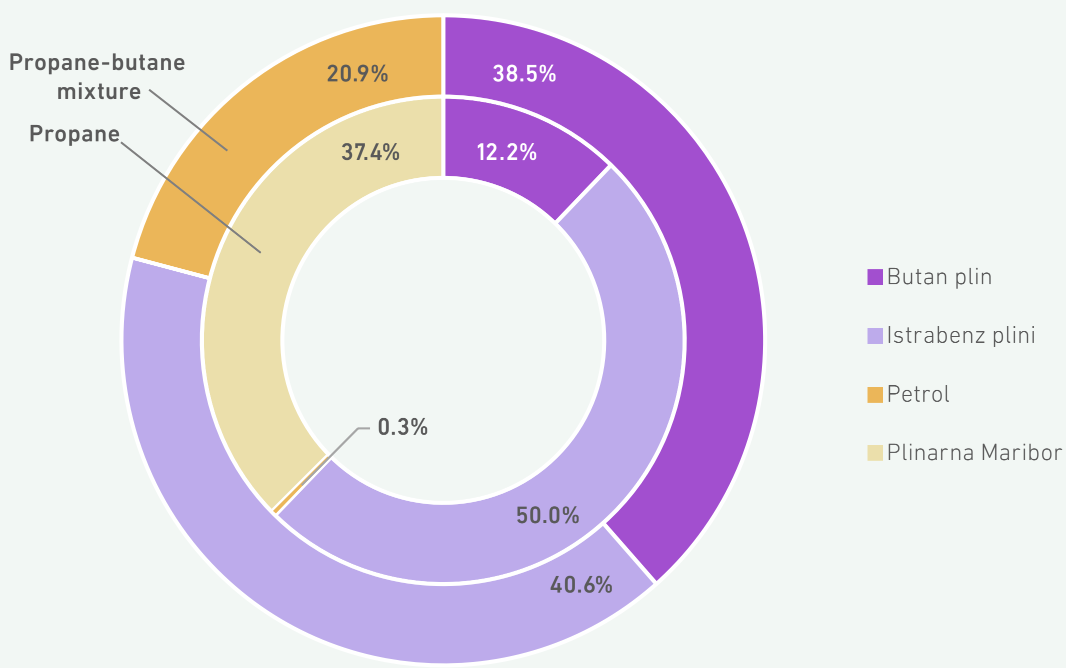
Figure 185 shows the market shares[136] of distributors of other energy gases by type of gas and the energy value of the quantities sold in 2023, while Figure 186 shows the market shares of distributors by the type of energy gas sold and the number of consumers served.

FIGURE 185: MARKET SHARES OF OTHER ENERGY GAS DISTRIBUTORS (ENERGY VALUE OF THE QUANTITIES SOLD)



SOURCE: ENERGY AGENCY

FIGURE 186: MARKET SHARES OF OTHER ENERGY GAS DISTRIBUTORS (NUMBER OF CONSUMERS)



SOURCE: ENERGY AGENCY

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

Regulation of Network Activities

Unbundling

In 2024, the mandatory public service obligation activity of the transmission system operator (TSO) for natural gas in Slovenia was performed by a single entity, while the number of entities carrying out the optional local DSO activity was 12. The transmission system operator, Plinovodi, owns the assets used to perform its activity and is both certified and designated as an independent transmission system operator. The owner of the transmission system operator is Plinhold, whose majority shareholder, with a 77.08% stake, is the Republic of Slovenia.

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 the distribution system operators, they prepared separate accounts following Article 101 of the Gas Supply Act. 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 adequacy of the requirements and the correctness of the application have to be audited annually by an auditor who makes a special report.

Technical Functioning

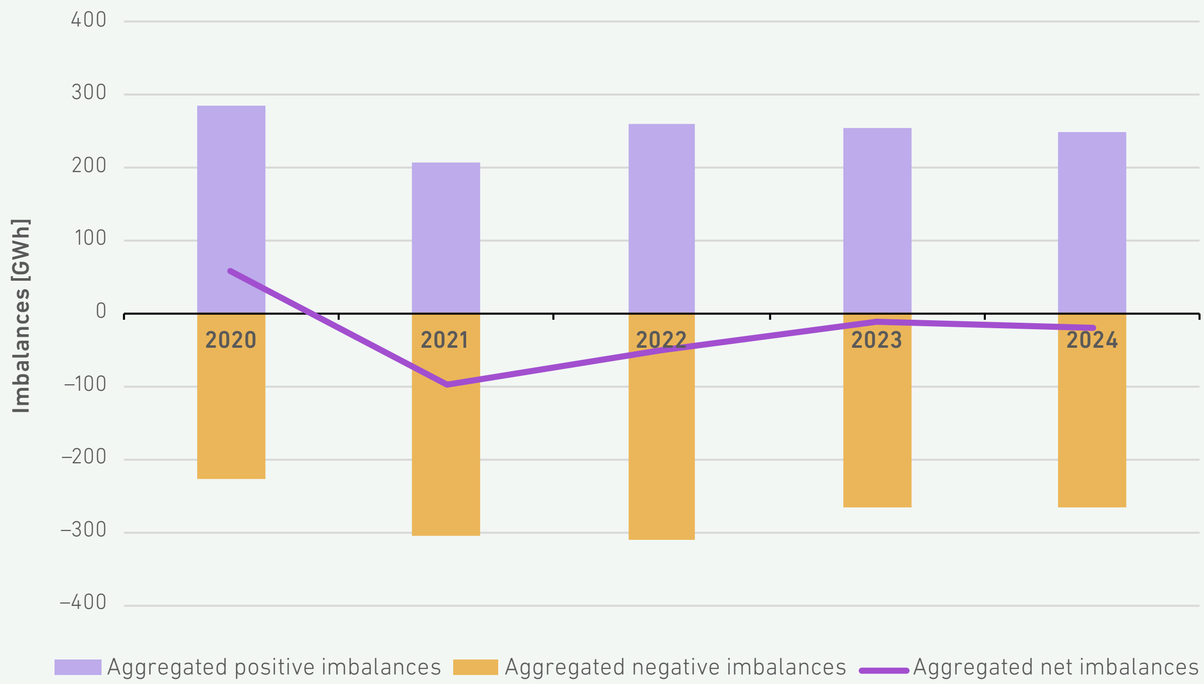
Balancing Services

At the end of 2024, there were 13 active balance group leaders in Slovenia, the same as the previous year. Of these, eight were also suppliers of gas to Slovenian consumers.

The TSO balances the transmission system by buying and selling gas on the trading platform and through an annual balancing contract, and performs the balancing of the transmission system and the calculation of deviations. The entire transmission system is one balancing area; deviations are determined daily and are calculated on a monthly basis for each gas day.

249 GWh of positive imbalances (2,5-% annual decrease), 267 GWh negative imbalances (unchanged from the previous year)

FIGURE 187: AGGREGATED NET IMBALANCES OF THE BALANCING GROUP LEADERS IN THE 2020–2024 PERIOD



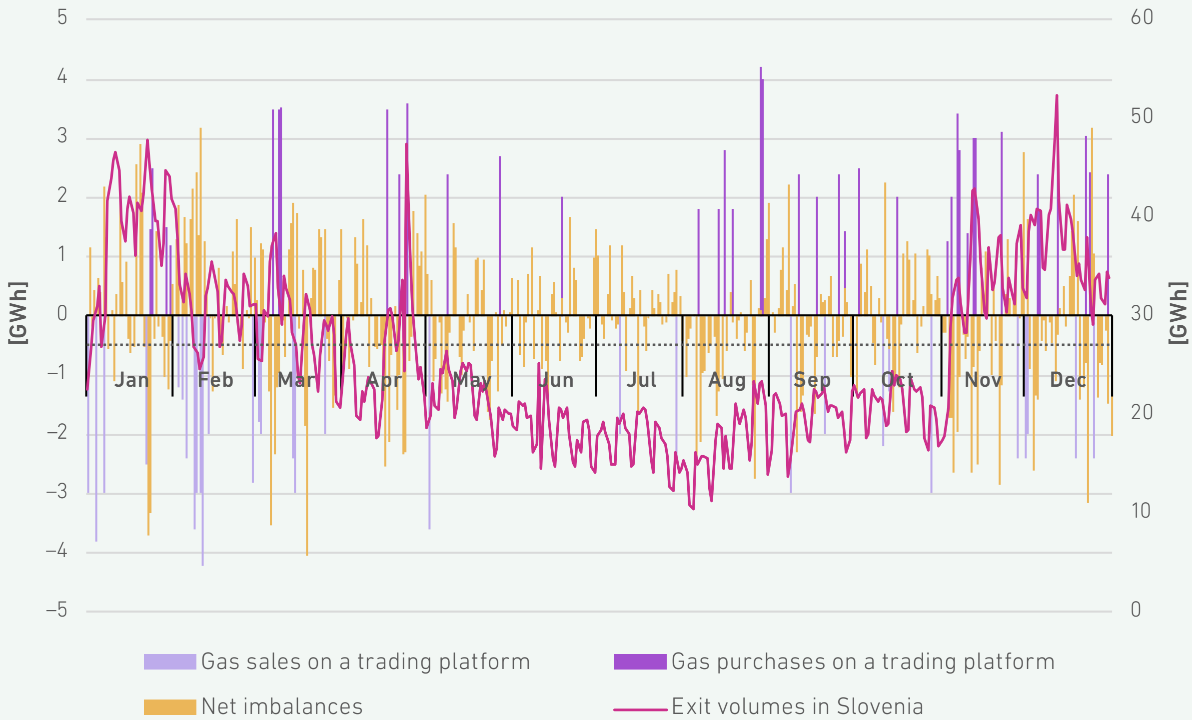
SOURCES: ENERGY AGENCY, PLINOVODI

Compared to the previous year, the positive imbalances of the balance group leaders decreased, while the negative imbalances remained at the same level. In absolute terms, negative imbalances were almost 8% higher than positive imbalances. The balance between positive and negative deviations was thus 3 percentage points lower than a year earlier, but still satisfactorily high.

On an annual basis, the imbalances of the balance group leaders amount to 5.4% of the volumes consumed by Slovenian gas consumers, which is 0.5 percentage points lower than the previous year.

The TSO has managed to ensure regular operation of the transmission system through trading on the trading platform and dynamic pressure regulation. After having to use the system balancing service 16 times in the crisis year 2022, there was no need to use it in 2024.

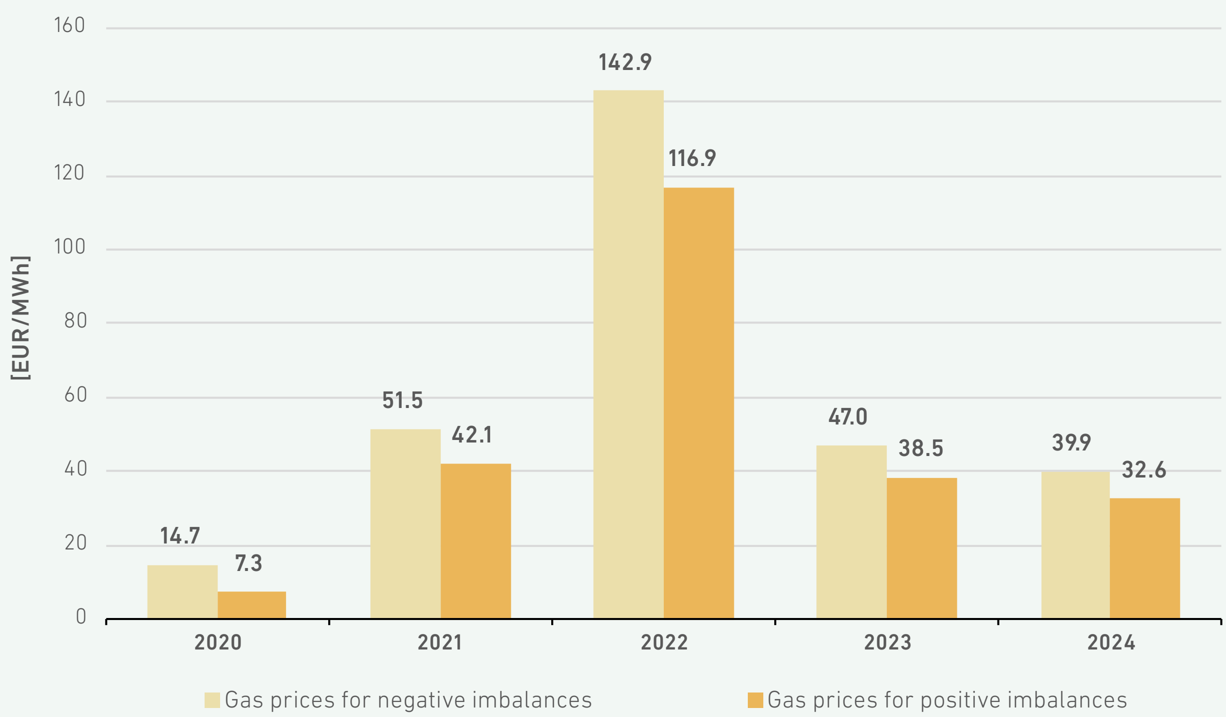
FIGURE 188: GAS PURCHASES AND SALES BY THE TSO ON THE TRADING PLATFORM, AGGREGATED NET IMBALANCES OF BALANCE GROUP LEADERS, AND EXIT GAS VOLUMES IN SLOVENIA IN 2024



SOURCES: ENERGY AGENCY, PLINOVODI

Average gas prices for imbalances have decreased for the second year in a row. Compared to the crisis year of 2022, prices are 3.6 times lower, but still around three to four times higher than in 2020, when prices were at record lows.

FIGURE 189: AVERAGE GAS PRICES FOR IMBALANCES IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

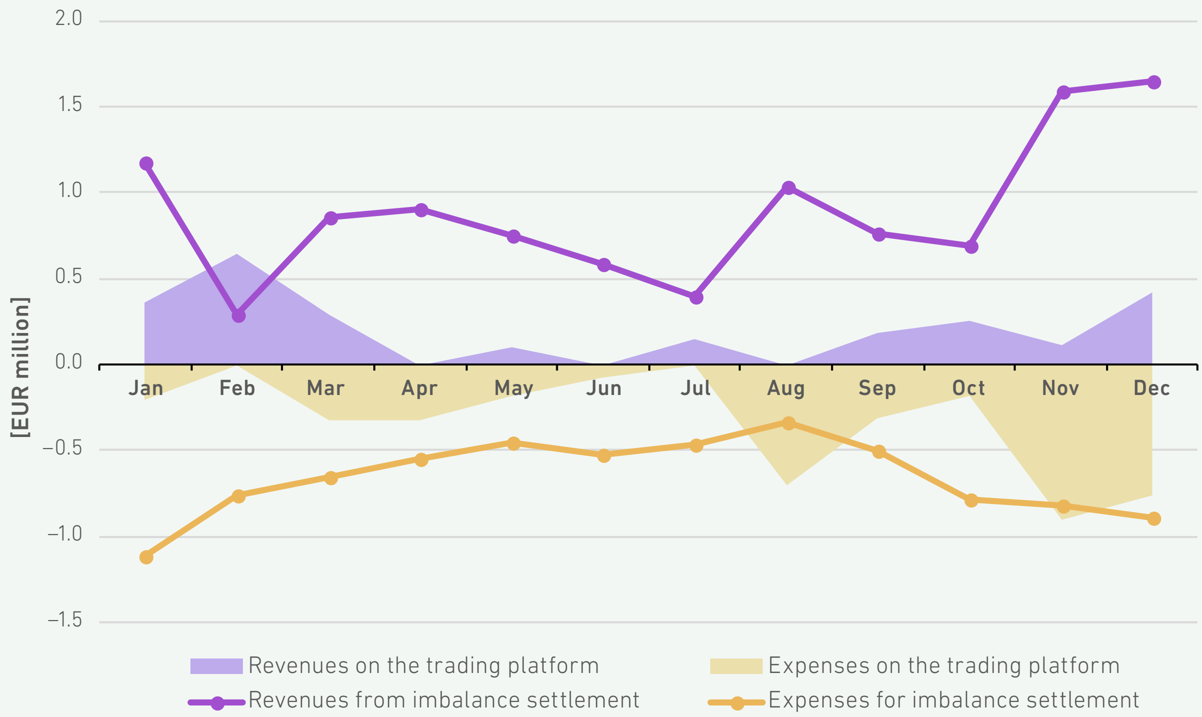
On the trading platform, the TSO generated 39% less revenue than the previous year, while incurring 30% less expenditure. The lower revenues and expenses from trading on the trading platform and from balancing deviations are due to lower volumes and lower selling and buying prices for gas. The TSO is cost-neutral in accounting for imbalances, in the purchase and sale of gas for balancing the transmission system. In trading on the trading platform, i.e., it allocates surpluses or deficits proportionally between the balance group leaders. In 2024, it thus generated a surplus of EUR 1.37 million, almost the same as the previous year.

TABLE 37: REVENUES AND EXPENSES OF THE TSO ON THE TRADING PLATFORM, FOR THE PROVISION OF THE BALANCING SERVICE, AND FOR THE SETTLEMENT OF DAILY IMBALANCES, AVERAGE SELLING/PURCHASE PRICES

Activity/ TSO's services		2021	2022	2023	2024
Trading platform	Revenues [EUR million]	3.4	12.8	4.1	2.5
	Average sales price [EUR/MWh]	37.9	110.5	37.5	33.6
	Expenses [EUR million]	–10.1	–20.6	–5.7	–4.0
	Average purchase price [EUR/MWh]	50.4	124.0	48.2	40.5
System balancing service	Revenues [EUR million]	1.1	1.9	0.1	0
	Average sales price [EUR million]	103.4	113.2	65.6	/
	Expenses [EUR million]	–0.2	–1.3	0	0
	Average purchase price [EUR/MWh]	76.3	149.7	/	/
Imbalances	Revenues [EUR million]	16.4	38.9	13.0	10.7
	Average marginal purchase price – settlement of negative imbalances [EUR/MWh]	51.5	142.9	47.0	39.9
	Expenses [EUR million]	–9.8	–28.8	–10.2	–7.9
	Average marginal sales price – settlement of positive imbalances [EUR/MWh]	42.1	116.9	38.5	32.6

SOURCES: ENERGY AGENCY, PLINOVODI

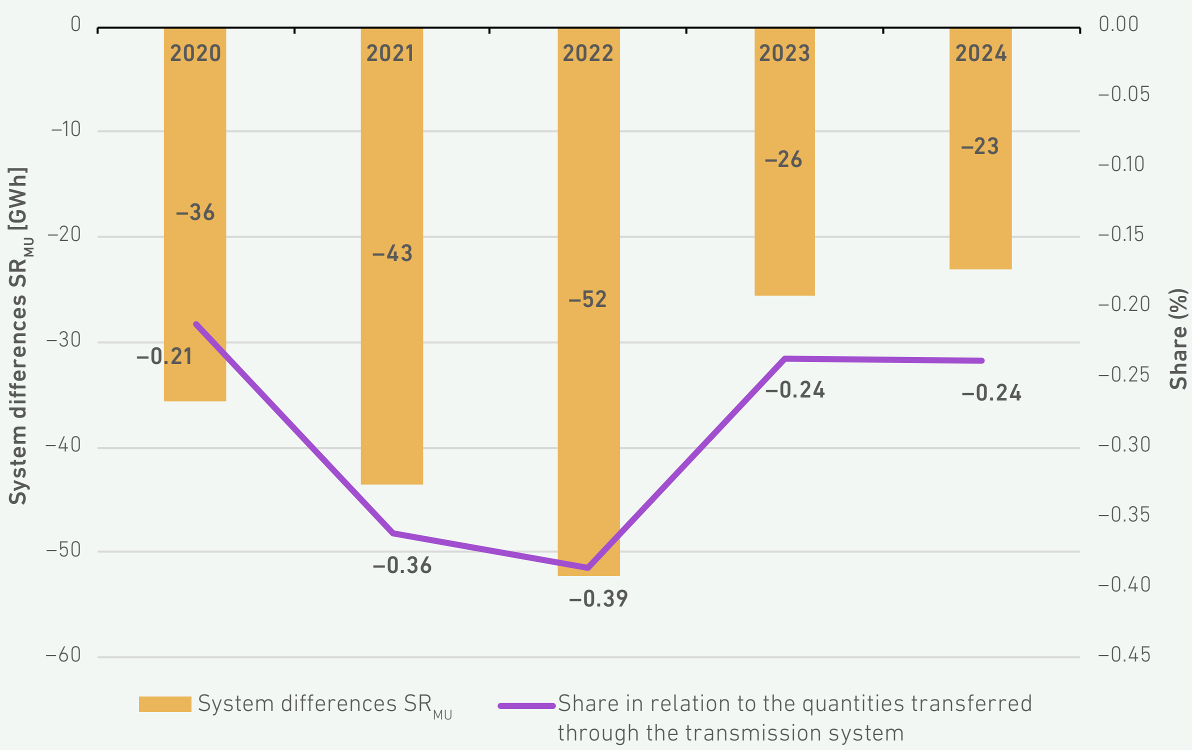
FIGURE 190: REVENUES AND EXPENSES OF TSOs ON THE BALANCING MARKET IN 2024



SOURCES: ENERGY AGENCY, PLINOVODI

From 2022, system differences are divided into system differences due to measurement uncertainties (SD_{MU}) and system differences due to losses (SR_L). System differences SD_{MU} were 10% lower compared to the previous year, while the share of volumes transported through the transmission system remained at the same level. As in previous years, they were negative in all months of 2024.

FIGURE 191: SYSTEM DIFFERENCES SD_{MU} AND THE SHARE IN RELATION TO THE QUANTITIES TRANSFERRED THROUGH THE TRANSMISSION SYSTEM IN THE 2020–2024 PERIOD

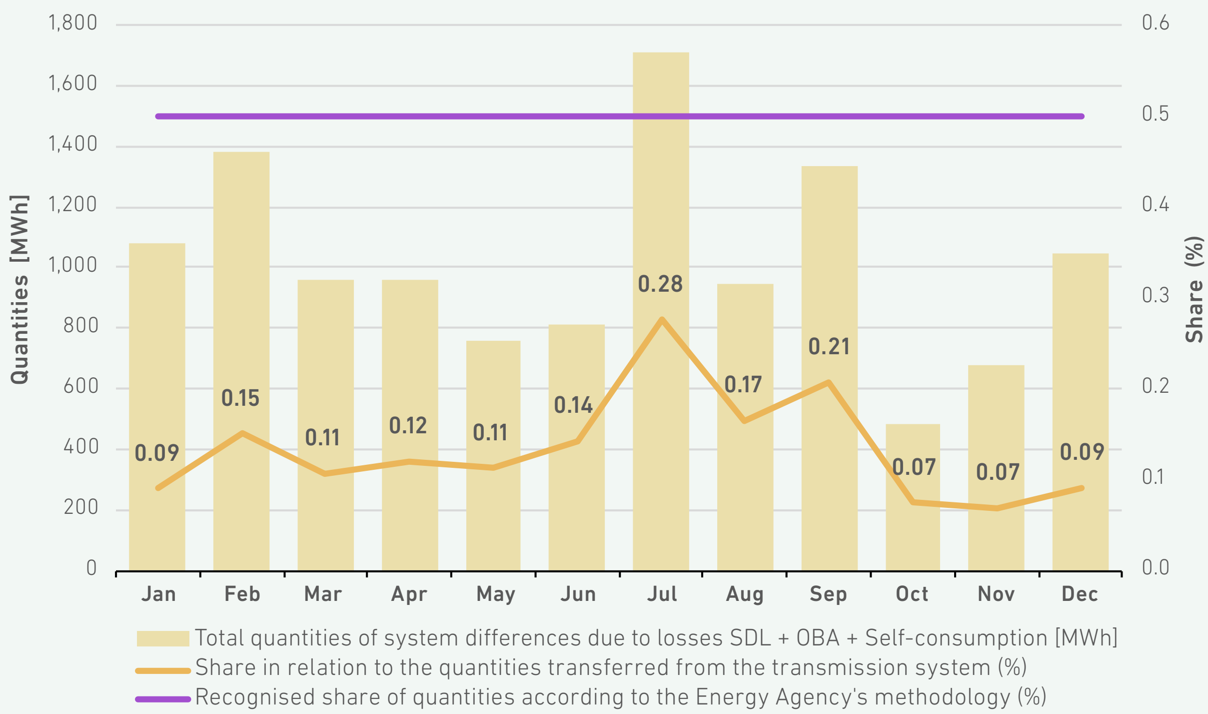


SOURCES: ENERGY AGENCY, PLINOVODI

The SR_L system differences are much smaller than the SD_{MU} system differences and amounted to 149 MWh in 2024, or 87% less than in the previous year.

The TSO is recognised for system difference costs due to losses, quantities for own use and quantities for billing purposes under OBA (Operational Balancing Agreement) up to a total of 0.5% of the volumes transported on the transmission system. In 2024, the sum of these volumes averaged 0.13%.

FIGURE 192: MONTHLY TRENDS IN THE SUM OF SYSTEM DIFFERENCES (SR_L), SELF-CONSUMPTION, AND OBA BILLING IN 2024

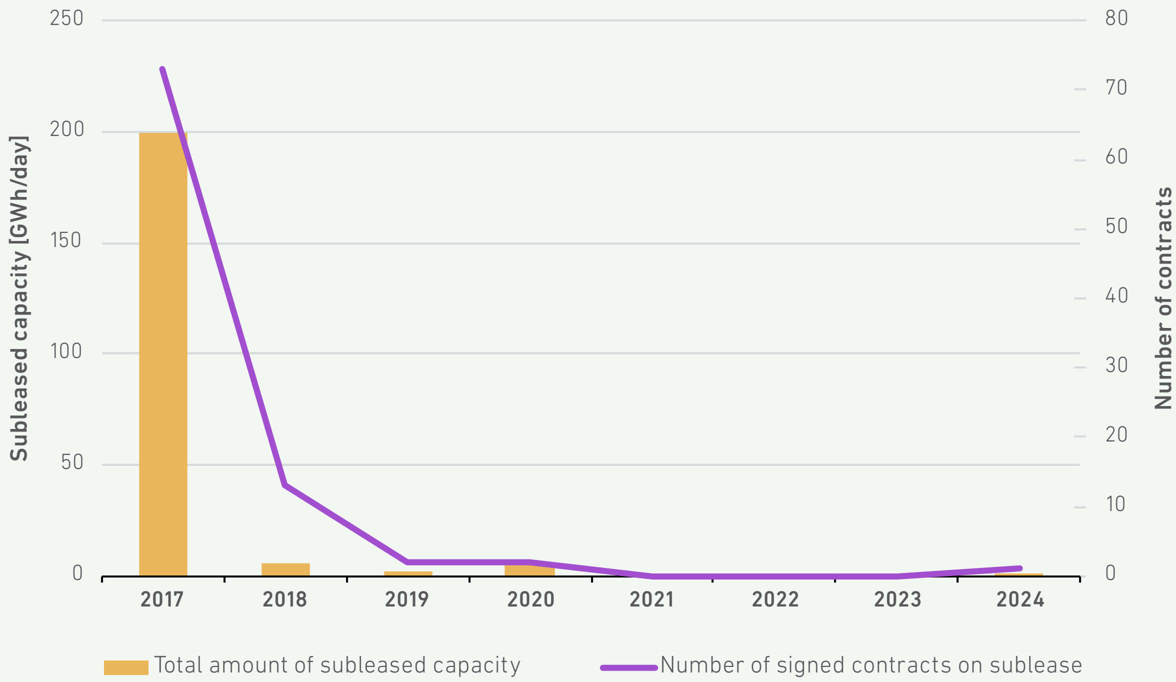


SOURCES: ENERGY AGENCY, PLINOVODI

Secondary Market for Transmission Capacity

In the secondary market for transmission capacity, trading in already leased transmission capacity has resumed after three years of inactivity. Transmission capacity at the Rogatec entry interconnection point was traded. This border interconnection point was contractually and physically congested in 2024.

FIGURE 193: TREND IN THE DEVELOPMENT OF THE SECONDARY TRANSMISSION CAPACITY MARKET IN THE 2017–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The year 2017 was a turning point for trading on the secondary market for transmission capacity, with the expiry of most long-term transmission contracts. The sharply reduced capacity leasing at border points, the growing trend of short-term capacity leasing, the introduction of electronic capacity leasing auctions and better optimisation of capacity leasing by transmission system users have all contributed to the reduced role of the secondary market.

The Multi-Year Development of the Transmission Network

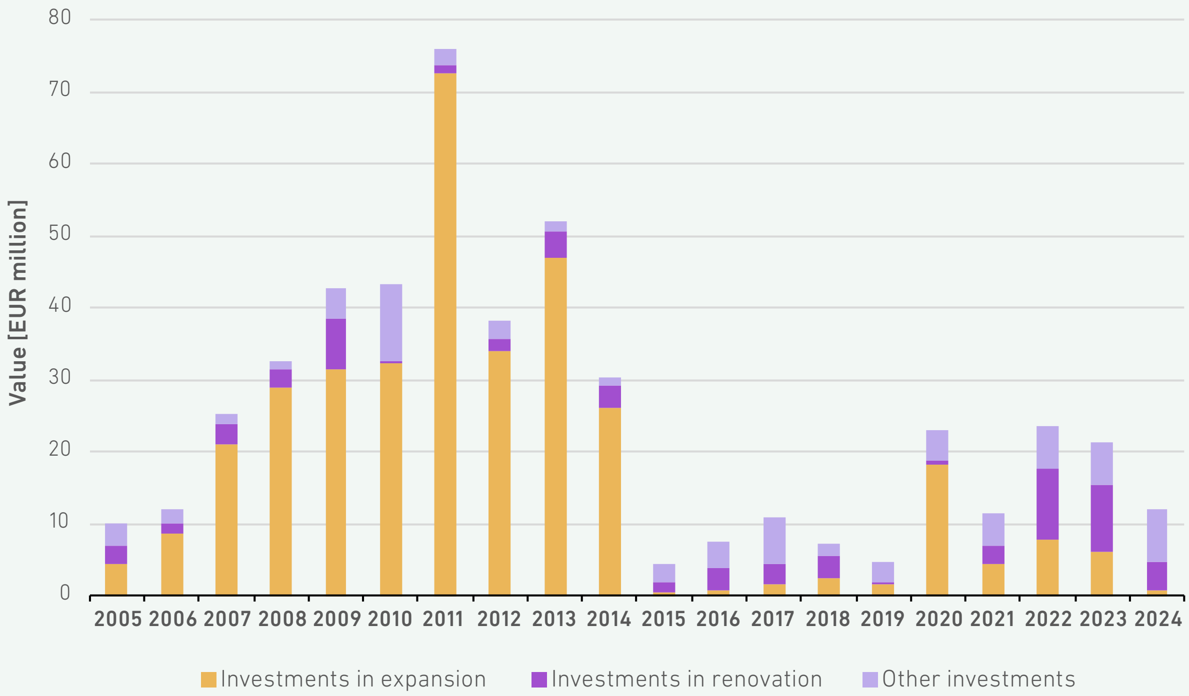
Investments in the Natural Gas Transmission System

The transmission system operator allocated EUR 12 million to investments in the transmission system, which is 44% less than in the previous year. Investments in expansion amounted to EUR 0.71 million, investments in renovation amounted to EUR 4.05 million, and other investments amounted to EUR 7.24 million. All investments were financed from the depreciation of fixed assets.

EUR 21.3 million of investments in the transmission system

0.5 kilometres of new gas pipelines were activated, of which 0.3 kilometres were at a pressure level above 16 bar. Due to the permanent disconnection of the end gas consumer, 2.2 kilometres of gas pipelines were abandoned.

FIGURE 194: INVESTMENTS IN THE GAS TRANSMISSION SYSTEM IN THE 2005–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The most important activities in 2024 in terms of investment implementation were related to the completion of the construction of an additional compressor unit at the compressor station in Ajdovščina, the start of construction of a new border metering and regulating station in Vrtojba, and activities on the M6 Ajdovščina–Lucija gas pipeline construction project (the procedure for selecting the contractor for the construction of the KP Ajdovščina–MRP Sežana transmission gas pipeline and the issuance of a building permit for the Sežana–Dekani transmission gas pipeline). A building permit was obtained for the route of the R21AZ Konjiška vas–Oplotnica transmission gas pipeline, and a public procurement procedure was carried out to select a contractor for the construction of the transmission gas pipeline. In relation to the R25A/1 Trojane–Hrastnik project, Trbovlje–Hrastnik stage, design and real estate matters were handled, and similar activities were also carried out on the MRS Koto and MRS Sava projects.

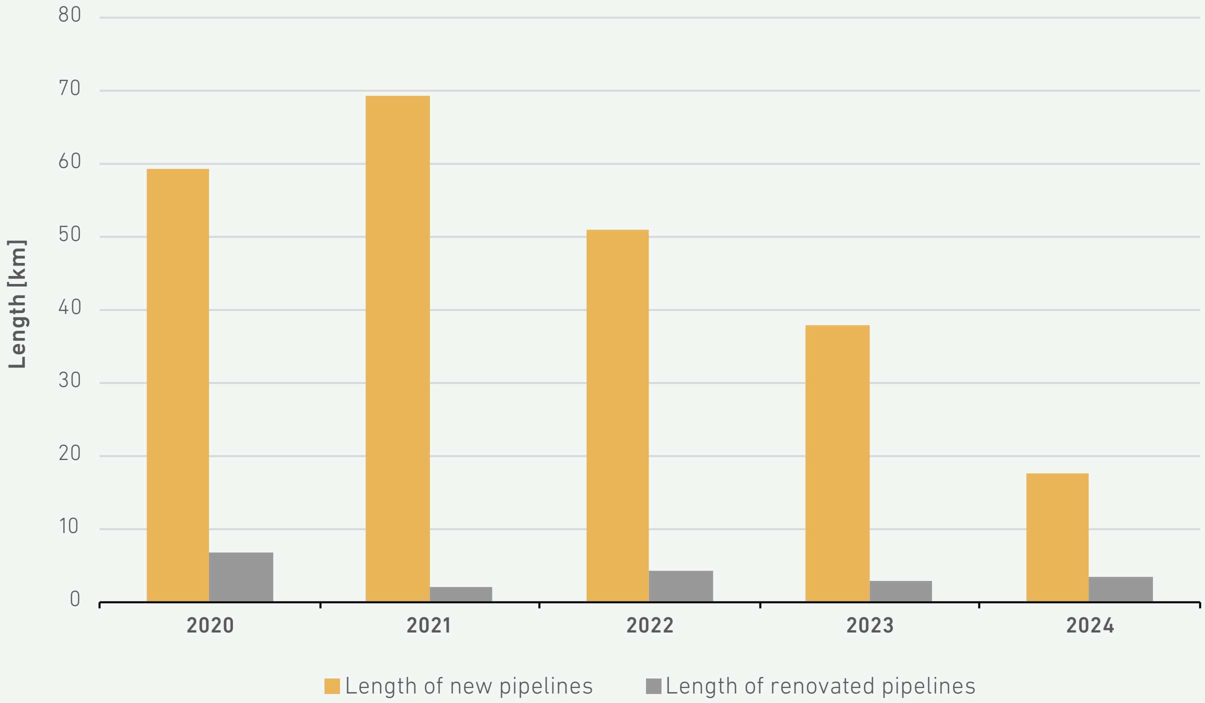
In 2025, the TSO will continue with the construction of the M6 Ajdovščina–Lucija gas pipeline and the construction of the new Vrtojba border MRS. Construction of the first stage of the loop to Zreče (R21AZ Konjiška vas–Oplotnica) will begin, and preparatory work for the construction of the second stage of the Trojane–Hrastnik gas pipeline (Trbovlje–Hrastnik with the Hrastnik and Podkraj border MRSs) will continue. Among the connection projects, completion of work on the Dobrunje MRS and Emona MRS is planned.

Investments in the Gas Distribution Systems

Distribution system operators built 17.7 km of new gas pipelines, a decrease of 20 km compared to the previous year. 3.3 km of gas distribution pipelines were renewed, similar to the previous year. 1.4 km of pipelines were decommissioned as they were no longer in use.

17.7 km of new distribution pipelines, – 53% less than in 2023

FIGURE 195: TREND OF BUILDING AND RENOVATING PIPELINES IN THE 2020–2024 PERIOD

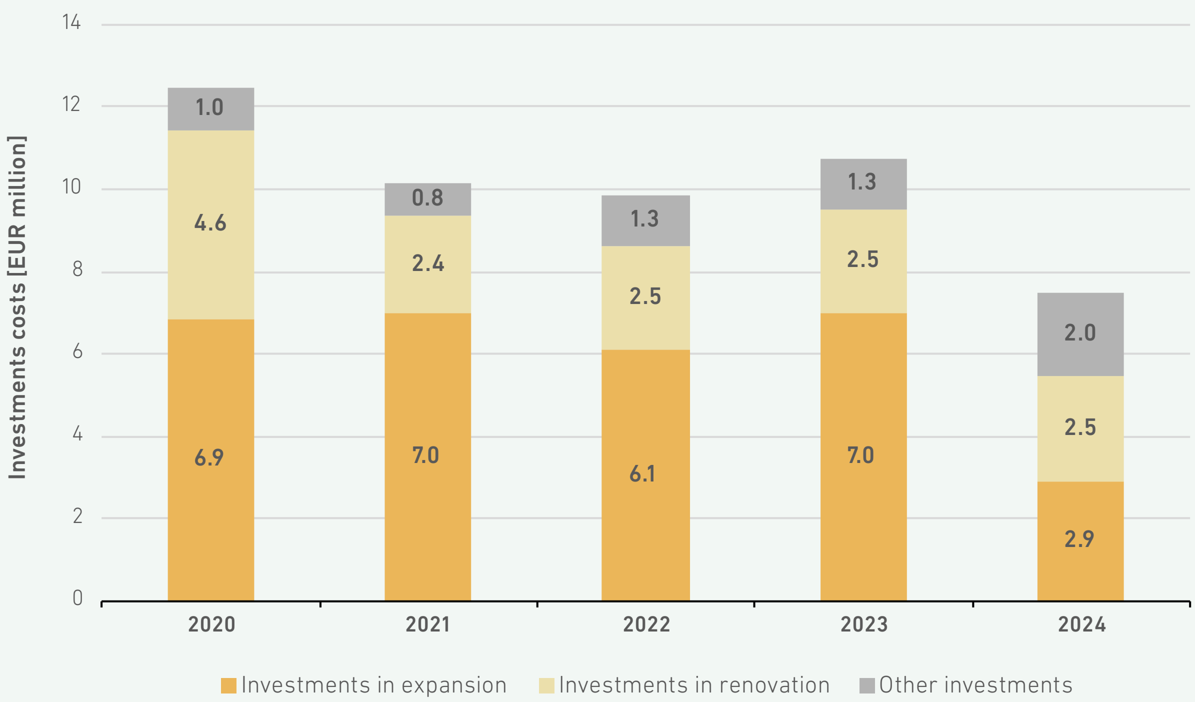


SOURCE: ENERGY AGENCY

The total value of investments in distribution systems amounted to EUR 7.49 million, a 30% decrease compared to the previous year. Investments in network expansion amounted to EUR 2.90 million, investments in the renewal of distribution systems to EUR 2.55 million and other investments not directly related to the construction or renewal of distribution systems to EUR 2.04 million.

3 km of renewed and 1.4 km of abandoned distribution pipelines

FIGURE 196: COSTS OF INVESTMENTS IN GAS DISTRIBUTION PIPELINES IN THE 2020–2024 PERIOD

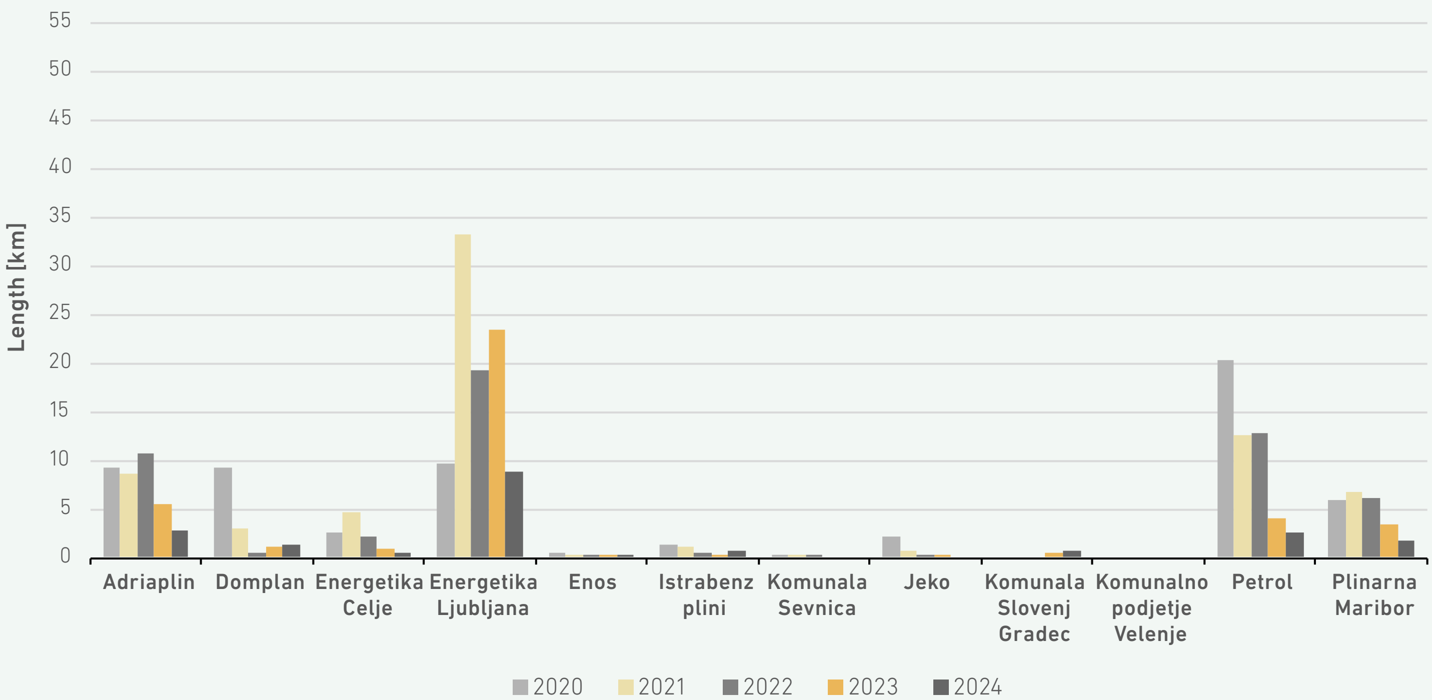


SOURCE: ENERGY AGENCY

Figure 197 shows the intensity of new gas pipeline construction by each DSO. Over the last five years, the six most active operators have built 97% of new gas pipelines in total, while the remaining six operators have hardly expanded their distribution systems, building only 3% of new pipelines in total.

EUR 7.5 million investments in distribuition systems – 30% less than in 2023

FIGURE 197: LENGTH OF THE NEW DISTRIBUTION NETWORKS IN THE 2020–2024 PERIOD BY OPERATORS



SOURCE: ENERGY AGENCY

The Security and Reliability of Operation and the Quality of Supply

The TSO, DSOs and CDSs ensured the safe and reliable transport of gas on their networks, connected and carried out all necessary maintenance work on the networks.

37% drop in connections to distribution systems compared to 2023

The daily peak load on the transmission network was recorded during the winter period (12 December 2024) and amounted to 2,180 MWh/h.

The TSO issued three connection consents, two fewer than the previous year. No new consumption point[137] was connected to the transmission system and activated in 2024.

In 2024, gas distribution system operators received 673 applications for connection consent and issued 678 consents. The number of applications received and consents granted is down by almost 15% compared to the previous year and by 29% compared to 2022. Operators connected 518 consumers in 2024, a decrease of nearly 37% compared to the previous year and almost 50% compared to 2022.

The average time taken to connect new consumer to the distribution system for the nine operators was up to 15 working days after the submission of a complete connection application. For the other

137 The number of new connections does not reflect the difference in the number of active consumption points on the transmission system at the end of 2024 compared to a year earlier, as the total number of active consumption points only includes those with a transmission capacity lease agreement.

three, the overall connection process took on average between 26 and 35 working days. 11 operators took on average between 1 and 6 working days for physical connection to the network, while one operator had to wait on average 21 working days for physical connection.

Two connections were recorded in 2024 in the five TSO areas, where the average time taken for the whole process was 11 days.

The TSO and the DSOs ensured the reliable and safe operation for the uninterrupted supply of consumers through regular and extraordinary maintenance works.

The TSO carried out 55 planned and 316 unplanned works on the transmission system in 2024. The well-planned works resulted in an uninterrupted gas supply. Similarly, unplanned works resulted in an uninterrupted gas supply in 2024.

Compared to 2023, the total duration of supply interruptions due to the planned works has increased by around 140%

On the distribution systems, 2,498 planned works were carried out by the operators. The number of scheduled works increased in 2024, and the total duration of the works was reduced by more than 13% compared to the 2023 base year. Notwithstanding the reduced duration of the works, the planned works resulted in more than 140% more interruptions of gas supply to consumers compared to 2023.

The total duration of interruptions in 2024 is higher than in previous years. Longer unplanned interruptions in supply in 2024 are due to leaks detected in gas connections at five facilities and the resulting need to repair the gas pipelines. The repairs were coordinated and agreed in advance with end users, who did not experience any particular problems during the supply interruptions.

The total duration of supply interruptions due to planned works was 2,543 hours. The planned work on the distribution systems of four operators was carried out without any disruptions or interruptions to supply. On the distribution system of one operator, the total duration of all interruptions due to planned work amounted to 1,922 hours. In the areas of the remaining seven operators, the total duration of interruptions due to planned works ranged between two and 340 hours.

A total of 340 hours of interruptions were recorded for the operator with the largest number of customers. The duration of individual interruptions ranged from at least one hour to a maximum of 30 days.

During the longest interruption, supply was interrupted in December 2024 to one of a total of 8,378 consumers.

For five of the eight operators with supply interruptions, the longest interruption did not exceed seven hours; for two, it was 57 or 58 hours, and for one operator, the longest individual interruption lasted 726 hours.

There were 773 unplanned interventions on distribution systems, which is a decrease of just under 17% compared to the previous year. These interventions caused 105 supply interruptions. The total duration of unplanned interruptions was 2,415 hours in 2024, which is completely incomparable with the year before, when interruptions lasted 6,908 hours. The cause of the prolonged unplanned interruptions in 2023 was the August floods. Four operators did not experience any such interruptions, four operators experienced a total of between four and 29 hours of unplanned interruptions, and the remaining operators experienced between 91 and 7,459 hours of unplanned interruptions.

The indicators of uninterrupted supply are SAIDI, which shows the duration of interruptions per consumer, and SAIFI, which indicates the number of interruptions per consumer.

The number of consumers is based on the average number of consumers in distribution in the reporting year.

The SAIDI indicator for distribution networks as a whole for 2024, which takes into account the duration of all interruptions, is 19.3 min/consumer, compared to 492.91 min/consumer in 2023. The reason for the significant deviation between 2023 and 2024 was the flooding in 2023.

The SAIDI indicator for unplanned interruptions reached 11.1 minutes per consumer in 2024 and 489.29 minutes per consumer in 2023, which was due to flooding.

This is also reflected in the change in the SAIFI indicator, which for the same period and all distribution networks amounted to 0.023 interruptions/consumer in 2024 and 0.037 interruptions/consumer in 2023.

The SAIFI indicator for unplanned interruptions reached 0.016 interruptions/consumer, compared to 0.079 interruptions/consumer in 2023.

A total of 773 unplanned works were also carried out on distribution systems; the total time spent on these works amounted to 4,141 hours. The number of unplanned interruptions in gas supply in 2024 was 105, which caused 2,415 hours of unplanned gas supply interruptions, of which 1,397 hours were due to force majeure and 1,018 hours were due to the actions of third parties.

Maintenance work was carried out in all areas of CDS operators, causing a total of 12 hours of supply interruptions. The total duration of planned work carried out on the CDS network was 6,620 hours, of which 3,405 hours were for regular maintenance, 116 hours for reconstruction, 2,390 hours for inspections, 305 hours for testing, and 374 hours for control measurements.

The activities of the transmission system operator and gas distribution system operators in connection with the connection of system users and maintenance work on the system in the period 2022–2024 are shown in the following table.

TABLE 38: CONNECTION AND MAINTENANCE WORK PARAMETERS IN THE 2022–2024 PERIOD

Gas operator	TSO			DSO		
	2022	2023	2024	2022	2023	2024
CONNECTION-RELATED SERVICES						
Number of approvals issued	9	5	3	956	796	678
Average duration of the administrative procedure [days]	32	16	17	7	7	6
Maximum length of the administrative procedure [days]	-	-	-	15	15	15
Minimum length of the administrative procedure [day]	-	-	-	1	1	1
Number of connections performed	7	1	0	1,021	822	518
Average duration of the entire connection procedure [days]	381	429	0	20	15	15
Maximum length of the entire connection procedure [days]	683	429	0	48	30	35
Minimum length of the entire connection procedure [days]	-	-	-	4	8	2
MAINTENANCE WORK ON THE SYSTEM						
Number of planned works performed	54	75	55	2,398	2,368	2,498
Total duration of the planned work [hours]	106,720	107,568	110	130,254	106,314	104,879
Total duration of supply interruption due to planned work [hours]	35	71	0	793	1,036	2,543
Maximum duration of each scheduled interruption [hours]	8	54	0	55	192	726
Minimum duration of each schedule interruption [hours]	6	6	0	1	1	1
Number of unplanned interventions performed	275	329	316	592	929	773
Total duration of the unplanned interventions [hours]	789	777	774	2,107	6,169	4,141
Number of supply interruptions due to unplanned work [hours]	-	1	-	68	78	105
Total duration of the supply interruption due to unplanned interventions [hours]	-	14	-	201	6,908	2,415

SOURCE: ENERGY AGENCY

Network Charges for Gas Transmission and Distribution Systems

Setting the Network Charge

The Energy Agency regulates gas transmission and distribution activities using the regulated network charges methodology. The methodology ensures 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, considering the network charge surpluses of earlier years. The eligible costs of a system operator are the costs necessary for the performance of the distribution or transmission of gas and that meet the criteria set out in the methodology for establishing the regulatory framework issued following Article 104 of the Gas Supply Act.

Through economic regulation, the Energy Agency promotes the cost-efficiency of the system operators, ensuring their continued and stable operations, a stable environment for investors or owners, and stable and predictable conditions for system users. Incentives are conditional on the realisation of eligible costs, the assets taken over free of charge and the achievement of a 25% difference between the TSO's revenues and costs when purchasing additional capacity under the excess leasing and repurchase programme.

Before the start of the regulatory period, system operators, with the agreement of the Energy Agency, determine the planned eligible costs and the planned resources to cover these 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 determine the tariffs for the regulatory period.

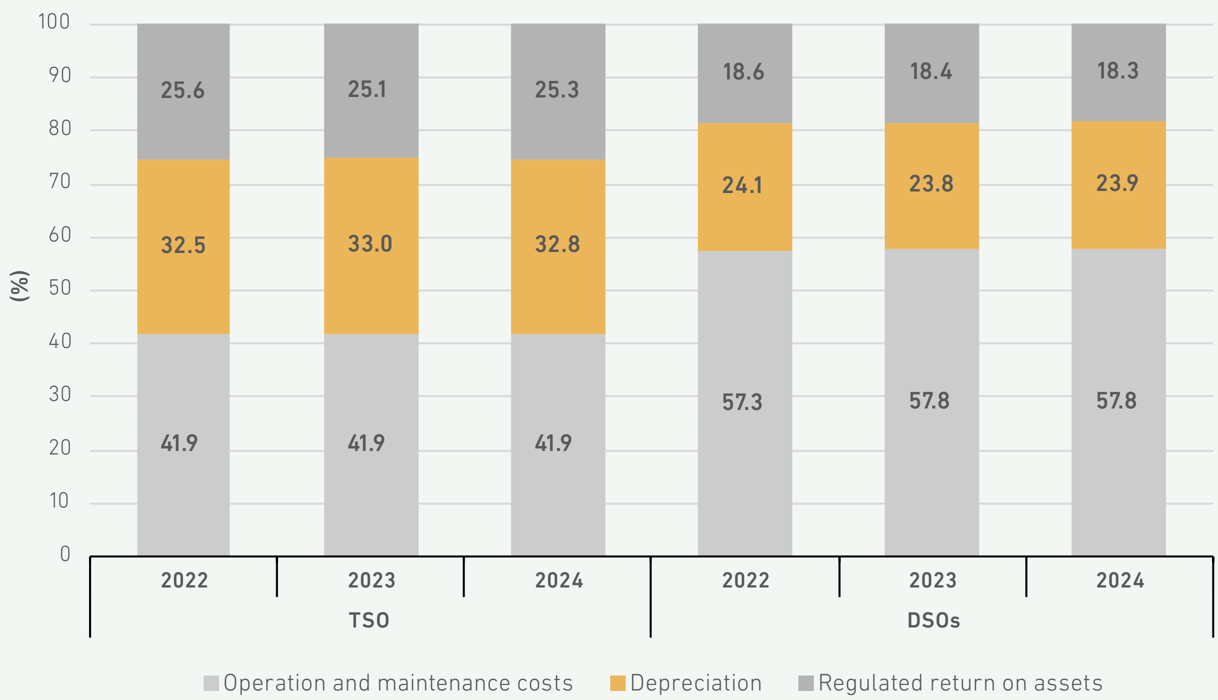
After the end of each regulatory period year, the system operators must identify any deviations from the regulatory framework as the difference between the recognised eligible costs and the recognised resources to cover the eligible costs, calculated based on the criteria for their determination set out in the methodology for setting the regulatory framework. In the context of identifying deviations from the regulatory framework, the eligibility of system operators for incentives is also verified. Deviations from the regulatory framework are reflected in a deficit or surplus of the network charge.

The Regulated Network Charge method 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 method gives the system operator the right to take the network charge deficit into account when setting the network charge in subsequent years.

On December 31, 2024, the three-year regulatory period for system operators, which lasted from January 1, 2022, to December 31, 2024, came to an end.

Figure 198 shows the structure of planned eligible costs of system operators for each year of the 2022–2024 regulatory period. A comparison of the structures of planned eligible costs shows that their structure by individual years of the 2022–2024 regulatory period did not change significantly for either distribution system operators or the transmission system operator.

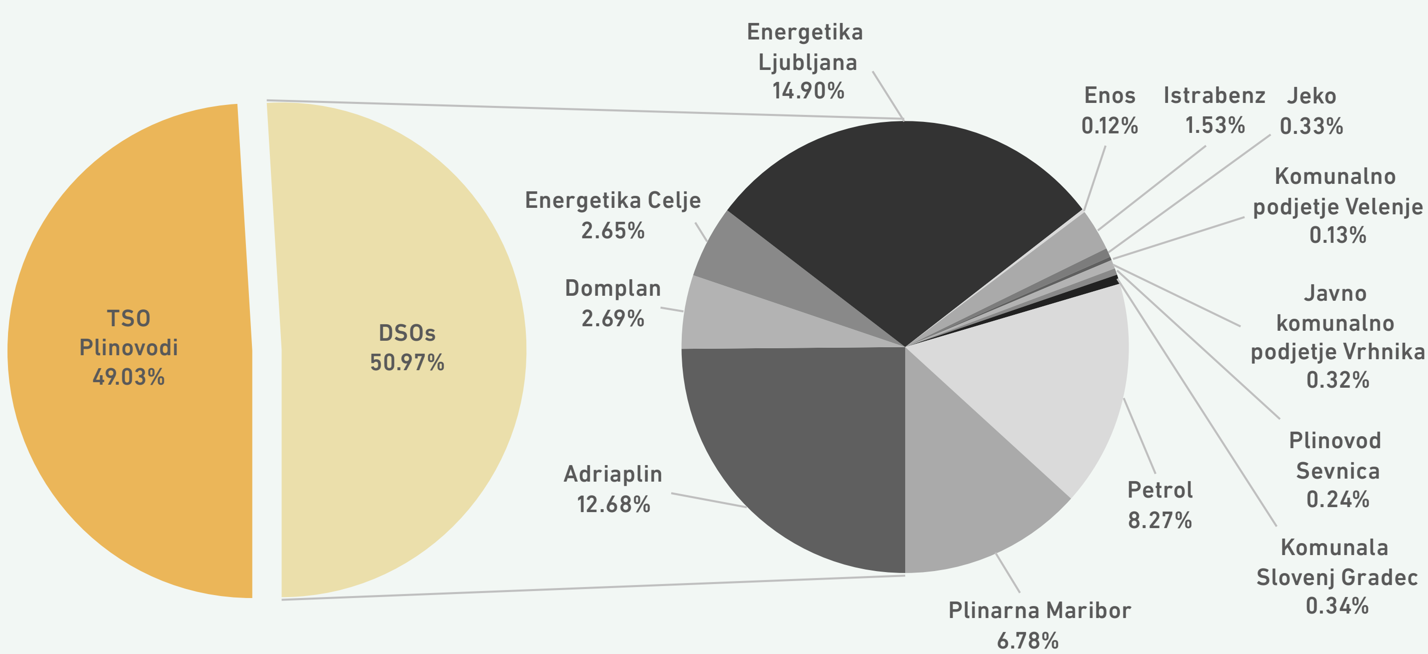
FIGURE 198: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE SYSTEM OPERATORS IN THE 2022–2024 PERIOD



SOURCE: ENERGY AGENCY

For 2024, distribution system operators have planned eligible costs of EUR 51.7 million, while the transmission system operator has planned EUR 49.7 million. Figure 198 shows the structure of planned eligible costs in 2024 for transmission and distribution system operators.

FIGURE 199: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF SYSTEM OPERATORS FOR 2024



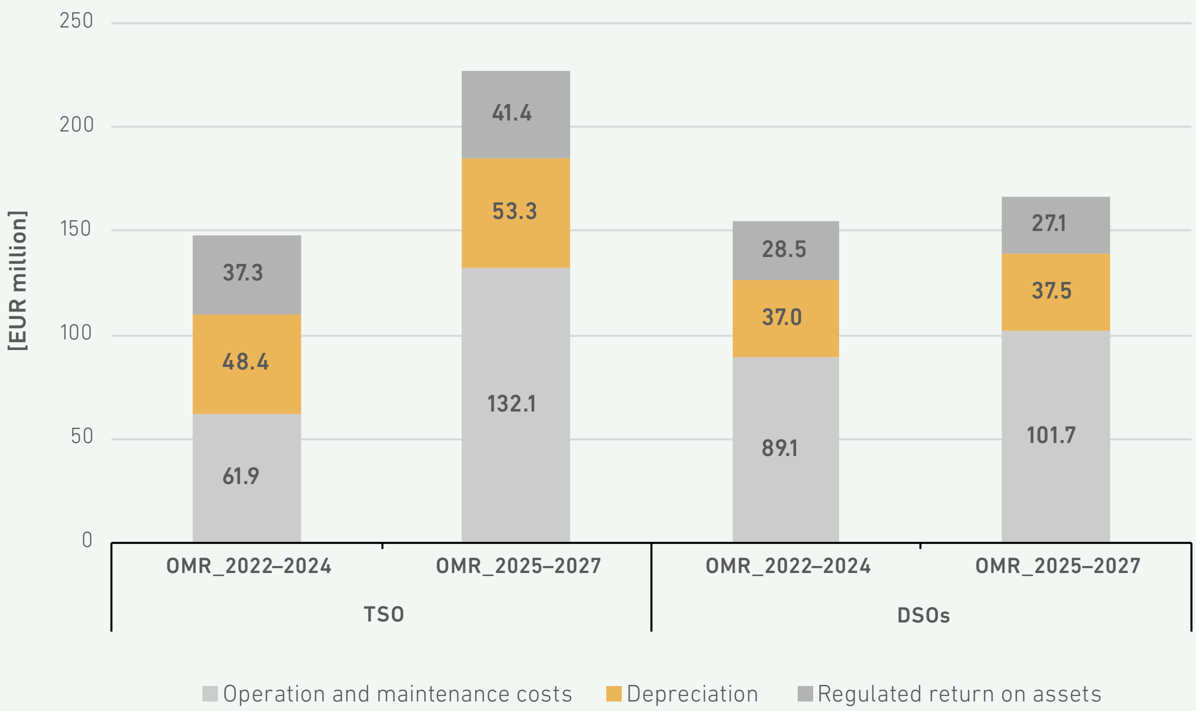
SOURCE: ENERGY AGENCY

In 2024, the Energy Agency adopted the Act on the Methodology for Determining the Regulatory Framework for Gas System Operators (Official Gazette of the Republic of Slovenia, No. 30/24). On this basis, in 2024, system operators, with the prior consent of the Energy Agency, determined the regulatory framework, network tariffs, and tariffs for other services for the 2025–2027 period.

For this regulatory period, the TSO has planned eligible costs of EUR 226.7 million, representing a 54% increase compared to the previous three-year regulatory period. The increase is mainly due to the costs of purchasing and selling gas for balancing purposes, which are not covered by the network charges but by other revenues. This item was not planned in advance in the previous regulatory period but was taken into account in the annual deviations from the regulatory framework.

DSOs have planned a total of EUR 166.3 million in eligible costs for the 2025–2027 regulatory period, representing an 8% increase compared to the previous regulatory period. The increase in eligible costs was due to higher planned operating and maintenance costs.

FIGURE 200: COMPARISON OF THE PLANNED ELIGIBLE COSTS OF SYSTEM OPERATORS IN THE REGULATORY PERIODS 2022–2024 AND 2025–2027



SOURCE: ENERGY AGENCY

EUR 226.7 million for the operation of the transmission system in the 2025–2027 regulatory period

EUR 166.3 million for the operation of distribution systems in the 2025–2027 period

Network Charge for the Gas Transmission System

The network charge for the natural gas transmission system is levied on transmission system users and consists of:

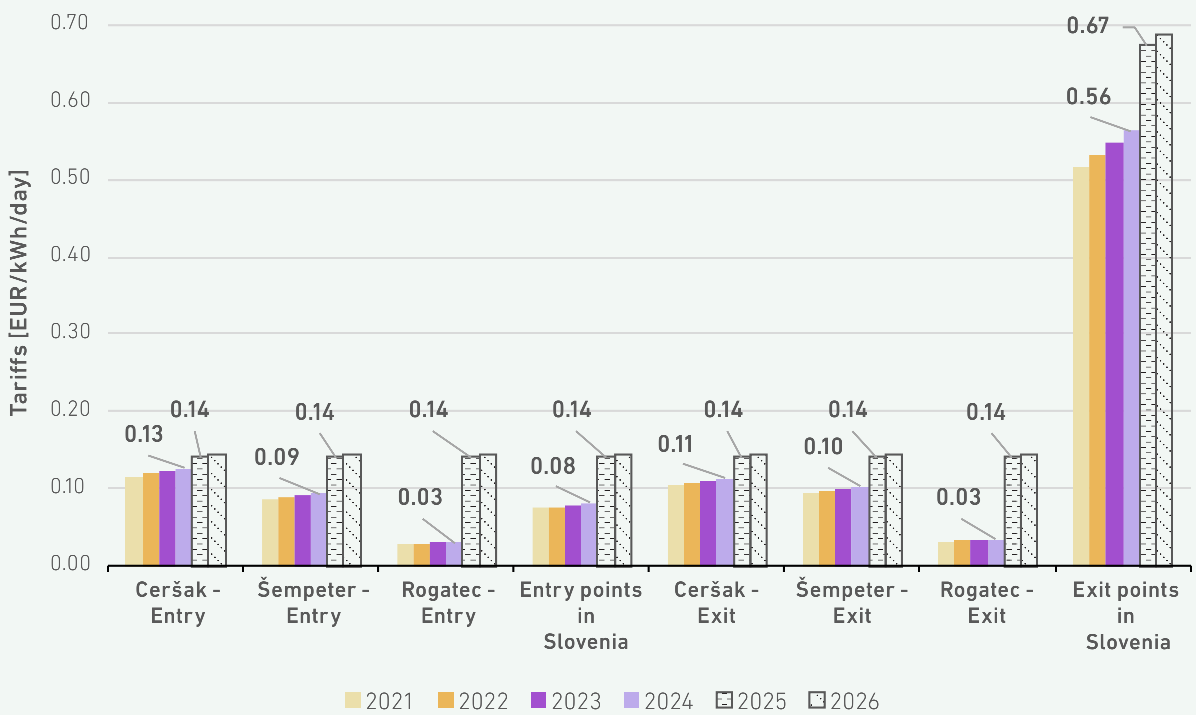
- network charge for the entry point,
- network charge for the exit point,
- network charge for self-consumption; and
- network charge for measurements.

The network charge for each entry/exit point depends on the product's capacity and booked capacity. Transmission system users book the capacity of 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 products and day-ahead standard capacity products. 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 capacity booked.

Transmission system users who book capacity are charged the network charge for their 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 201: MOVEMENT OF THE NETWORK CHARGE TARIFFS FOR THE ENTRY AND EXIT POINTS OF THE TRANSMISSION SYSTEM DURING THE 2021–2026 PERIOD



SOURCE: ENERGY AGENCY

The transmission system operator determined the network tariffs for 2024 as part of the determination of the 2022–2024 regulatory period. The network tariffs for 2024 increased by 2.9% compared to 2023. More significant changes in the level of network tariffs and the ratio between network tariffs for individual entry or exit points will be seen in 2025.

Network Charges for the Gas Distribution Systems

The natural gas distribution system's network charge consists of a distribution network charge and a network charge for measurements.

The distribution system operator determines the network charge tariffs uniformly for all the areas where it distributes natural gas. Only in specific cases may network charge tariffs differ for different areas of service.

The distribution system users pay the network charge for distribution 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. For smaller consumers, this is calculated as a monthly flat-rate fee, and for larger consumers, it is calculated as the amount of connected power or booked capacity.

The network charge for metering depends on the size and type of the measuring device and the ownership or management of that device.

The tariff items for network charges for 2024 were set in 2021, when the regulatory framework for the period 2022–2024 was approved. In 87 municipalities, 17 acts on the determination of network tariff items for the distribution network were used to calculate the network charge.

Distribution system operators must show the amount for gas distribution and the amount for metering separately on the distribution system user's bill.

The network charge for consumers on the distribution systems was reduced by 11.3% compared to 2023 for one distribution system operator.

Other distributors did not change network tariff; it remained approximately at the same level.

The annual network charges paid by consumers with an estimated annual consumption of up to 50,000 kWh, which accounts for a good 96% of all customers on distribution systems, have not changed significantly for most consumers in 2024 compared to 2022 and 2021.

Trends in the level of distribution network charges per megawatt hour (MWh) of gas consumed by typical household consumers and medium-sized industrial consumers in individual years of the period 2020–2024 for seven operators distributing gas in the ten municipalities with the largest number of customers are shown in the Figures below. These operators are responsible for distribution in 73 other municipalities, which means that the network charges shown apply to 83 of the total 87 local communities and almost 98% of all distribution customers.

In these areas, typical small household consumers (consumption group D1 with an annual consumption of 3,765 kWh), medium-sized household consumers (consumption group D2 with annual consumption of 10 MWh), medium-sized household consumers (consumption group D2 with annual consumption of 32 MWh) and large household consumers (consumption group D3 with annual consumption of 215 MWh), the network charge increased compared to the previous year for one gas distributor supplying three local communities, ranging from 3.7% to 4.46%.

In 40 local communities, consumers paid the same as in the previous year, while in 40 local communities, the network charge decreased by between 11.26% and 0.48%.

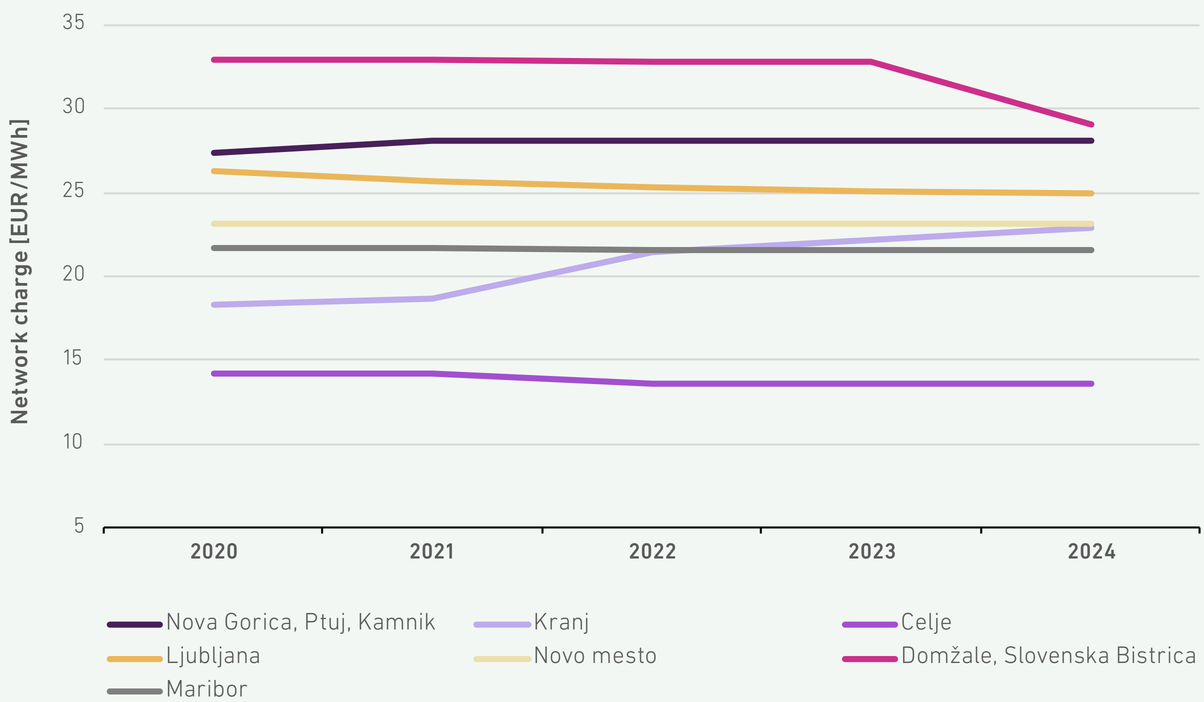
The average changes in the annual network charges for individual types of household customers between 2020 and 2024 were as follows:

- small household consumers (consumption group D1 with annual consumption of 3,765 kWh) in the range from –11.5% to +25.1% (annual average from –2.3% to +5.0%);
- medium-sized household consumers (consumption group D2 with annual consumption of 10 MWh) in the range from –11.9% to +24.1% (annual average from –2.4% to +4.8%);
- medium-sized household consumers (consumption group D2 with annual consumption of 32 MWh) in the range from –11.3% to +25.9% (annual average from –2.3% to +5.2%);
- large household consumers (consumption group D3 with annual consumption of 215 MWh) in the range from –11.3% to +22.2% (annual average from –2.3% to +4.4%).

For individual distribution system operators, annual network charges were up to 12% lower than five years ago. The most significant increase in network charges between 2020 and 2024 was recorded by the distribution system operator Domplan, for all consumers (with an average annual consumption of 3,765 kWh, up to the largest with an average annual consumption of 215,200 kWh). For the smallest consumers, the network charge was 25.1% higher than five years ago, while for the largest household consumers, it was 22.2% higher than in 2020.

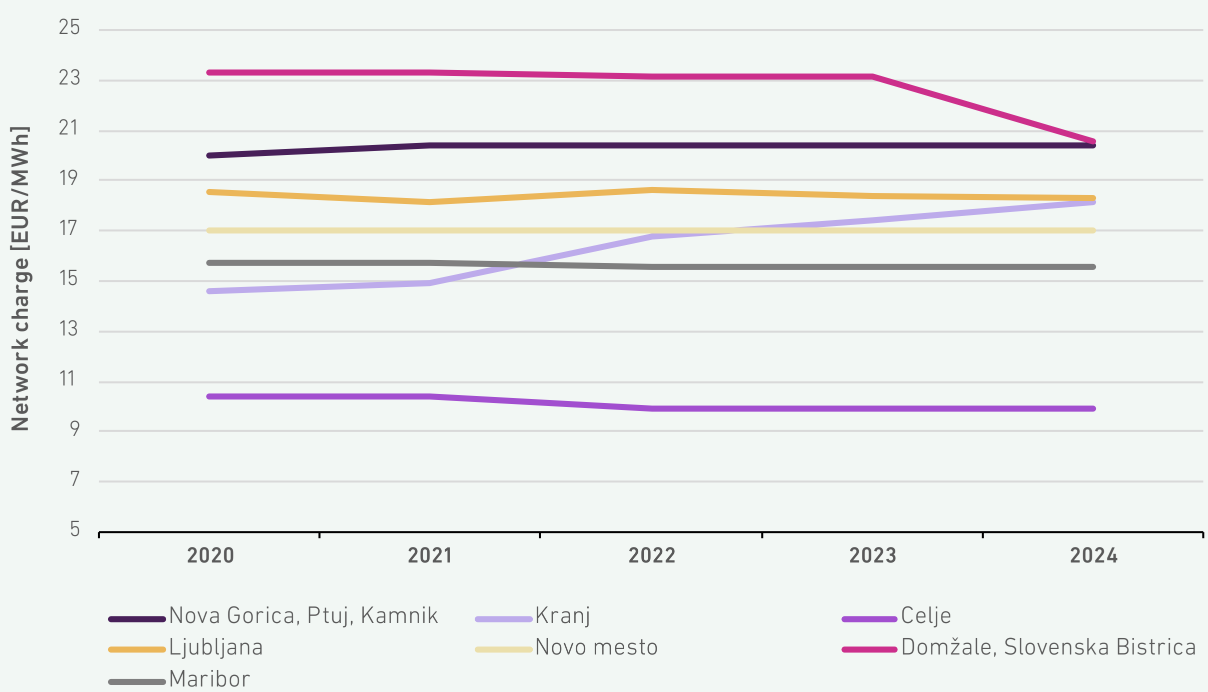
The changes in network charges in the period 2020–2024 are shown in Figures 202, 203, 204 and 205.

FIGURE 202: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR SMALL HOUSEHOLD CONSUMERS D1 (3,765 kWh) IN THE 2020–2024 PERIOD



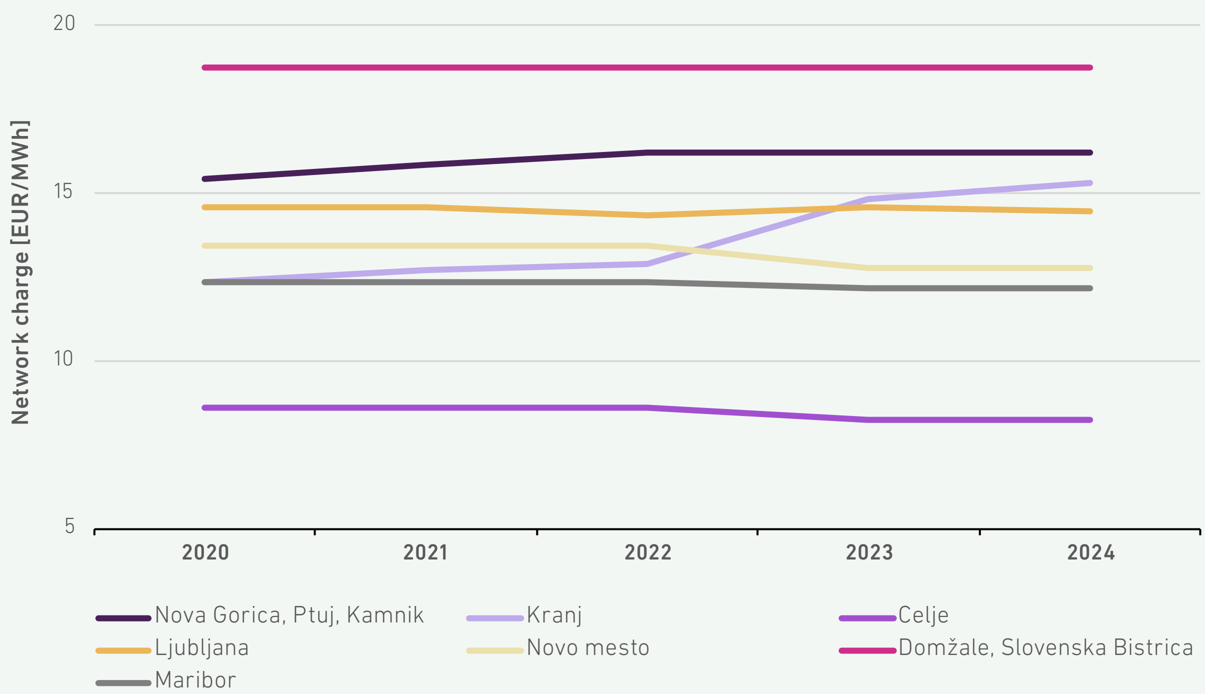
SOURCE: ENERGY AGENCY

FIGURE 203: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR MEDIUM-SIZED HOUSEHOLD CONSUMERS – D2 (10 MWh) IN THE 2020–2024 PERIOD



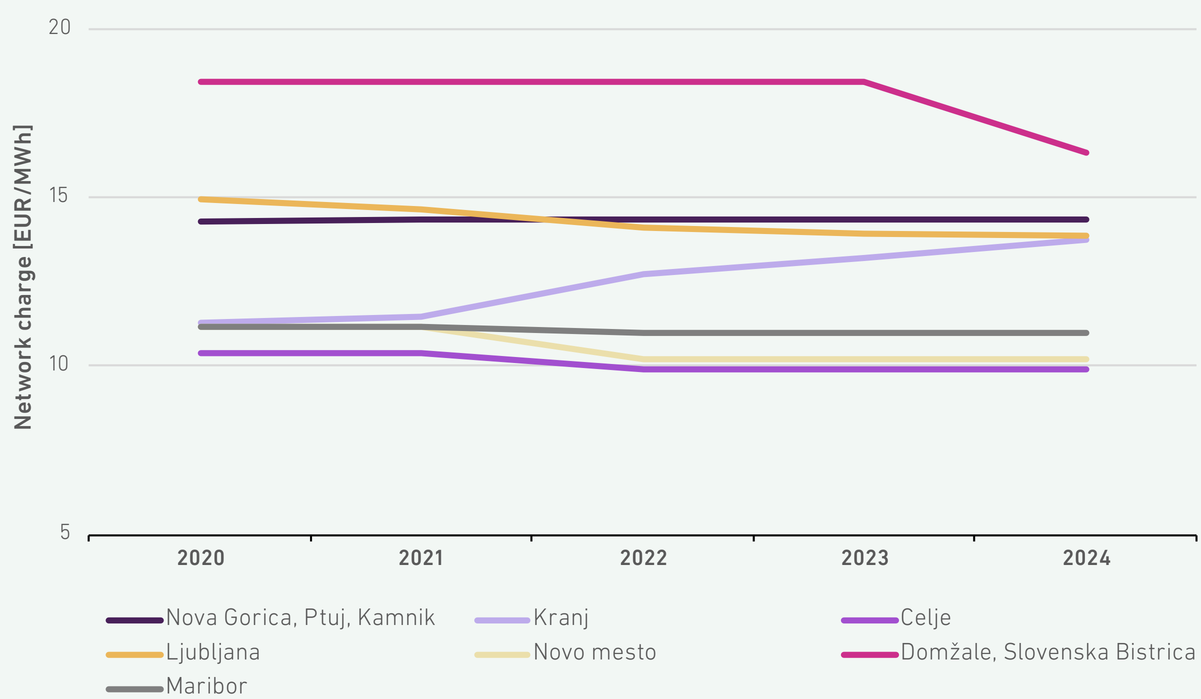
SOURCE: ENERGY AGENCY

FIGURE 204: DISTRIBUTION NETWORK CHARGE FOR MEDIUM-SIZED HOUSEHOLD CONSUMERS D2 (32 MWh) IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

FIGURE 205: DISTRIBUTION NETWORK CHARGE FOR LARGE HOUSEHOLD CONSUMERS – D3 (215 MWh) IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

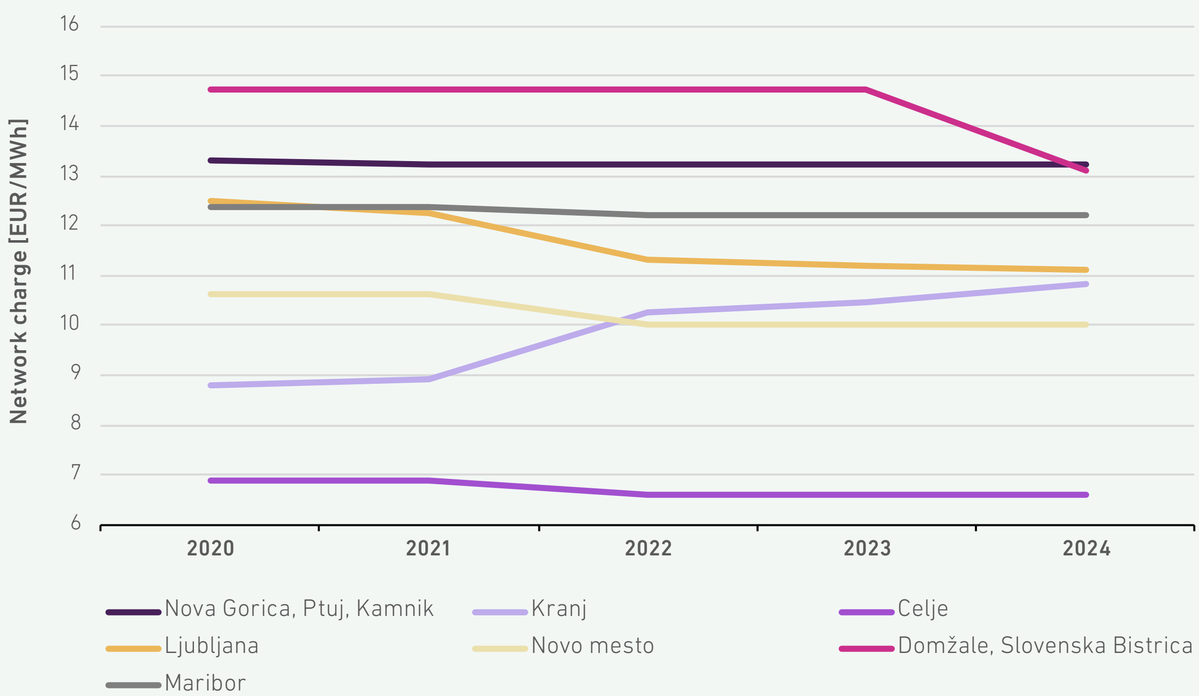
For medium-sized industrial consumers (consumption group I3 with an annual consumption of 8,608 MWh), the average annual network charge increased by 3.8% compared to the previous year in three local communities. In contrast, consumers in 40 local communities paid the same as in the previous year, while in 40 local communities the network charge decreased by between 11.26% and 0.53%.

Most medium-sized industrial consumers paid equal or lower network charges in 2024

The average annual change in network charges for these consumers over the last five years ranged between –11.3% and +23.4% depending on the individual operator.

In 80 local communities, consumers paid between 1.0% and 11.3% less for network charges than five years ago. Differences in the annual network charges in individual municipalities reflect differences in the structure of consumers and their consumption, as well as the age and size of distribution systems. Figure 206 shows the trend in network charges for medium-sized industrial consumers in the period 2020–2024.

FIGURE 206: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR MEDIUM-SIZED INDUSTRIAL CONSUMERS – I3 (8,608 MWh) IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

Capacity at Border Points

Capacities at border points were allocated based on market-based methods through the online reservation platform PRISMA. Auctions have been carried out for firm and interruptible capacities.

Auctions of firm and interruptible capacity were organised, with 61,710 auctions published. Individual and bundled capacities were offered at the auctions. There were 687 successful auctions of firm capacities, which is 33% less than in the previous year. Of all successful auctions of firm capacities, 77% were auctions of bundled capacities. All successful auctions accounted for 1.2%. There were also 38 successful auctions of interruptible capacity at the Rogatec entry point. There were no auctions of incremental capacity in 2024.

TABLE 39: NUMBER OF SUCCESSFUL FIRM CAPACITY AUCTIONS IN 2024

Auction	Ceršak entry	Rogatec entry	Rogatec exit	Šempeter entry	Šempeter exit	Total
Annual	2	1	1	1	0	5
Quarterly	9	5	0	0	2	16
Monthly	15	4	1	0	0	20
Day-ahead	319	66	1	2	53	441
Intraday	165	0	5	7	28	205
Total	**510**	**76**	**8**	**10**	**83**	**687**
Bundled	356	74	8	10	83	531
Individual capacity	154	2	0	0	0	156

SOURCES: ENERGY AGENCY, PLINOVODI

TABLE 40: NUMBER OF SUCCESSFUL INTERRUPTIBLE CAPACITY AUCTIONS AT ROGATEC ENTRY POINT IN 2024

Auction	Rogatec entry	
	Number of auctions	Total leased capacity [kWh/day]
Annual	1	990,192
Quarterly	0	
Monthly	2	1,977,504
Day-ahead	35	30,554,376

SOURCES: ENERGY AGENCY, PLINOVODI

Compared to the previous year, the number of successful auctions at the Rogatec and Šempeter exit points decreased the most, while the number of successful auctions of interruptible capacity at the Rogatec entry point increased more than sixfold.

38 successful auctions of interruptible capacity at the Rogatec entry point

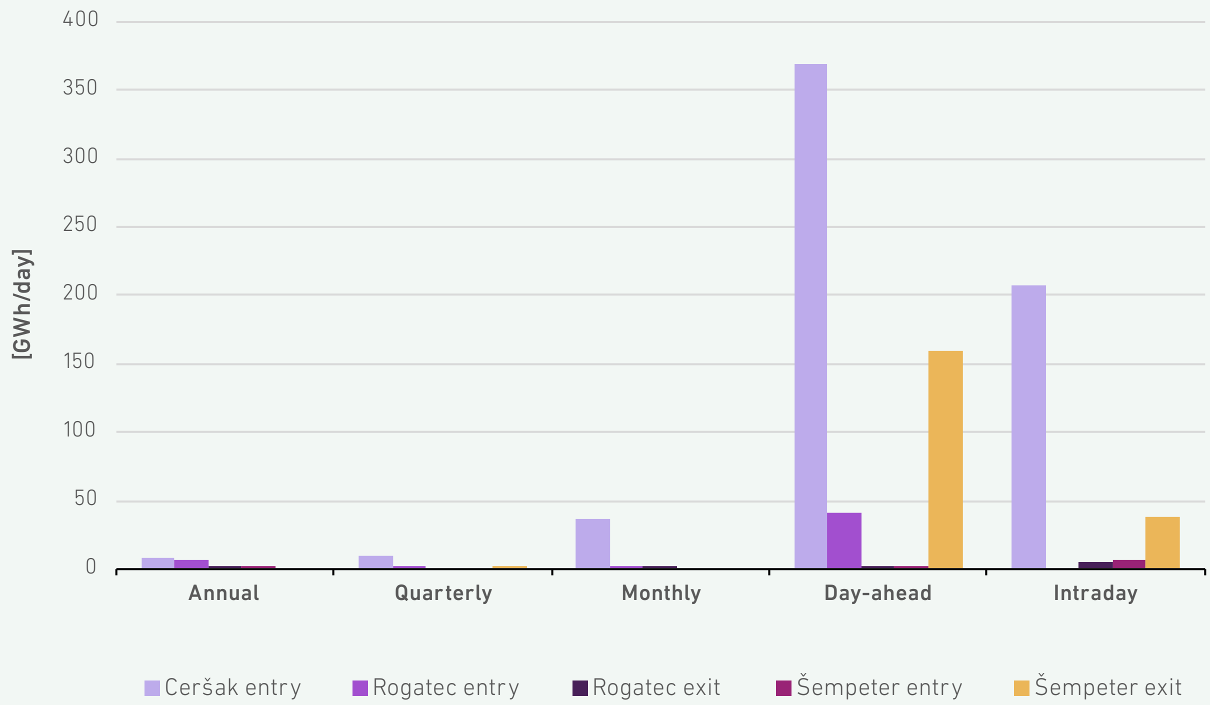
TABLE 41: COMPARISON OF THE NUMBER OF SUCCESSFUL AUCTIONS IN 2023 AND 2024

Year	Ceršak entry	Rogatec entry	Rogatec exit	Šempeter entry	Šempeter exit	Total
2023	563	129	68	85	181	**1,026**
2024	510	114	8	10	83	**725**
Index	**0.91**	**0.88**	**0.12**	**0.12**	**0.46**	**0.71**

SOURCES: ENERGY AGENCY, PLINOVODI

Figure 207 shows the transmission capacity purchased at auctions in 2024 by border points. Capacity purchased at day-ahead auctions (64%) and intraday auctions (29%) accounts for 93% of all purchased capacity.

FIGURE 207: LEASED TRANSMISSION CAPACITIES AT AUCTIONS IN 2024

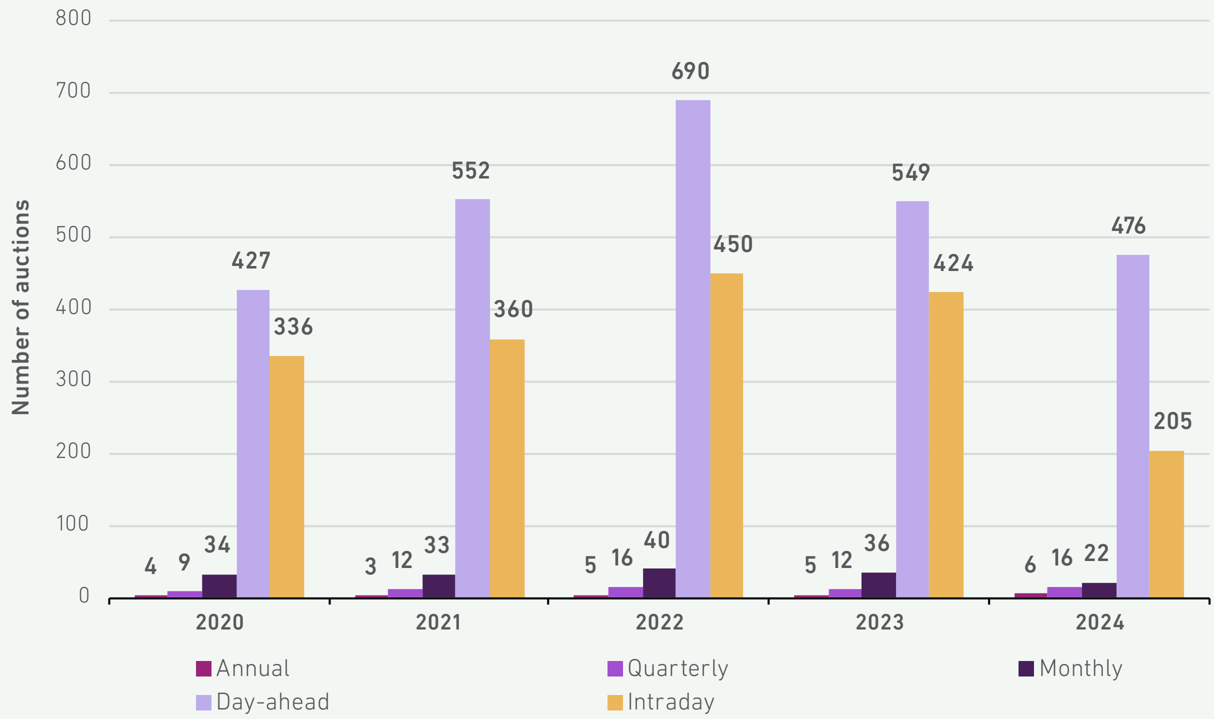


SOURCES: ENERGY AGENCY, PLINOVODI

A comparison of successfully completed auctions of transmission capacity (firm and interruptible) over the last five years shows that in 2024, the number of successful intraday auctions decreased the most (by 52%) and monthly capacity auctions (by 39%). There was a slight increase in the number of successful auctions of annual capacity, while the number of successful auctions of quarterly capacity increased slightly more.

52% fewer successful intraday capacity auctions

FIGURE 208: SUCCESSFUL AUCTIONS OF CAPACITY IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

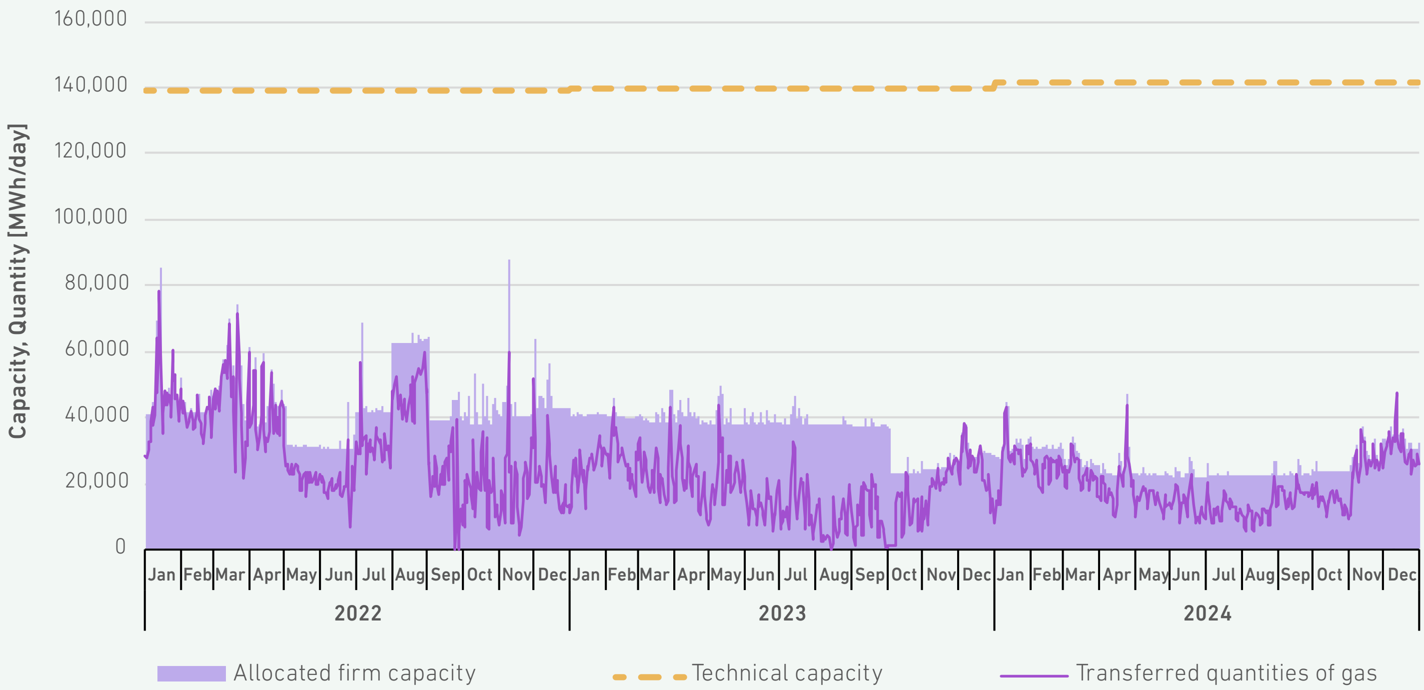
27% less capacity contracted in Ceršak, but 7% more gas transferred

Despite a decline in the last two years, day-ahead and intraday capacity purchases remain the most frequently used methods of capacity trading. The reasons for this are: high unpredictability in the gas market, increasingly better optimisation of capacity purchases, and generally sufficient capacity available at border points.

In 2024, the TSO did not assess the demand for additional transmission capacity on the Slovenian gas market.

The decline in interest in purchasing transmission capacity at Ceršak, Slovenia's largest border entry point, continued. Following a 17% decrease in capacity leasing in 2023, the decrease amounted to 27% in 2024. Nevertheless, 7.5% more gas was transferred than in the previous year. There was no leasing of interruptible capacity.

FIGURE 209: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF GAS, TECHNICAL CAPACITY, AND ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE CERŠAK ENTRY POINT IN THE 2022–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

At the Ceršak border point, there's no physical flow of gas from Slovenia to Austria, and in 2024, there were no virtual flows in the form of gas swaps.

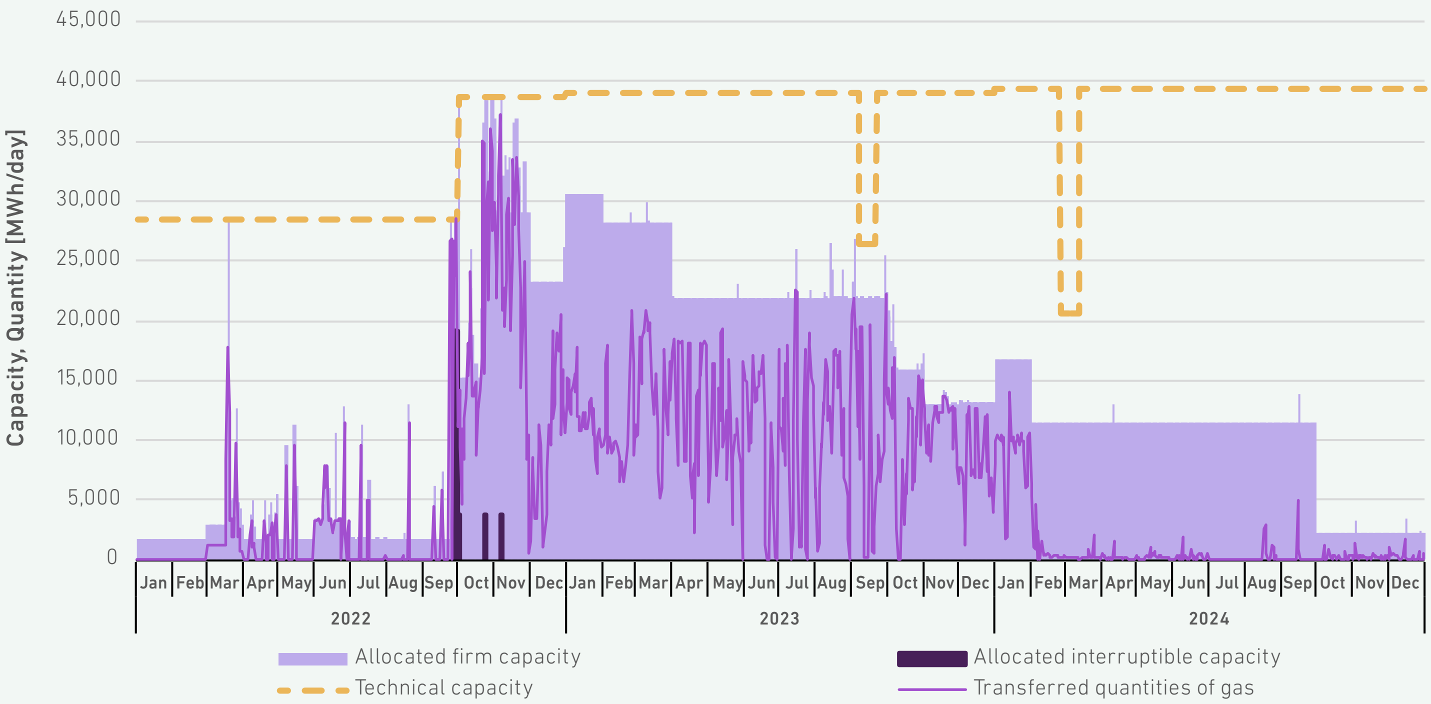
A significant drop in capacity purchases of 56% was also recorded at the Šempeter entry point.

Only 9% of gas volumes were transmitted compared to the previous year.

Due to necessary additional work on the transmission system, technical capacity at this entry point was reduced by 48% for 15 days in February and March.

In Šempeter, 56% less capacity was contracted and 10 times less gas was transported

FIGURE 210: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF GAS, TECHNICAL CAPACITY, AND ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ŠEMPTER ENTRY POINT IN THE 2022–2024 PERIOD

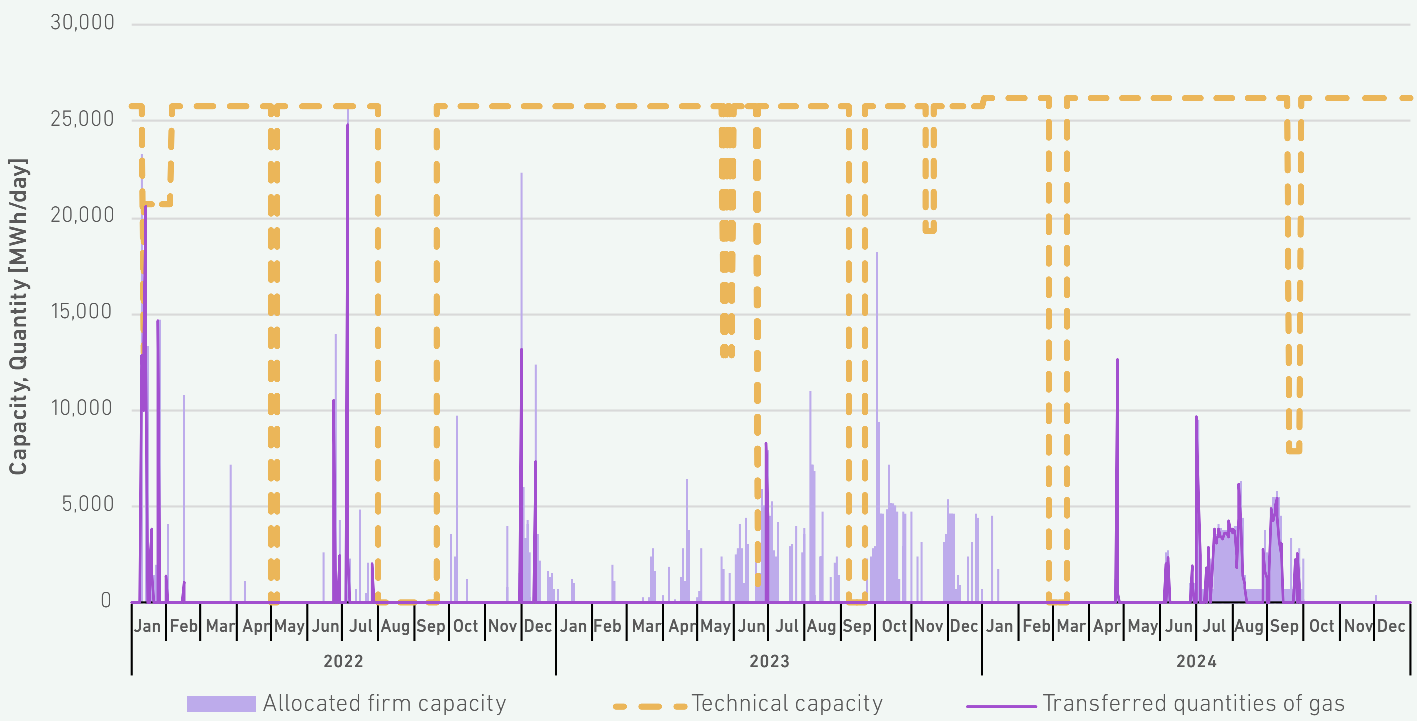


SOURCES: ENERGY AGENCY, PLINOVODI

At the Šempeter exit point, where there are no long-term capacity contracts, capacity was mostly booked only during the summer months. Although 36% less capacity was booked than in the previous year, 16 times more gas was transmitted (in 2023, gas transmission took place on only two days).

Due to necessary additional work on the transmission system, technical capacity was completely reduced for 16 days in February and March, and in September, technical capacity was reduced by 70% for 11 days due to the limited availability of the compressor station.

FIGURE 211: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF GAS, TECHNICAL CAPACITY, AND ALLOCATED FIRM CAPACITY AT THE ŠEMPETER EXIT POINT IN THE 2022–2024 PERIOD

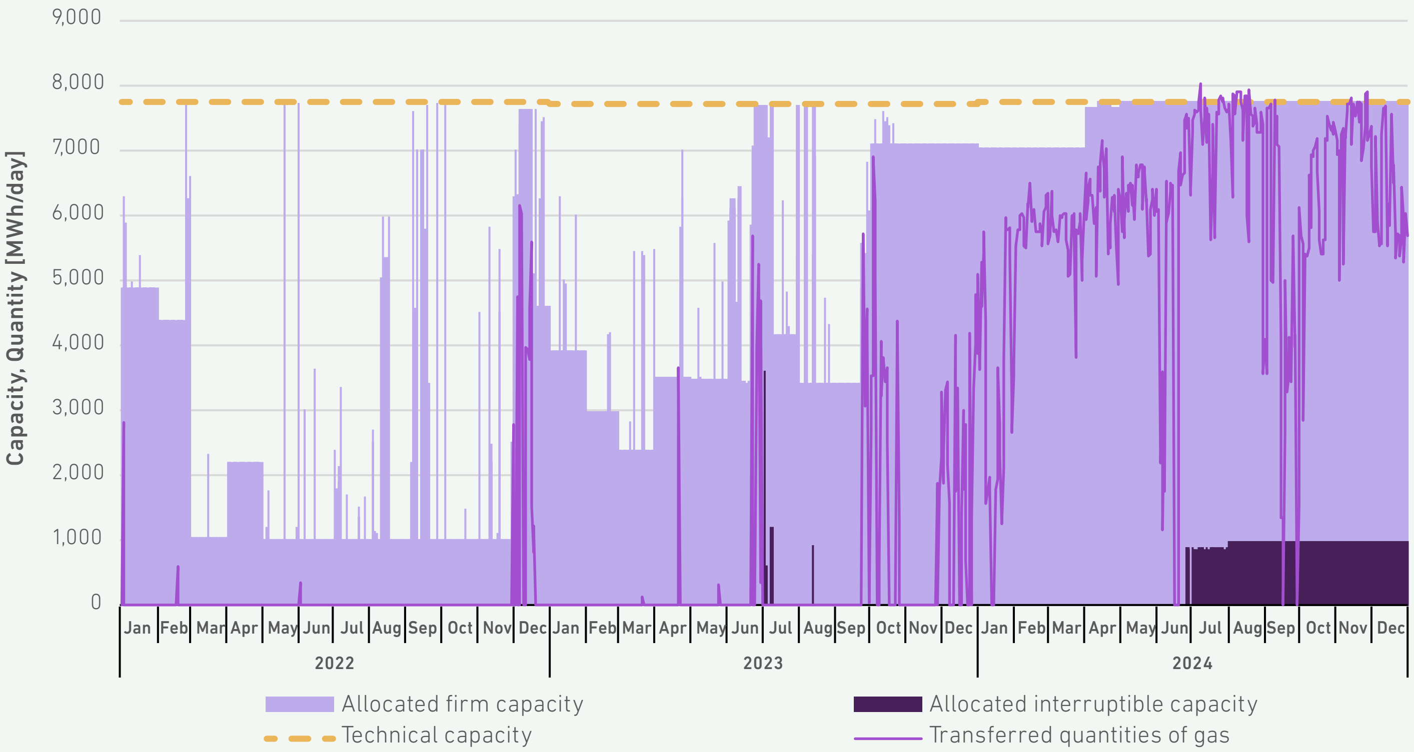


SOURCES: ENERGY AGENCY, PLINOVODI

Due to its low technical capacity (7.7 GWh/day) and changes in gas flows in the region, the Rogatec entry point has been contractually congested since April, and for 78 days, the daily gas volumes transmitted exceeded 95% of technical capacity, which means that physical congestion also occurred. Interruptible capacity was also allocated on 188 days.

Contractual and physical congestion at the Rogatec entry point

FIGURE 212: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF GAS, TECHNICAL CAPACITY, AND ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ROGATEC ENTRY POINT IN THE 2022–2024 PERIOD

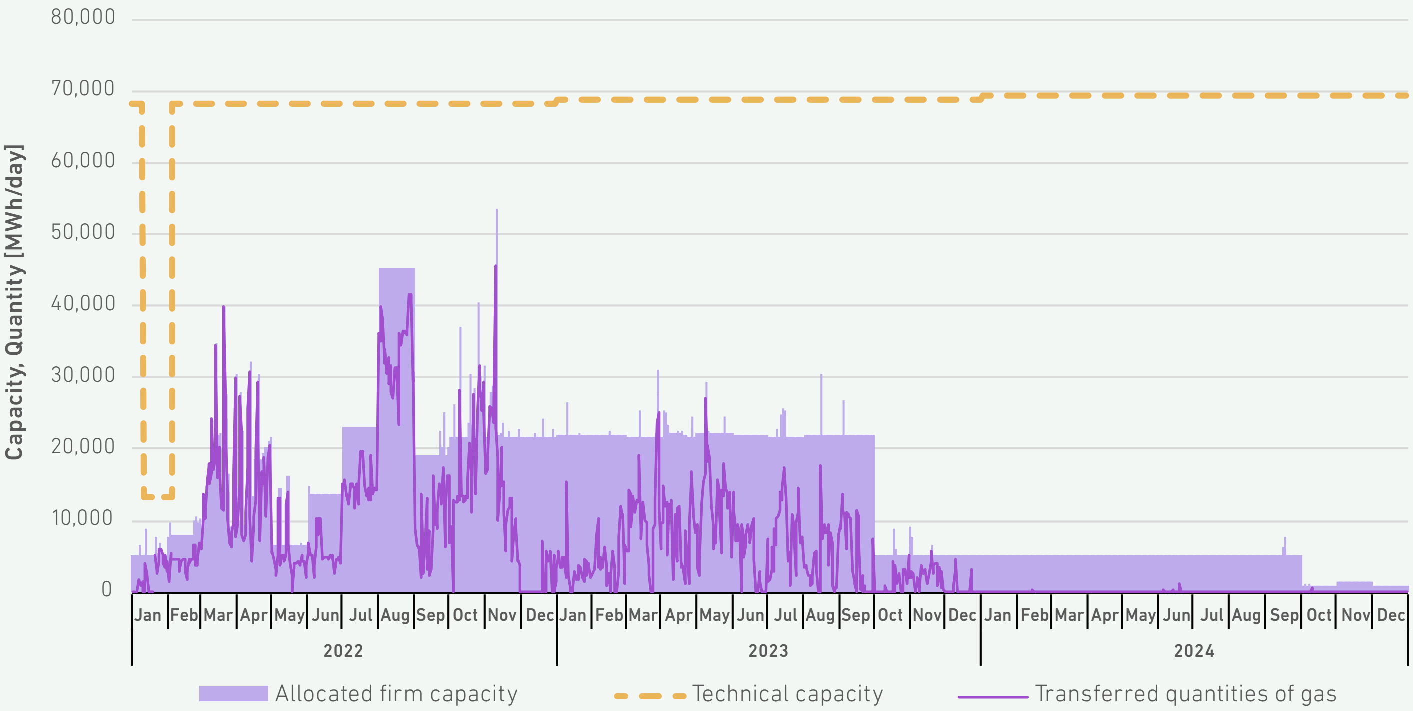


SOURCES: ENERGY AGENCY, PLINOVODI

At the largest exit point, Rogatec, 76% less transmission capacity was booked compared to the previous year. On average, only 6% of the technical capacity was booked, which represents a 20 percentage point decrease year-on-year. The volume of gas transmitted from Slovenia to Croatia was negligible, as transmission occurred on only five gas days.

Gas transmission from Slovenia to Croatia has completely stopped

FIGURE 213: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF GAS, TECHNICAL CAPACITY, AND ALLOCATED FIRM CAPACITY AT THE ROGATEC EXIT POINT IN THE 2022–2024 PERIOD

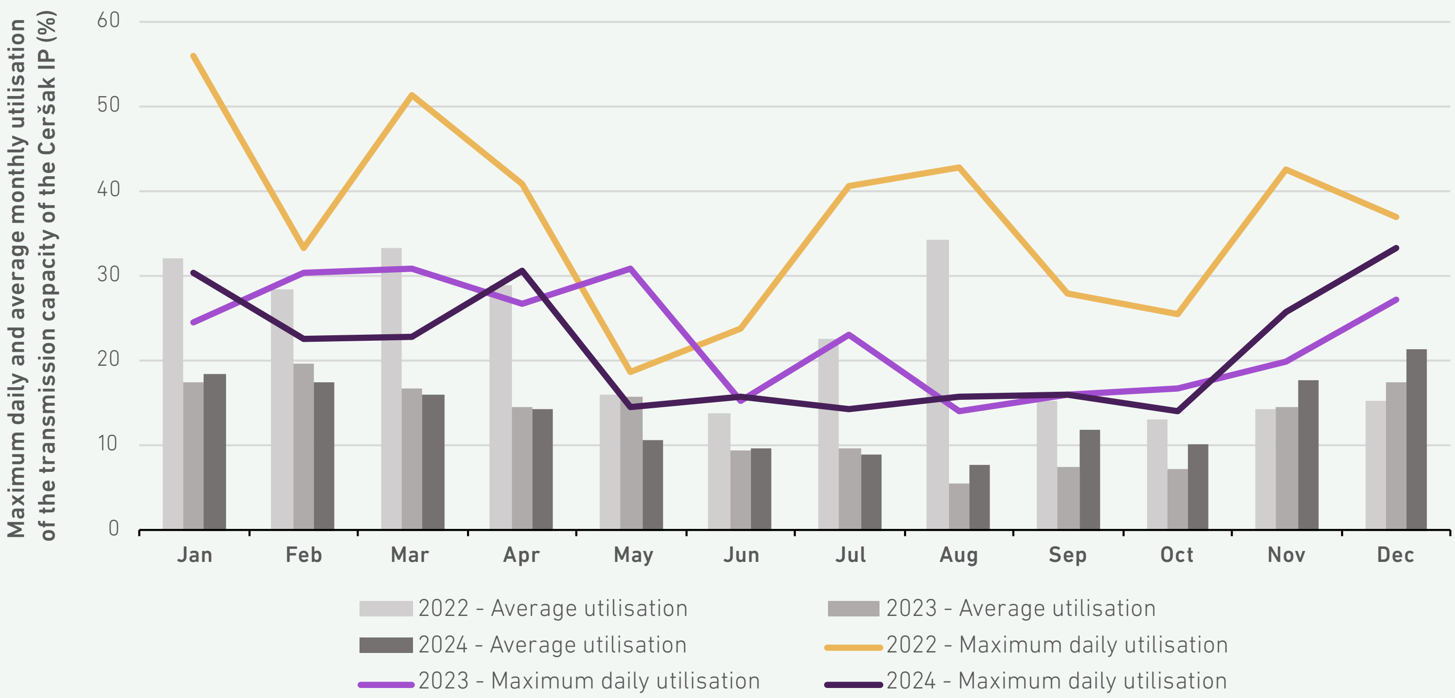


SOURCES: ENERGY AGENCY, PLINOVODI

The highest average monthly utilisation of technical capacity at the Ceršak entry point was achieved in December (22%), while the lowest was in August (8%). The highest daily utilisation of technical capacity, 34%, was achieved in December. Due to a decline in gas flows for filling storage facilities in Croatia during the summer months, the highest flows in the last two years were achieved in the winter months and are linked to the heating season and daily temperatures.

The average monthly utilisation of technical capacity at the Ceršak entry point was 14%, which is one percentage point higher than in the previous year.

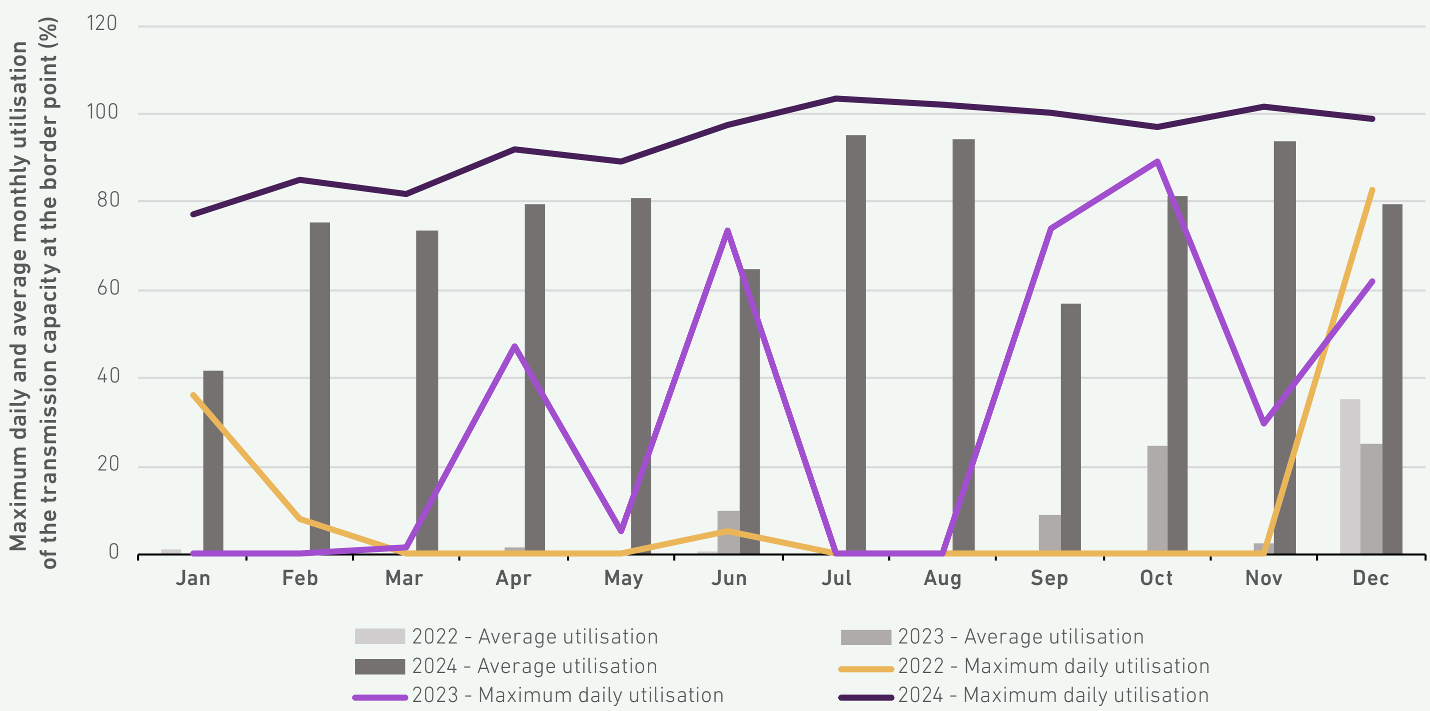
FIGURE 214: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE CERŠAK BORDER ENTRY POINT IN THE 2022–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The highest average monthly capacity utilisation of the Rogatec entry point was achieved in July (95%), while the lowest was in January (42%). In July, August, and November, there were several instances of physical overcapacity (100% daily utilisation of technical capacity), and technical capacity was fully utilised on 29 days throughout the year. The average monthly utilisation of technical capacity at the Rogatec entry point was 77% (only 6% in the previous year).

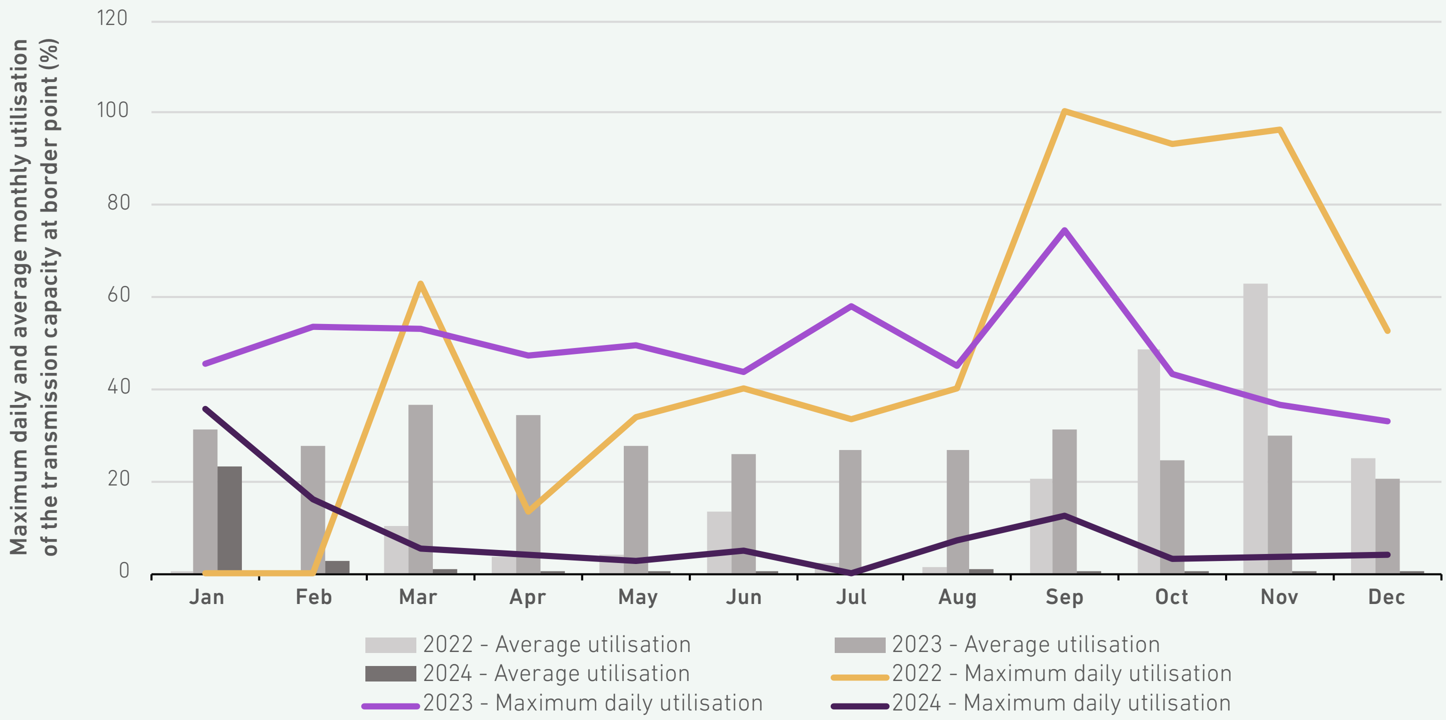
FIGURE 215: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE ROGATEC BORDER ENTRY POINT IN THE 2022–2024



SOURCES: ENERGY AGENCY, PLINOVODI

The average monthly utilisation of technical capacity at the Šempeter entry point was only 2.6%, which is 11 times less than in the previous year. The highest average monthly utilisation of technical capacity was achieved in January, at 23.3%. The highest daily utilisation of technical capacity was also recorded in January (35.6%).

FIGURE 216: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE ŠEMPETER BORDER ENTRY POINT IN THE 2022–2024 PERIOD

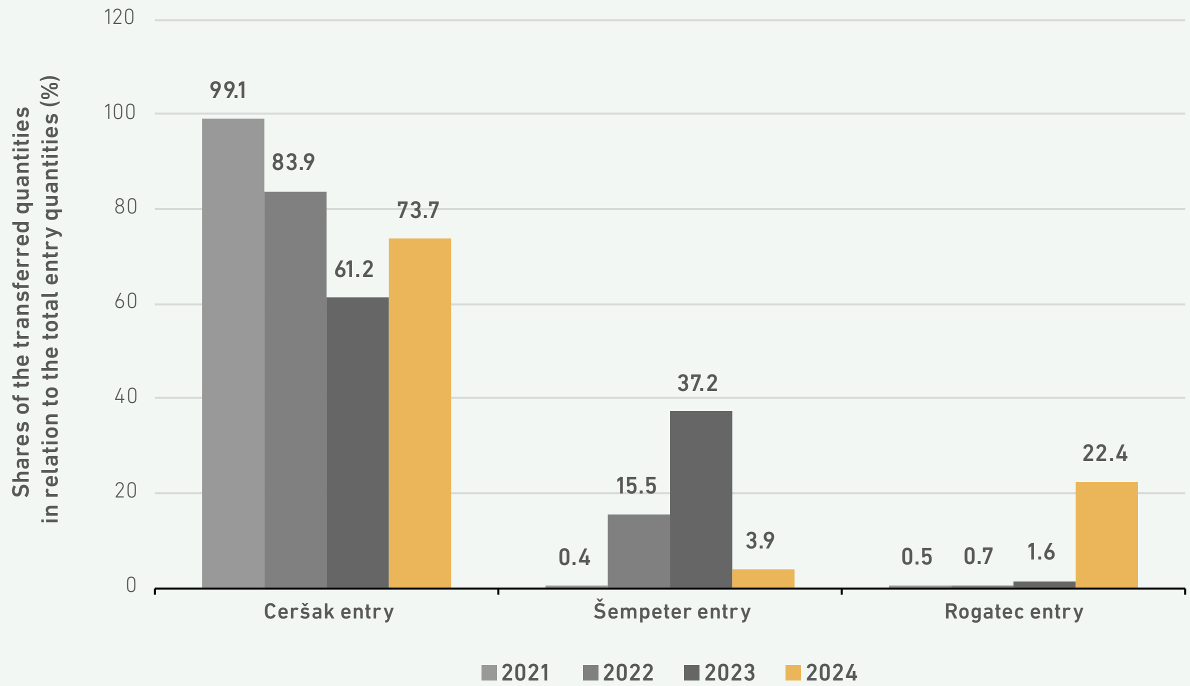


SOURCES: ENERGY AGENCY, PLINOVODI

The unpredictability of the gas market in Europe, which is mainly due to the uncertain geopolitical situation, is also reflected in the unpredictability of gas flows through Slovenian entry points. After two years of decline in gas entry volumes from Austria, gas volumes through Ceršak increased again in 2024. The opposite trend can be observed at the Šempeter entry point, where gas entry volumes from Italy decreased significantly in 2024 after two years of sharp growth. In the last year, despite its low technical capacity, the Rogatec entry point has also gained in importance, which could mean that suppliers have been importing gas from the LNG terminal on Krk and Croatian gas storage facilities.

Gas flows through Slovenian entry points remain highly volatile and unpredictable

FIGURE 217: AVERAGE DAILY GAS TRANSPORT AT ENTRY POINTS TO SLOVENIA IN THE 2021–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

Promoting Competition

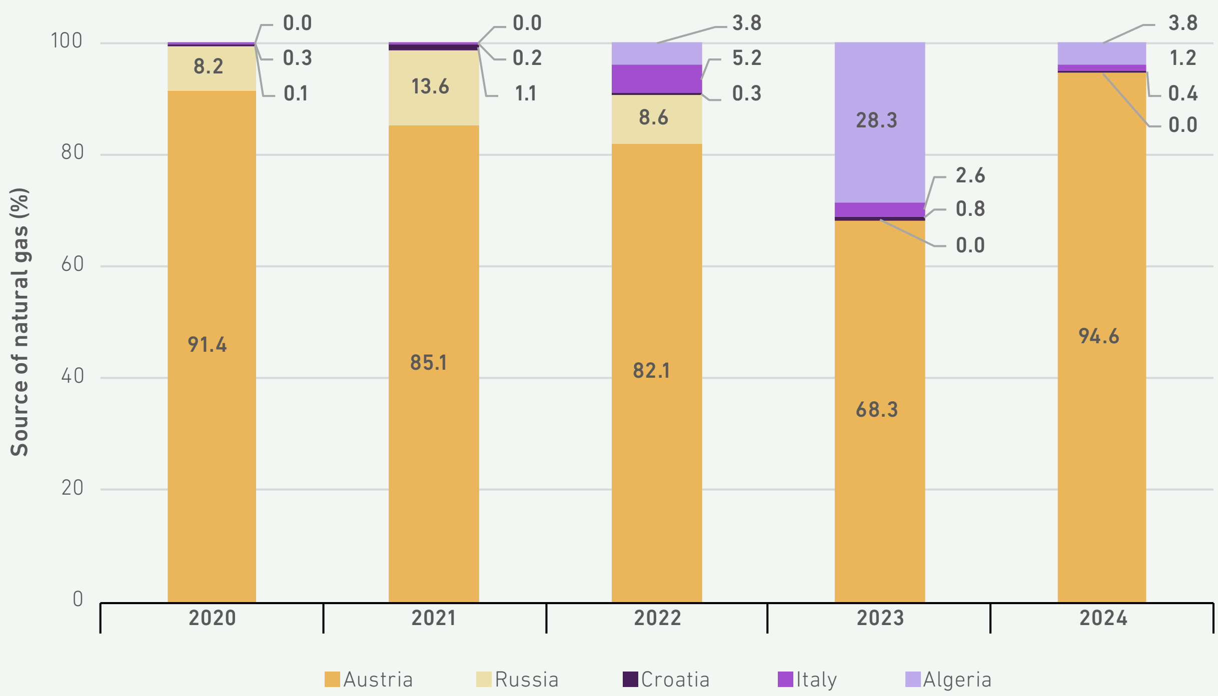
The following section sets out the state of play in the natural gas markets, covering pricing (influencing factors on prices, price movements, the impact of liquidity on prices, etc.), the transparency and integrity of market functioning, and market efficiency (openness and competition). The publication of the results of the continuous market monitoring, in addition to other measures taken by the Energy Agency, contributes to enhancing market competition and transparency and providing quality energy supply services at an optimal price.

Wholesale market

Slovenia has no natural gas sources, gas storage facilities or terminals for liquefied natural gas, which means that the Slovenian wholesale market is supplied entirely by gas imported from neighbouring countries via transmission systems. In recent years, the Slovenian wholesale market has been supplied mainly with gas from Austria, Russia, Croatia, and Italy. In line with the reduction in gas volumes from Russia, gas imports from Algeria have resumed since 2022. Contrary to expectations, the downward trend in gas imports from Austria was interrupted in 2024, with as much as 95% of imported gas originating in Austria. Gas imports from Algeria also fell surprisingly, which may indicate gas swaps between suppliers. No gas declared as being of Russian origin has been imported into Slovenia in the last two years.

95% of all imported gas comes from Austria

FIGURE 218: SOURCES OF NATURAL GAS IN THE 2020–2024 PERIOD BY PLACE OF PURCHASE



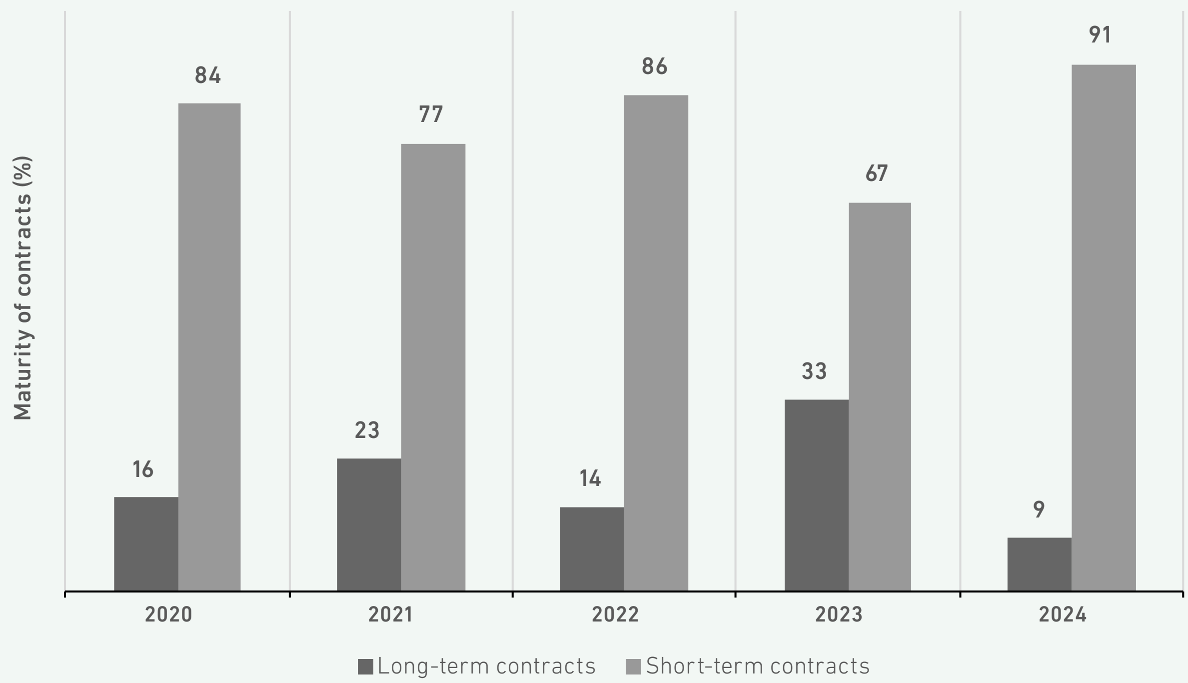
SOURCE: ENERGY AGENCY

In the past, Slovenia has been highly dependent on gas from Russia for its energy needs. The Energy Agency monitors the volume of gas imported for domestic consumption, but does not trace the source of the gas back to production. Slovenian traders and suppliers do indeed purchase the vast majority of gas at the gas hub in Austria, but it is known that gas arriving there from Russia predominates. Slovenia's dependence on Russian gas is therefore higher than shown in Figure 218. The figure does not show the geographical origin of the gas, but rather the country from which traders or suppliers imported gas into Slovenia.

Share of long-term contracts only 9% – lowest ever

In recent years, long-term contracts between gas traders and producers have been replaced by short-term contracts concluded at gas hubs, exchanges, and other points within the EU. The energy crisis in 2022 has encouraged suppliers and traders to re-enter into long-term contracts, as the maturity of contracts or the ratio between short-term and long-term contracts can affect the reliability of supply. As a result, the share of capacity contracted under long-term contracts increased in 2023, but fell again by as much as 24 percentage points in 2024.

FIGURE 219: STRUCTURE OF IMPORTED GAS IN RELATION TO THE MATURITY OF CONTRACTS



SOURCE: ENERGY AGENCY

The Herfindahl-Hirschman Index (HHI) decreased in 2024, indicating a reduced concentration of the Slovenian wholesale gas market. Geoplin, the largest Slovenian supplier, reduced its market share in the Slovenian wholesale market by 8.6 percentage points. HSE took over the second-largest share from Petrol, which had the second-largest share in 2023. Energetika Ljubljana increased its market share by 0.3 percentage points to take third place. The market shares of other smaller suppliers did not change significantly.

TABLE 42: MARKET SHARES AND THE HHI OF THE WHOLESALE GAS MARKET

Company	Market share (%)	
	2023	2024
Geoplin	84,9	76,3
HSE	0,0	19,2
Energetika Ljubljana	2,7	3,0
Plinarna Maribor	1,4	0,9
Petrol	10,0	0,0
Ostali	1,0	0,6
HHI of the wholesale market	7.312	6.202

SOURCE: ENERGY AGENCY

The CR3 and CR5 indices also show a high degree of concentration. The CR3 index shows the market shares of the three largest suppliers, while the CR5 index shows the market shares of the five largest suppliers. In 2024, the three largest suppliers controlled 98.5% of the wholesale market, while the five largest suppliers controlled the entire Slovenian market. Concentration has changed only slightly over the last five years.

FIGURE 220: WHOLESALE GAS MARKET CONCENTRATION

SOURCE: ENERGY AGENCY

Market Transparency

The REMIT Regulation, Implementing Regulation (EU) No 1348/2014[138] and the Energy Act provide a comprehensive legal framework to ensure price transparency in the wholesale electricity and natural gas markets. This area is discussed in more detail in the chapter on electricity market transparency.

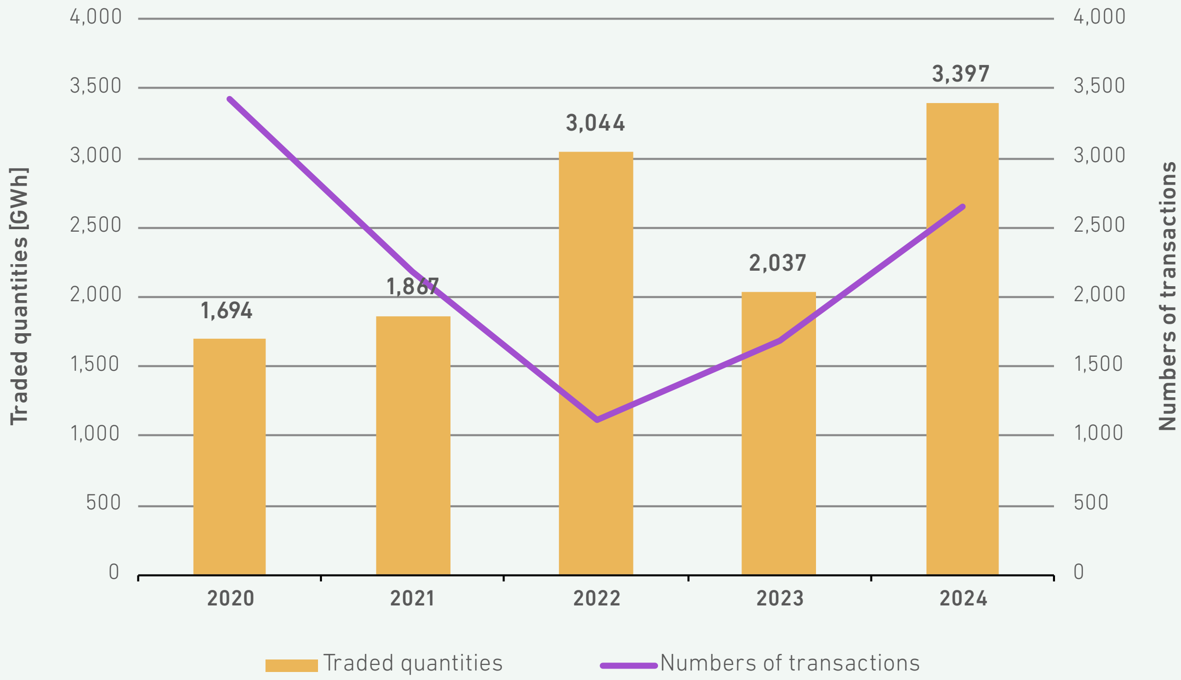
Market Effectiveness

A record amount of gas was sold at the virtual trading point since its establishment in 2016. The number of trading transactions also increased by 56%.

Two-thirds more gas sold on the free market

138 On 17 April 2024, Regulation (EU) 2024/1106, known as the REMIT II Regulation, was published, on improving the protection against market manipulation in the energy market.

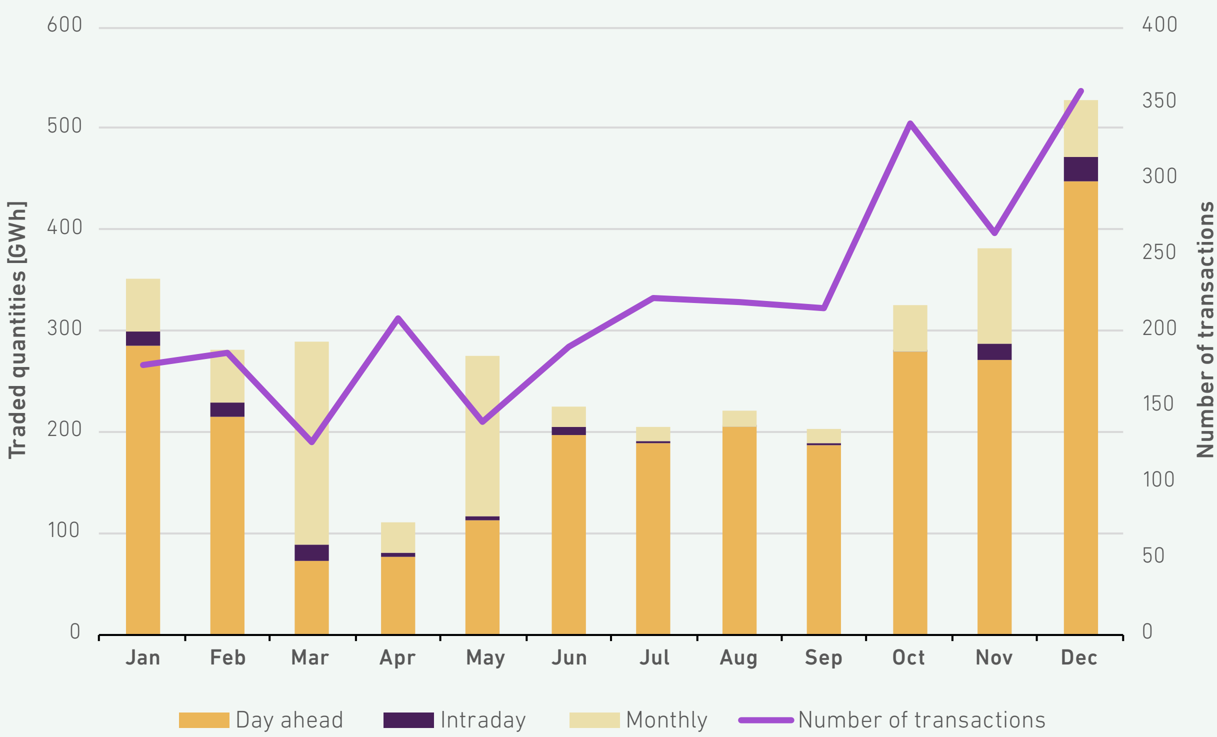
FIGURE 221: TRADING IN THE VIRTUAL POINT (FREE MARKET) IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The largest share of sold quantities (75%) was sold on a day-ahead basis, 22% was sold on a monthly basis, and only 3% was sold within the day. In terms of the number of transactions, which totalled 2,643, products sold on a day-ahead basis predominated (91%), with monthly transactions accounting for 3% and intraday transactions for 6%. No transactions were made with weekly products. On average, ten traders traded at the virtual point each month, one more than in the previous year.

FIGURE 222: TRADING IN VIRTUAL POINT BY TRADING PRODUCT IN 2024

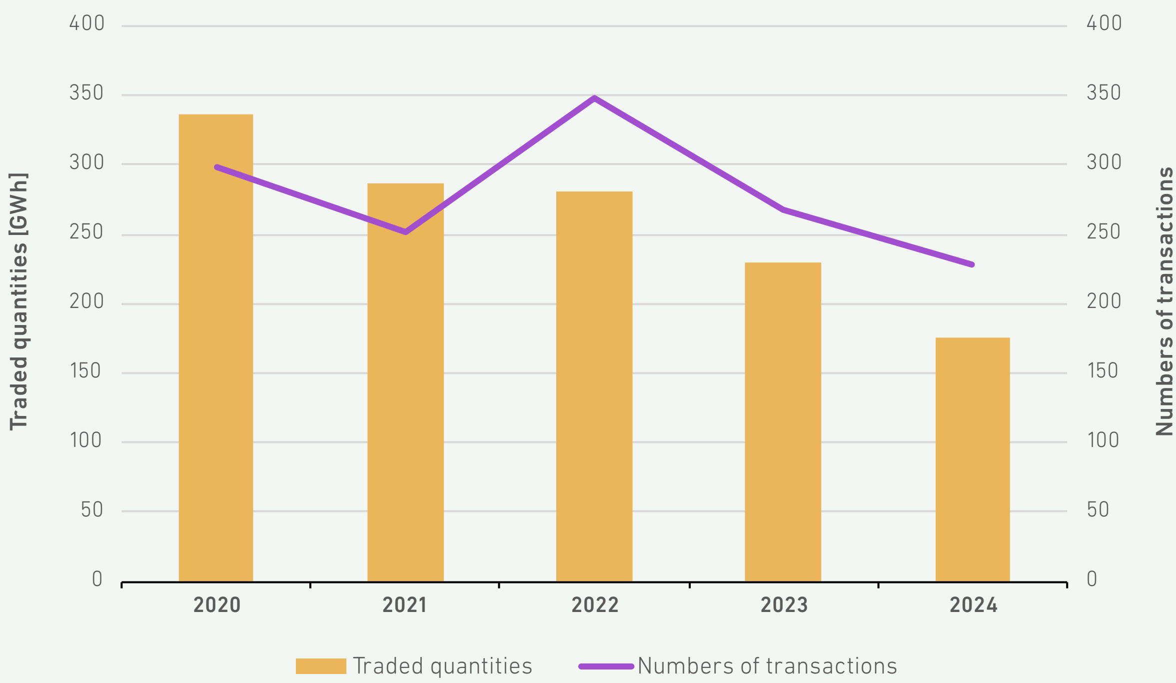


SOURCES: ENERGY AGENCY, PLINOVODI

While the TSO does not trade at the virtual point, the vast majority of transactions on the trading platform, where trading takes place for the purpose of balancing daily imbalances, are carried out between the TSO and the balance group leaders. Transactions between balance group leaders are very rare; in 2024, there were no such transactions at all. A total of 176 GWh of gas was exchanged, which is 23% less than in the previous year. The number of transactions was also 15% lower than in 2023.

18% less gas sold on the trading platform, number of transactions down by 15%

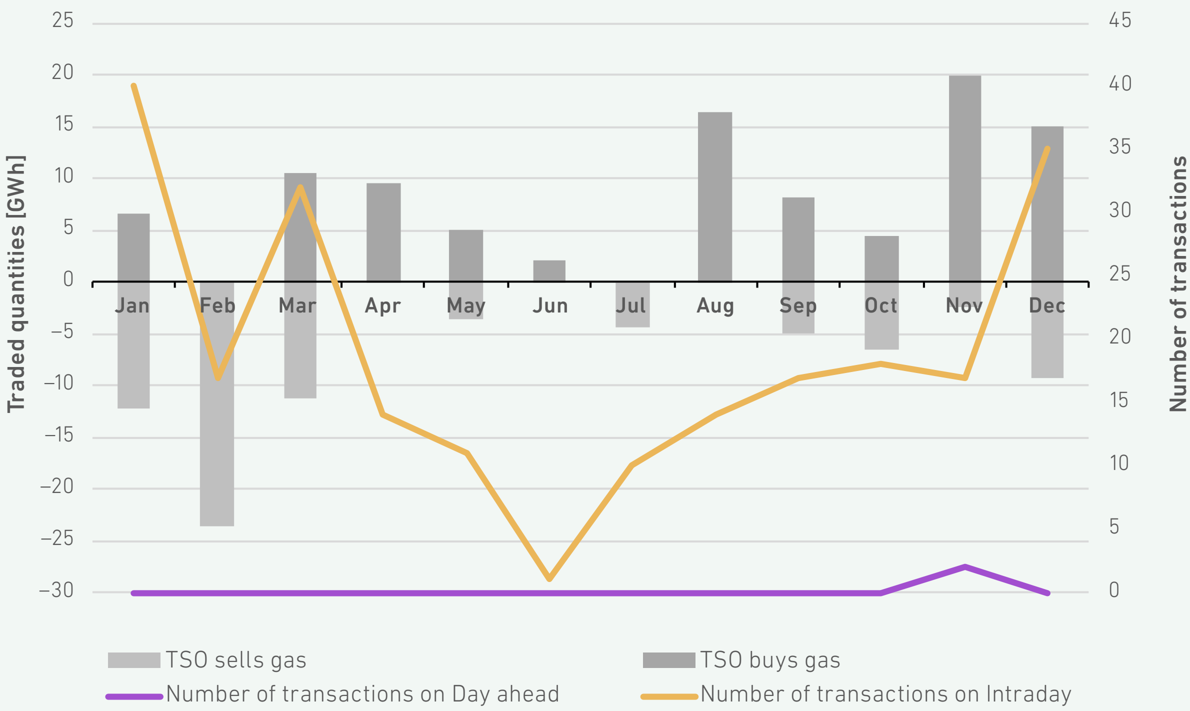
FIGURE 223: TRADING ON A TRADING PLATFORM (BALANCING MARKET) IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

Almost all transactions were executed within the day (226), with only two transactions executed for the day ahead. On average, three balance group leaders traded on the trading platform each month alongside the TSO, which is the same as in the previous year.

FIGURE 224: TRADING ON TRADING PLATFORM IN 2024



SOURCES: ENERGY AGENCY, PLINOVODI

The weighted average trading price on the trading platform followed the CEGHIX exchange index of the CEG gas hub in Vienna. On approximately one-third of days, it was on average 4% lower than the CEGHIX, and on two-thirds of days, it was on average 5% higher than the CEGHIX. The maximum deviation of the weighted average price from the CEGHIX stock exchange index was 21% upwards and 16% downwards.

FIGURE 225: WEIGHTED AVERAGE PRICE ON THE TRADING PLATFORM AND VALUES OF THE CEGHIX IN THE 2022–2024 PERIOD

SOURCES: PLINOVODI, CEGH

Members of the virtual point did not advertise their offers or requests on the notice board. The TSO advertised on the notice board only twice, both times offering its gas quantities for sale on the trading platform.

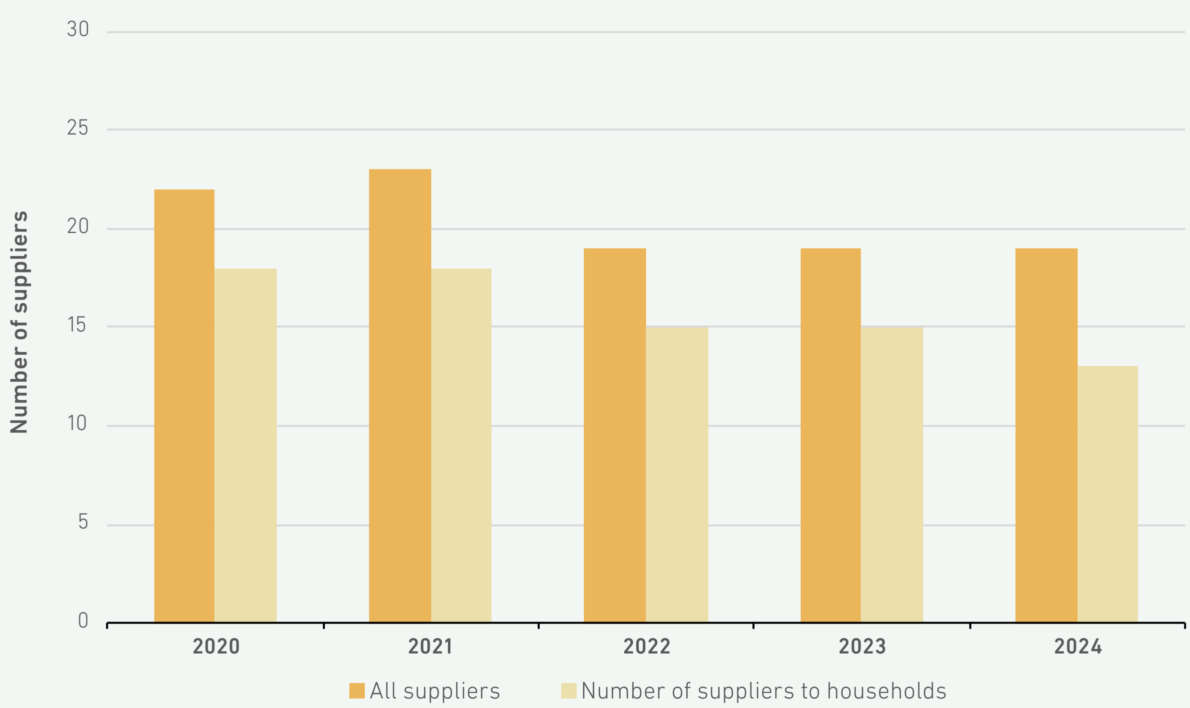
Retail market

At the end of 2024, there were 19[139] active gas suppliers on the retail market in Slovenia. Of these, 13 suppliers supplied gas to household consumers connected to distribution systems based on concluded contracts, while 19 supplied gas to business consumers connected to distribution systems and the transmission system. Although the number of suppliers remained the same, there were changes among the suppliers. In 2024, Komunalno podjetje Vrhnika ceased to supply gas, and HSE began to perform this activity. ENNA Next (formerly PPD energija) also entered the gas market. The number of suppliers supplying household consumers decreased because Komunalno podjetje Vrhnika and ENOS no longer supplied household consumers.

Number of suppliers in the retail market unchanged

Consumers can choose between offers from all suppliers offering gas in their local community. Individual gas suppliers with smaller annual supply volumes supply gas to consumers only in local communities where they also operate gas distribution activities under the umbrella of the same company. Consumers pay for the gas delivered on a monthly basis based on the actual quantity consumed, as measured by a metering device, or based on the estimated amount of consumption[140],if the operator does not have access to the meter reading.

FIGURE 226: NUMBER OF SUPPLIERS ON THE RETAIL MARKET IN SLOVENIA IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

139 The Energy Agency considered as suppliers those companies that are members of a balance group or balance subgroup.
140 Calculated on the basis of the provisions of the Methodology for forecasting non-daily measured off-takes of natural gas network users.

In October 2023, the Government of the Republic of Slovenia adopted a new Decree on the Determination of Natural Gas Prices from the Gas System, setting revised maximum prices for the supply of gas, applicable from 1 January to 30 April 2024. The maximum allowed gas prices were defined for household consumers, joint household consumers, and heat distributors who use the gas to produce heat for household supply.

During this period, the maximum tariff rate for supply was 0.0599 EUR/kWh, which was 0.0131 EUR/kWh lower than the regulated price in effect in 2023. In the first four months of 2024, only two suppliers offered gas at prices slightly below the government-regulated rate for household consumers.

After the expiry of the decree setting the maximum retail gas price, several suppliers introduced new offers with lower prices. Although these offers included significant price differences, most consumers did not take advantage of the opportunity to switch suppliers and thus missed the potential for savings.

Gas Prices in the Retail Market

Price monitoring in the retail market is carried out using public data and data from offers to household and small business consumers obtained from suppliers in the framework of the Energy Agency's comparison services.

Retail gas prices in supply offers during periods of stable market functioning depend mainly on price developments in the wholesale markets, the purchasing conditions secured by suppliers in trading, and the business decisions of the individual supplier.

In recent years, gas prices have fluctuated significantly due to unpredictable gas supply reliability, changing geopolitical conditions, the decarbonization process, and other factors that have required suppliers to adapt to new circumstances and seek new sources of gas.

Falling gas prices for all consumers groups

Gas prices for household consumers were capped from September 1, 2022, to April 30, 2024, and for small business customers from September 1, 2022, to December 31, 2023. Gas prices for business consumers were not regulated.

In 2024, gas prices fell for all consumer groups, but the decrease was greater for business consumers than for households.

Retail Price Index

As part of monitoring the relevant market, the Energy Agency determines the Retail Price Index (RPI). The RPI is based on the cheapest offer available on the market that is accessible to all consumers. This allows consumers to switch suppliers without contractual penalties for an unlimited period of time. Based on the contracts concluded, it only reflects the price potential, not the realised price.

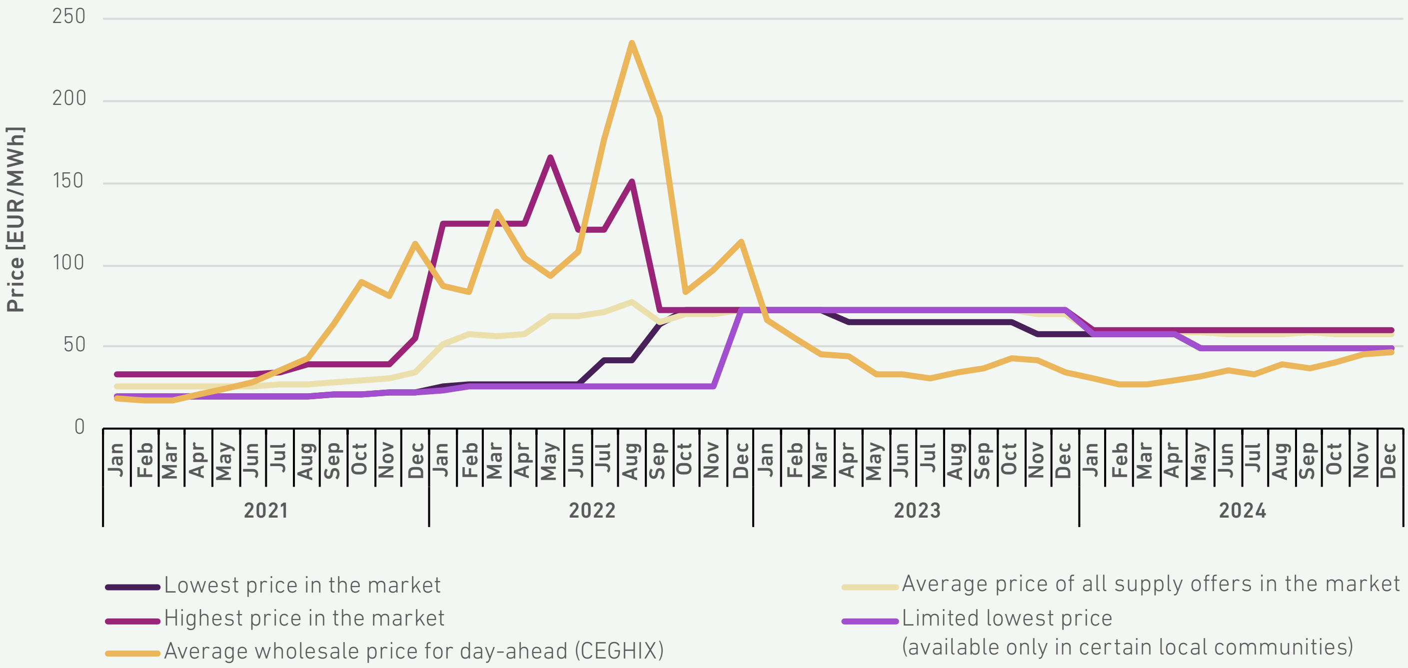
Figure 227 shows the trend in the following prices for a typical household consumer:

- 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.

The maximum price of gas for household consumption was 17.9% lower than the maximum price in 2023

In the first four months of 2024, gas prices were capped at EUR 59.9/MWh, which was 17.9% lower than the maximum price allowed for 2023. During the period of the maximum permitted price, only two suppliers (Adriaplin and Petrol) were offering gas at a price that was between 1.1% and 2.5% lower than the maximum price.

FIGURE 227: RETAIL PRICE INDEX AND SOME TYPICAL GAS PRICES WITHOUT THE NETWORK CHARGE, DUTIES AND VAT IN THE 2021–2024 PERIOD



SOURCE: ENERGY AGENCY

In May 2024, after the end of gas price regulation, GEN-I offered the lowest promotional gas price of 49.5 EUR/MWh, while Energetika Ljubljana offered a regular price of 53.91 EUR/MWh. Some other suppliers reduced gas prices for household consumers in June (Energija Plus EUR 49.4/MWh) or during the summer months. At the end of 2024, five smaller suppliers still had the highest price of 59.9 EUR/MWh. At the end of 2024, most household consumers had a price below 54.0 EUR/MWh.

Wholesale day-ahead gas prices on the Austrian CEGH exchange were rising throughout the year. In January, the wholesale price of gas for the day ahead was 30.4 EUR/MWh, reaching 47.1 EUR/MWh in December 2024. In December 2024, the lowest gas price offered on the market was only 5.0% higher than the average wholesale price.

Reducing the average monthly price of natural gas, which fell by 18.2% by the end of the year

Final Gas Prices

Figure 228 shows the movement of gas prices, including all taxes and levies, for household consumers in the period 2021–2024. For all household consumer groups D1, D2, and D3, gas prices in the first half of 2024 were at least 13% lower than in the second half of 2023. In the second half of 2024, gas prices fell further, reaching levels 14.8% lower than in the second half of 2023 for the smallest household consumers and as much as 17.7% lower for household consumers in group D2.

For a typical D2 household consumer, the average price in 2024 was 94.2 EUR/MWh, which was 10.2% lower than in 2023, but 14.9% higher than in 2022 and as much as 66.1% higher than in 2021.

Gas prices for household consumers down by more than 10%

FIGURE 228: FINAL GAS PRICES FOR HOUSEHOLD CONSUMERS IN SLOVENIA WITH ALL TAXES AND DUTIES IN THE 2021–2024 PERIOD

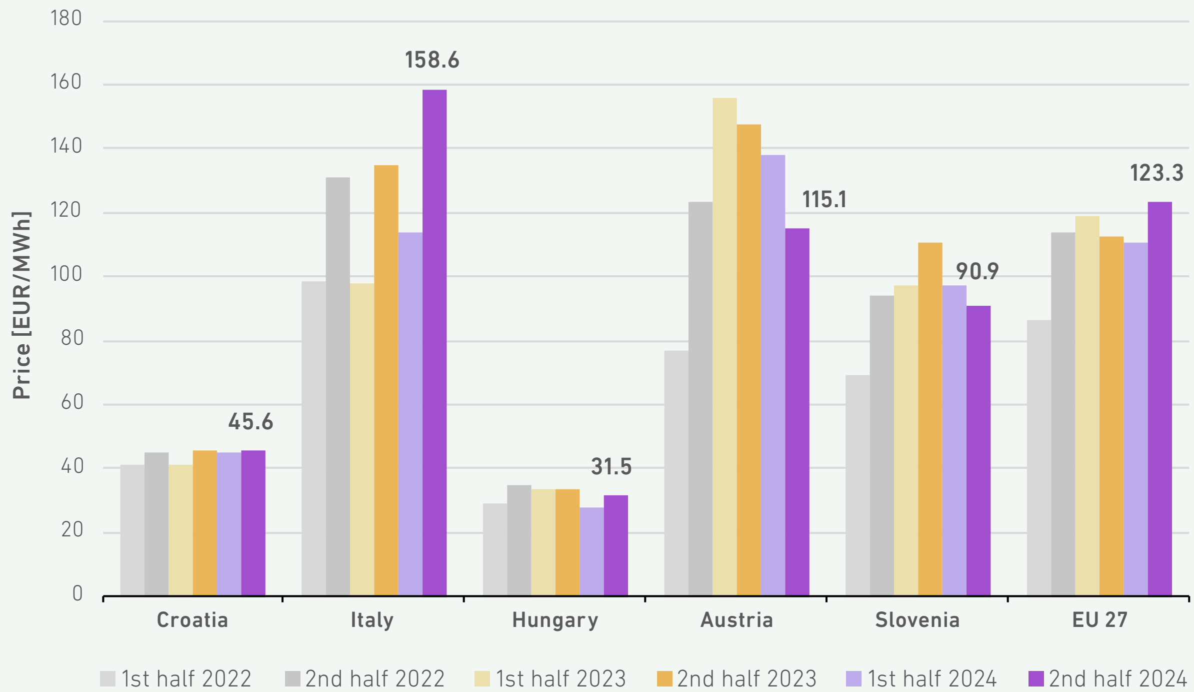
SOURCE: STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

Figure 229 shows the movement of final gas prices, including all taxes and levies, in 2022, 2023, and 2024 for a typical D2 household gas consumer in Slovenia and neighbouring countries. Final gas prices in Slovenia fell by 9.3% year-on-year in 2024 compared to the previous year. Meanwhile, in 2024, they were also lower than in the previous year in Hungary (–12.2%) and Austria (–16.7%). In contrast, they were higher than in the previous year in Croatia and Italy. Final gas prices for typical household consumers in Slovenia remain well below the EU average.

Gas prices for household consumers 20% below the EU average

As in the previous two years, final gas prices in 2024 also varied more between EU countries due to the different measures taken by EU Member States to mitigate energy price increases.

FIGURE 229: FINAL PRICES OF GAS FOR TYPICAL D2 HOUSEHOLD CONSUMERS, INCLUDING TAXES AND LEVIES, IN SLOVENIA AND IN NEIGHBOURING COUNTRIES IN THE 2022–2024 PERIOD



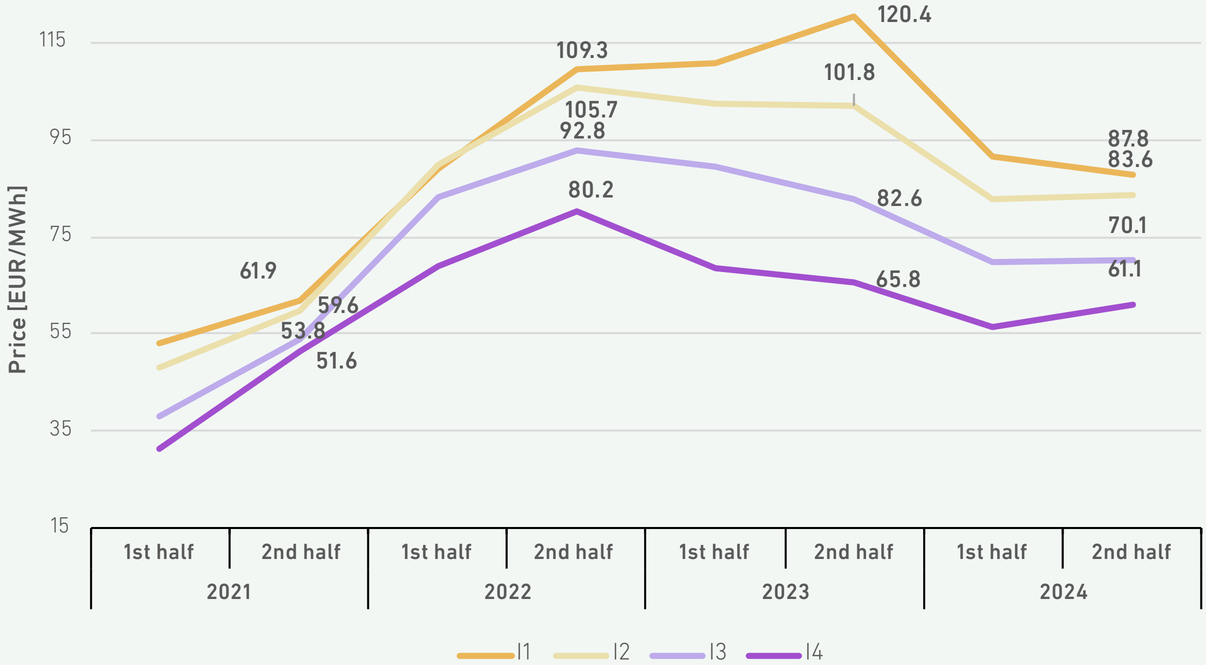
SOURCE: EUROSTAT

Final gas prices for business consumers in Slovenia fell significantly in 2024 compared to 2023 and 2022. The decrease in gas prices for business customers is also greater than for household consumers. For the smallest business consumers (I1), the final gas price at the end of 2024 was 89.6 EUR/MWh, which was 22.4% lower than in 2023 and 9.6% lower than in 2022.

Gas prices for business consumers lower by between 12.6% (I4) and 22.4% (I1)

The same trend can be observed for other business consumers. The Figure also shows that the final gas price is converging again between different user groups of business consumers. While in the second half of 2023, the highest gas price for business consumers I1 was as much as 83% higher than for business consumers I4, in the second half of 2024, the gas price for group I1 was only 44% higher than for I4. Figure 230 shows the trend in the final gas price, including all taxes and levies, for business consumers in the period 2021–2024.

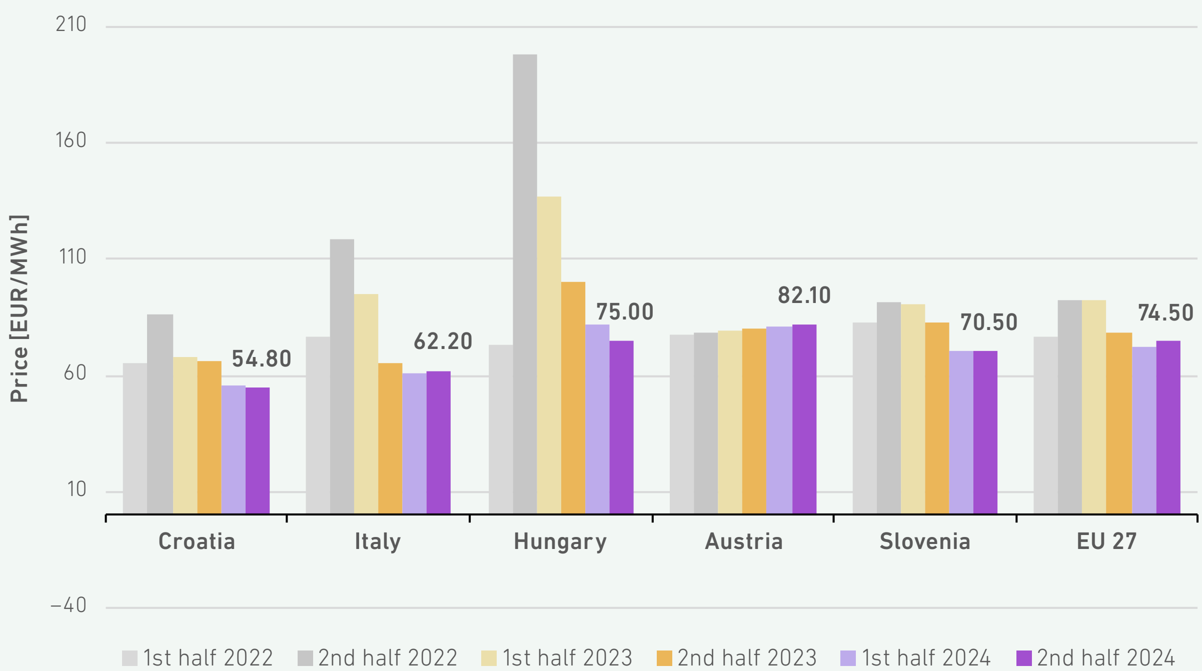
FIGURE 230: FINAL PRICES OF GAS FOR BUSINESS CONSUMERS IN SLOVENIA, INCLUDING TAXES AND LEVIES, IN THE 2021–2024 PERIOD



SOURCE: STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

Figure 231 shows the final gas prices for typical I3 business consumers in Slovenia and neighbouring countries. For these consumers, the final price of gas in Slovenia fell by 18.3% on an annual basis, while there was no noticeable decline in prices in the second half of the year compared to the first half. The final price of gas for typical business consumers was 3.7% below the EU average. Compared to the previous year, final prices were also lower in all neighboring countries except Austria. Final gas prices fell the most on an annual basis in Hungary, by 34.0%, which also saw the highest half-yearly price decline, with final prices in the second half of the year falling by 8% compared to the first half of the year.

FIGURE 231: FINAL PRICES OF GAS FOR TYPICAL I3 BUSINESS CONSUMER, INCLUDING TAXES AND LEVIES, IN SLOVENIA AND IN NEIGHBOURING COUNTRIES IN THE 2022–2024 PERIOD

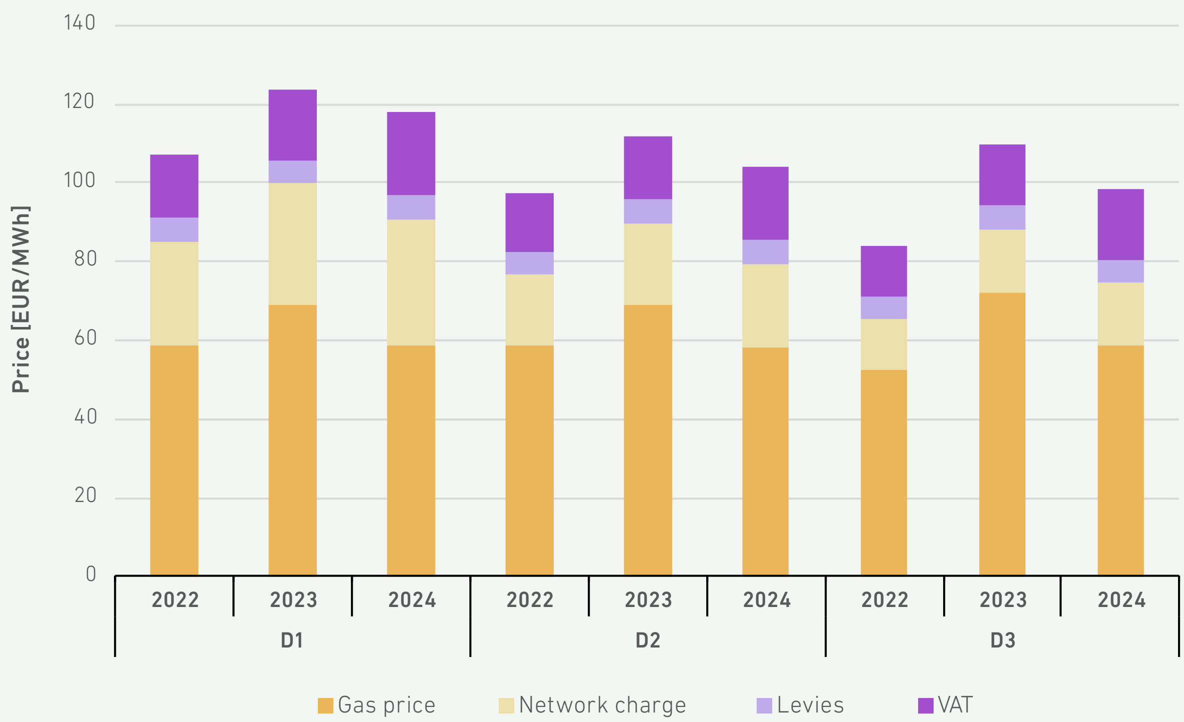


SOURCE: EUROSTAT

Figures 232 and 233 show the structure of the final price for typical household and business consumers connected to distribution systems in the period 2022–2024.

In the structure of the final gas price for household consumers, the share of energy decreased in all consumer groups in 2024 compared to the previous year. As in previous years, the share of energy in the final gas price in 2024 will be the highest for user group D3, accounting for 59.6% of the final gas price. The network charge will account for the highest share of the final gas price for user group D1, at 27.5%. User group D1 had the highest share of network charges throughout the entire observation period, while user group D3 had the lowest.

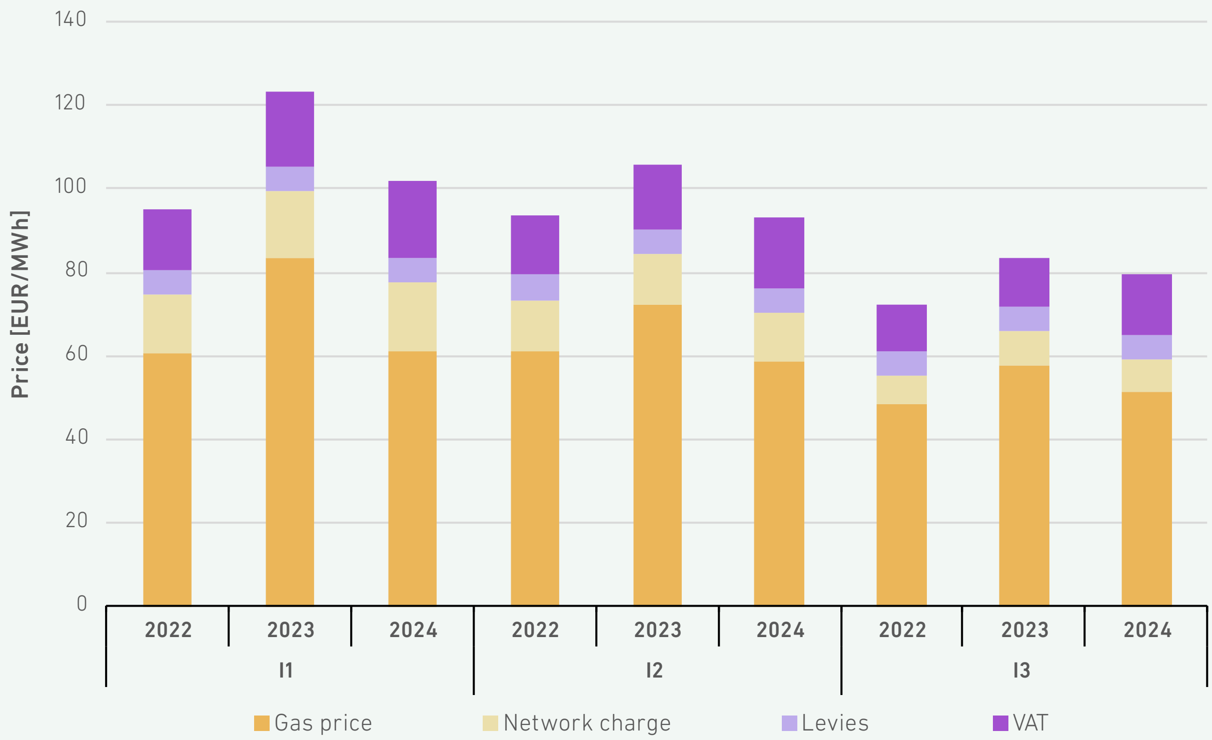
FIGURE 232: STRUCTURE OF THE FINAL GAS PRICE FOR HOUSEHOLD CONSUMERS IN THE 2022–2024 PERIOD



SOURCES: SUPPLIERS

The share of energy in the final gas price for business consumers also decreased in 2024 compared to the previous year for all consumer groups. For the smallest business consumers (I1), the share of gas in the final price of gas supply was 60.1%, while for the largest (I3) it was 64.4%. The network charge accounted for the largest share of the final gas supply price in user group I1 at 22.0%, and the smallest share in user group I3 at 10.3%.

FIGURE 233: STRUCTURE OF THE FINAL GAS PRICES FOR BUSINESS CONSUMERS IN THE 2022–2024 PERIOD



SOURCES: SUPPLIERS

Compared to the previous year, the share of value added tax increased, as a lower value added tax rate was in effect in the first six months of 2023.

Market Transparency

The results of monitoring the efficiency and competitiveness of the retail gas market presented below are based on the continuous processing of data submitted to the Energy Agency by the liable parties (suppliers).

Financial Transparency of Suppliers and Transparency of Invoices

Under the Companies Act (ZGD-1), gas suppliers must prepare annual reports to ensure adequate financial transparency in their natural gas supply activities. The consolidated yearly reports must give an accurate and fair view of the company's financial position and profit or loss. They are audited by independent auditors and submitted to the AJPES for public publication. The applicable legislation regulates the accounts' transparency in a systemic manner. The invoice for gas supplied thus separately shows the amounts for gas consumed, the network charge (distribution amount and metering amount), the energy efficiency contribution, the RES and CHP contribution, the environmental levy (CO_2 tax), the excise duty and the VAT. In the absence of innovative offers on the retail gas market, the current legislation ensures adequate transparency in the cost of supply accounting.

Obligation to Publish Supply Offers

Suppliers must transparently inform household and small business consumers about their offers to supply natural gas, the applicable price lists, and the general contract terms and conditions for the supply service.

Energy Agency's Activities for Providing Transparency

The Energy Agency regularly monitors the functioning of the gas retail market, including the number and characteristics of published offers, focusing on prompt action on identifying controversial practices. The obliged parties provide data on current offers and any changes in the characteristics of these offers to the Energy Agency every month. They are used by the Energy Agency for electronic services in the framework of the single contact point, in accordance with the legislation.

To ensure transparency in the gas retail market, the Energy Agency's website provides users with comparative e-services, including the online application for comparing natural gas supply costs (cost comparator). This application enables the calculation and comparison of the gas supply amount for each consumption profile based on the offers entered into the web application by suppliers. Users of comparison services were provided with access to all price lists or basic information about all offers from suppliers. Among other things, users could quickly access individual price lists and general contractual terms and conditions of suppliers via a list of suppliers or offers in the comparison.

A more detailed analysis of the use of comparison services in gas supply is presented in the section Ensuring Transparency in the Retail Electricity Market. The study of the number of comparisons and invoice verifications confirms a marked decrease in consumer interest in the choice of supplier or supply product, with a 91% decrease in the number of comparisons performed compared to 2022 and an 87% decrease in the number of consumers performing comparisons. A comparable decrease in interest is observed for the e-service that allows the verification of invoices.

The insignificant number of service users and another drastic reduction in the number of calculations performed are indicators of the absence of competitive offers

Market Effectiveness

Market Shares and HHI of the Gas Retail Market

Supply of Natural Gas to Final Consumers

Table 43 shows the market share by suppliers in 2024 to all final consumers in the retail gas market in Slovenia.

TABLE 43: MARKET SHARES AND HHI OF SUPPLIERS TO ALL FINAL CONSUMERS IN THE GAS RETAIL MARKET IN 2024

Supplier	**Delivered energy [GWh]**	**Market share**
Geoplin	4,368	46.6%
Energetika Ljubljana	1,475	15.7%
Petrol	787	8.4%
GEN-I	983	10.5%
Adriaplin	438	4.7%
Plinarna Maribor	233	2.5%
Goodyear Slovenija	143	1.5%
ECE	193	2.1%
Energija Plus	319	3.4%
HSE	118	1.3%
Other small suppliers	318	3.4%
Total	**9,374**[141]	**100.0%**[142]
HHI of the retail market		**2,658**

SOURCE: ENERGY AGENCY

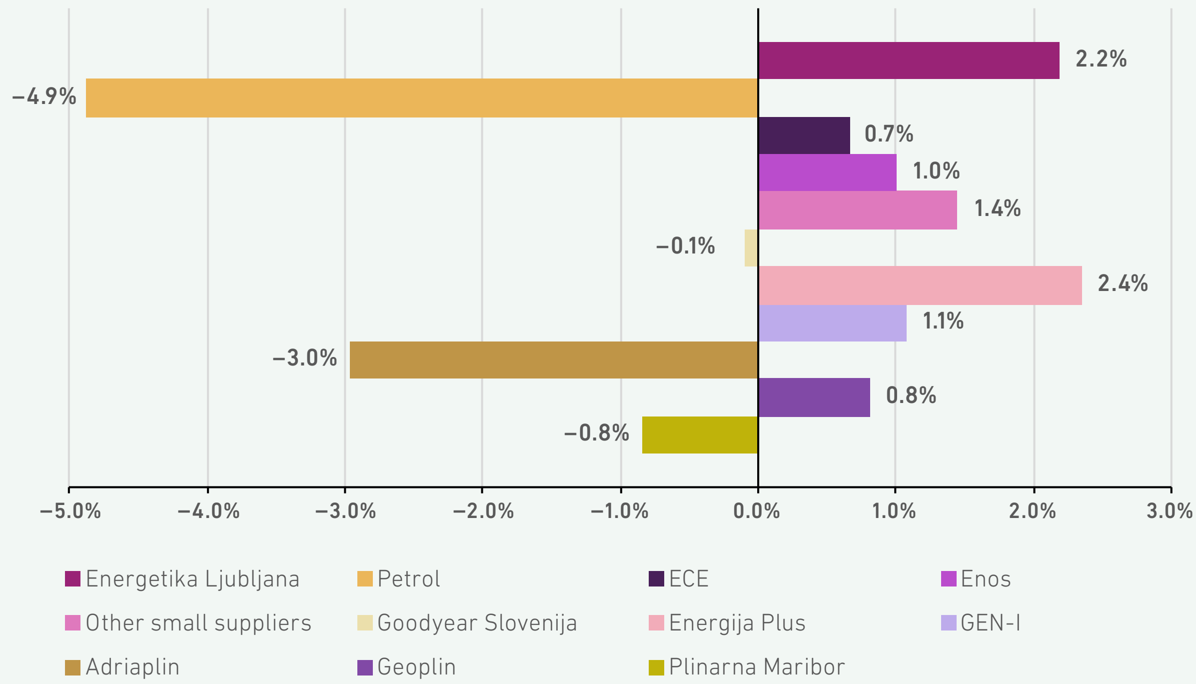
The HHI value indicates that the retail market remains highly concentrated (HHI is over 2,000) and that the HHI value has increased by 34 compared to 2023, indicating a more or less unchanged market situation and thus maintaining the relatively low competitiveness of the retail market.

The retail market remains highly concentrated

A slight increase in the HHI is also noticeable compared to 2000, when it stood at 2,590. In terms of the volume of supplies to all consumers, the market shares of Energija Plus and Energetika Ljubljana increased the most in 2024 compared to 2023, while Petrol and Adriaplin lost the most. The following figure shows the year-on-year changes in the market shares of suppliers to final consumers.

141 The difference between the total sum and the sum of the energy supplied by suppliers is due to rounding.
142 The difference between the total sum and the sum of the market shares of suppliers is due to rounding to one decimal place.

FIGURE 234: CHANGES IN SHARES OF THE FINAL CONSUMERS MARKET IN 2024 IN COMPARISON TO 2023[143]



SOURCE: ENERGY AGENCY

Increases in market share for Energija Plus, Energetika Ljubljana, and GEN-I may be the result of promotional or regular offers that were significantly lower than the maximum permitted gas price after the end of regulation.

Supply of Gas to Business Consumers

The market shares of gas suppliers supplying business consumers in 2024 are shown in Table 44.

143 Changes in market shares are rounded to one decimal place.

TABLE 44: MARKET SHARES AND HHI OF SUPPLIERS TO ALL BUSINESS CONSUMERS IN THE GAS RETAIL MARKET

Supplier	Delivered energy [GWh]	Market share
Geoplin	4,368	52.7%
Energetika Ljubljana	1,165	14.1%
Petrol	631	7.6%
GEN-I	723	8.7%
Adriaplin	308	3.7%
Plinarna Maribor	96	1.2%
Goodyear Slovenija	143	1.7%
ECE	165	2.0%
Energija Plus	306	3.7%
HSE	118	1.4%
Other small suppliers	269	3.2%
Total	**8,292**	**100.0%**
HHI of the retail market		**3,154**

SOURCE: ENERGY AGENCY

The change in the HHI value compared to the previous year was relatively small. In 2024, the HHI fell by 17 to 3,154, indicating that the retail market remained highly concentrated (HHI above 2,000). In 2000, it was 3,110, showing a slight upward trend in concentration.

Energija Plus, Energetika Ljubljana, and GEN-I also gained the largest shares in the business consumer supply market. Energija Plus increased its market share by 2.7 percentage points, Energetika Ljubljana by 2.5, and GEN-I by 1.4 percentage points. Smaller suppliers increased their share by 1.7%. ECE and Geoplin increased their share by less than one percentage point.

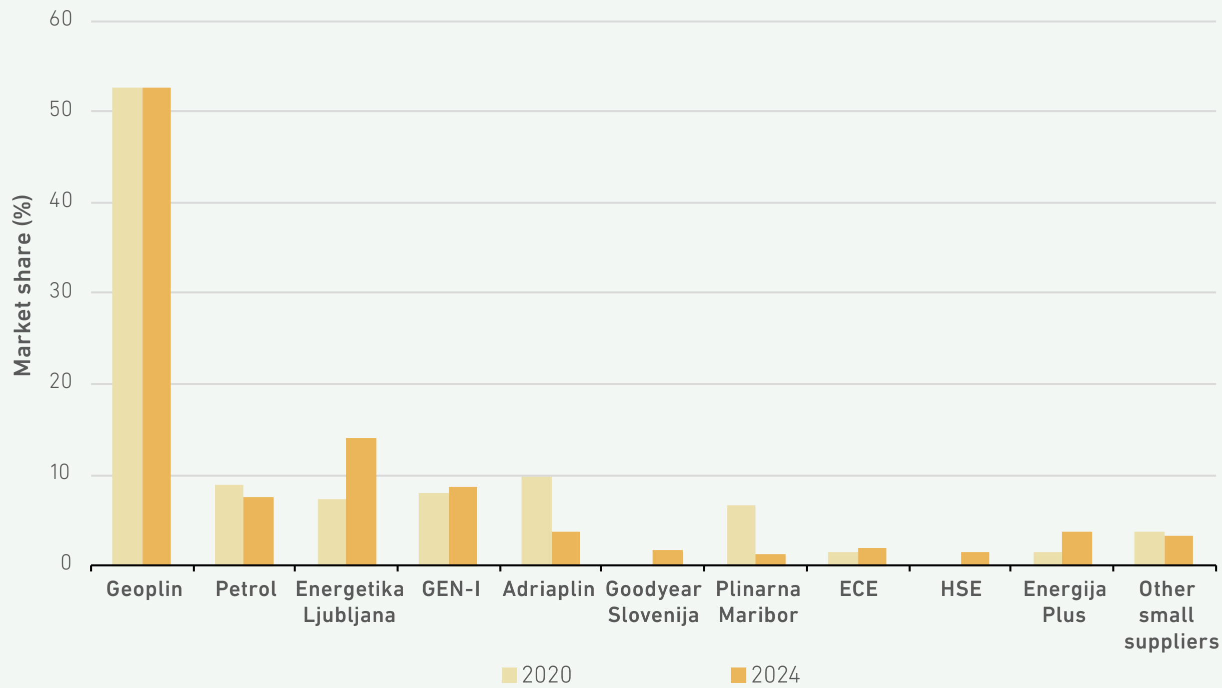
The most significant market share losses were recorded by Petrol (–5.4%), Adriaplin (–3.4%) and Plinarna Maribor (–0.7%).

A comparison of the market shares of suppliers to business customers in 2020 and 2024, shown in Figure 235 shows that Energetika Ljubljana (+6.7 percentage points), Energija Plus (+2.2 percentage points), Goodyear Slovenija (+1.7 percentage points) increased their share, while the most significant decrease was recorded by Adriaplin (–6.0 percentage points), Plinarna Maribor (–5.5 percentage points) and a group of smaller suppliers (–0.6 percentage points).

The four largest gas suppliers to business consumers have an 83% market share

The shares of gas supplies to business consumers indicate a decline in market competition for consumers, as the four largest suppliers in terms of supply volume maintained their shares at previous levels.

FIGURE 235: COMPARISON OF THE SUPPLIERS' MARKET SHARES TO BUSINESS CONSUMERS IN 2020 AND 2024



SOURCE: ENERGY AGENCY

Supply of Gas to Household Consumers

The market shares of gas suppliers in the retail market for household consumers in 2024 are shown in Table 45.

TABLE 45: MARKET SHARES AND HHI OF SUPPLIERS TO ALL HOUSEHOLD CONSUMERS IN THE GAS RETAIL MARKET

Supplier	Delivered energy [GWh]	Market share
Energetika Ljubljana	309	28.6%
GEN-I	260	24.1%
Petrol	156	14.5%
Plinarna Maribor	137	12.6%
Adriaplin	130	12.0%
ECE	29	2.6%
Istrabenz plini	24	2.2%
Energija Plus	12	1.1%
Energetika Celje	4	0.4%
Other small suppliers	21	1.9%
Total	**1,082**	**100.0%**
HHI of the retail market		**1,925**

SOURCE: ENERGY AGENCY

The HHI value indicates that the retail market for supplies to household customers remained highly concentrated (HHI below 2,000), although the HHI value increased for the third consecutive year. Compared to 2022 and 2023, when the HHI was 1,731 and 1,892 respectively, the HHI increased by 33 in 2024. The market share of the three largest suppliers (CR3) was a good 67.1%, which is 0.8% more than in the previous year. This share was divided among the same three largest suppliers as in 2023.

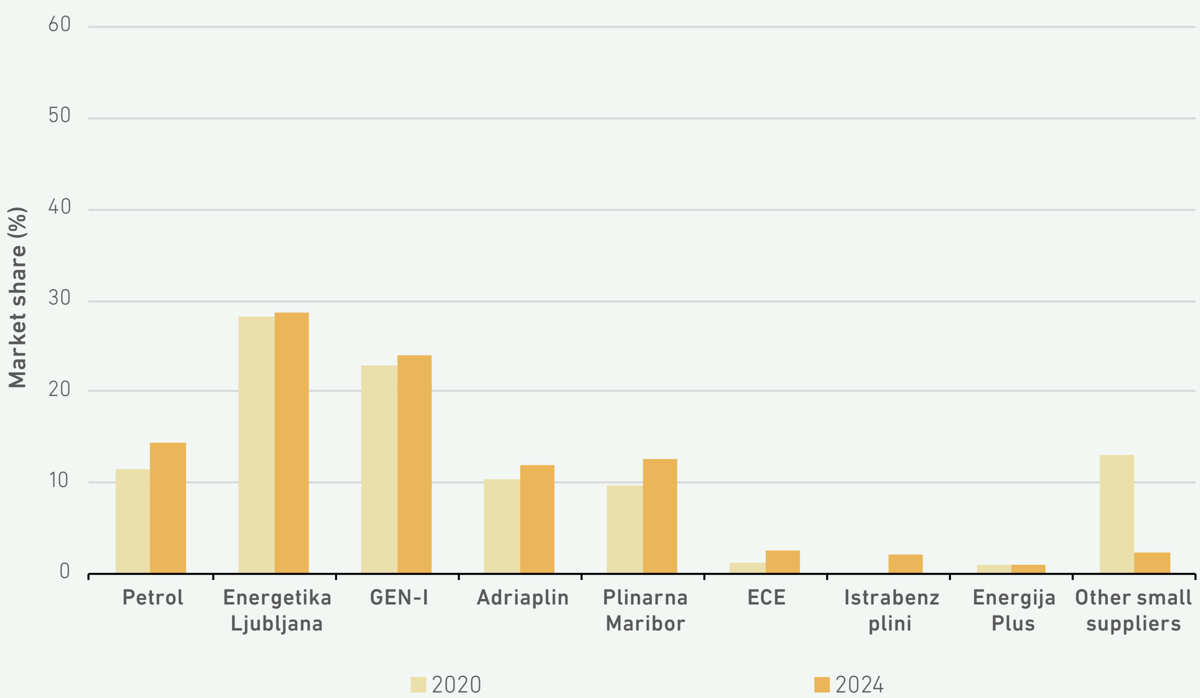
In 2024, Energetika Ljubljana managed to increase its market share by 1.1 percentage points compared to the previous year, while Adriaplin increased its market share by 0.9 percentage points. GEN-I also increased its market share by 0.2%.

On the other hand, the largest decrease in market share in the household consumers segment was seen at Plinarna Maribor (–1.6%). The share of supply also decreased for Petrol and ECE, as well as other smaller suppliers. Petrol's share decreased by 0.5 percentage points, ECE's by 0.1 percentage points, and other smaller suppliers' market shares decreased by less than 0.1 percentage points. The reasons for these changes in market shares are the termination of gas supply activities to household consumers by two suppliers and the unpredictable situation on the gas market.

The retail supply market for household consumers remains low in concentration

Changes in the market shares of suppliers to household consumers in 2020 and 2024 are shown in Figure 236. The market shares of Petrol (3.1%) and Plinarna Maribor (2.9%) increased the most. On the other hand, the market share of other smaller suppliers decreased the most in these years (–10.7%).

FIGURE 236: COMPARISON OF THE SUPPLIERS' MARKET SHARES TO HOUSEHOLD CONSUMERS IN 2020 AND 2024

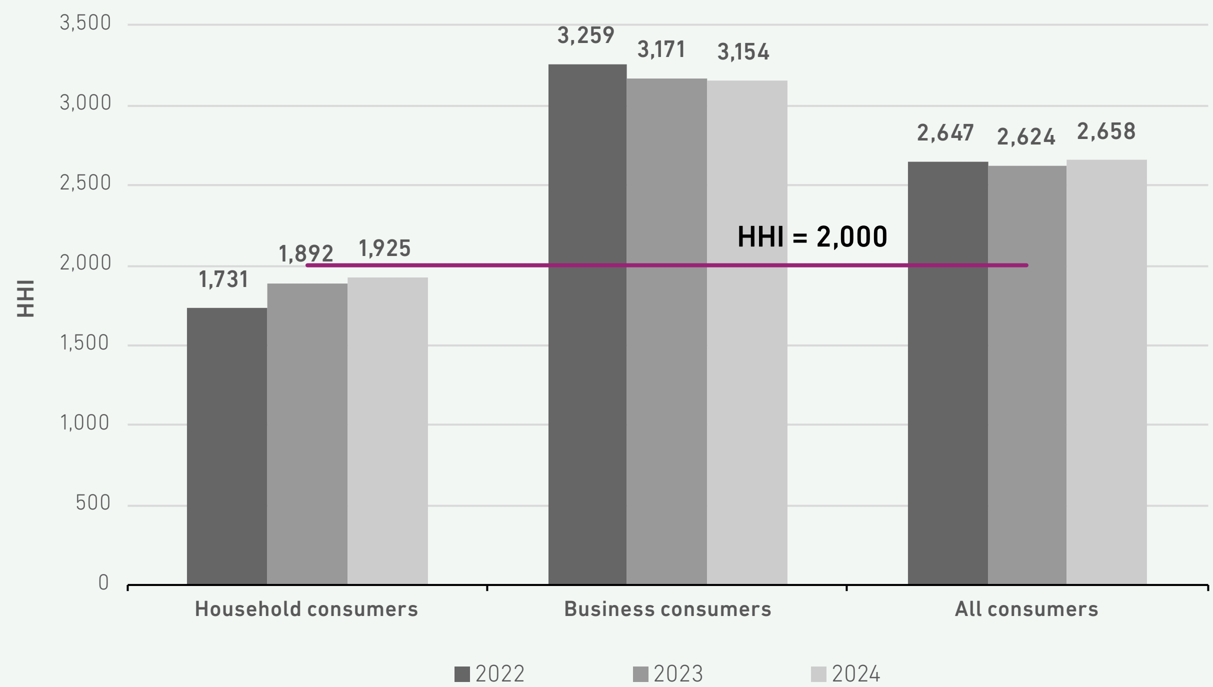


SOURCE: ENERGY AGENCY

Comparison of Concentrations on the Relevant Markets

In 2024, the HHI value increased in the retail market for households, while it decreased for business consumers. A slight increase in the HHI value was also observed in the segment of all consumers. The HHI values for the three-year period are shown in Figure 237. The state of the retail market does not reflect the desired state of a competitive market. The household consumer segment remains the only observed market with low concentration, but it has approached the threshold value (HHI=2,000) in the last three years. In terms of HHI, the business consumer market is a highly concentrated market where no significant improvement can be observed.

FIGURE 237: MOVEMENT OF THE HHI IN THE RETAIL MARKET IN THE 2022–2024 PERIOD

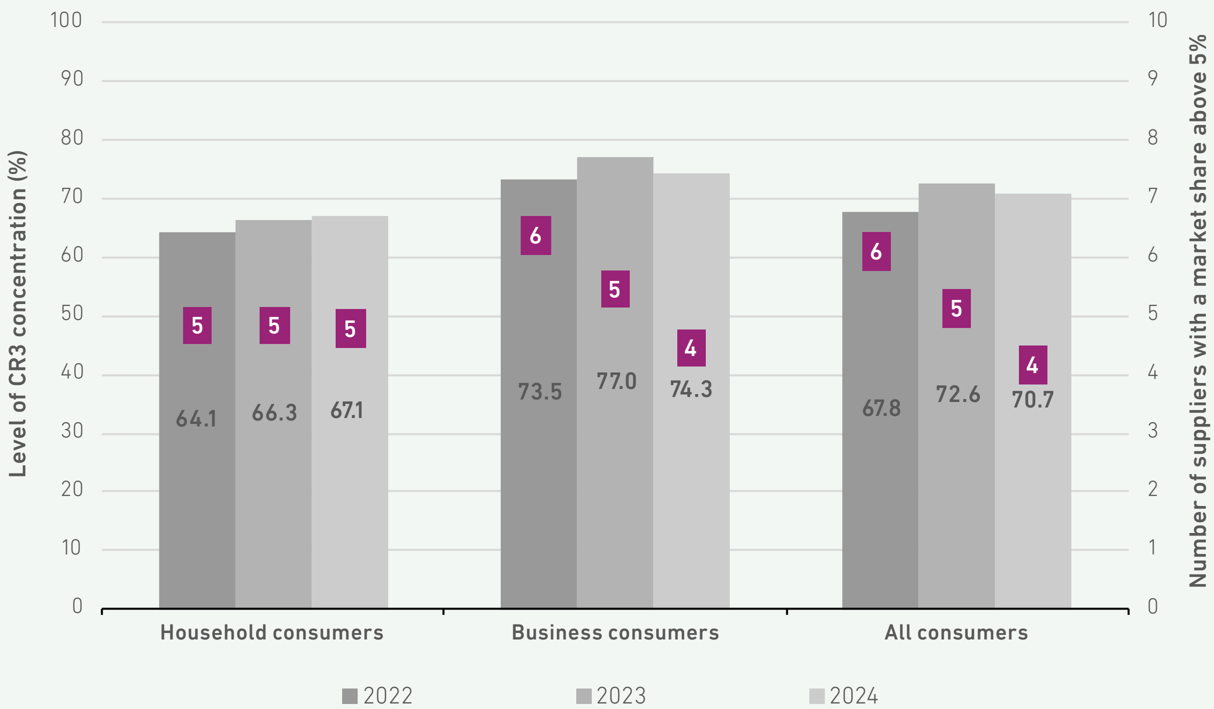


SOURCES: SUPPLIERS

Figure 238 shows the concentration ratio index of the three CR3[144] in individual market segments over the last three years. CR3 values exceeded the high concentration threshold (70%) in the business and all consumer segments in 2024. A negative trend of increasing concentration in 2024 compared to 2022 and 2023 can be observed in the supply to household consumers. For business consumers, it remained the same as in 2023 (77%).

144 Total market share of the three largest suppliers in the market.

FIGURE 238: LEVEL OF CONCENTRATION OF CR3 AND THE NUMBER OF SUPPLIERS WITH A MARKET SHARE ABOVE 5% IN THE 2022–2024 PERIOD



SOURCES: SUPPLIERS

Switching Supplier

The number of supplier switches is one of the key indicators of a well-functioning retail market. In 2024, we still cannot speak of a well-functioning market, because the period was characterised by gas supplies with a regulated upward price cap to protect households and other vulnerable consumer groups, and consumers, so consumers only had access to a wider variety of offers after the regulated gas prices ended.

The retail gas market was pretty static in 2024, as you can see from the supplier switching statistics. The number of supplier switches was by far the lowest in the period since 2012, when the retail gas market took off. Only 1,953 customers switched gas suppliers, namely 1,002 household customers and 951 business customers. Among household consumers, a higher number of supplier switches was observed in the first and last months of 2024.

In 2024, the TSO recorded three switches of gas suppliers by system users during the term of a valid transmission contract.

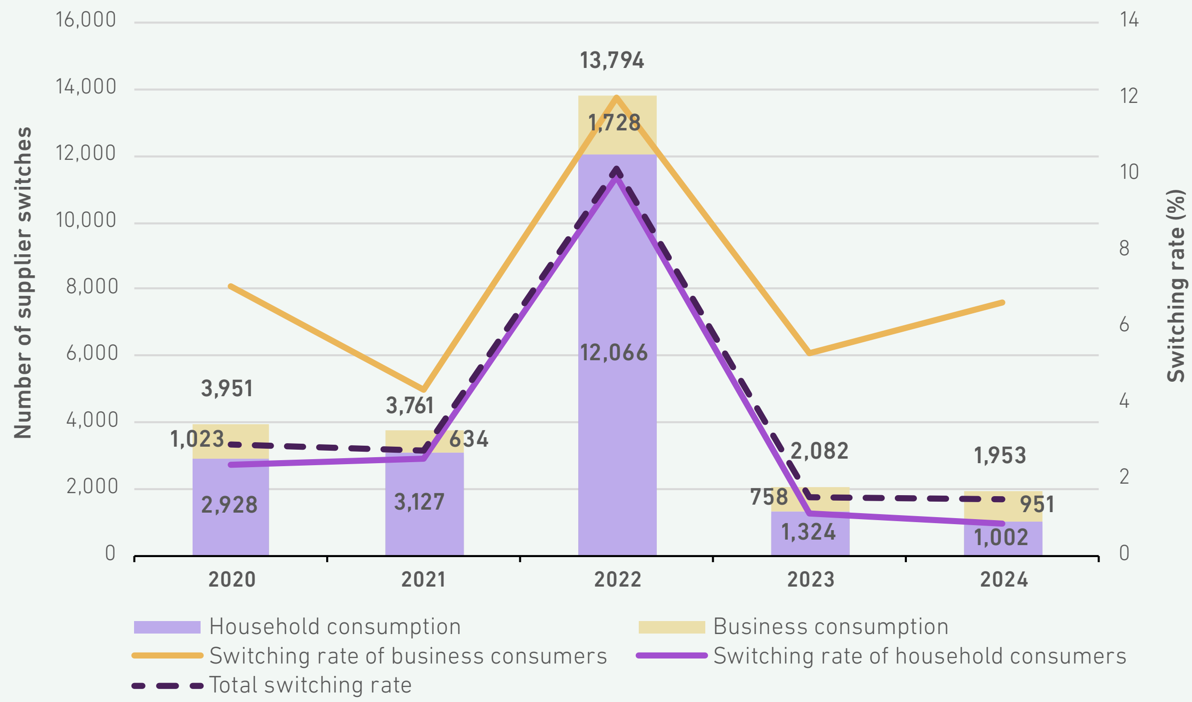
In CDS, there was only one change of gas supplier in 2024.

The lowest number of switches since 2012

Compared to 2023, the total number of switches is down by 6.2%. Among household consumers, the number of switches decreased by 24.3% (from 1,324 in 2023 to 1,002 consumers in 2024), while among business consumers it increased by a good 25% (from 758 in 2023 to 951 customers in 2024).

Excluding 2022, when the number of supplier switches was high due to consumers switching to another supplier because of the termination of this activity, there has been a downward trend in the number of supplier switches since 2015. The number of supplier switches in 2024 was 77% lower than in 2015 and almost 70% lower than the average for the period 2012–2023.

FIGURE 239: NUMBER OF SUPPLIER SWITCHES IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

The share of supplier switching among household consumers reached only just under one percent (0.8%) in 2024, indicating consumer inactivity, which is likely due, among other things, to regulated prices and equal supply conditions among most suppliers. The situation was slightly better for business consumers, where the share of switches reached 6.6%.

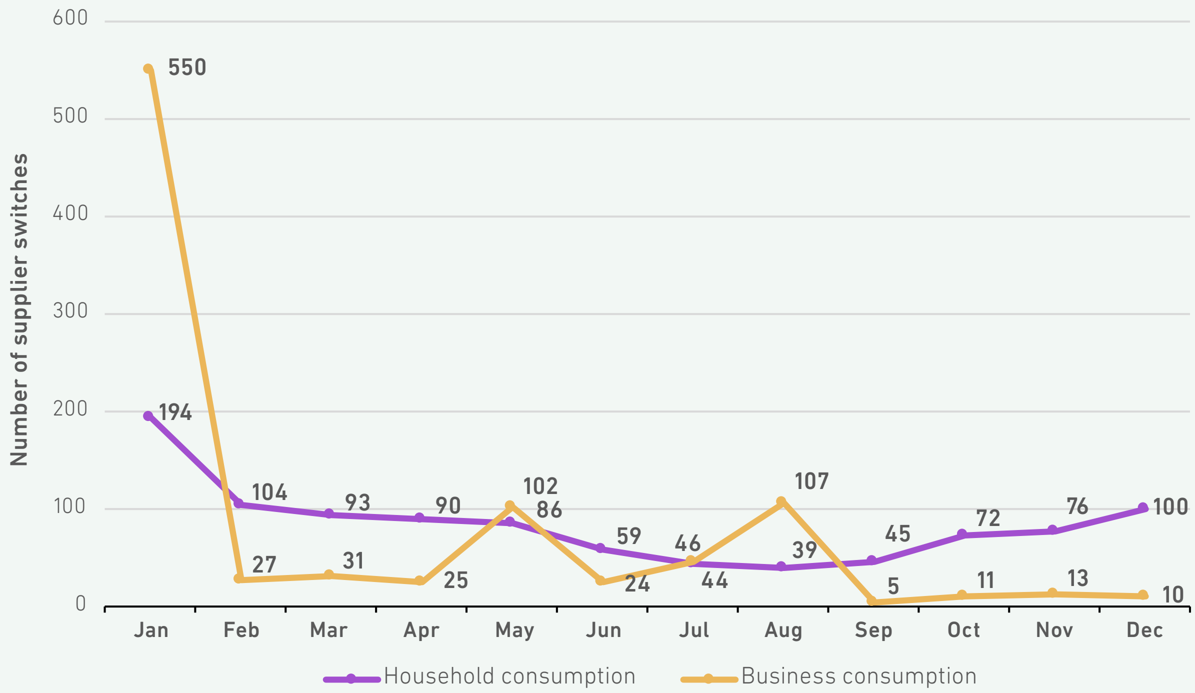
Only 1.5% of all consumers switched suppliers

In 2024, there was an increase in the number of supplier switches among business consumers in January (550 consumers), which is usually the result of the expiry of fixed-term supply contracts, which are often concluded for a calendar year. This was followed by an increase in the number of switches in May (102 consumers) and August (107 consumers).

In January 2024, as many as 58% of business consumers switched suppliers

The share of supplier switches in January, May, and August, when the number of switches was highest, accounted for as much as 80% of all switches made during the year. The number of supplier switches among household and business consumers by month is shown in Figure 240.

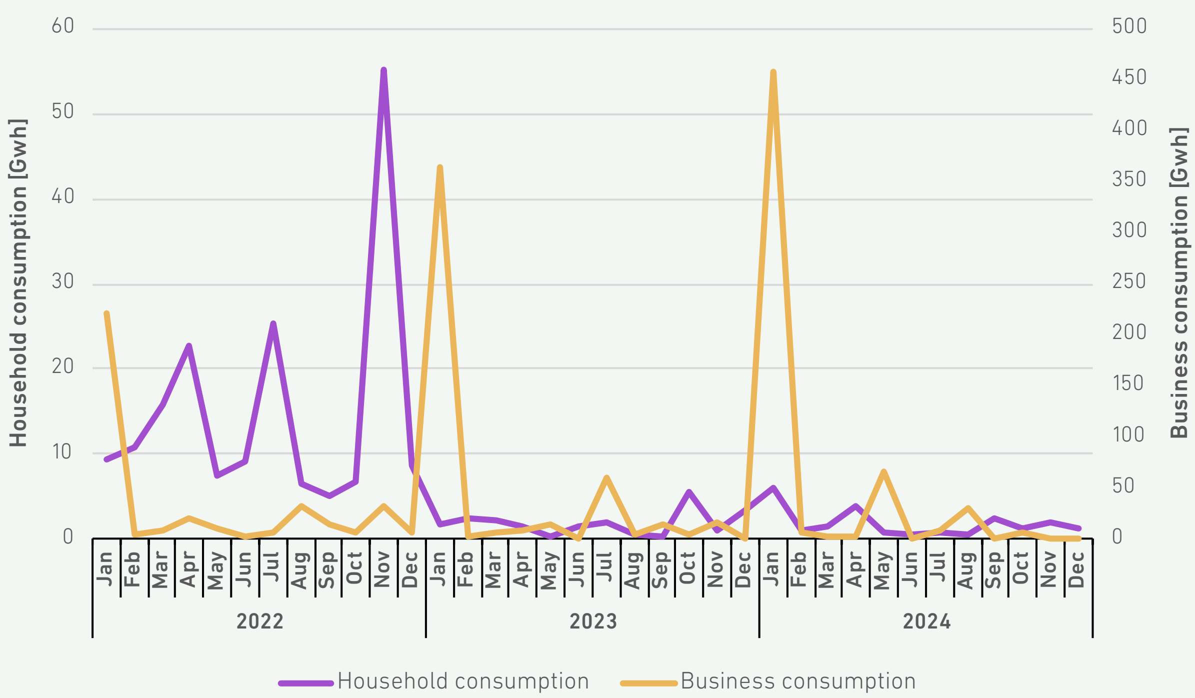
FIGURE 240: DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES DEPENDING ON THE TYPE OF CONSUMPTION



SOURCE: ENERGY AGENCY

The volume of energy switched refers to the estimated annual gas consumption of consumers who changed their supplier. Among business consumers, an annual growth of 18% was recorded. In January 2024 alone, the estimated annual gas consumption of consumers who switched suppliers was already at the level of the total volume of energy switched in the whole of 2023. The situation was different for household consumers, where in 2024 the volume of energy switched was approximately the same as in 2023. The monthly trend in the quantities of gas switched for the period 2022–2024 is shown in Figure 241.

FIGURE 241: QUANTITIES OF EXCHANGED GAS WITH RESPECT TO THE TYPE OF CONSUMPTION



SOURCE: ENERGY AGENCY

In the household segment, the volume of gas switched was highest in December 2023 and continued into January 2024. In January 2024, the volume of gas switched accounted for 27% of the entire year's total.

In the business segment, the highest volume of gas switched was recorded in January, when just over 78% of the annual switched volume occurred. A larger share of switched quantities was also recorded in May, at just under 11.4%, and in August, at 5.2%.

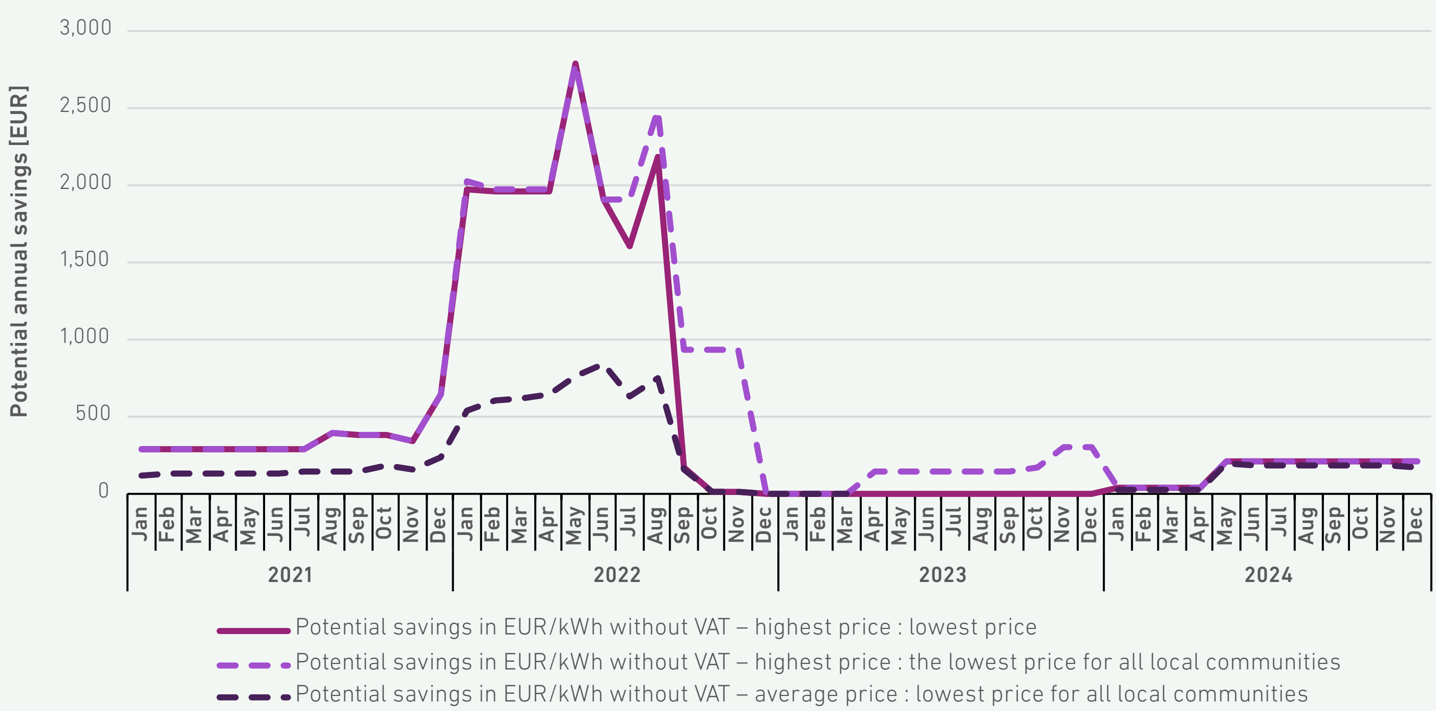
The change in pattern is mainly the result of relatively static conditions in the retail market for household consumers, while business consumers already had more opportunities to switch to a supply under more favourable conditions.

Estimating the Potential Benefits of Switching Supplier

A well-functioning retail market is characterised by a variety of supply offers, offering consumers the possibility to be supplied with a variety of terms and conditions, as well as the opportunity to make savings by keeping up-to-date with the suppliers' offers and choosing the most favourable ones for them. 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, but only if there is sufficient competition in the market to attract new customers and increase the share of supply.

As upward-regulated prices for household consumers were in effect during the first four months of 2024, noticeable differences between the gas prices offered only emerged from May onwards. Monthly gas consumption for most household customers is linked to the heating season, so in colder months–when consumption is generally highest–consumers have the opportunity to achieve savings if supplied under the most competitively priced offers.

FIGURE 242: POTENTIAL SAVINGS IN THE CASE OF SWITCHING GAS SUPPLIER FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2021–2024 PERIOD



SOURCE: ENERGY AGENCY

The potential savings in each month from switching from the supplier with the highest supply price to the supplier with the lowest supply price are calculated assuming a continuous 12-month supply under unchanged conditions. Given the highly variable conditions of gas supply, the potential savings of EUR 210 shown are purely theoretical. The potential savings in 2024 in the event of differences between the average price and the lowest price of gas for all local communities are only shown from May onwards, when the price was no longer capped. The potential savings between the average and lowest gas prices for 12 months amount to approximately EUR 170.

Given the availability of supply during the period of lower consumption, this saving was significantly lower. In May, the supplier GEN-I offered the lowest price of 49.5 EUR/MWh, while Energija Plus offered a slightly lower price of 49.4 EUR/MWh from June onwards. Considering that a consumer had a regulated gas price offer in the first half of the year and switched from the highest offer (59.9 EUR/MWh) to the lowest price in the second half of the year, they saved EUR 105. If the same consumer had switched to an offer with an average market price under the same conditions, he could have saved EUR 81.

Measures to Promote Competition

The Energy Agency monitors the retail gas market. It cooperates with the regulatory and supervisory authorities at the national level, such as the Market Inspectorate of the Republic of Slovenia, the Public Agency for the Protection of Competition of the Republic of Slovenia and, where appropriate, independent and non-profit consumer organisations. The Energy Agency's actions are multifaceted and are based on the Energy Agency's internal analyses, bilateral actions and the results of public consultations. The Energy Agency ensures that relevant information on market developments is kept up-to-date through its online single contact point.

Security of the Gas Supply

The gas supply situation remained stable throughout 2024, and security of supply was not threatened in either Slovenia or other EU Member States. The situation across the EU reflected an increased level of preparedness and resilience, the result of measures and efforts undertaken in 2022 and 2023. On the supply side, two new floating LNG terminals operating in Germany, with another one in preparation, contributed significantly to higher supply reliability. In the past two years, investments in infrastructure have made it possible to transport gas from new entry points – such as LNG reception and regasification terminals – across most Member States to where it is needed.

Gas supply situation in the EU stable, supply in Slovenia also uninterrupted

On the consumption side, the EU Council recommendation, in force since the previous year, remained applicable throughout 2024. The recommendation encourages Member States to maintain reduced gas consumption until 31 March 2025, by at least 15% compared with their average gas consumption during the reference period from 1 April 2017 to 31 March 2022. The target for reduced gas consumption at the EU level was achieved again in 2024, even though actual consumption in some Member States remained unchanged or even slightly increased. This EU target was met partly through reduced energy consumption and partly by shifting some energy needs to other sources.

Voluntary reduction of gas consumption remained in force in 2024

The Energy Agency monitors Slovenia's monthly gas consumption and publishes data on consumption and the achieved reductions. Slovenia made use of the exemption applicable to the transition from coal to gas in thermal power plants for the needs of the new gas-steam unit at the Ljubljana CHP plant. Taking this exemption into account, gas consumption from April 2024 to March 2025 was 6.4% lower than in the reference period.

Among the measures that have significantly contributed to security of supply in the EU over the past two years is the obligation to fill gas storage facilities by the end of October each year. Storage facilities are also the main source of flexibility for EU gas supply, as the vast majority of stored gas is available to the market. According to ENTSOG data, on 1 November 2024, the EU's storage facilities were filled to just over 95%, corresponding to around 1,093 TWh of gas. As in the previous year, this exceeded the required 90% level. Gas withdrawal from storage mainly reflects two factors – winter temperatures and market conditions. From October 2024 to April 2025, temperatures in most EU Member States were relatively mild, though lower than the year before. At times, market conditions encouraged the use of gas from storage. As a result, the EU storage fill level on 1 April 2025 was just above 34%.

Since Slovenia has no storage facilities, suppliers acting as balancing group leaders are required to store abroad 15% of their average gas consumption over the past five years as of 1 November of the current year. On 1 November 2024, balancing group leaders in Slovenia had gas stored in other EU Member States in volumes corresponding to approximately 15% of the average consumption in their balancing groups (including subgroups) over the last five years, thereby fulfilling this obligation at the national level.

The Ministry of the Environment, Climate and Energy and the Energy Agency are closely involved in cooperation between competent authorities of Member States and associations within the Gas Coordination Group. This advisory group to the European Commission facilitates the exchange of information on the situation in individual Member States, consultations, and coordination on planned and potentially necessary measures. In 2024, the Gas Coordination Group met regularly and provided opinions and assessments of the expected impacts of events affecting supply security. Examples include the storage obligation and the anticipated expiry of the Russian gas transit contract through pipelines across Ukraine at the end of 2024, for which Member States also made appropriate preparations. In November 2024, the European Commission organised a three-day exercise in which representatives of transmission system operators, competent authorities, and some regulatory bodies from almost all Member States tested procedures and preparedness for potential severe gas shortages in several Member States. The Commission will use the findings to shape updated legislation. Slovenia was well represented by officials from the Ministry, the Agency, and Plinovodi, demonstrating a high level of preparedness.

All these activities have contributed significantly to the resilience of the entire gas system, readiness for potential crises, and high security of supply in the EU and its Member States.

In Slovenia, the crisis group - comprising representatives of the Ministry, the Energy Agency, the transmission system operator, and suppliers- met regularly, albeit less frequently than in the previous year. The crisis group monitored the gas supply situation in Slovenia and the EU, exchanged information, and would have coordinated measures at the national level if necessary. Throughout 2024, the early warning level – the first of three crisis levels, declared in July 2022 – remained in force. The reasons for its declaration had not yet been eliminated, and the crisis group therefore did not propose any changes.

The Gas Supply Preventive Action Plan Order requires suppliers to meet a supply standard each year. This means they must provide gas to supply protected customers in three cases. The quantities of gas needed to meet the supply standard for the period from 1 October 2024 to 30 September 2025 are as follows:

(a) during the seven-day minimum temperature period: 14.266 MWh/day;
(b) during the 30-day period with exceptionally high demand: total 30-day quantities of 282,257 MWh or an average of 9,408 MWh/day;
(c) during a 30-day period with an interruption on each major infrastructure: 10,494 MWh/day.

Suppliers to protected customers must be able to provide the above gas quantities for case (a) for seven consecutive days and cases (b) and (c) for 30 consecutive days. The suppliers have provided gas from different sources and through various transmission routes. Slovenia has sufficient transmission capacity for the indicated quantities.

CONSUMER PROTECTION

The right to reliable, good quality and affordable energy

IN DECEMBER 2024, 85 FINAL CONSUMERS SUPPLIED UNDER LAST RESORT SUPPLY CONDITIONS

FOUR NEW SUBSTITUTE SUPPLIERS DESIGNATED

NO BENEFICIARIES OF EMERGENCY ELECTRICITY OR GAS SUPPLY

FEWER DISCONNECTIONS OF ELECTRICITY CONSUMERS

FEWER DISCONNECTIONS OF NATURAL GAS CUSTOMERS

THE MOST COMMON REASON FOR DISCONNECTING ELECTRICITY WAS NON-PAYMENT, WHILE THE MOST COMMON REASON FOR DISCONNECTING GAS WAS A REQUEST FROM A FINAL CONSUMER

96.1% MORE

COMPLAINTS FROM HOUSEHOLD CONSUMERS TO ELECTRICITY SUPPLIERS (MOSTLY ABOUT BILLS)

CONSUMER PROTECTION

In addition to the right to a reliable, secure, high-quality, and affordable energy supply, which must be sustainable, applicable legislation also guarantees consumers other rights, namely:

- the right to emergency electricity and a substitute and a basic supply of natural gas,
- the right to last resort supply,
- the right to complain to suppliers and out-of-court dispute resolution,
- the right to the protection of rights in administrative proceedings,
- the right to safe and reliable operation of the system and a quality supply of electricity or gas at a reasonable price.

The Right to be Informed

Consumers are informed about their rights, the applicable rules and general acts for exercising public powers, and the methods for handling complaints regarding the supply of electricity and gas through the Single Contact Point on the Energy Agency's website, where all the necessary information for consumers is published. The website also provides access to a comparator covering all offers for household and small business consumers on the electricity and natural gas market managed by the Energy Agency and a network charge cost comparator for the calculation of the network charge for the electricity transmission and distribution system has been introduced, which calculates the network charge for 2024 according to the current and new methodologies. Also, in 2024, the Energy Agency kept up-to-date with news on developments in the retail market. It informed users on an additional website (www.uro.si) about all the new developments relating to the new way of calculating the network charge. Consumers could also ask questions about this topic to the robot advisor URO online. In September 2024, all household consumers received a brochure entitled »Network of a Green Future«, which explained how the new network charge would affect electricity bills, the reasons for the urgent introduction of this change, and the desired objectives, which included, in particular, a fairer distribution of costs among all users and the efficient use of networks.

An important means of informing consumers is through invoices and information on invoices issued by suppliers, operators or other electricity and gas undertakings. They must provide consumers with regular (periodic) access to transparent, complete and understandable information on their consumption and costs, the origin of the electricity supplied and the characteristics of their consumption on the bills issued to enable them to control their consumption and the cost of the energy consumed and thus to be motivated to save. They must also provide consumers, upon request and free of charge, with an explanation of how their bill or final account is prepared in relation to their actual consumption. On both the bills and the suppliers' websites, consumers should be provided with clear and understandable information on how complaints are handled and how and where to send a complaint.

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Electricity and gas distribution system operators must also give end-users effective access to consumption data. They must inform consumers before they are connected to the system that they can choose their supplier freely on the market. To facilitate the selection of a supplier, a supply cost comparison tool is available on the agency's website, which was upgraded in 2024 with support for price capping based on a volume sharing model for electricity supply offers. In addition to information on package deals and special offers from electricity and gas suppliers and price lists, the comparison tool also includes offers for contracts with dynamic electricity prices. The comparison tool is intended for household and small business consumers and enables the calculation of network usage costs according to the new network charge calculation methodology. More active consumers (i.e., those who are able or willing to engage in price trading on the exchange) have access to products based on dynamic prices. The agency's website also describes the procedure for switching suppliers and publishes a list of substitute gas suppliers for each distribution system, which are provided to consumers eligible for substitute supply by one of the four suppliers designated for the period until August 31, 2026.

In accordance with its powers, in 2024, the Energy Agency checked, among other things, the compliance of suppliers with the legal provisions on dynamic pricing and did not find any violations of the applicable legislation in this area. However, it did find irregularities in relation to the charging of a newly introduced cost by an electricity supplier to self-supplied consumers, and issued a decision prohibiting the supplier from charging this cost and requiring it to amend its price lists for the supply of electricity to households and small businesses. It also ensured that the supplier remedied the identified violations related to the provision of out-of-court settlement of consumer disputes.

The Right to Last Resort, Substitute, Basic and Emergency Supply

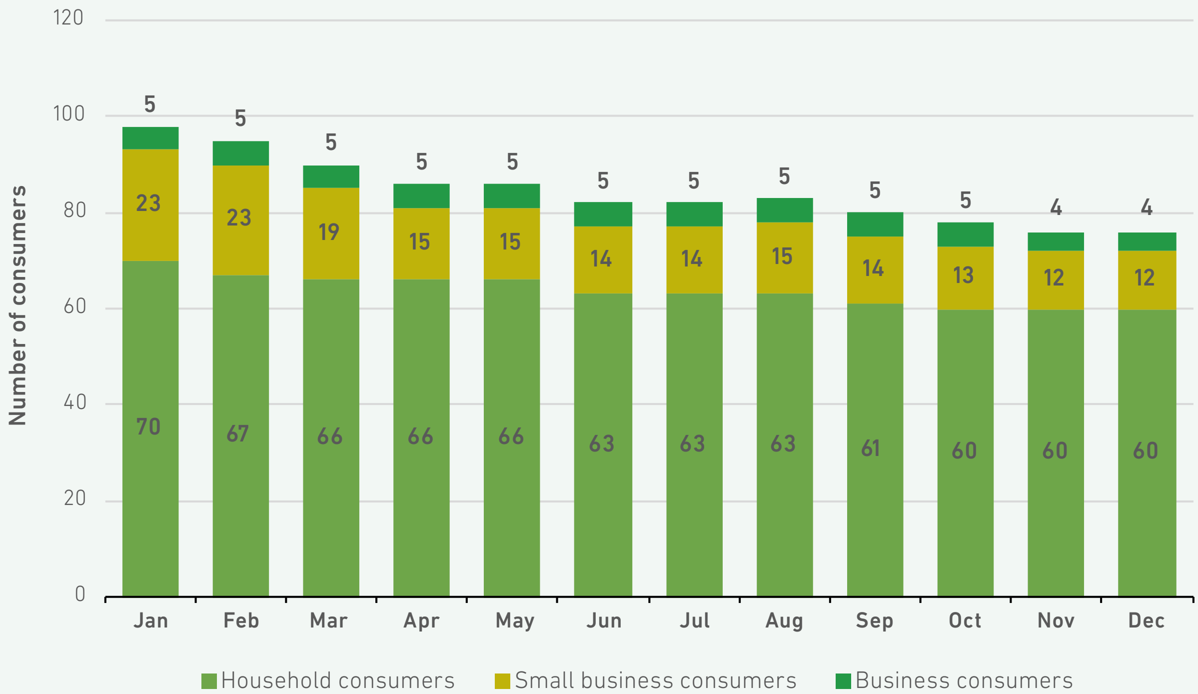
The Right to Last Resort for Electricity Consumers

Last resort supply is provided by the DSO when the supply contract of a household or small business consumer is terminated as a result of measures resulting from the insolvency or illiquidity of the supplier or if the supplier loses its status as a member of the balancing scheme, or at the explicit request of a household or small business consumer of electricity, of which they must be informed. The ZOEE does not limit the duration of last resort supply. Still, last resort supply at the request of household and small business electricity consumers may be provided for an indefinite period in accordance with the SONDSEE, provided that all outstanding obligations under the last resort supply have been settled. As the last resort supply of electricity is carried out by an electricity DSO that is not otherwise engaged in supplying electricity, the price for last resort supply is regulated. The price of electricity for last resort supply is set by the DSO based on the provisions of the ZOEE and is publicly announced. The price must be higher than the market price for supply to a comparable consumer but may not exceed it by more than 25%. In addition to protecting the rights of consumers, this also ensures that they are active in finding a new supplier more quickly and securing more favourable conditions for their electricity supply.

In December 2024, 60 household, 12 small business and four business consumers were supplied under conditions of last resort supply, which is slightly less than the previous year, which is slightly less than the previous year, and, upon request, five household consumers and four small business consumers, for a total of 85 final consumers. The figures below show the number of consumers supplied under last resort supply for reasons attributable to the supplier, broken down by month in 2024.

85 final consumers on last resort supply in December 2024

FIGURE 243: LAST RESORT SUPPLY DUE TO REASONS ATTRIBUTABLE TO THE SUPPLIER IN 2024

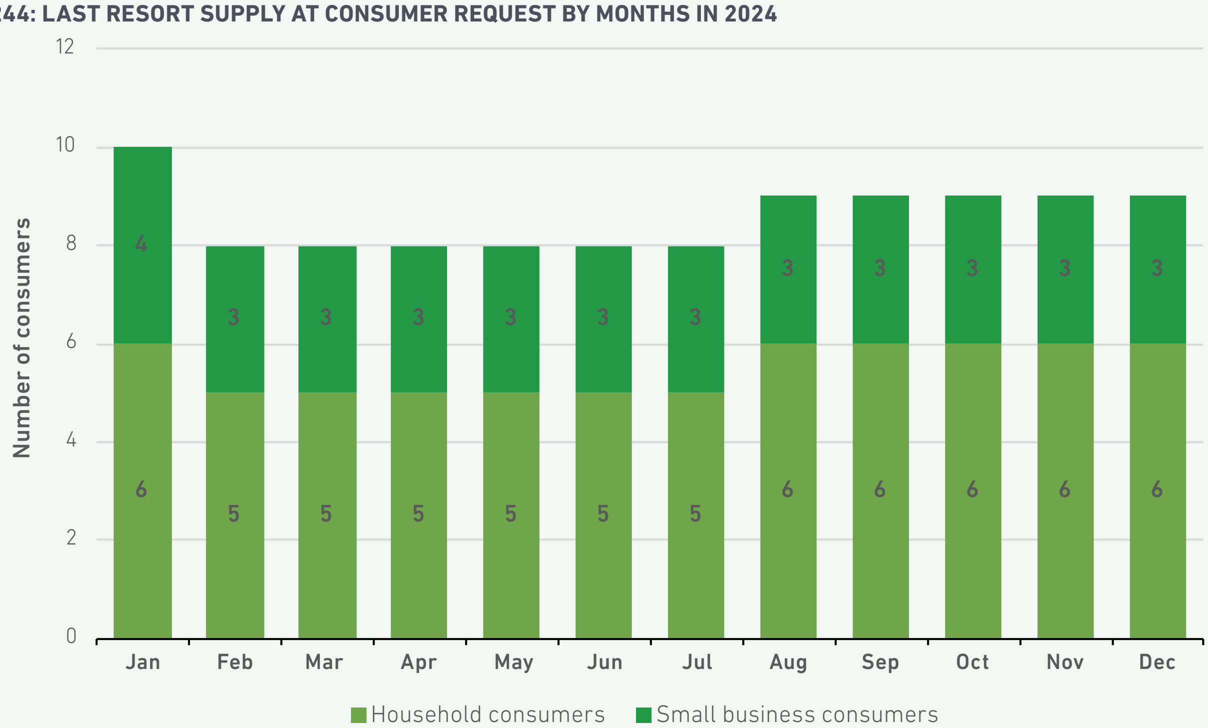


SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

At the specific request of household and small business electricity consumers, the DSO continued to supply household and small business consumers in 2024. The number of final consumers supplied under last resort supply at their explicit request remained almost unchanged throughout the year (only one small business consumer submitted a new request for last resort supply, while one consumer ceased to be supplied under these conditions).

Last resort supply at the request of consumers by month in 2024 is shown in the following figure.

FIGURE 244: LAST RESORT SUPPLY AT CONSUMER REQUEST BY MONTHS IN 2024



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

The Right to a Substitute Gas Supply

While the electricity DSO carries out the last resort supply of electricity, a gas substitute supply is carried out by gas suppliers appointed by the Energy Agency. Household consumers, small business consumers, joint household consumers and protected consumers[145], connected to the distribution system are eligible for this supply if their gas supply contract is terminated as a result of measures resulting from the insolvency or illiquidity of the supplier or if the supplier loses its status as a member of the balancing scheme for any other reason.

The price of gas for substitute supply may be higher than the market price for the supply of gas to a comparable consumer. Still, it may not exceed the marginal purchase price for gas on the balancing market published by the gas transmission system operator, plus 25%. The supplier of the substitute supply determines the price of gas for the substitute supply, which must be published at least on the supplier's website and notified to the Energy Agency.

Until August 31, 2024, substitute supply was provided by five substitute suppliers designated by the Energy Agency in 2022 (Adriaplin, Energetika Ljubljana, GEN-I, Petrol, and Plinarna Maribor). In 2024, the Energy Agency designated four new suppliers (Adriaplin, Energetika Ljubljana, GEN-I, and Petrol) for the next two years, which will provide substitute supplies until August 31, 2026. In order to protect certain consumers of this energy source in 2024 (until April 30, 2024), the Government capped the price of substitute supplies at the maximum retail price.

Four new substitute suppliers designated

According to reports from gas suppliers, in 2024, most replacement suppliers did not provide substitute supplies, except for one substitute supplier, which provided substitute supplies to 26 household consumers and seven small business consumers in the first months of 2024. At the end of 2023, the gas supplier (JP KPV) decided to cease gas supply activities as of January 1, 2024. Despite informing consumers of the termination of supply, some small business and household consumers did not switch suppliers in time, so the supplier terminated their supply contracts with effect from December 31, 2023, and on that date the supplier was also removed as a member of the balancing scheme.

The Right to a Basic Gas Supply

All gas suppliers are obliged to provide a gas supply to consumers without a supply contract upon request or they must not refuse to conclude a contract. The price of the basic supply is determined by the suppliers, whereby the price of gas for the basic supply may be higher than the market price of gas for comparable new suppliers, up to a maximum of EUR 20/MWh. If consumers who have entered into a supply contract under the Basic Supply Conditions breach the provisions of this contract or the Supply Conditions (e.g. outstanding obligations), the supplier may terminate their supply contract under the published General Supply Conditions and the supply contracts entered into. If consumers who have entered into a supply contract under the Basic Supply Conditions breach the provisions of this contract or the Supply Conditions (e.g. unsettled obligations), the supplier may terminate their supply contract under the published General Supply Conditions and the supply contracts entered into.

In 2024, the price of gas was for household consumers, for final gas consumers who supply heat to several households through a common heating system owned or co-owned by these households (hereinafter referred to as joint household consumers), for public heat distribution service providers that distribute heat in accordance with the provisions of the ZOTDS, and for other heat producers for gas for heat production for household consumers, limited to April 30, 2024 by a Government regulation on the determination of gas prices from the gas system.[146] The Decree also applied to substitute and basic gas supplies.

145 In addition to household consumers, common household consumers, kindergartens, primary schools and health centres connected to the distribution system, the definition of protected consumer include the following:
- distributors of district heating in installations that cannot switch to a fuel or heat source other than gas, to the extent that they supply heat to households and basic social services other than educational or public administration services;
- basic social services connected to a distribution or transmission system other than educational or public services.

146 Decree on determining the prices of natural gas from the gas system (Official Gazette of the RS, No. 107/23, limited until April 30, 2024).

In 2024, three gas suppliers supplied their customers under basic supply conditions, with one supplier supplying only household consumers, one supplying only small business consumers, and one supplying both household and small business consumers. A total of 196 consumers (149 household consumers and 47 small business consumers) were supplied under basic supply conditions in 2024.

No beneficiaries of emergency electricity or gas supply in 2024

The Right to Emergency Supply

If a consumer is unable to pay the costs of the electricity and gas supply due to poor financial circumstances and their life and health or the lives and health of persons living with them are endangered due to special circumstances, e.g., time of year, temperature, place of residence, state of health and other similar circumstances, they may apply for a postponement of the disconnection and exercise the right to an emergency supply.

Vulnerable consumers, as defined in the ZOEE and ZOP, are household consumers who, due to their financial situation, the share of their energy expenditure in 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 consumers can prove their vulnerable consumer status and thus their eligibility for emergency supply with a certified statement from the Centre for Social Work (CSD), which must show that the household consumer has applied for regular social assistance before receiving the notification from the electricity or gas distribution system operator of the intended disconnection and that the decision procedure has not yet been completed with the CSD.

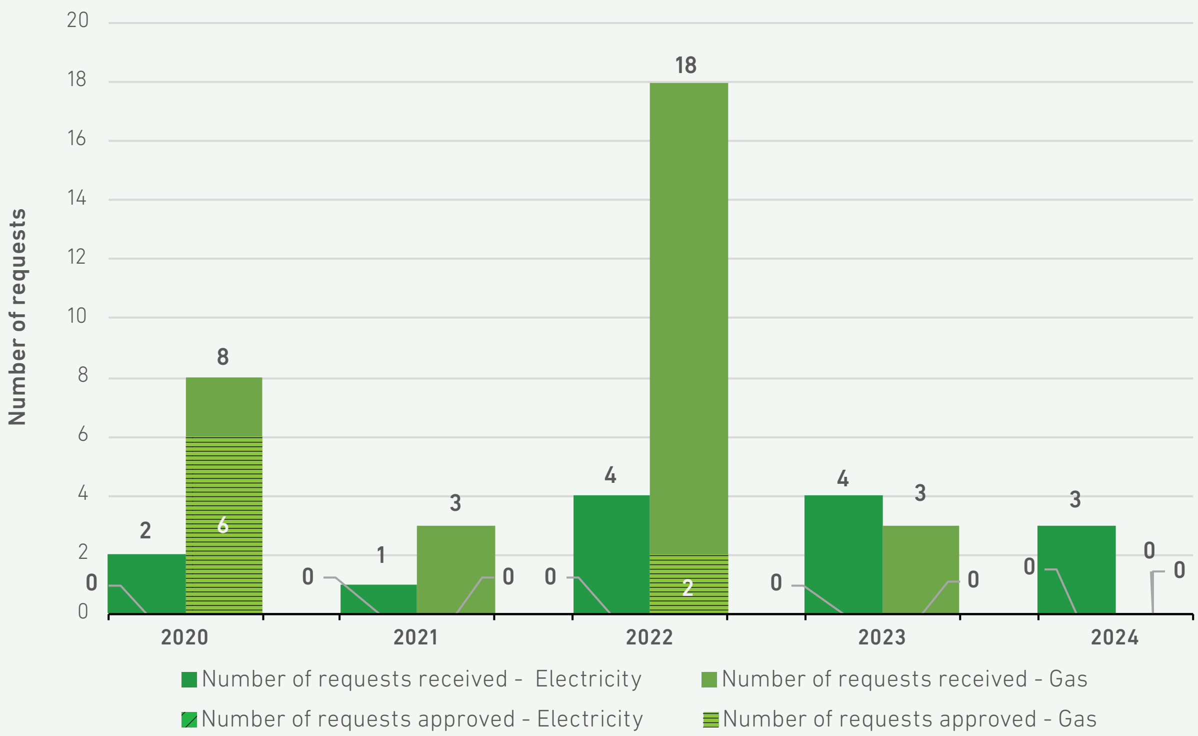
All DSOs must inform household consumers of their right to an emergency supply, the conditions under which it is possible and the deadlines for submitting evidence before disconnection.

The costs of an emergency supply of electricity to vulnerable consumers are eligible costs of the electricity DSO, while in the case of the supply of gas, the costs of the emergency supply are borne by the gas DSO until the vulnerable consumer pays them.

Eligibility for emergency supply is assessed by the electricity DSO in accordance with the procedure laid down in the System Operating Instructions for the Electricity Distribution System and with the rules and criteria established by the Energy Agency in the Legal Act on the Criteria and Rules for Providing an Emergency Supply of Electricity, and gas DSOs according to the procedure laid down in their system operating instructions.

In 2024, the electricity DSO received three requests for emergency supply approval, none of which were approved, and none of the applicants for emergency supply were disconnected. In the gas sector, the gas DSO received no requests for emergency supply in 2024. A comparison of requests submitted and approved for postponement of disconnection and exercise of the right to emergency supply in the last five years is shown in the following figure.

FIGURE 245: COMPARISON OF REQUESTS RECEIVED AND GRANTED FOR EMERGENCY SUPPLY



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

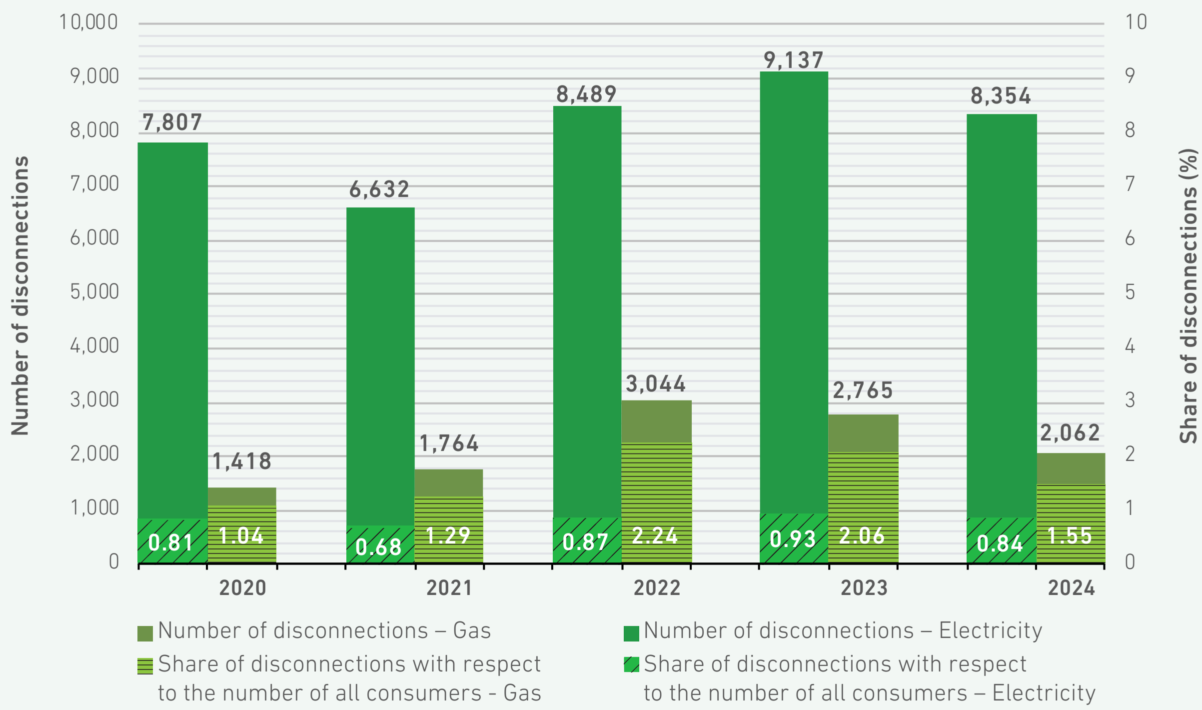
If the application for an emergency supply is not approved and a consumer fails to pay the energy supply bill, disconnection follows. Given that the cost of an emergency supply is paid by all the other electricity consumers through the network charge, the eligibility criteria for an emergency supply 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 or non-payment of electricity bills.

Disconnection of Consumers

The disconnection of a consumer is one of the last resort methods of correcting infringements caused by the consumer's behaviour. The electricity or gas DSO may disconnect a consumer due to the termination of a supply contract by the energy supplier (most often due to non-payment) or for other reasons (infringements), which are listed in the ZOEE and the ZOP. Depending on the type of infringement, the disconnection procedure may be carried out with or without prior notice and a consumer may also be disconnected at his request.

The number of electricity disconnections decreased slightly in 2024 (8,354 outages, or 8.6% fewer disconnections). As in the previous year, 2024 saw a decrease in the number of disconnections in the gas sector compared to last year (2,062 or 25.4% fewer). In both the electricity and gas sectors, disconnections of household consumers are still the most frequent (6,106 in the electricity sector and 1,774 in the gas sector). A comparison of the number of disconnections of all final consumers in the last five years and the share about the total number of all consumers is shown in the following figure.

FIGURE 246: COMPARISON OF THE NUMBER OF DISCONNECTIONS OF FINAL CONSUMERS



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

The most common reason for disconnecting an electricity consumer is non-payment, which terminates the supply contract (disconnection after prior notice, 5,162). In gas field, most disconnections were made at the request of the final consumer (1,719).

The most common reason for disconnecting electricity is non-payment, while disconnecting gas is at the request of a final consumer

Under the ZOEE and the ZOP, electricity and gas distribution system operators are obliged to inform the household consumer of the intended disconnection with a prior warning at least 10 days before the intended disconnection and the business consumer at least eight days before the intended disconnection. During this period, consumers may eliminate the reasons why they are threatened with disconnection, and household consumers may exercise their right to emergency supply. In this case, household and small business electricity consumers may also request the electricity distribution system operator to provide them with a last resort supply.

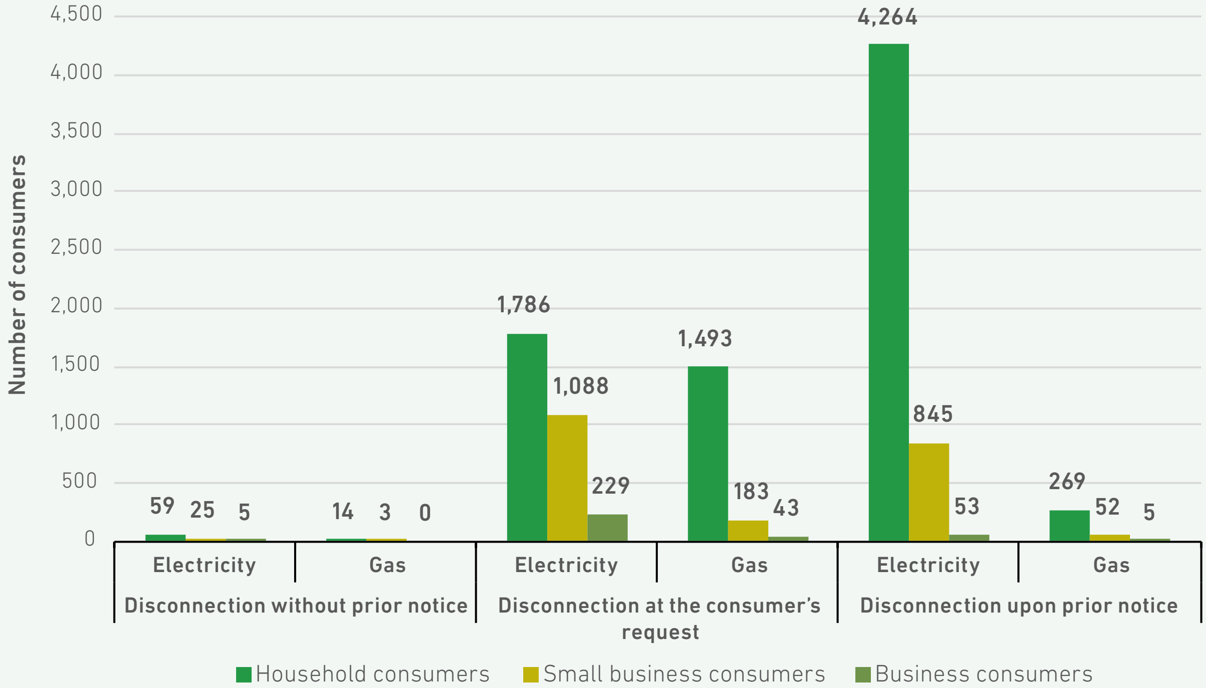
The Table below shows the distribution of individual procedures for disconnecting final consumers. A comparison of individual disconnection procedures for different consumer groups for electricity and gas is presented in the Figure below.

TABLE 46: OVERVIEW OF FINAL CONSUMER DISCONNECTIONS BY DISCONNECTION PROCEDURE

	Electricity	Gas
Disconnection without prior notice	89	17
Disconnection upon prior notice	5,162	326
Disconnection at the consumer's request	3,103	1,719
All disconnections	8,354	2,062

SOURCES: ENERGY AGENCY, OPERATORS, SUPPLIERS

FIGURE 247: COMPARISON OF INDIVIDUAL DISCONNECTION PROCEDURES ACCORDING TO CONSUMER GROUPS FOR ELECTRICITY AND GAS



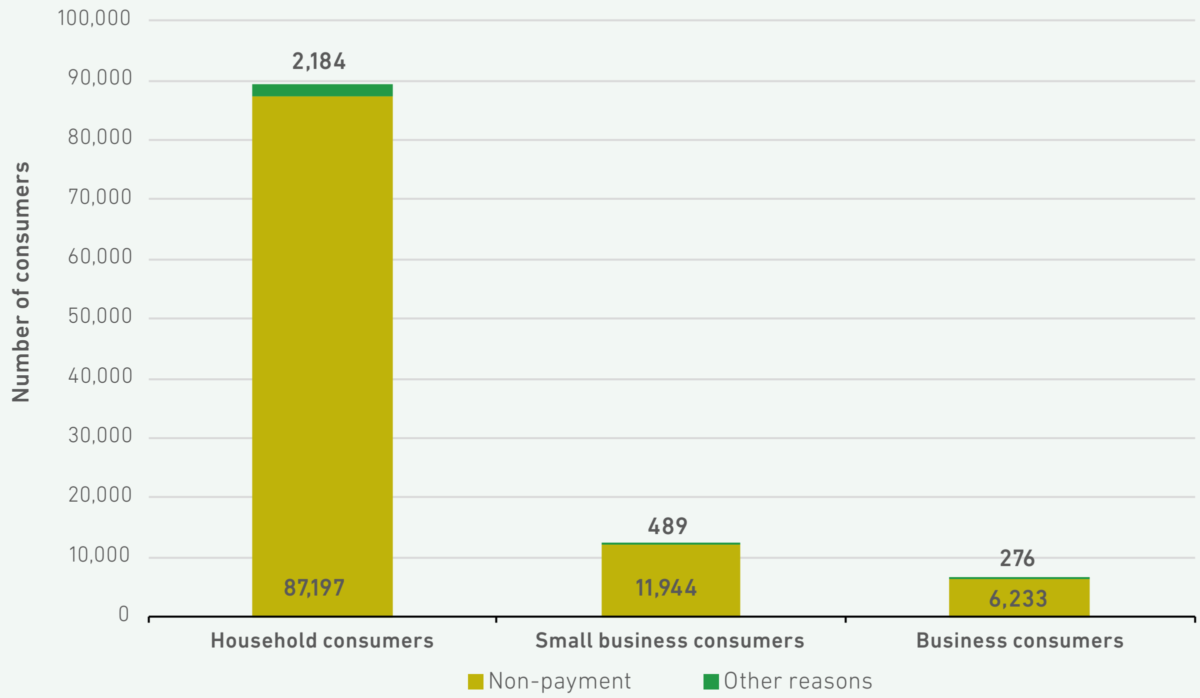
SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

In 2024, electricity suppliers issued a total of 108,323 contract terminations to final consumers, of which 97.3% (105,374) were related to non-payment of debt. Gas suppliers issued 1,671 termination notices to end users, 98.5% of which were due to non-payment of debt. Electricity suppliers canceled 69.4% of electricity supply contract terminations due to non-payment because the debt was paid immediately, while in the gas sector, 96.2% of consumers whose supply contracts were terminated due to non-payment immediately settled their obligations.

If a consumer fails to pay the debt, the operator disconnects the supply after giving prior notice. In 2024, 5,162 final consumers were disconnected from the electricity system and 281 from the gas system in procedures involving prior notice.

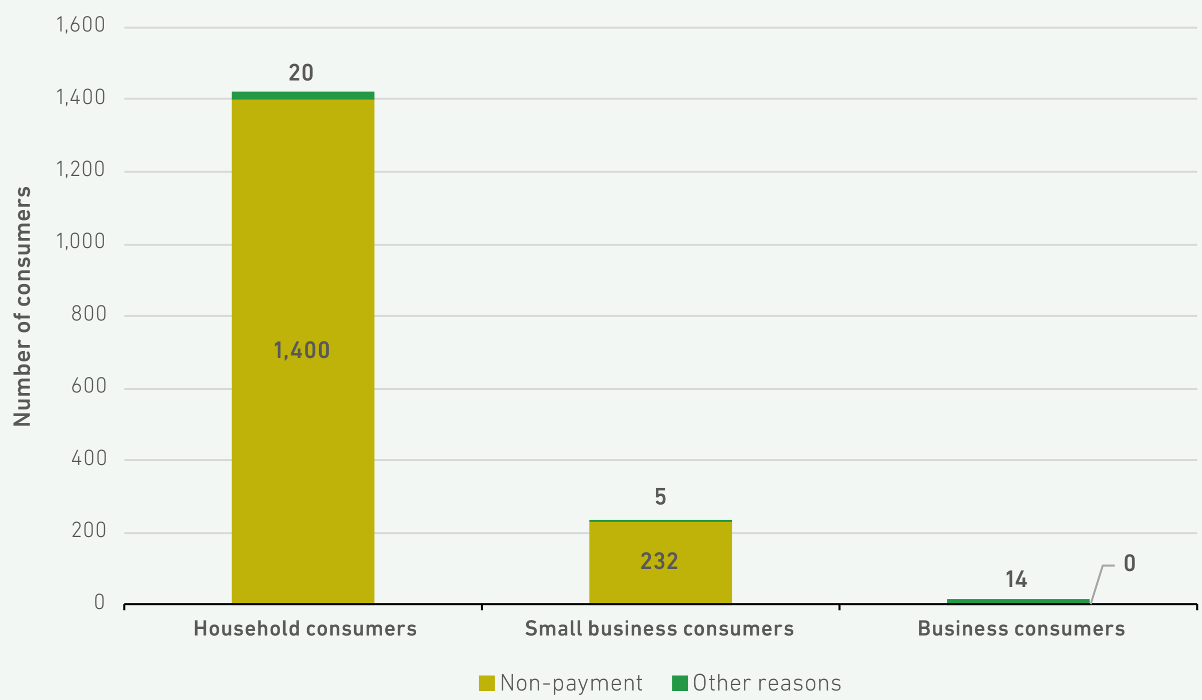
The next two figures show the number of electricity or gas supply contract terminations by consumer size and reason for disconnection.

FIGURE 248: NUMBER OF CANCELLATIONS OF ELECTRICITY SUPPLY CONTRACTS BY REASON



SOURCES: ENERGY AGENCY, SUPPLIERS

FIGURE 249: NUMBER OF CANCELLATIONS OF GAS SUPPLY CONTRACTS BY REASON



SOURCES: ENERGY AGENCY, SUPPLIERS

There were no disconnections on closed distribution systems in 2024 as in previous years. One of the operators of a closed electricity distribution system issued one notice of intended disconnection, based on which an agreement was reached with these small business consumers on how to repay the debt, which was settled. Therefore, no actual disconnection took place.

The Right of Complaint and the Out-of-Court Settlement of Consumer Disputes with Suppliers

Complaints and Out-of-Court Consumer 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 are settled first with the individual supplier and then before the competent court. For electricity end-users other than household consumers, the complaints procedure is provided for in an out-of-court procedure in accordance with the Mediation in Civil and Commercial Matters Act, and for household consumers, the out-of-court settlement of disputes with energy suppliers is also specifically provided for in the legislation. According to reports from gas suppliers, in 2024, one gas supplier received 105 requests for dispute resolution from an independent out-of-court dispute resolution provider, six of which were due to disputes over gas prices and 99 due to disputes over invoices. Electricity suppliers did not report any initiatives by household consumers to resolve disputes with an independent out-of-court dispute resolution provider in 2024, although in 2024 the Energy Agency carried out a supervisory procedure at one of the electricity suppliers regarding the provision of dispute resolution procedures with an independent out-of-court dispute resolution provider.

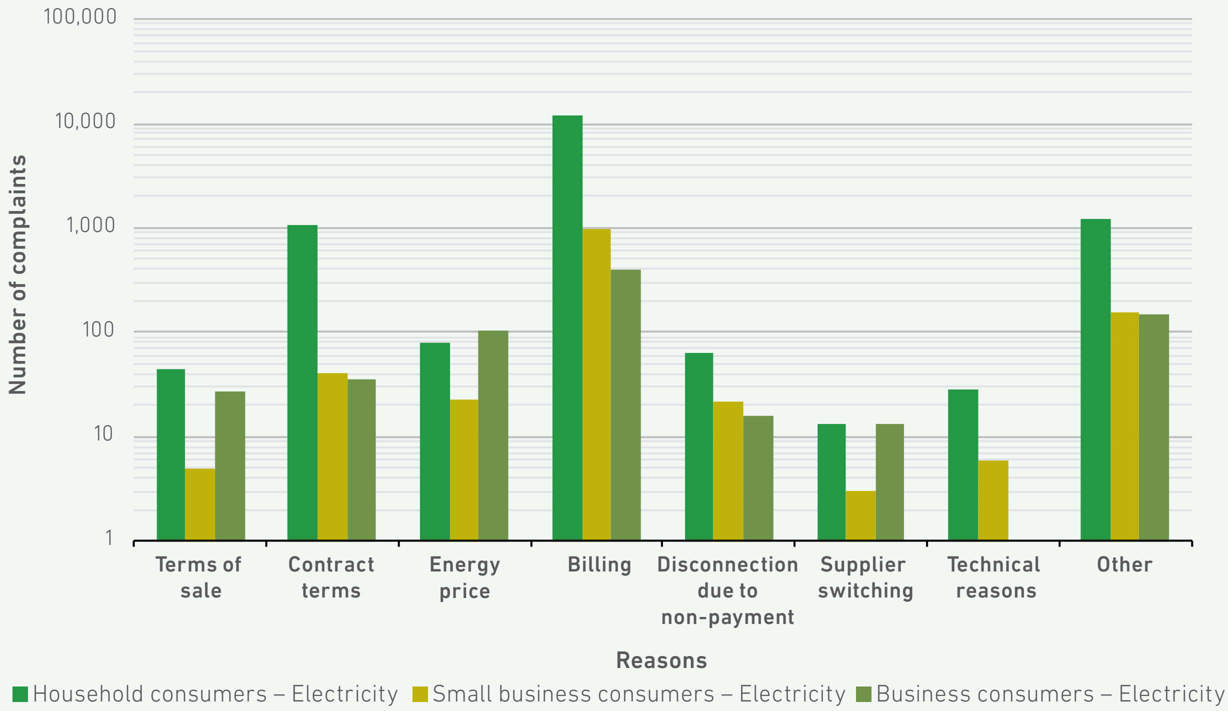
96.1% more complaints from household customers to electricity suppliers (mostly concerning issued invoices)

The number of complaints from household electricity and gas consumers increased by 96.1% compared to the previous year in the electricity sector, to a total of 14,624 complaints, while in the gas sector it decreased by 20.7%, with a total of 1,396 complaints filed.

Based on all complaints received, the majority of complaints were again submitted by household consumers, with 1.5% of all household consumers in the electricity sector and 1.2% of household consumers in the gas sector submitting complaints. The majority of all complaints from final consumers related to the content of the invoices issued by the energy supplier. Of the 14,624 complaints from household electricity consumers, 12,107 (82.8%) related to the invoice issued, and of the 1,396 complaints from household gas consumers, 1,114 (79.8%) related to the invoice issued. (82.8%) of complaints, and 1,114 (79.8%) of the 1,396 complaints from household gas consumers.

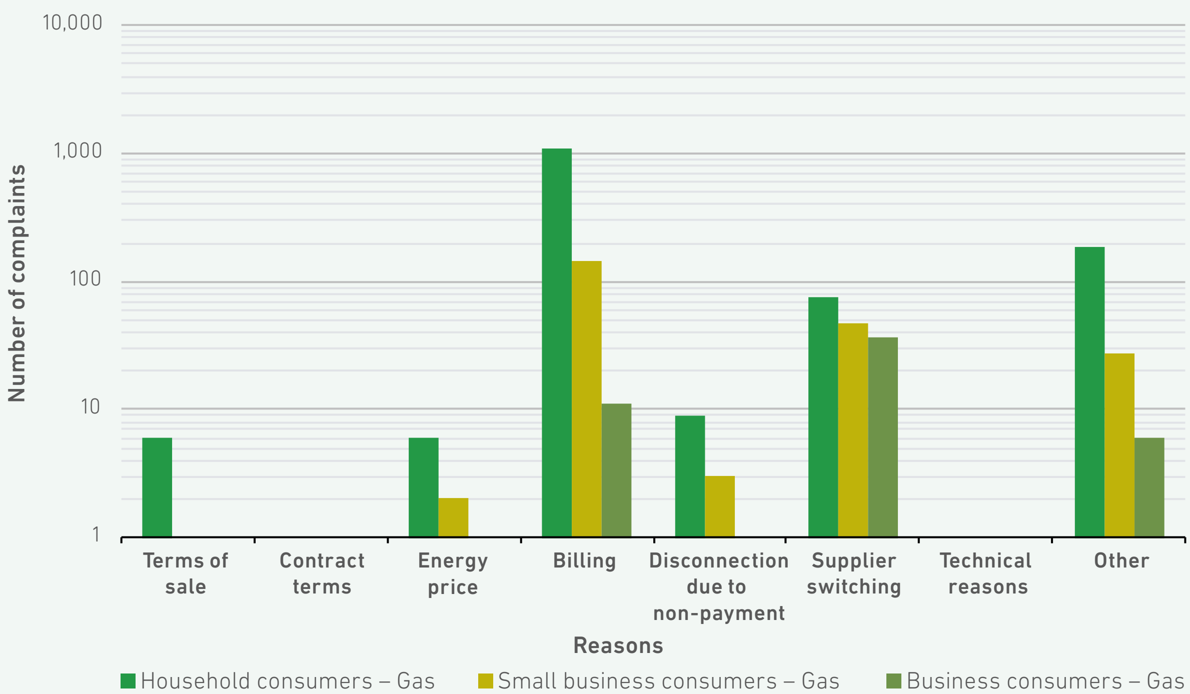
The following Figures shows the number of complaints from electricity and gas consumers against energy suppliers in 2024 by content.

FIGURE 250: CONSUMERS COMPLAINTS AGAINST ELECTRICITY SUPPLIERS BY REASONS



ENERGY AGENCY, SUPPLIERS

FIGURE 251: CONSUMER COMPLAINTS AGAINST GAS SUPPLIERS BY REASONS

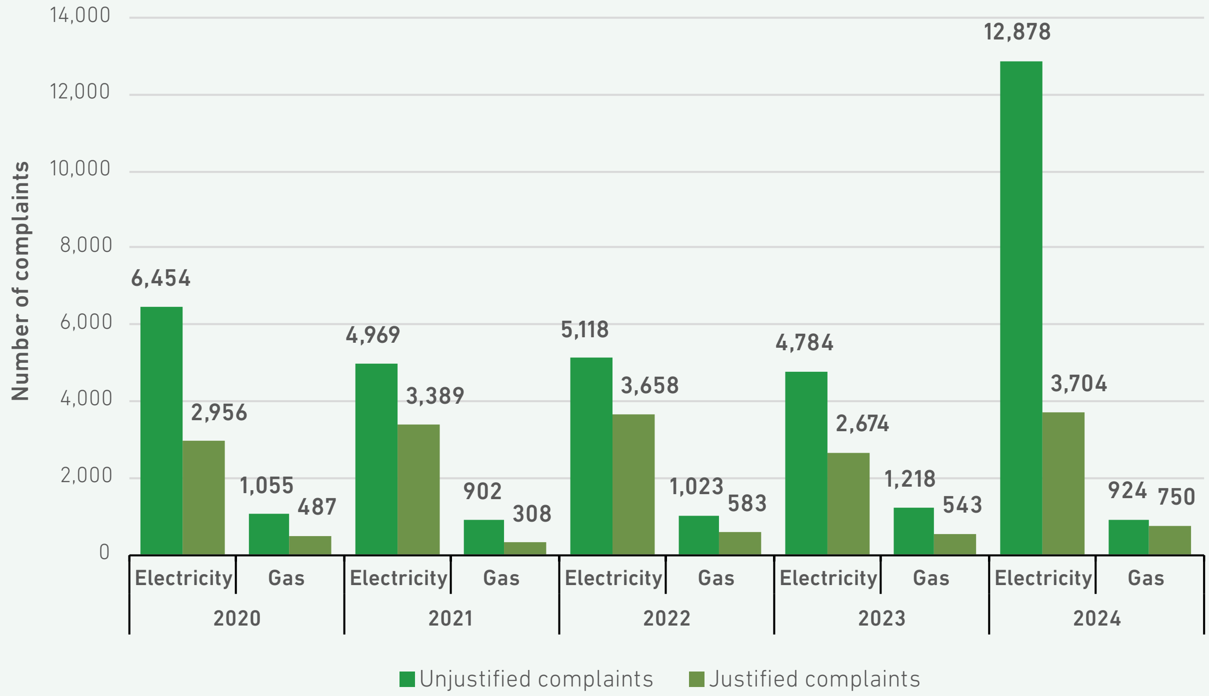


SOURCES: ENERGY AGENCY, SUPPLIERS

In the field of electricity, 77.7% of all complaints received were unjustified, which is slightly more than in the previous year, while in the field of gas, such complaints accounted for 55.2%, which is somewhat less than in the previous year. The following figure shows the decisions of energy suppliers on complaints from household customers of electricity and gas, broken down by the eligibility of the complaint.

Most complaints from household consumers to suppliers were unjustified

FIGURE 252: SUPPLIERS' DECISIONS ON THE ELIGIBILITY OF COMPLAINTS BY HOUSEHOLD CONSUMERS IN THE 2020–2024 PERIOD



SOURCES: ENERGY AGENCY, SUPPLIERS

According to electricity and natural gas suppliers, household electricity and gas consumers did not continue their complaint procedures with the out-of-court consumer dispute resolution provider in 2023. Although electricity and natural gas consumers are aware of this dispute resolution option, they do not use it despite the high proportion of rejected claims.

Household consumers did not opt for out-of-court dispute resolution with suppliers

The Energy Agency monitors unfair commercial practices under the provisions of the ZOEE and the ZOP, which relate to:

- false or misleading representation of the company, which the person addressing the final consumer represents, or in the name and on behalf of which they act;
- misrepresentation of the supplier's offer to final consumers;
- giving untrue reasons for visiting final consumers;
- false or misleading claims relating to contracts.

The Market Inspectorate also monitors and sanctions possible breaches of the general consumer protection rules in Slovenia. With the adoption of the ZSROVE and ZURE, certain areas (metering and billing of energy consumed, provision of information on metering and consumption) are also monitored by the Inspectorate of the Environment and Energy, the Energy Inspectorate.

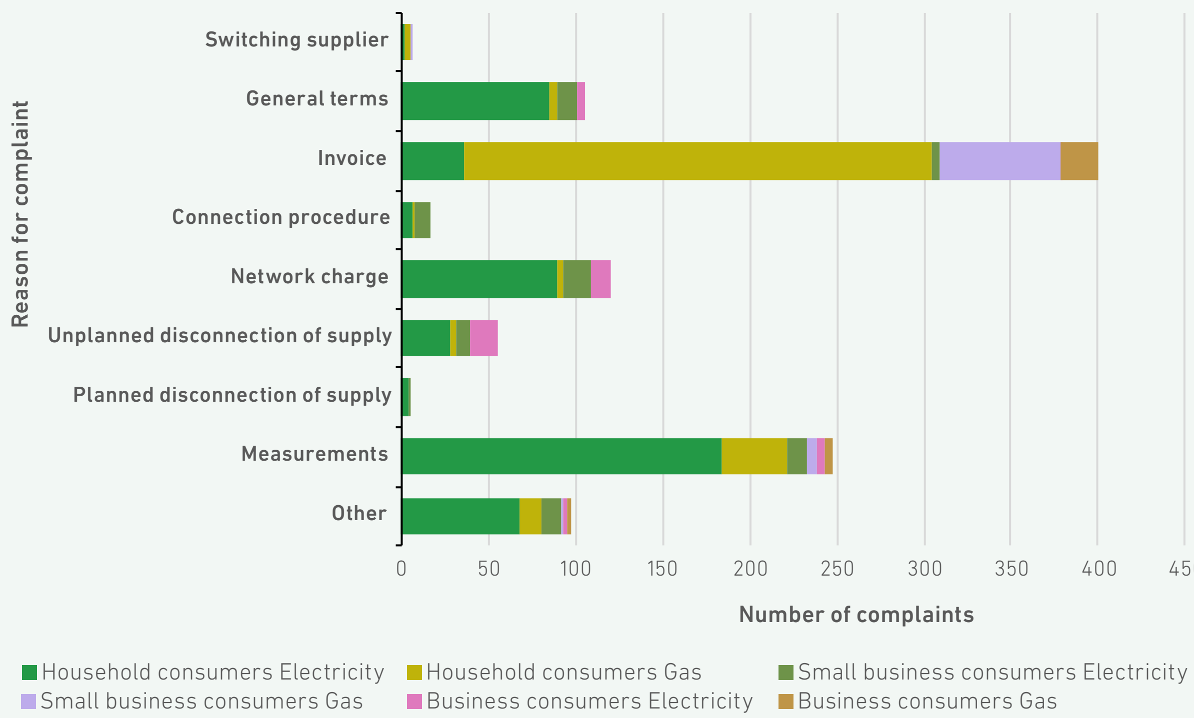
In the context of performing its tasks in 2024, the energy Agency found that at least five electricity consumers had attempted to initiate complaint proceedings with an out-of-court consumer dispute resolution provider about disputes with one of their suppliers. However, as the electricity supplier did not have an appropriate contract with this provider for the implementation of complaint procedures with the out-of-court consumer dispute resolution provider, these procedures were not initiated in 2024. Through its supervisory procedure, the Energy Agency ensured that this electricity supplier concluded an appropriate contract for the implementation of complaint procedures with an out-of-court consumer dispute resolution provider.

Consumer Complaints to Electricity and Gas Distribution System Operators

If consumers disagree with the operator regarding billing, metering, network charges, supply interruptions, connection procedures, switching supplier, etc., they also have the right to lodge a complaint directly with 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, disputes are settled by the Energy Agency using the procedures described in the following chapter.

In 2024, a total of 615 complaints were submitted directly to DSOs by electricity consumers (61 more than in the previous year), and 439 complaints were submitted to gas DSOs (239 fewer than in the previous year). Most complaints were addressed to electricity and gas DSOs by household customers (503 electricity and 334 gas consumers). As in the year before, most complaints in the electricity sector in 2024 were about metering, while in the gas sector, they were about invoicing.

FIGURE 253: NUMBER OF CONSUMER COMPLAINTS TO OPERATORS BY CONTENT

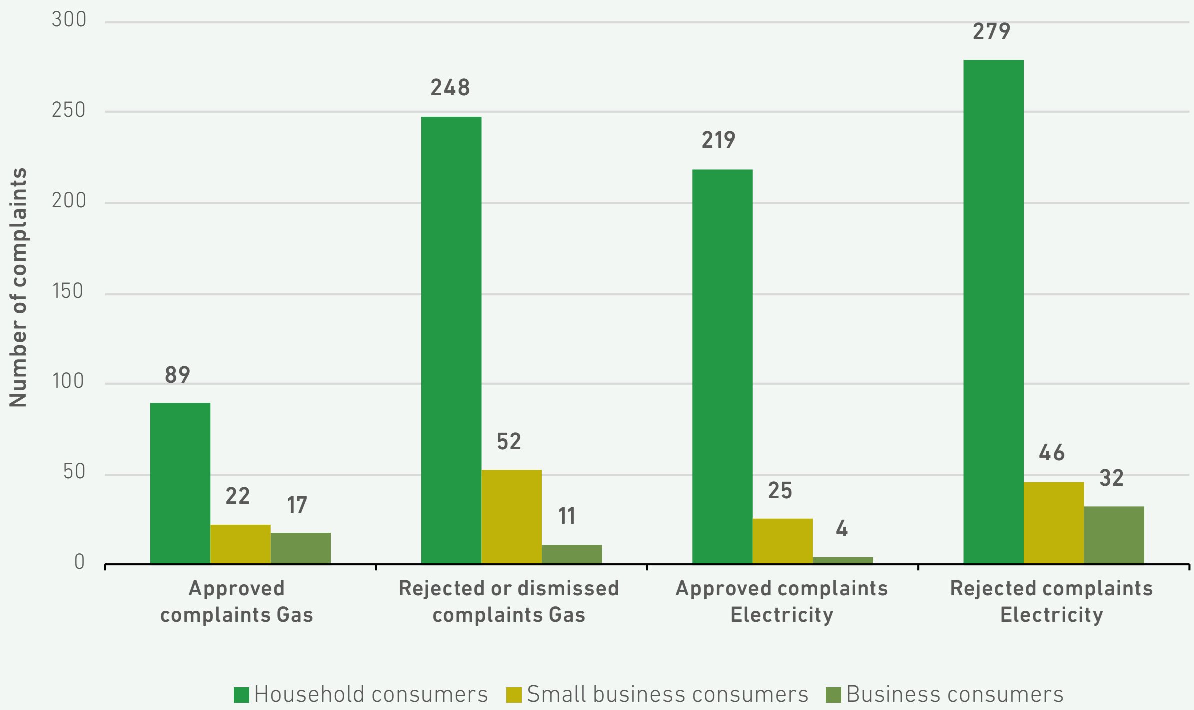


SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

The following Figure shows the number of approved and rejected complaints against electricity and gas distribution system operators. Of the total 605 complaints submitted by all electricity customers, only 41% (248) were approved, while the rest were rejected (354) or dismissed (three). In the gas sector, 311 complaints were rejected or dismissed, with operators accepting only 29% of complaints filed, or 128.

More than half of final consumers' complaints were not approved

FIGURE 254: NUMBER OF COMPLAINTS DEALT WITH BY OPERATORS



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

In 2024, the operators of closed electricity and natural gas distribution systems did not receive any complaints.

The Right to the Protection of Rights in Administrative Procedures

In addition to electricity and natural gas consumers, electricity and natural gas suppliers may also submit a request for dispute settlement before the Energy Agency. These are disputes brought before the Energy Agency by eligible entities in relation to electricity and natural gas transmission system operators, electricity and natural gas distribution system operators, or electricity market operators. They must first follow the procedure set out in the EZ-1 before submitting a request for a decision to the Energy Agency.

The Energy Agency primarily decides on disputes arising from access to the system, the amounts charged for the use of the system, disputes relating to violations of the system operating instructions, disputes relating to established deviations and the amounts to cover the costs of balancing deviations and violations of the general acts governing deviations and their balancing, disputes relating to breaches of the rules in the field of self-supply and the right to compensation for violations of the guaranteed standard of quality of electricity.

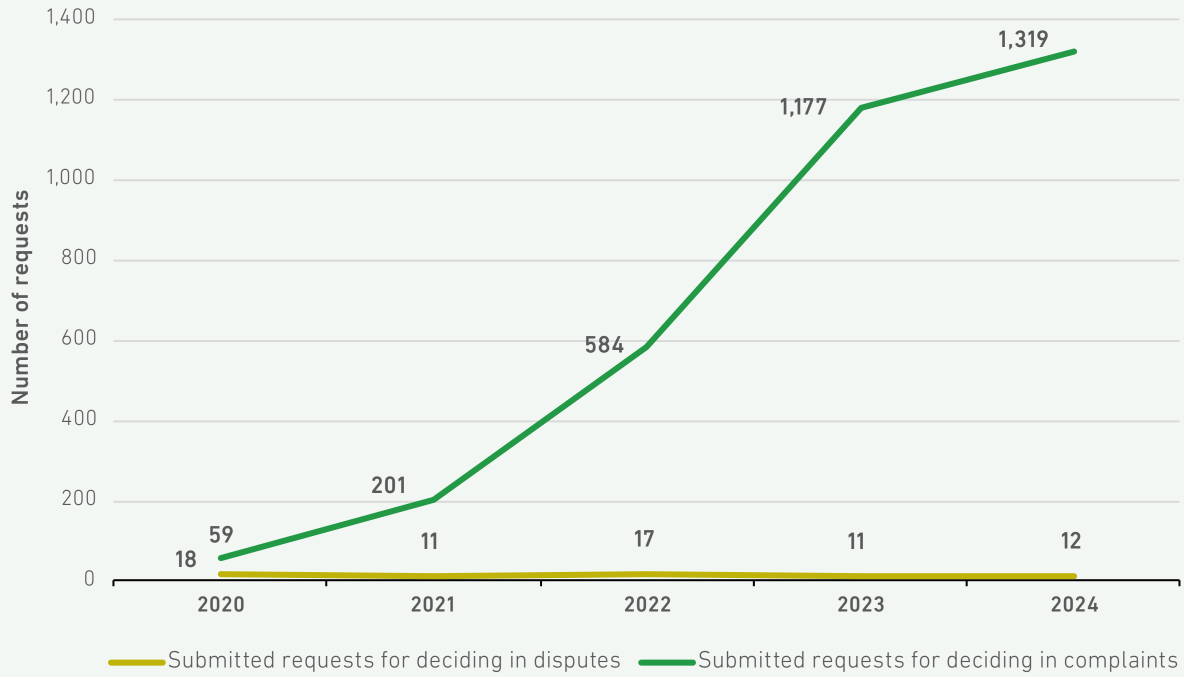
Administrative proceedings before the Energy Agency are fast and free of charge. Dispute settlement requests shall be decided on within two to four months.

In 2024, the Energy Agency dealt with 1,331 new individual cases, namely 12 requests at the first instance and 1,319 cases at the second instance.

The number of appeals against connection approvals issued since 2020 is shown in the next Figure

Most appeals concerned the refusal to approve the connection of self-supply equipment to the electricity distribution system.

FIGURE 255: ENERGY AGENCY DECISIONS IN DISPUTES AND APPEALS IN THE 2020–2024 PERIOD



SOURCE: ENERGY AGENCY

Since 2021, there has been a significant increase in the number of complaints received, which increased further in 2024 compared to 2023, which is a result of the number of applications received from end users for the issuance of consent for the connection of self-supply generation facilities, which was exceptionally high at the end of 2023, amounting to 47,990[147] for the entire distribution system in 2023. Although the deadline for inclusion in the self-supply system with annual net metering expired at the end of 2024, the number of applications received from end users for approval to connect self-supply production facilities in 2024 for the entire distribution system area fell dramatically to 3,981[148]. Regardless of this, a total of 19,499 connection approvals were issued in 2024. Of these, 7,243 applications were rejected, with the largest share of rejected applications in the Elektro Maribor area (39% of rejected applications compared to the number of applications whose processing was completed).

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 gas provided by the electricity and 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 the supply regulation seeks to improve or maintain the level already achieved at the optimum cost. Various activities are carried out to ensure the quality of the electricity supply, such as monitoring, reporting and data analysis of the following: continuity of supply, commercial quality and voltage quality. In addition to the above, the Energy Agency 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.

147 The data published on the ELES website: 67fca0660be54908197439.xlsx
148 The data published on the ELES website: 67fca0660be54908197439.xlsx

In 2024, the gas system operators continued to ensure reliable and safe operations for a smooth and quality supply by carrying out regular and emergency maintenance.

The chapters on the quality of the electricity supply, safe and secure operation, and the quality of the gas supply provide more details.

ENERGY EFFICIENCY

Lower costs, less pollution, more reliable energy supply

LIABLE ENTITIES ACHIEVED SAVINGS OF

131 GWh

IN 2024

WITH ENERGY EFFICIENCY MEASURES,

SAVINGS OF

713 GWh

LIABLE ENTITIES ACHIEVED THE HIGHEST SAVINGS IN THE INDUSTRY -

64 GWh,

WITH MEASURES IDENTIFIED BY ENERGY AUDITS (25.7 GWh)

THE LARGEST SHARE OF SAVINGS WAS ACHIEVED BY THE FOLLOWING MEASURES:

ADDING ADDITIVES TO TRANSPORT FUELS

34%

INSTALLATION OF CHP SYSTEMS

14%

SAVINGS ACHIEVED BY ENERGY AUDITS

20%

INSTALLATION OF SELF- SUPPLY SYSTEMS FOR ELECTRICITY

12%

97.5%

OF ALL LARGE COMPANIES COMPLY WITH THE ENERGY AUDIT OBLIGATION

SAVINGS BY SECTOR:

- ALMOST HALF OF ALL SAVINGS BY LIABLE ENTITIES IN THE INDUSTRY
- LEAST SAVINGS IN THE PRIVATE AND PUBLIC SECTORS

ENERGY EFFICIENCY

Effective energy use is a fundamental element of development and energy policy, as it significantly contributes to increased competitiveness and the decarbonisation of industry and society as a whole. Its main mission is to improve the quality of energy services while simultaneously reducing energy consumption. In this way, energy efficiency supports the transition to a climate-neutral society, reduces dependence on energy imports, and increases the reliability of energy supply.

According to the updated National Energy and Climate Plan (NECP), final energy consumption in Slovenia, with consistent implementation of the planned policies and measures, should not exceed 50.2 TWh (4,320 ktoe) by 2030. Slovenia commits to keeping primary energy consumption below 70 TWh (6,026 ktoe) compared to the baseline scenario from 2007. This implies an improvement in energy efficiency of at least 35%, exceeding the overall EU target set at 32.5%.

Slovenia's energy efficiency goals are realised through measures that promote efficient energy use across all final consumption sectors as well as in the sectors of production, transmission, and distribution of energy, including district heating and cooling networks.

Slovenia achieves most of its energy savings, which help meet the set energy efficiency targets, through the implementation of measures under the mandatory energy savings scheme, which obliges energy suppliers to end consumers, and through an alternative energy efficiency program carried out by the Eco Fund (Eko sklad).

Energy Savings Obligation Scheme and Alternative Measure

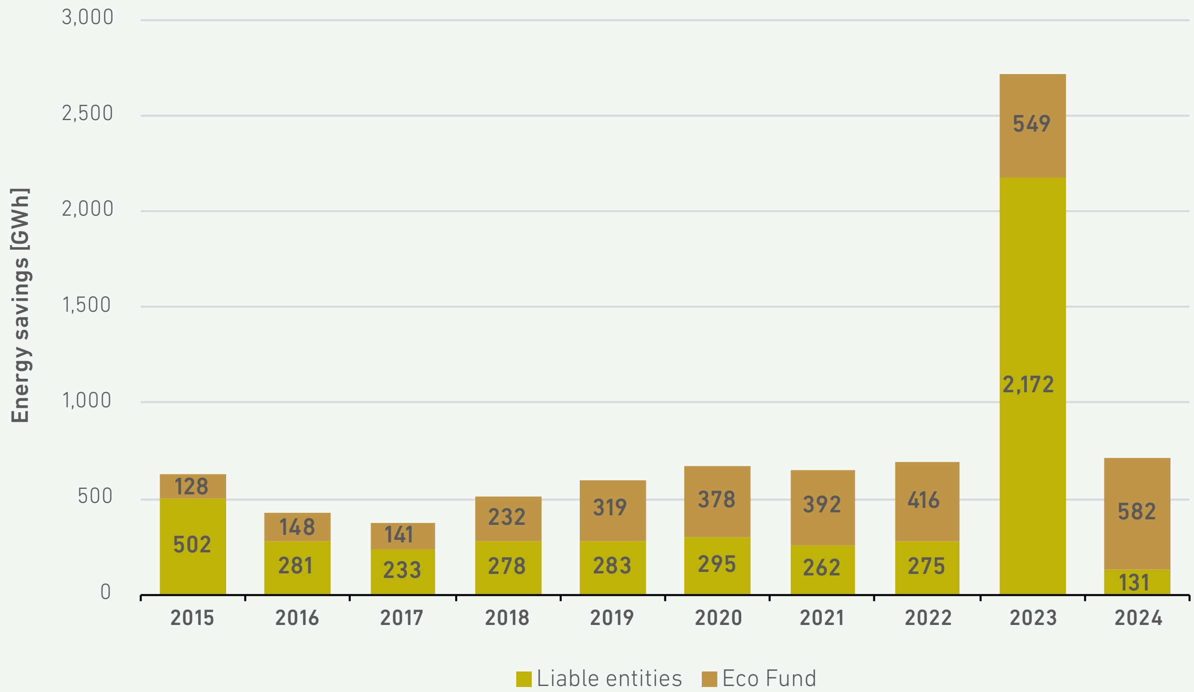
Within the mandatory energy savings scheme, Slovenia must ensure an annual savings rate of 0.8% in final energy consumption. Fuel suppliers are allowed a gradual increase in achieved savings during a transitional period. By 2026, they must also meet the full 0.8% annual savings target based on the previous year's sales. In 2024, these obligated parties were required to achieve a 0.6% savings compared to the quantities of fuels sold in 2023.

713 GWh of savings achieved with energy efficiency measures in 2024

An alternative measure through which Slovenia also achieves energy savings is implemented within the Eco Fund's energy efficiency program, financed by funds collected from final energy consumers via a contribution for efficient energy use.

With these two measures combined, Slovenia achieved a total energy savings of 713 GWh in 2024, with obligated parties contributing 131 GWh and the Eco Fund 582 GWh. Figure 256, which shows total annual savings by obligated parties and the Eco Fund during 2015–2024, indicates that savings fluctuated between 400 and 700 GWh annually from 2015 to 2023, except in 2023 when obligated parties achieved 2,721 GWh of savings. During this period, obligated parties generally achieved higher savings than the Eco Fund. However, 2024 marks an important change in the structure of achieved savings–the Eco Fund achieved a larger share with 582 GWh, while the contribution of obligated parties significantly decreased to just 131 GWh, the lowest value since 2015. This decrease is primarily because obligated parties mostly covered their obligations in 2024 with unused surpluses from previous years.

FIGURE 256: ENERGY SAVINGS IN THE 2015–2024 PERIOD[149]



SOURCES: ENERGY AGENCY, ECO FUND

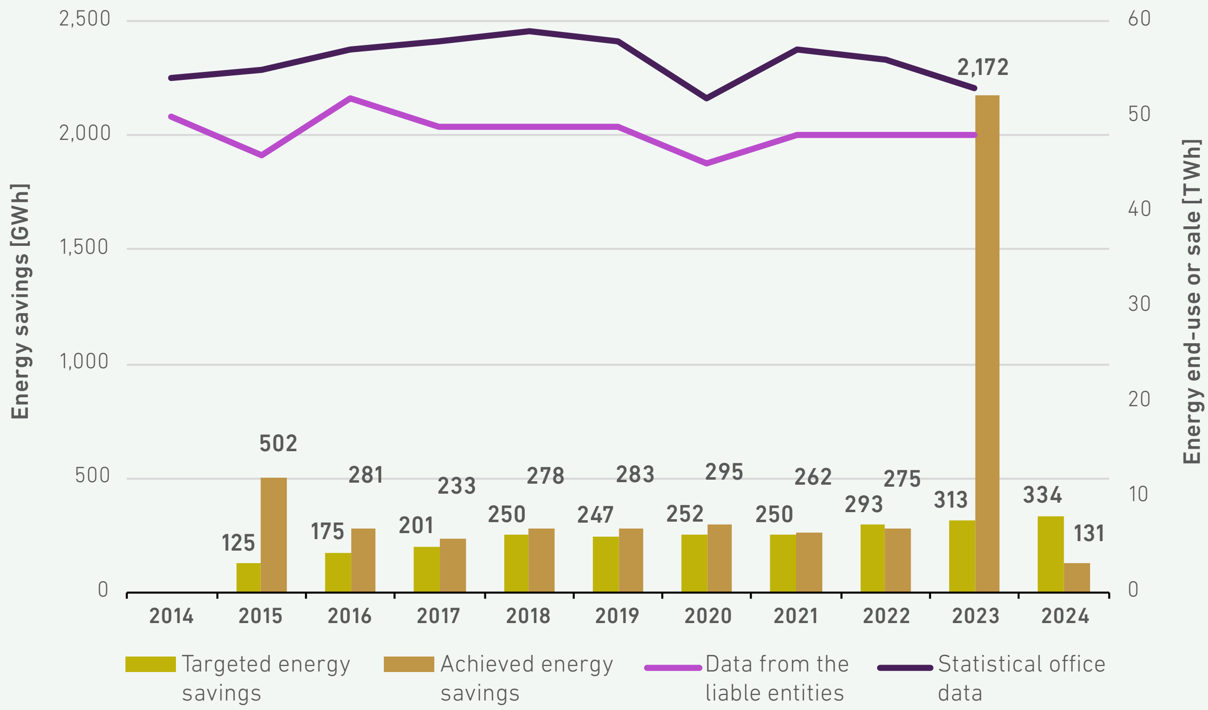
Target Energy Savings of the Liable Entities

Slovenian energy efficiency policy includes electricity, heat, natural gas, and liquid and solid fuel suppliers who supply or sell energy to final consumers, among those obligated to achieve energy savings. However, in accordance with the legislation, suppliers of solid fuels are only required to achieve savings if their annual sales exceed 100 MWh of energy. Following the regulations, in 2024, liable entities had to achieve 0.8% energy savings compared to the amount of energy sold to end users in 2023 through various measures. Suppliers of liquid fuels selling petrol and diesel fuel had a slightly lower obligation in 2024. They had to achieve savings of 0.6% based on the previous year's sales of motor gasoline and diesel fuel.

According to the reported data, energy suppliers sold a total of 47,881 GWh of energy to final consumers in 2023, of which 24,191 GWh was petrol and diesel fuel. On this basis, the target savings for liquid fuels (petrol and diesel fuel only) in 2024, taking into account the 0.6% obligation, amounted to 145 GWh. With a 0.8% obligation for other energy sources – electricity, heat, natural gas, and solid and other liquid fuels – the target savings amounted to 189 GWh. The total target savings for 2024 thus amounted to 334 GWh, which is 21 GWh more than in the previous year. The increase in the overall target is due to an increase in the obligation for liquid fuels, but only for suppliers of petrol and diesel, where the savings requirement increased from 0.5% in 2023 to 0.6% in 2024.

149 When reviewing the savings achieved by suppliers in previous years, the Energy Agency identified discrepancies between the reported savings and the actual savings in individual years and included them in this report.

FIGURE 257: COMPARISON OF FINAL ENERGY CONSUMPTION OR SALES BETWEEN THE DATA REPORTED BY OBLIGATED PARTIES AND THE STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA (SURS) FOR THE 2014–2023 PERIOD, AND OF THE TARGETED AND ACHIEVED ENERGY SAVINGS BY OBLIGATED PARTIES FOR THE 2015–2024 PERIOD[150]



SOURCES: ENERGY AGENCY, SURS

Figure 257, which shows a comparison of final energy consumption or sales between the data provided by the obligated parties and SURS for the period 2014–2023 and the target and achieved energy savings of the liable entities for the period 2015–2024, it can be seen that the liable entities exceeded their energy savings targets through energy efficiency measures. In 2024, however, the liable entities achieved only 131 GWh through energy efficiency measures, but met their target obligation with savings exceeding the target value from the previous three years.

Activities of Suppliers to Achieve the Target Energy Savings

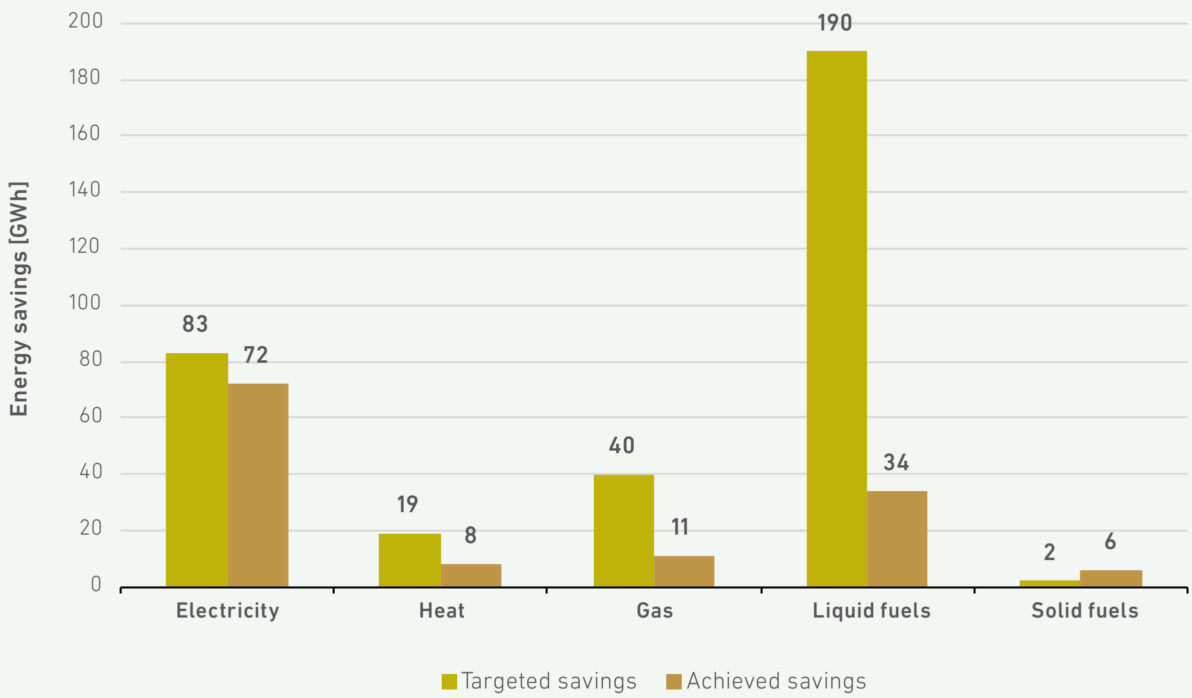
In 2024, energy suppliers achieved energy savings of 131 GWh for final consumers by participating in the implementation of energy efficiency measures or by implementing such measures themselves.

Entities that do not achieve the target energy savings through their contribution to the implementation of energy efficiency measures shall fulfil their obligation for each megawatt hour of energy savings not achieved by paying financial compensation to the Eco Fund. The amount of the financial compensation was determined by the Eco Fund and amounted to 174.75 EUR/MWh for 2024.

Figure 258 shows a comparison between the planned (target) and actual energy savings achieved by the type of energy supplier for 2024. The most significant savings were achieved by electricity suppliers, which generated 72 GWh of energy savings, representing 87% of their target. Liquid fuel suppliers, which sold the most energy in 2023, achieved savings of 34 GWh, which is only 18% of the planned amount. Gas suppliers contributed 11 GWh, while heat suppliers achieved savings of 8 GWh. The largest solid fuel suppliers attained a total of 6 GWh in savings. Suppliers covered the difference between actual and target energy savings for 2024 with surpluses from actual savings above target savings from the previous three years.

150 When reviewing the savings achieved by suppliers in previous years, the Energy Agency identified discrepancies between the reported savings and the actual savings in individual years and included them in this report.

FIGURE 258: TARGETED AND ACHIEVED ENERGY SAVINGS BY THE TYPE OF ENERGY SUPPLIER



SOURCE: ENERGY AGENCY

Energy Savings Achieved by Individual Measures

Suppliers achieved energy savings by participating in and implementing measures with end-users in the public, service and industrial sectors. They can also achieve savings through additional measures in the residential, energy conversion, distribution and transmission sectors. The savings achieved are calculated using the measure-specific savings calculation methodologies set out in the Regulation on methods for determining energy savings. Liable entities may also achieve savings through measures not defined in the methodology. Still, they must be demonstrated by an energy audit, in which the savings achieved for each measure are evaluated.

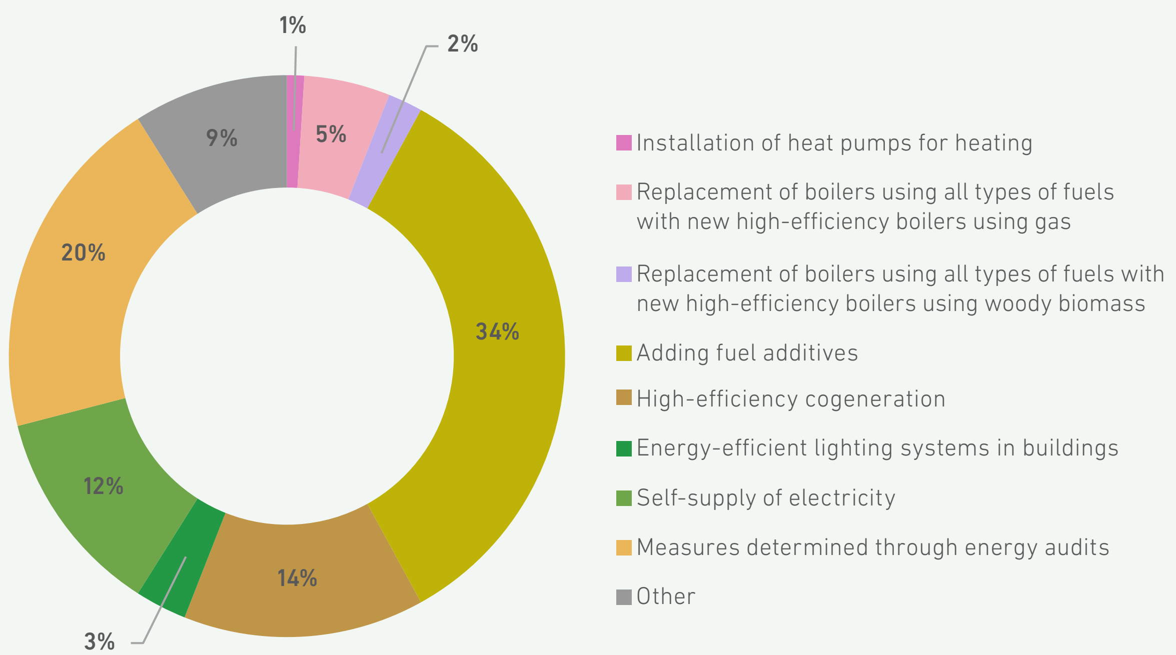
TABLE 47: ENERGY SAVINGS BY INDIVIDUAL MEASURES IN THE 2015–2024 PERIOD

Measure	2015 [GWh]	2016 [GWh]	2017 [GWh]	2018 [GWh]	2019 [GWh]	2020 [GWh]	2021 [GWh]	2022 [GWh]	2023 [GWh]	2024 [GWh]
Complete renovation of buildings	0.0	0.6	0.1	15.9	7.0	7.7	4.0	3.4	5.8	0.5
Replacement of boilers using all types of fuels with new high-efficiency boilers using gas	7.6	13.6	20.8	14.8	13.5	15.6	16.8	9.9	7.7	6.5
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	6.8	1.8	2.7
Installation of advanced metering and energy billing systems in households and the service sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	30.2	0.0
Installation of heat pumps for heating	2.7	0.3	1.7	3.5	6.1	2.8	9.7	4.1	18.0	1.7
Comprehensive renovation of heat stations	73.6	3.1	0.8	1.7	0.5	1.9	2.7	1.8	0.4	0.4
Connecting a building to district heating	2.3	4.7	5.8	2.6	2.2	2.3	1.3	2.2	2.4	1.7
Renewal of the district heating distribution network	3.9	4.4	2.9	4.5	3.8	1.6	3.0	1.9	2.5	1.6
Systems for the recovery of waste heat in buildings	0.0	9.2	2.0	0.6	0.0	0.9	7.9	0.0	0.3	0.0
Optimisation of the 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	4.4	1.2	1.0
Adding fuel additives	195.6	99.2	41.2	53.4	33.3	27.8	41.9	51.4	46.4	44.7
High-efficiency cogeneration	37.7	9.8	11.9	62.2	78.9	62.2	34.0	92.0	1,937.3	17.7
Energy-efficient lighting systems in buildings	14.5	15.5	22.9	42.5	56.8	55.0	47.6	11.8	4.8	3.2
Implementation of energy management systems	98.3	92.9	93.8	9.7	29.5	3.4	5.4	2.0	2.9	0.0
Excess heat recovery in industry and the service sector	0.0	0.0	6.0	22.6	0.3	0.0	0.6	3.7	0.4	0.2
Self-supply of electricity	0.0	0.0	0.0	0.0	5.0	4.6	15.8	17.4	41.1	16.3
Measures determined through energy audits	44.9	12.3	7.5	27.1	27.6	75.4	48.7	30.5	59.3	25.7
Other	9.8	11.9	19.9	17.8	9.9	14.3	10.5	5.7	9.5	7.1

SOURCE: ENERGY AGENCY

In 2024, as much as 80% of all energy savings achieved were generated by four key measures: adding additives to transport fuels (34%), implementing measures whose effects are demonstrated by energy audits (20%), introducing systems for the cogeneration of heat and electricity (14%), and installing systems for the self-supply of electricity (12%). The selection of measures implemented shows that those that contribute quickly to reducing energy consumption or fuel costs, such as adding additives and replacing old boilers, were at the forefront. On the other hand, measures such as the installation of heat pumps and energy-efficient lighting are less common, which may indicate higher initial costs or a longer payback period. Figure 259 shows which measures were prioritised and how often they were implemented.

FIGURE 259: SHARES OF ENERGY SAVINGS ACHIEVED THROUGH INDIVIDUAL MEASURES



SOURCE: ENERGY AGENCY

Based on methodologically determined calculations of CO_2 emission reductions for individual types of measures, the measures under the energy efficiency obligation scheme reduced annual CO_2 emissions by 42,214 tons. The most considerable reduction, totalling 36,287 tons, was achieved in the industrial and transport sectors, which also achieved the highest energy savings in relation to individual sectors.

Energy Savings by Sector

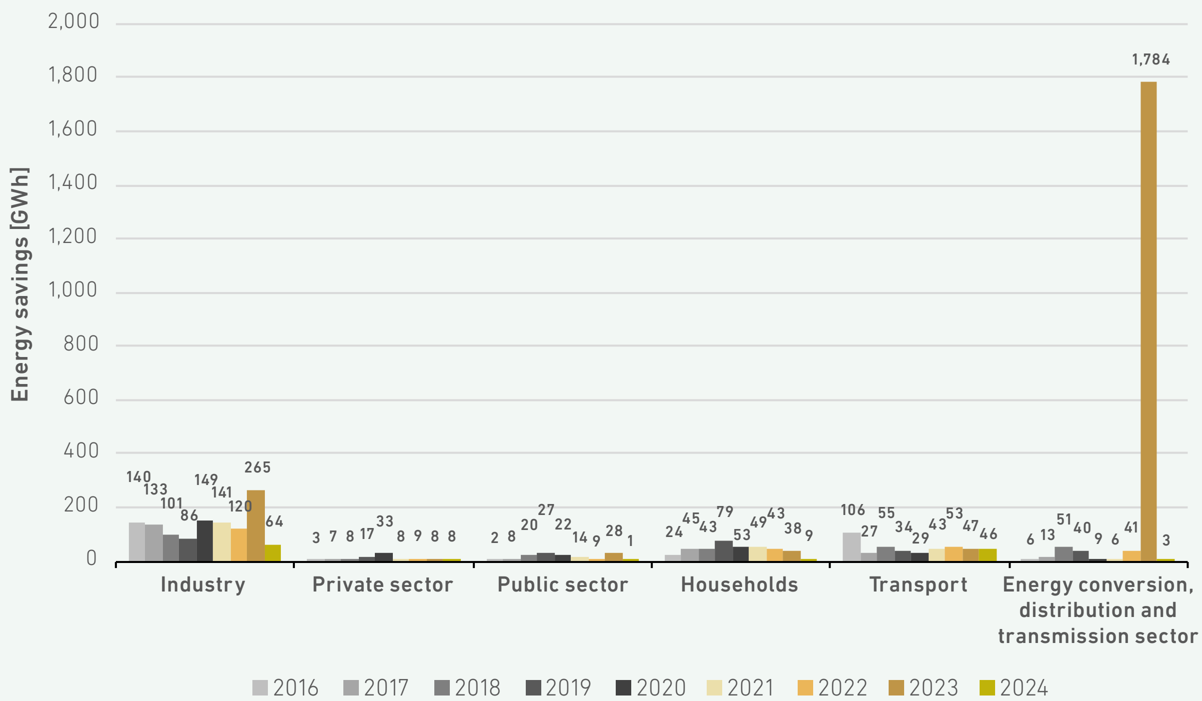
In 2024, the largest share of energy savings, totalling 64 GWh, was achieved in industry, accounting for almost half of all savings achieved by the liable entities. Most of these savings come from three key measures, with the largest share (25.7 GWh) achieved through measures approved on the basis of energy audits, followed by self-supply of electricity and combined heat and power (CHP) generation.

The second largest contribution to savings was made by transport, with 46 GWh, with the majority of savings resulting from the addition of additives to transport fuels. The household sector generated 9 GWh of savings, mainly through the replacement of hot water boilers with gas or wood biomass boilers.

The lowest savings were achieved in the conversion sector (3 GWh) and in the public sector, where the liable entities achieved only 1 GWh of savings in 2024. Compared to the previous year, lower energy savings were achieved in all sectors except the private sector, where the level remained unchanged.

Over the entire reporting period, the largest savings were achieved in the industrial sector, while the private and public sectors contributed the least. Excluding 2023, when a single considerable measure resulted in exceptional savings in the energy conversion, distribution, and transmission sector, this sector has been among those with the lowest energy savings for several years.

FIGURE 260: ENERGY SAVINGS BY SECTORS IN THE 2016–2024 PERIOD



SOURCE: ENERGY AGENCY

Energy Savings 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 48, namely investment loans for energy-efficiency measures, awarding grants for the implementation of efficiency measures, and 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 2024, there were a total of 516 GWh of energy savings, while with the Eco Fund measures together 582,3 GWh of savings were achieved in 2024.

TABLE 48: ENERGY SAVINGS IN THE ECO FUND PROGRAMME FOR IMPROVING ENERGY EFFICIENCY IN THE 2015–2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Investment loans [GWh]	5	8	11	24	23	39	44	29	15	43
Non-refundable grants [GWh]	123	127	117	190	272	314	323	358	510	516
Energy advisory service for the public [GWh]	0	14	14	18	23	25	25	29	24	24

SOURCE: ECO FUND ANNUAL REPORTS

The Eco Fund achieves most of its energy savings through measures implemented by individuals in households and businesses, which are partly financed by non-refundable grants from the Eco Fund's public tenders. In 2024, two measures contributed the largest share of savings: the installation of heat pumps (218.8 GWh) and the use of solar energy for electricity (157.8 GWh). In total, non-repayable funds enabled 516 GWh of energy savings in that year, accounting for 89% of all savings achieved. These two solutions were also key to the Eco Fund's energy savings in the period under review, contributing significantly to their steady increase.

TABLE 49: ENERGY SAVINGS BY MEASURES FOR THE 2018–2024 PERIOD, PARTLY FINANCED BY ECO FUND GRANTS

	2018 [GWh]	2019 [GWh]	2020 [GWh]	2021 [GWh]	2022 [GWh]	2023 [GWh]	2024 [GWh]
Biomass boilers	18.3	30.6	27.2	26.5	32.4	35.8	33
Heat pumps	63.1	102.7	103.8	99.0	126.8	214.2	218.8
Self-supply – net metering	10.0	16.3	30.9	58.0	62.4	107.0	157.8
Installation of joinery	2.9	3.3	4.1	3.6	3.1	4.2	6.5
Facade thermal insulation	49.9	55.0	48.9	43.2	42.0	45.0	38
Roof thermal insulation	18.0	15.2	13.6	13.5	9.0	8.1	7.6
Heat recovery ventilation	0.0	2.1	4.2	4.0	4.0	6.1	6.5
Natural gas condensing boilers	10.9	31.7	39.4	33.2	42.5	6.4	0.3
sNES[151] Public buildings or sNES of general social importance	3.7	1.9	1.3	4.8	7.4	9.5	8.9
Energy audits	3.3	1.3	4.1	0.4	1.8	4.4	7.7
Environmentally friendly passenger cars	3.2	2.5	3.8	5.0	3.3	4.6	7.8
Replacement of lighting	0.0	1.6	4.9	8.9	4.7	4.4	5.6
Excess heat recovery	0.0	0.1	3.8	2.9	0.0	11.5	0.6
Energy optimisation	0.0	2.0	11.1	8.0	1.1	23.4	1.4
Tyres	0.0	0.0	7.9	7.8	8.6	18.1	10.8
Other measures	6.8	6.1	5.0	4.2	8.9	8.0	4.7

SOURCE: ECO FUNDS ANNUAL REPORTS

151 sNES - almost zero-energy buildings

Energy Audits

Another well-established national energy efficiency measure is the mandatory energy audits in large companies, which identify possible measures to improve energy efficiency and consequently reduce energy consumption while helping to reduce energy costs. Under the ZURA, large companies must carry out an energy audit every four years and report on the audit to the 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, 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 companies that have exceeded 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 EUR 20 million and
- net operating income exceeds EUR 40 million.

Based on data from the Slovenian Business Register, the Energy Agency identified 401 large companies registered in Slovenia. Four companies were removed from the register because they no longer met the conditions for classification as large companies in 2024, while 50 companies were newly added to the register.

According to Business Register (AJPES) data, the main activities of the identified large companies are as follows:

- 165 companies, or 41% of all entities required to perform an energy audit, operate in the manufacturing sector,
- 109 companies, or 27% of all entities required to perform an energy audit, are engaged in trade,
- 18 companies, or 5%, have energy supply as their main activity,
- 15 companies, or 4%, operate in transport,
- 13 companies, or 3%, provide financial services
- 13 companies, or 3%, are active in construction
- 10 companies, or 3%, are active in insurance.

The category »other,« which comprises 58 companies, or 14% of all entities required to perform an energy audit, includes activities such as telecommunications, warehousing, printing, waste collection and disposal, publishing, gambling, catering, accommodation services, and other related activities.

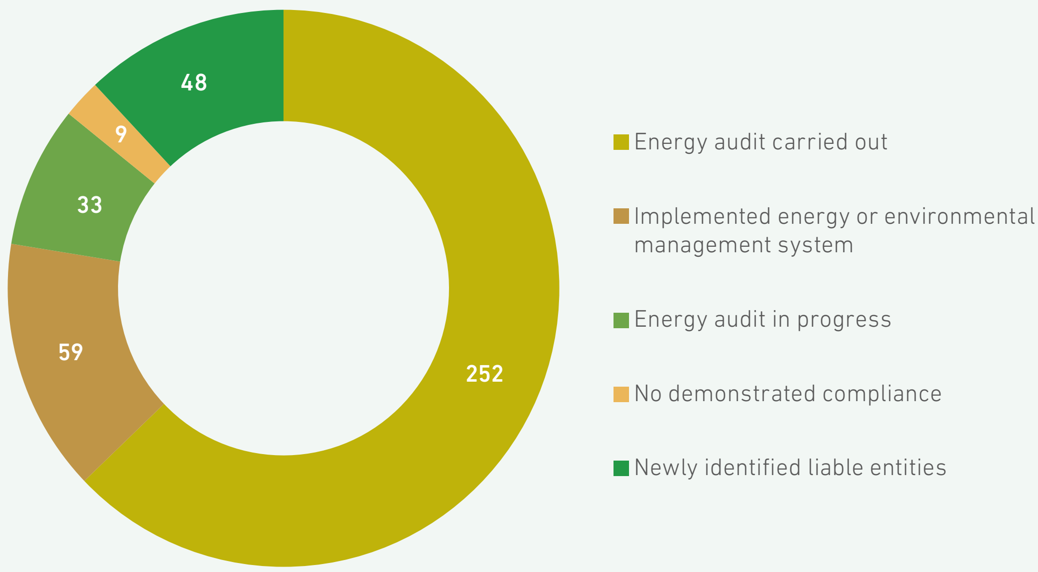
In accordance with applicable legislation and standards, large companies can fulfill their obligation to perform an energy audit by:

- by performing an energy audit in accordance with the SIST ISO 50002 standard 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);
- obtaining an energy management certificate in accordance with the SIST EN ISO 50001 standard or an environmental management system in accordance with the SIST EN ISO 14001 standard, which must also include a minimum review in accordance with Annex A, point A.3 of the SIST ISO 50002 standard, which is carried out every four years.

97.5% of all large companies comply with the energy audits obligation

At the end of 2024, 311 companies had fulfilled the obligation to carry out an energy audit. Of these, 252 carried out an energy audit, while 59 have established a certified energy or environmental management system in accordance with European or international standards. Of the remaining companies, 33 were in the process of carrying out an energy audit at the end of 2024. Nine companies are currently not yet compliant, as they have not yet demonstrated compliance. Of the total of 50 companies newly included in the register of large companies, two have already fulfilled their obligations.

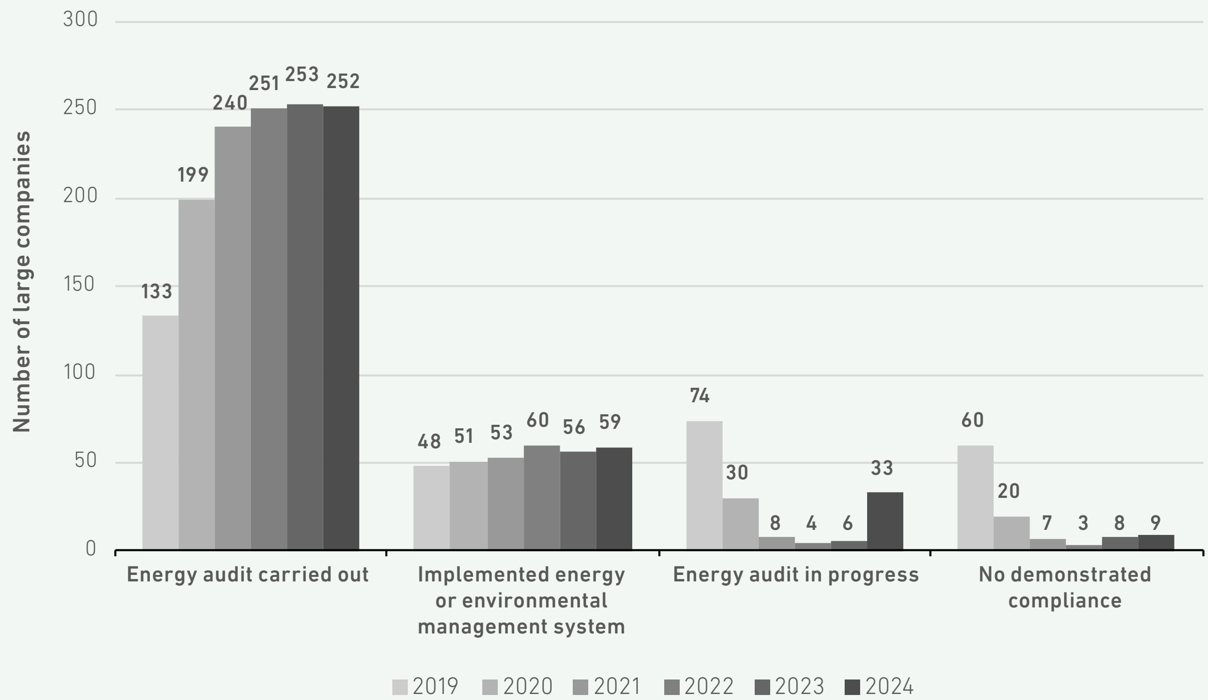
FIGURE 261: ENERGY AUDITS OF LARGE COMPANIES



SOURCE: ENERGY AGENCY

Figure 262 shows the compliance of large companies with their obligations to carry out energy audits in the period 2019–2024. The data show that most companies required to carry out energy audits are complying with the legal requirements. In 2024, 252 large companies fulfilled their obligation to carry out an energy audit, and 59 companies have an energy or environmental management system in place. However, there has been an increase in the number of companies conducting an audit. In 2024, there were 33, because many companies are repeating their energy audits after four years. It should also be noted that companies that have been newly classified as large companies have one calendar year from the date of classification to fulfil their obligation. Thus, general trends indicate consistent compliance with the obligation by most large companies and a positive impact of the regulation on improving energy efficiency through systematic monitoring of energy consumption.

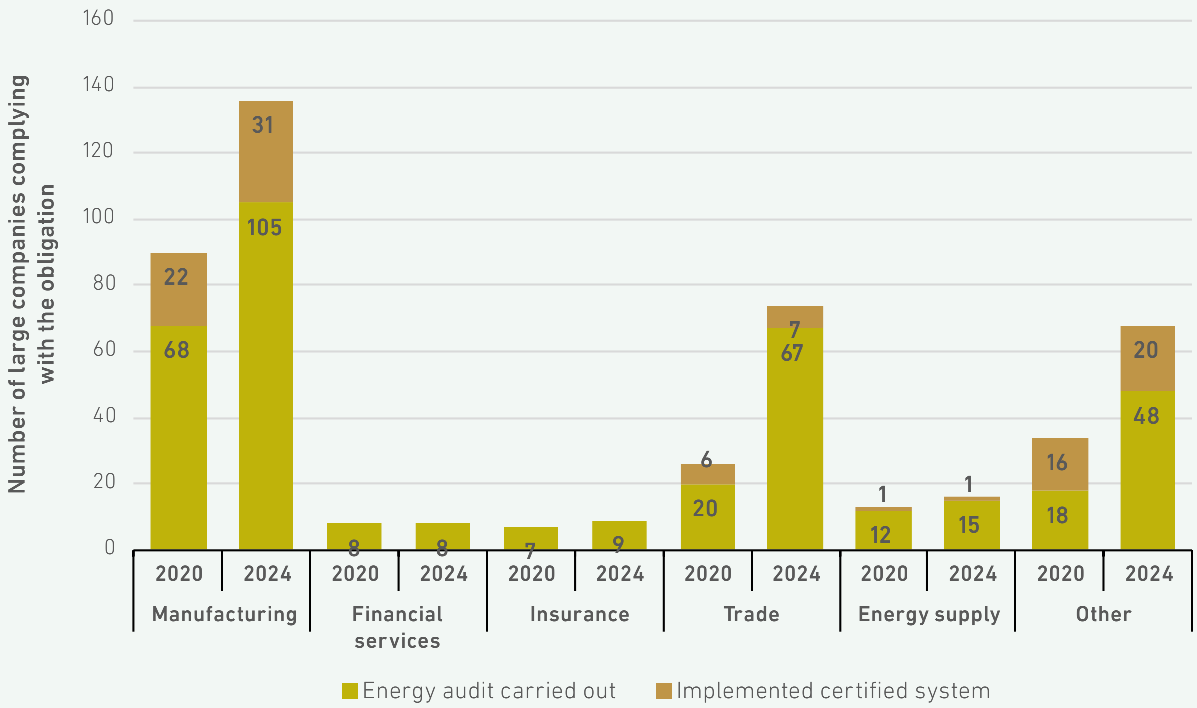
FIGURE 262: COMPARISON OF THE FULFILMENT OF OBLIGATIONS BY LARGE COMPANIES BETWEEN 2019 AND 2024



SOURCE: ENERGY AGENCY

Among the 311 companies that complied with the obligation, companies engaged in manufacturing predominate, with 42% having carried out an energy audit and 53% having established a certified energy or environmental management system, which the Energy Agency has certified as complying with the obligation to carry out an energy audit. A comparison of large companies by sector of activity with an energy audit carried out or a certified system in place, shown in Figure 263, shows that the highest share of certified systems in place and energy audits carried out is in manufacturing, with 55% of companies in this sector having a certified system in place, while approximately 42% of companies have carried out an energy audit. In the trade sector, around 27% of companies have carried out an energy audit, while significantly fewer companies (around 11%) have established a certified system. The »other« category is also strongly represented, with around 34% of companies having established a certified system and around 19% having carried out an energy audit. This activity shows low shares in both areas – less than 2% of companies have established a certified system, while around 5% of companies have carried out an energy audit. In insurance, 2% of companies have carried out an energy audit, but no certified system has been established. The situation is similar in financial services.

FIGURE 263: COMPARISON OF THE FULFILMENT OF OBLIGATIONS BY LARGE COMPANIES 2020 AND 2024



SOURCE: ENERGY AGENCY

HEAT

3.8% LOWER HEAT CONSUMPTION COMPARED TO 2023

Energy in the form of warm water, hot water, steam or cold

13.7% LOWER HEAT CONSUMPTION COMPARED TO 2022

4.5% LOWER PRIMARY FUEL CONSUMPTION

57.9% OF THE DISTRIBUTED HEAT

PRODUCED IN COGENERATION PRODUCTION PROCESSES

20.2% OF HEAT PRODUCED FROM RES

55.7% OF DISTRIBUTION SYSTEMS ARE ENERGY EFFICIENT

9.0% HIGHER AVERAGE RETAIL PRICE OF HEAT

HEAT

Supply of Heat

In 2024, there were 122 distribution systems registered in Slovenia for the supply of heat, of which 12 were newly registered privately owned distribution systems. The distribution systems were operated by 51 heat distributors in 68 municipalities.

3.8% lower consumption of heat compared to 2023

Heat distributors distributed 1,955.7 GWh of heat for heating and cooling buildings, domestic hot water and industrial steam processes, and supplied 1,592.7 GWh of heat to 156,754 customers. The difference is 363.0 GWh of heat distribution losses. Heat consumption by customers from registered distribution systems was 3.80% lower than in the previous year[152], and consumption was as much as 13.7% lower than in 2022. The downward trend in annual heat consumption by final consumers can be attributed primarily to high heat prices, lower annual temperature deficits and increasingly intensive thermal renovation of building envelopes. Relatively warm periods during the heating season also contributed to lower heat consumption from district heating systems, as some final consumers are increasingly compensating for daily temperature deficits with the help of built-in inverter air conditioning units.

13.7% lower consumption of heat compared to 2022

The number of heat consumers increased by 2.1% compared to the previous year. In terms of the structure of final consumers, the number of households, businesses and other consumers increased by 2.2%, while the number of industrial consumers decreased by 8.9%.

152 Due to subsequent corrections to data for the calendar year 2023 received from reporting entities, the year-on-year comparisons may differ slightly from last year's published data.

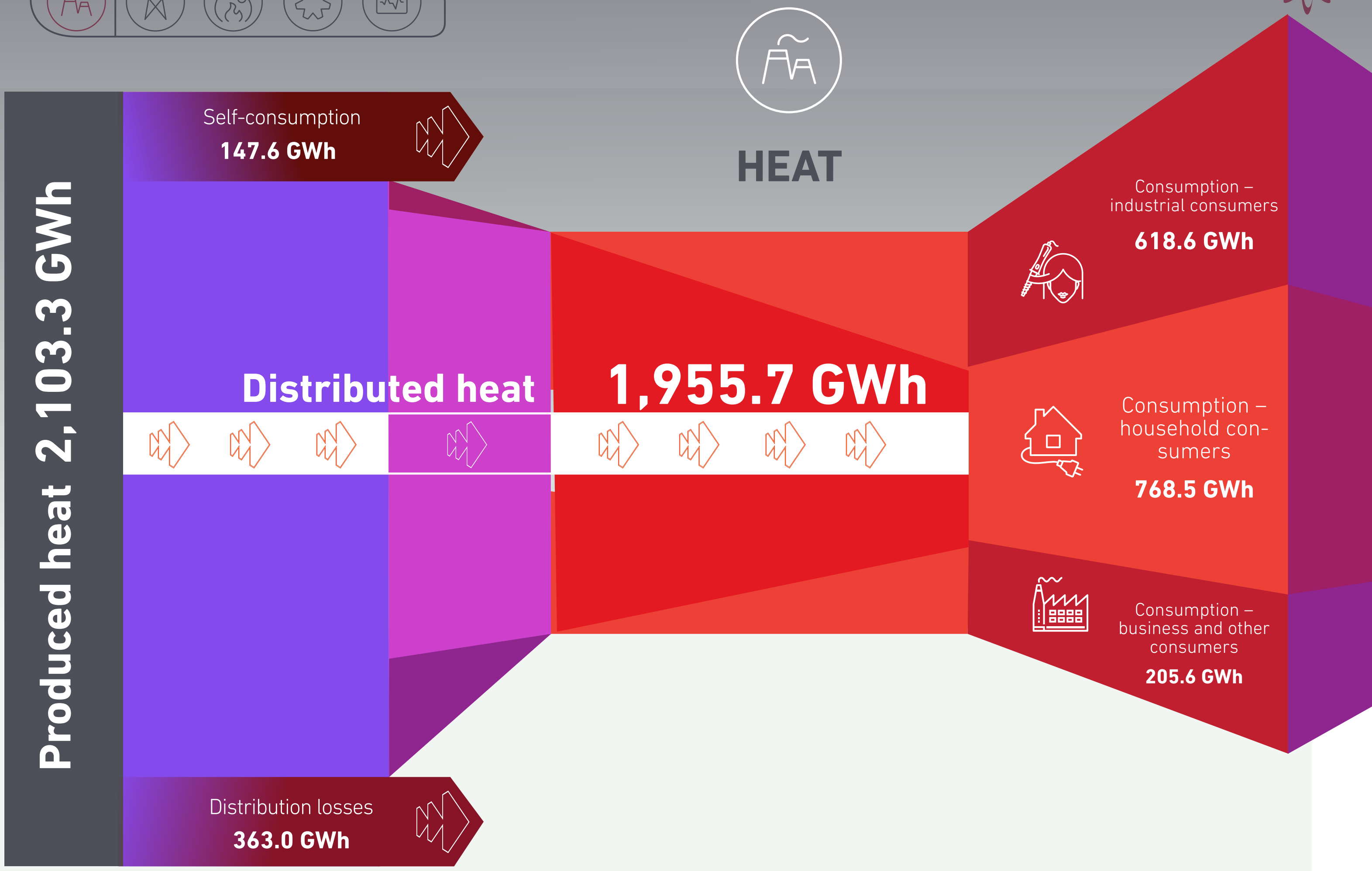


FIGURE 264: BASIC DATA ON PRODUCED AND DISTRIBUTED HEAT FOR CONSUMERS OF HEAT CONNECTED TO THE DISTRIBUTION SYSTEMS

SOURCE: ENERGY AGENCY

In 2024, the agency registered two major district cooling distribution systems with a total installed cooling capacity of 3.66 MW, which primarily supply business consumers in Velenje and industrial consumers in Kranj.

Heat distributors with their own production and heat producers supplying distribution systems produced 2,103.3 GWh of useful heat for space heating, domestic hot water, industrial processes, and their own needs. At the same time, 606.8 GWh of electricity was produced, or 536.2 GWh of electricity at the threshold of cogeneration production processes.

Heat for space heating, sanitary hot water and steam production generated in cogeneration production processes accounts for 67.1% of all useful heat produced (heat for own use and distribution system supply). The remaining 32.9% of heat was produced in other technological processes (wood biomass boilers, gas, liquefied petroleum gas, heat extraction from geothermal wells, waste heat from industrial processes, municipal waste incinerators, etc.). In the share of heat intended solely for distribution systems (excluding district cooling systems), heat from cogeneration sources accounted for 58.1%, which is a 17.8% decrease compared to the previous year.

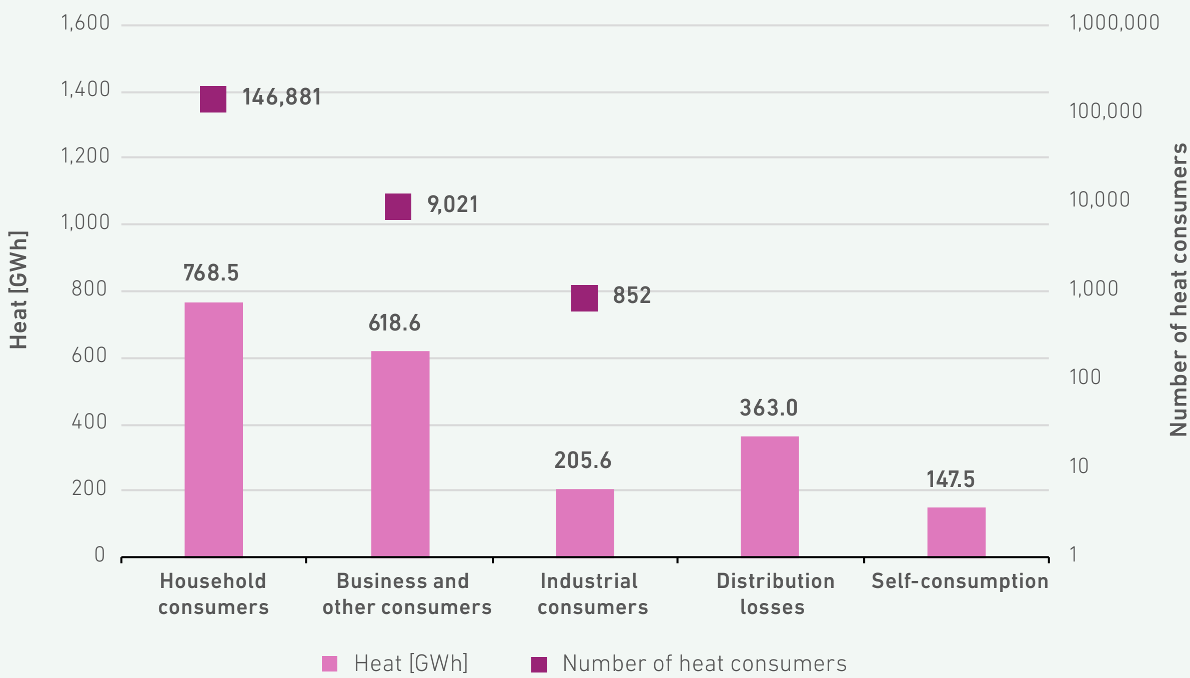
57.9% of distributed heat was produced in cogeneration units

The largest share, 36.6% of total useful heat produced, was used to supply 146,881 household consumers, 29.4% of heat was consumed by 9,011 business consumers, and 850 industrial consumers consumed 9.8% of heat. Heat producers and distributors used 7.0% of heat for their own needs (for industrial processes, space heating, and domestic hot water preparation), while the remaining 17.3% represented total distribution losses[153].

153 Total distribution losses also include distribution losses from internal distribution systems of heat producers. Due to rounding of shares, the sum of shares may not add up to 100%.

The consumption of useful produced heat in production processes supplying distribution systems, by type of consumers and their number, is shown in Figure 265.

FIGURE 265: HEAT CONSUMPTION BY THE TYPE OF CONSUMER AND THEIR NUMBER



SOURCE: ENERGY AGENCY

In 2024, 12.2 PJ of primary energy sources were used to supply the distribution systems. Due to the lower demand for heat by final consumers, the consumption of primary fuels was down by around 4.5% compared to the previous year.

A 4.5% decrease in primary fuel consumption

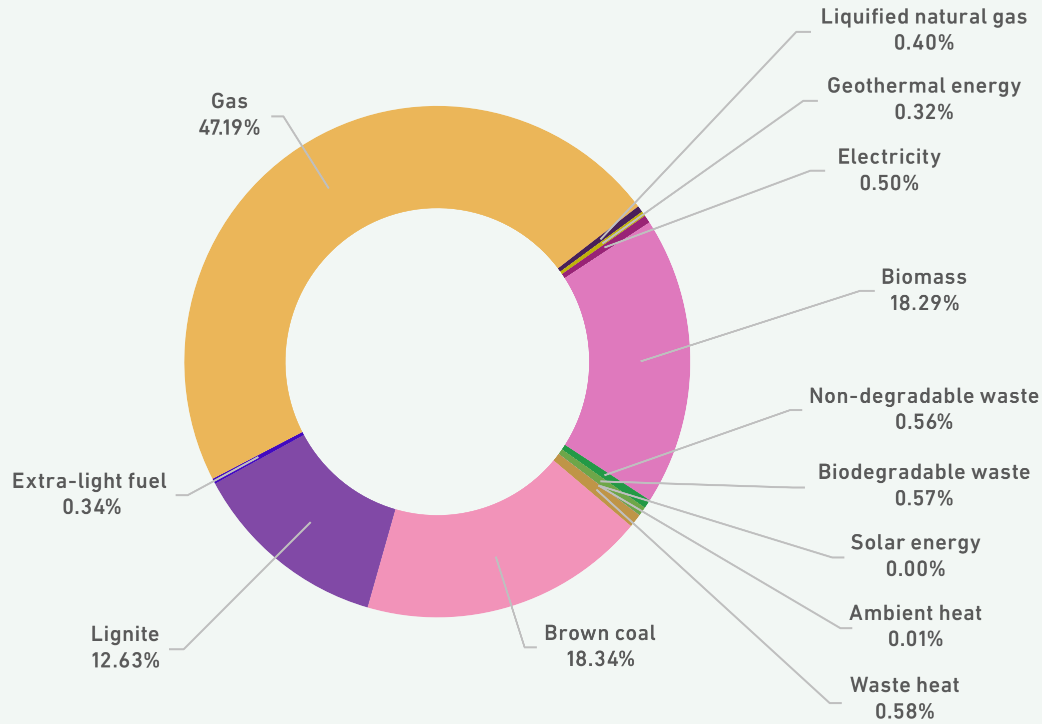
Gas, as the primary energy source for heat production, accounted for 47.19% in 2024, followed by coal with 30.97% and other primary energy sources with 21.84%. The share of gas increased by approximately 11.86% compared to 2023. The reason for this is the commissioning of two new gas turbines, which are part of a new gas-fired steam unit operated by Energetika Ljubljana, the largest heat distributor in Slovenia. The share of oil and oil derivatives as primary energy sources in the structure amounted to 0.74%, and renewable sources (wood biomass, geothermal energy)

18.62%, mixed municipal waste 1.13%, industrial waste heat 0.85% and electricity 0.50%.

Heat from mixed municipal waste for district heating systems was produced only in the Celje municipal waste incinerator, while waste heat from industrial processes was produced in the Ravne ironworks (SIJ Metal Ravne) and the Novartis Ljubljana pharmaceutical factory. Given the upward trend in the prices of other primary energy sources, the use of surplus heat from production processes to supply district heating systems is becoming an increasingly important factor in achieving an affordable supply of heat for consumers. Its increase compared to 2023 is 207.35%.

Figure 266 shows a more detailed structure of the primary energy sources used for heat production in 2024.

FIGURE 266: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS FOR HEAT PRODUCTION



SOURCE: ENERGY AGENCY

In the structure of primary energy sources, the shares of electricity, waste heat, and mixed municipal waste changed the most compared to the previous year (Figure 267). The lower consumption of coal, an energy-intensive primary energy source, is mainly due to the start of regular operation of the aforementioned gas-steam unit in Ljubljana. The gas-steam unit consists of two gas and steam turbines with a total rated thermal capacity of 148 MW. As a result, heat production in the existing coal-fired steam turbines is reduced, which means 18.35% lower coal consumption and an 11.86% higher share of gas in the primary fuel structure.

These energy sources account for 78.31% of the total energy value of fuels used to supply district heating systems.

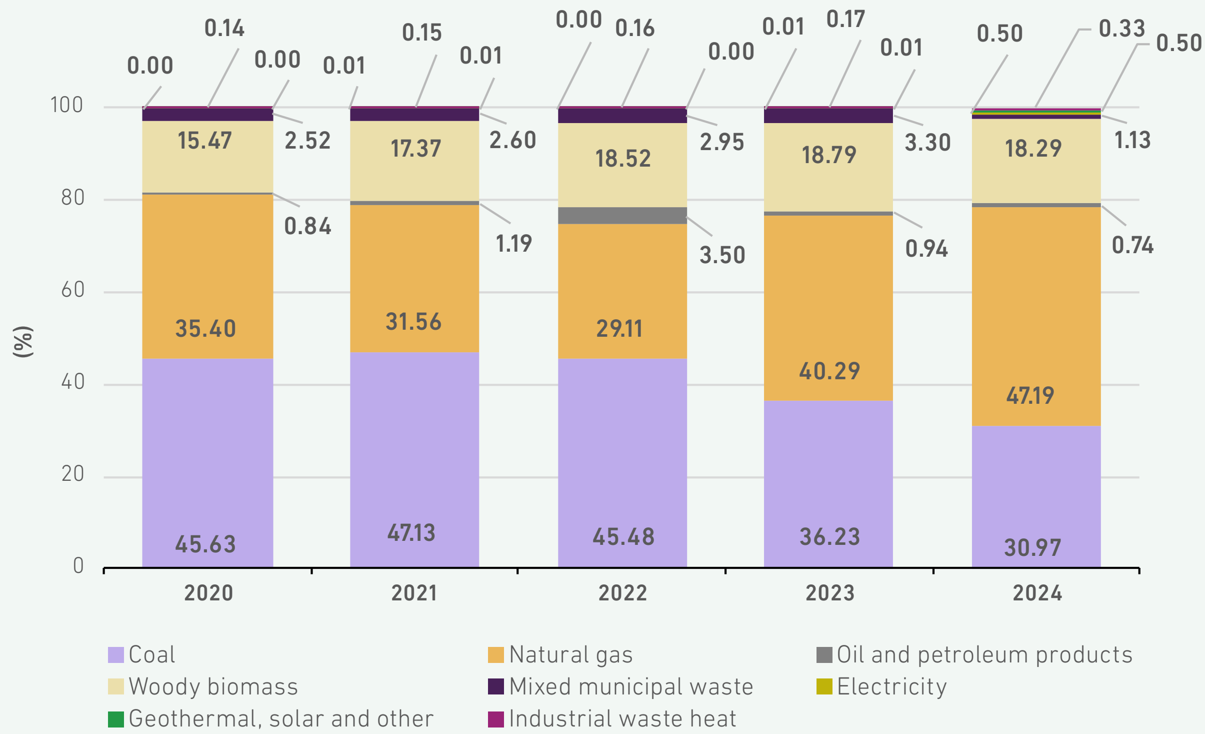
The consumption of petroleum derivatives, which are an alternative fuel to gas in certain production facilities and account for only 0.74% of the annual primary fuel structure, decreased by 24.40% compared to the previous year. Electricity consumption also increased significantly (accounting for 0.50% of the annual primary fuel structure), mainly due to the increased use of heat pumps and electric boilers, which mostly use electricity from their own solar power plants as the primary source for heat production.

18.35% lower coal consumption

11.86% higher gas consumption

In 2024, the price of heat from district heating systems was also affected by the still relatively high prices of CO_2 emission allowances. According to data from the European Energy Exchange portal, their average monthly offer price on the stock markets in 2024 was 66.1 EUR/ton of CO_2, which is a 20.9% decrease compared to the previous year. The average monthly offer prices for emission allowances in 2024 ranged between 52.2 EUR/tonne of CO_2 and 120 EUR/tonne of CO_2.

FIGURE 267: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS IN THE 2020–2024 PERIOD

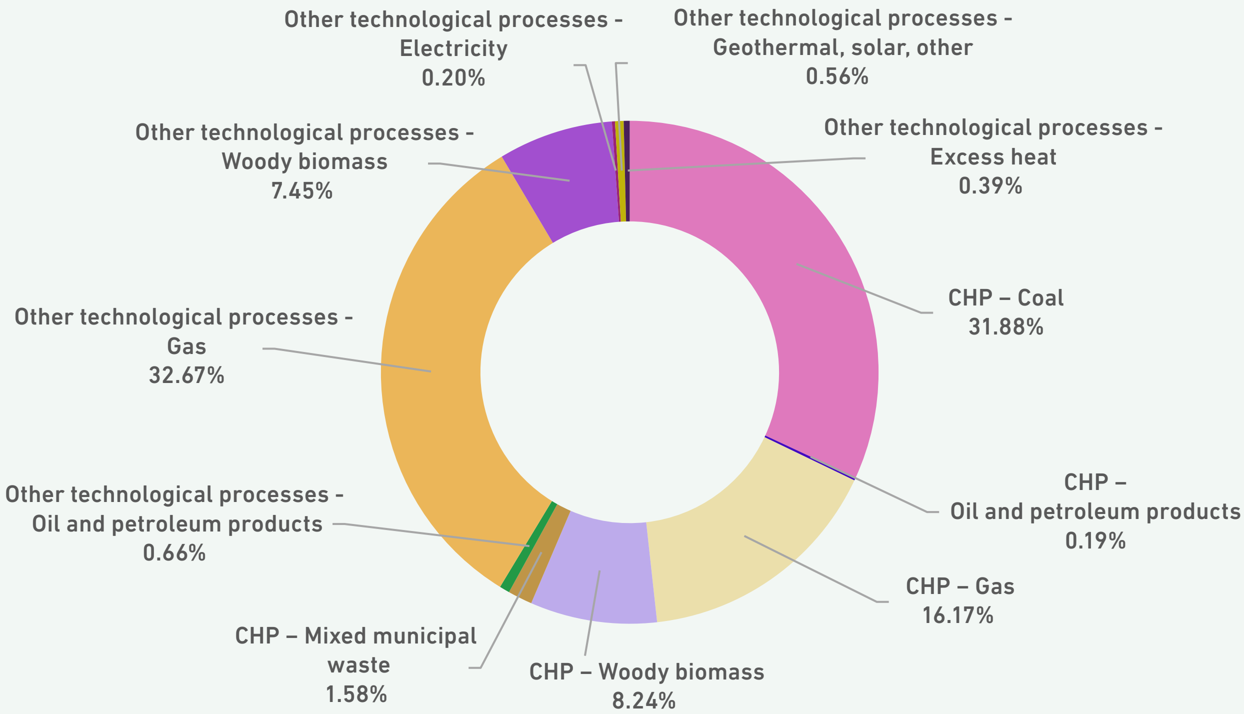


SOURCE: ENERGY AGENCY

Coal as a primary source was only used in cogeneration processes, with 239.3 GWh of gross electricity and 622.0 GWh of gross heat produced in cogeneration to supply heat distribution systems. Other cogeneration and other technological processes used natural gas as the primary energy source to a greater extent (294.0 GWh of gross electricity and 952.8 GWh of heat produced). Renewable sources produced 70.2 GWh of gross electricity and 341.8 GWh of heat. 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 268.

20.2% of heat produced from RES

FIGURE 268: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS[154] FOR HEAT PRODUCTION FOR DISTRIBUTION SYSTEMS



SOURCE: ENERGY AGENCY

The five largest distribution systems[155] in terms of the amount of heat supplied to final consumers accounted for 76.1% of all heat delivered from distribution systems in 2024. Distribution systems supplied 67.3% of all heat distribution system consumers. Heat distribution for space heating and cooling, and domestic hot water preparation was provided by 118 distribution systems, and steam preparation by two.

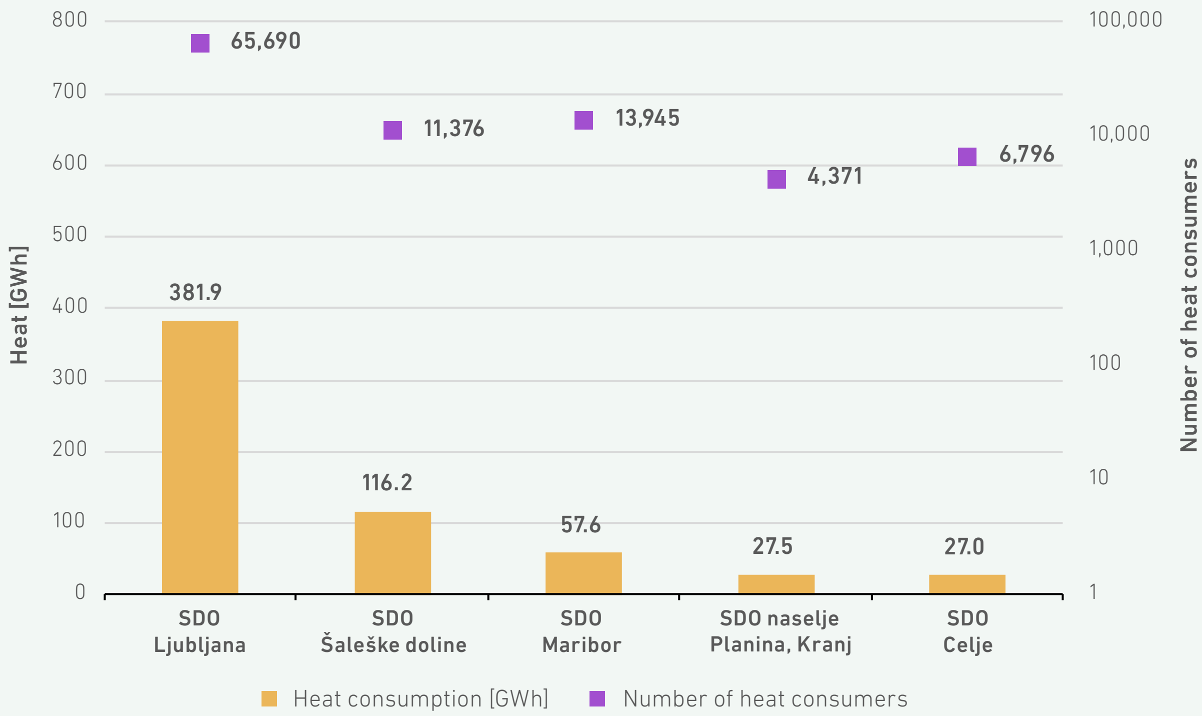
The five largest distribution systems supplying household consumers supplied 69.6% of all household consumers. They supplied them with 79.4% of the heat intended for household consumers,

or 53.4% of all heat supplied from these systems. The average annual consumption of a household consumer in 2024 was 5.2 MWh, while average annual distribution losses amounted to 19.3%.

The supply of household consumers was ensured by 96 distribution systems in 60 Slovenian municipalities. The above is illustrated in Figure 269.

154 Due to rounding values (shares) to two decimal places, there may be discrepancies in the total value of the shares.
155 Due to the intended use of steam systems (supplying only industrial processes), they are excluded from the comparison.

FIGURE 269: HEAT CONSUMPTION AND THE NUMBER OF HOUSEHOLD CONSUMERS OF THE FIVE LARGEST HEAT DISTRIBUTORS[156]

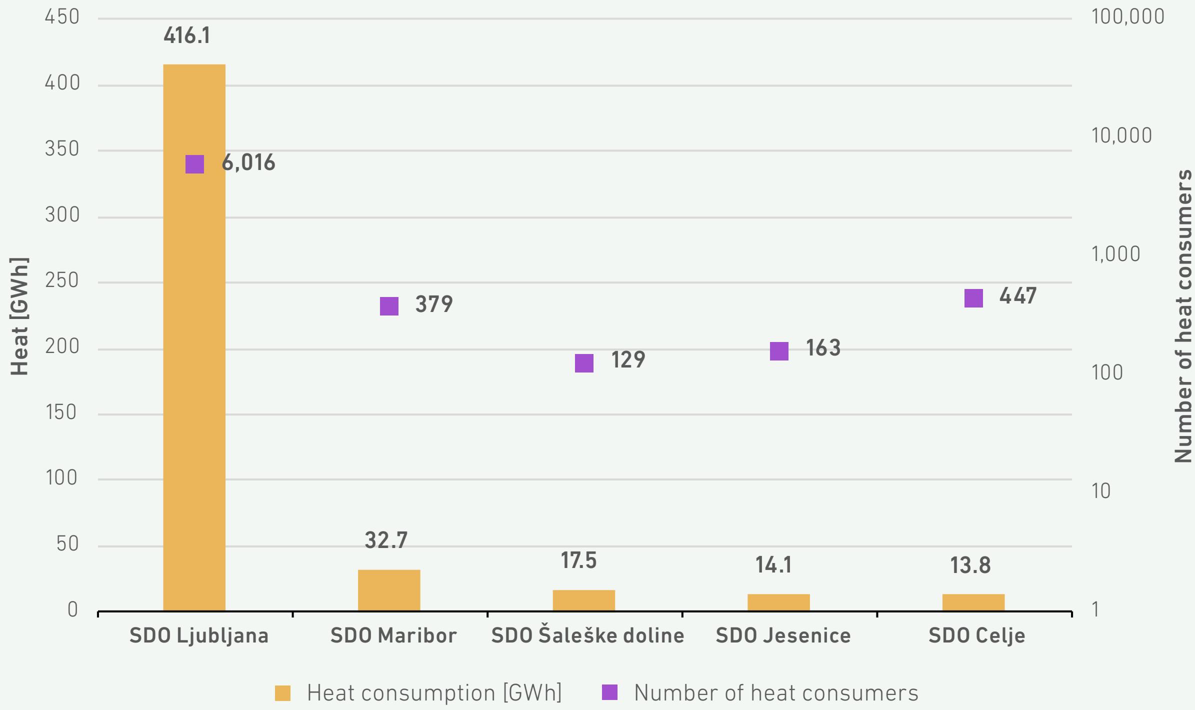


SOURCE: ENERGY AGENCY

The five largest distribution systems supplying heat for space heating and domestic hot water to business and other heat consumers supplied 79.2% of these consumers and provided them with 80.0% of all heat (Figure 270), intended for business and other consumers, or 41.8% of all heat supplied from these systems. The average annual consumption of a business consumer in 2024 was 68.5 MWh, with average annual distribution losses of 19.1%. In 2024, business and other heat consumers were supplied from 82 distribution systems in 62 Slovenian municipalities.

156 SDO – abbreviation used for district heating system

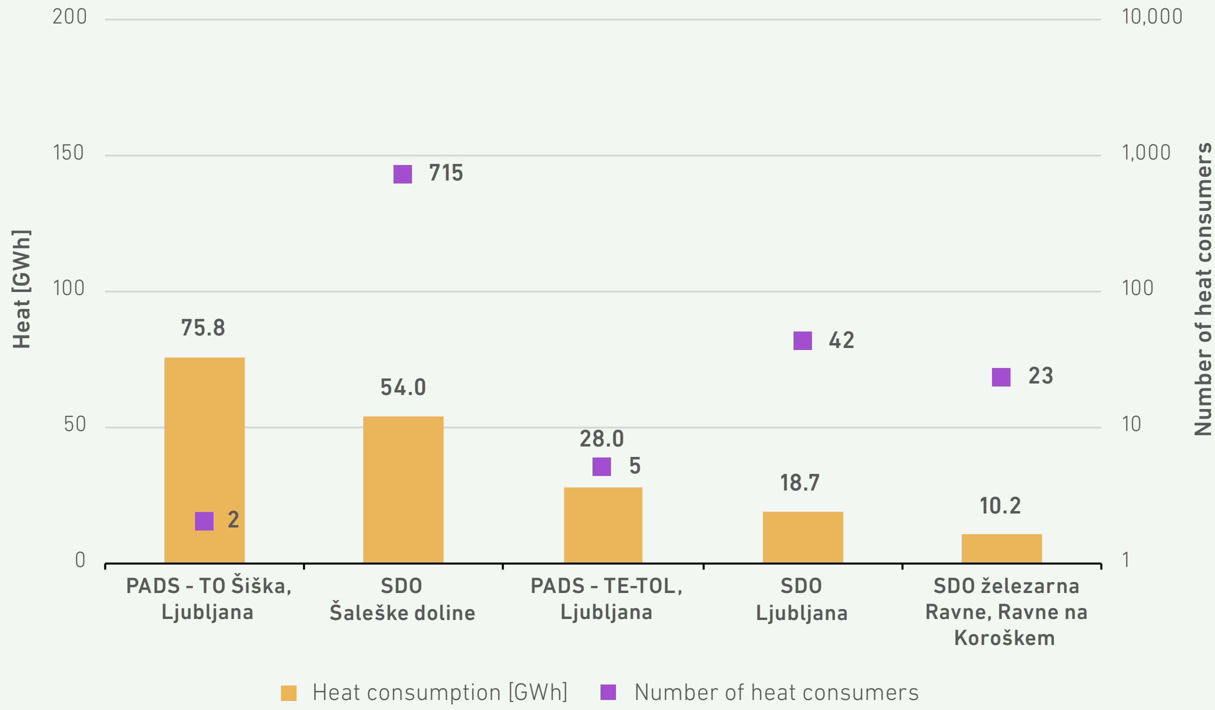
FIGURE 270: HEAT CONSUMPTION AND THE NUMBER OF BUSINESS AND OTHER CONSUMERS OF THE LARGEST HEAT DISTRIBUTORS



SOURCE: ENERGY AGENCY

In 2024, the five largest distribution systems supplying heat to industrial consumers for industrial processes, space heating, and domestic hot water supplied 92.6% of these consumers and provided them with as much as 90.9% of their heat (Figure 271). In terms of the total heat supplied to end consumers in distribution systems that provided heat to industrial consumers, industrial consumers accounted for 17.3% of consumption, with the average annual consumption of an industrial consumer reaching 241.8 MWh. In 2024, industrial customers were supplied from 20 distribution systems in 18 Slovenian municipalities.

FIGURE 271: HEAT CONSUMPTION AND THE NUMBER OF INDUSTRIAL CONSUMERS OF THE FIVE LARGEST DISTRIBUTORS[157]



SOURCE: ENERGY AGENCY

Heat Distribution Systems

According to the Energy Agency's records, heat supply from distribution systems[158] was in 2024 provided by 122 distribution systems (62 as public services, 19 commercial and 41 privately owned) in 68 Slovenian municipalities. The total length of the distribution system routes was 921.7 kilometres. Heat supply was provided as an optional local public service by 62 distribution systems operated by 34 distributors in 51 Slovenian municipalities. In 13 municipalities, heat supply was provided as a market activity and in 18 municipalities as a supply from privately owned distribution systems. The owned distribution systems in the municipalities of Kranj, Koper, Maribor, Krško, and Žalec are among the larger distribution systems for supplying household and business customers. In 2024, 15 privately owned distribution systems supplied 11,873 customers in the five municipalities mentioned above, including 11,746 households.

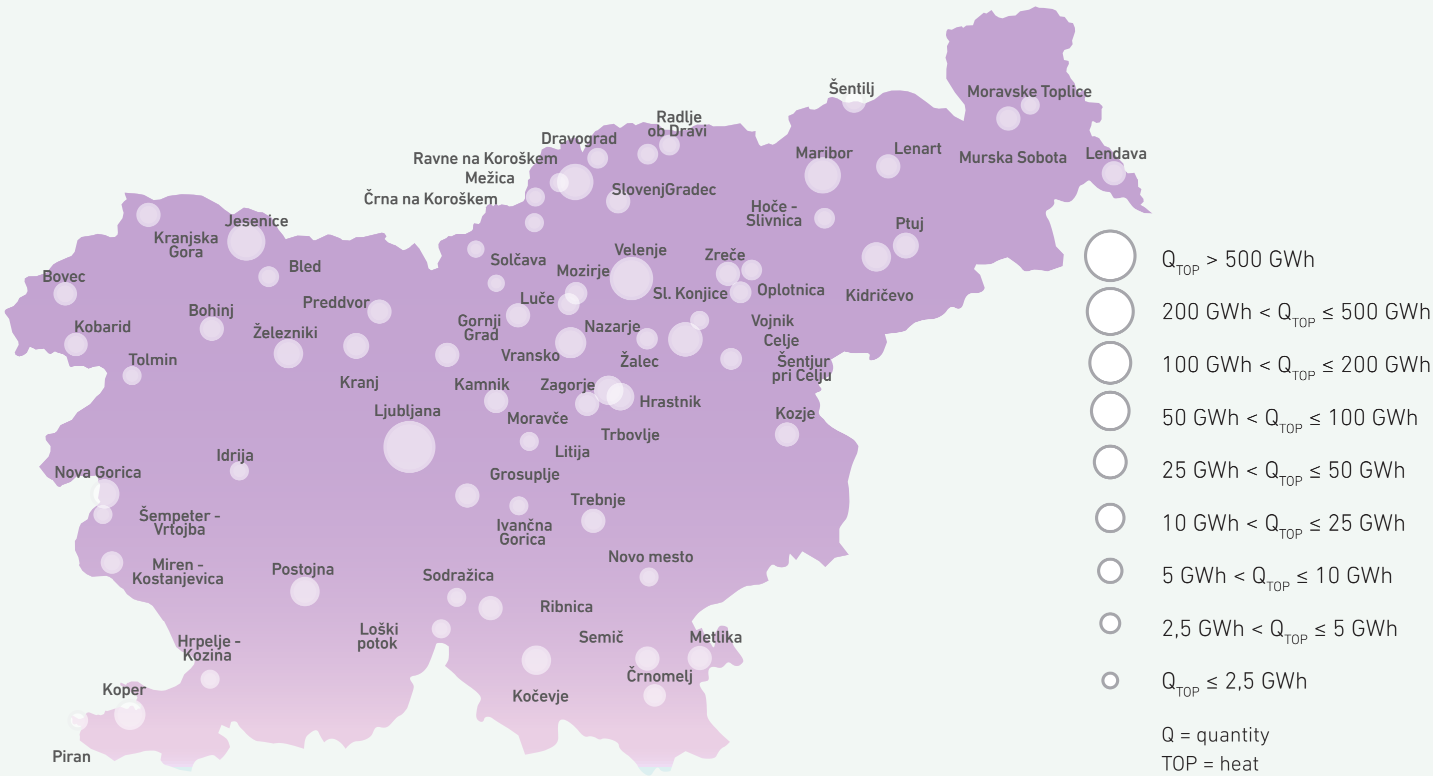
Distribution systems whose heat distribution activity was carried out as an optional local public service provided heat to 90.0% of heat consumers, while the share of heat supplied from these systems amounted to 92.5% of all heat supplied from distribution systems.

The only large district cooling distribution systems remain in the municipalities of Velenje and Kranj, with a total network length of 1.6 kilometres.

Figure 272 shows the municipalities with distribution systems and the quantities of heat distributed in 2024.

157 PADS – abbreviation used for steam distribution system
158 Distribution systems do not include internal distribution systems of heat producers.

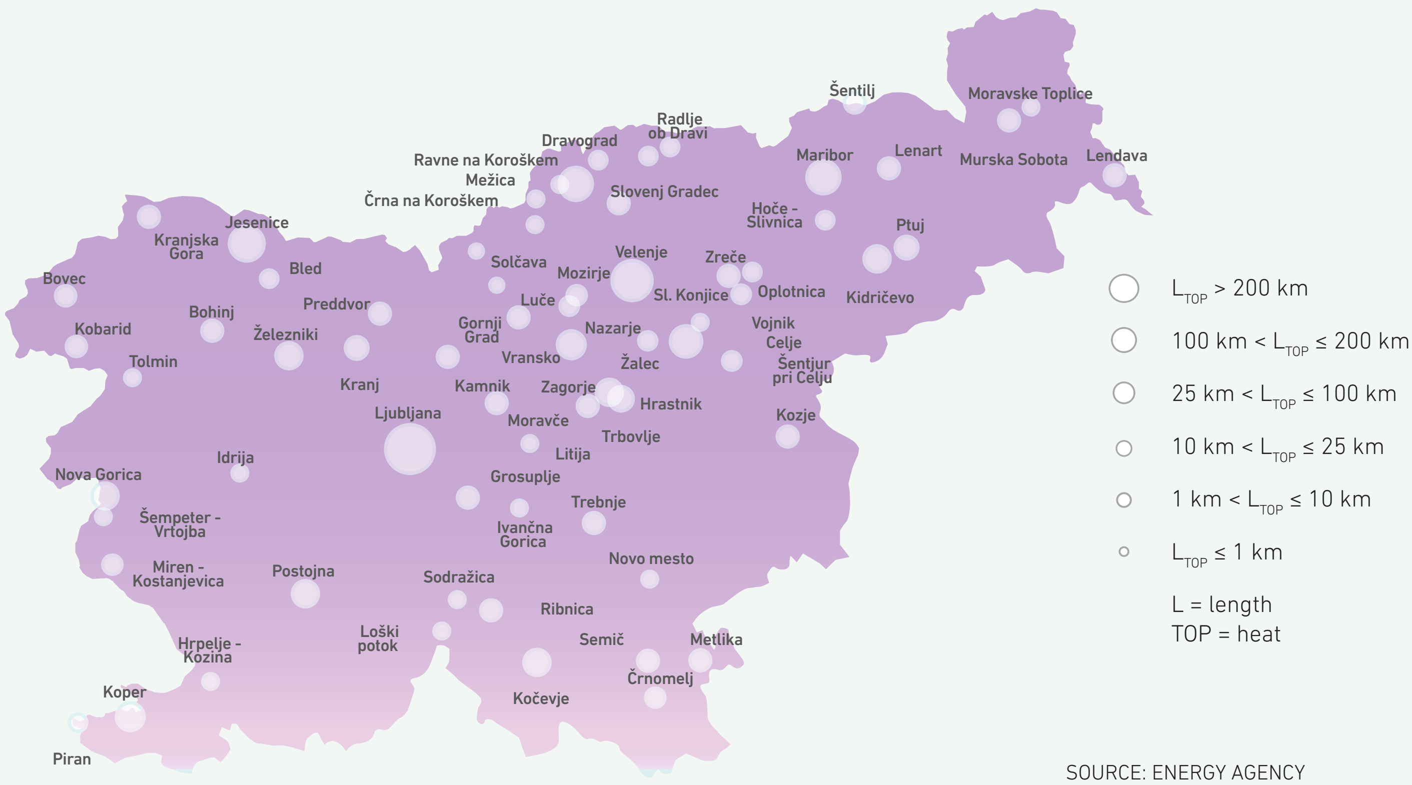
FIGURE 272: QUANTITIES OF DISTRIBUTED HEAT BY SLOVENIAN MUNICIPALITIES



SOURCE: ENERGY AGENCY

Concerning 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 lengths of the warm water and hot water distribution systems account for 99.0% of the total length of distribution system routes, steam distribution systems account for 0.8%, and cooling distribution systems account for slightly less than 0.2% of the total length of distribution systems. The longest heat distribution systems remain in Ljubljana (280.3 kilometres of hot water distribution system) and Velenje with Šoštanj (180.1 kilometres of hot water distribution system). The average length of heat distribution systems was 7.6 kilometres, while hot water distribution systems recorded average annual heat distribution losses of 19.4% of all distributed heat. Average annual heat distribution losses in district cooling and steam distribution systems reached 9.7%, which can be attributed to the shorter length of these distribution systems.

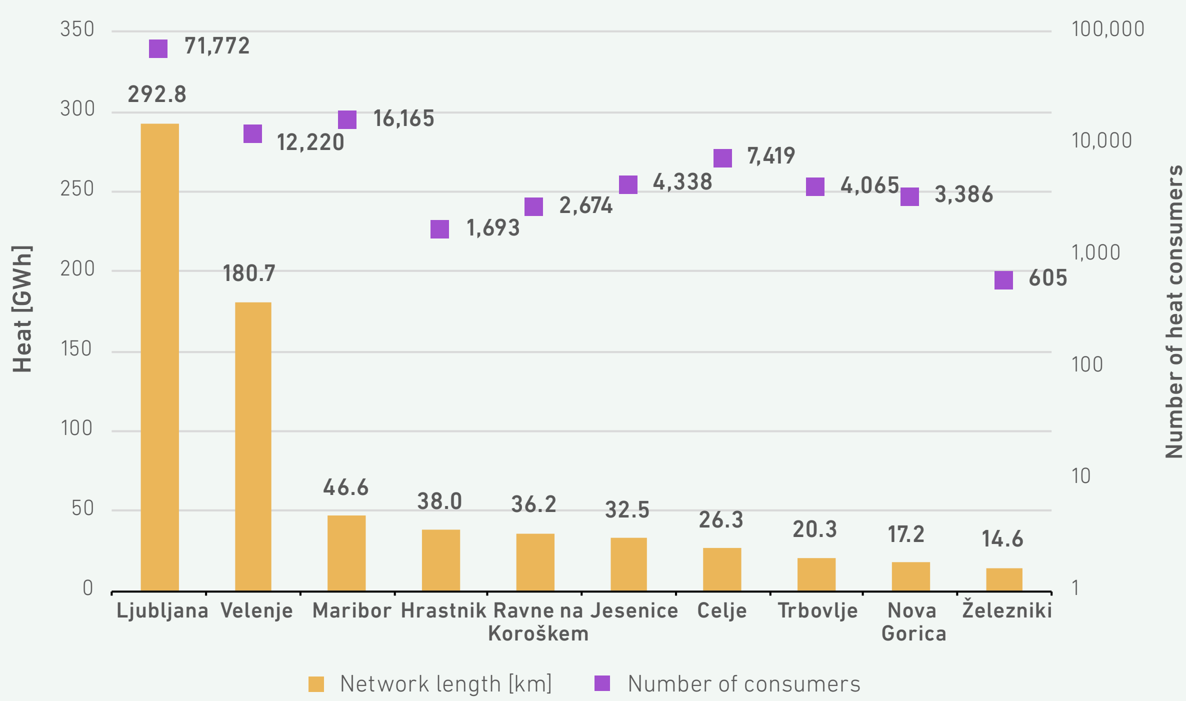
FIGURE 273: LENGTH OF THE HEAT DISTRIBUTION SYSTEMS IN THE SLOVENIAN MUNICIPALITIES



SOURCE: ENERGY AGENCY

Figure 274 shows the first ten municipalities in terms of the total length of registered heat distribution systems and the number of heat consumers in 2024.

FIGURE 274: 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.

The Energy Agency monitors which heat distribution systems meet the criteria each year and publishes a list of energy-efficient heat distribution systems on its website (https://www.agen-rs.si/izvajalci/toplota/ucinkoviti-distribucijski-sistemiww).

55.7%
of distribution systems
are energy-efficient

According to these criteria, in 2024, out of 122 registered heat distribution systems where heat distribution is carried out as an optional local public service or market activity, or where it is a privately owned distribution system, 68 distribution systems were energy efficient (meaning that they met at least one of the criteria, some even more). Compared to 2023, the number of efficient distribution systems remains unchanged, although the number of registered distribution systems increased by 12. Most distribution systems, namely 54, met the energy efficiency criterion by generating at least 50% of the distributed heat directly or indirectly from RES. Only four distribution systems met the energy efficiency criterion that at least 75% of the distributed heat was produced in cogeneration. No distribution system met the criterion that at least 50% of the distributed heat was produced from waste heat.

A heat distribution system can also be energy efficient if at least 50% of the distributed heat is produced from a combination of at least two of the sources mentioned above. 16 distribution systems met this criterion.

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 supply for residential heating and domestic hot water based on publicly available price lists of heat distributors for 2024 for a typical household heat consumer in a multi-dwelling building with an annual billing power of 6.54 kW and an average annual consumption of 4.32 MWh.

In 2024, distribution systems in selected municipalities supplied 78.0% of all supplied household consumers, and the amount of heat they took over amounted to 85.6% of all heat delivered to these consumers.

The average retail prices of heat in the municipalities mentioned above[159] are shown in Figure 275. They are calculated as the average monthly retail prices for a typical household heat consumer in a multi-dwelling building in each selected municipality, and the average monthly retail price of heat for the whole of Slovenia, weighted by the number of household consumers supplied, is also shown.

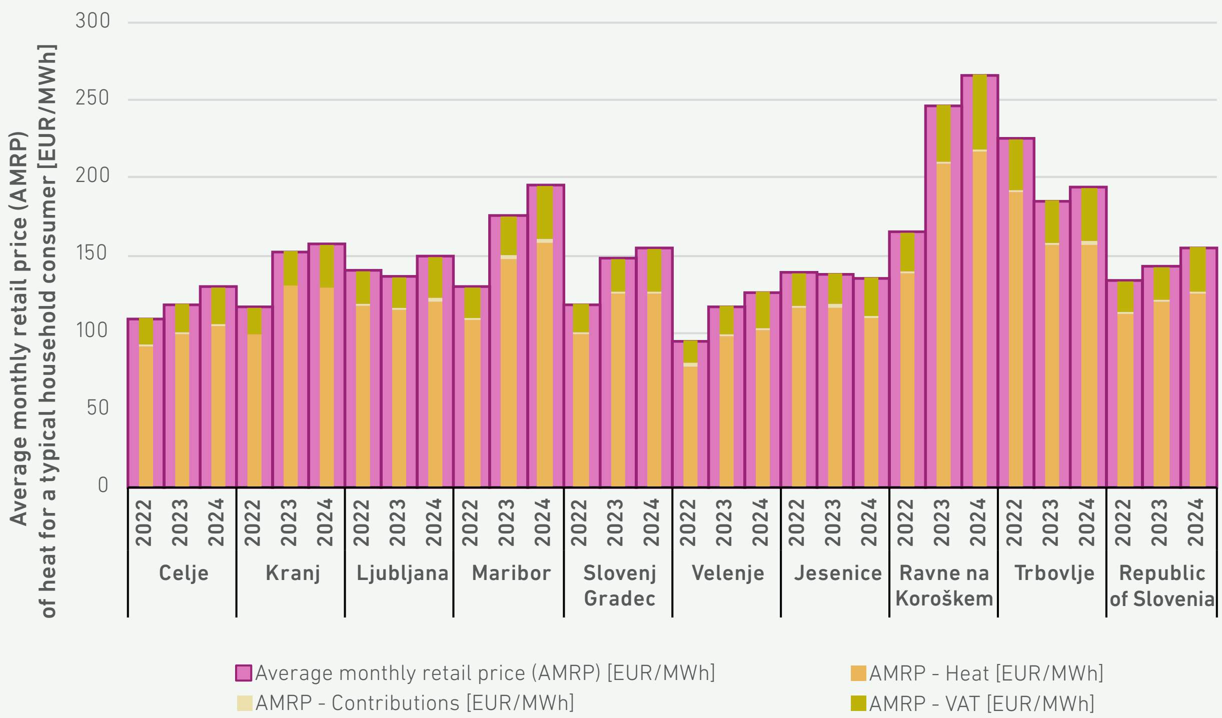
A 9.0%
higher average retail price of heat

The average monthly retail price of heat for household consumers increased by an average of 9.0% in all the municipalities mentioned compared to the previous year and amounted to 155.2 EUR/MWh in 2024. The highest price was achieved in Ravne na Koroškem, at 266.17 EUR/MWh, followed by Maribor at 195.29 EUR/MWh and Trbovlje at 193.87 EUR/MWh. The lowest average price was provided by the district heating distribution system in Velenje and Šoštanj at 126.18 EUR/MWh, while the second lowest price was in Celje at 129.60 EUR/MWh. The most significant increase in the average retail price of heat compared to the previous year was recorded in Maribor, 11.2%, while the only decrease was in Jesenice, 2.1%.

159 A comparison of average retail prices due to changes in the consumption characteristics of a typical heat consumer cannot be made using the retail prices published in the Energy Agency's annual reports for previous years.

Based on the methodology for determining the consumption characteristics of typical heat consumers in the Republic of Slovenia, the Energy Agency carried out a correction in the second half of 2024 (change) of the consumption characteristics of household heat consumers in multi-dwelling buildings that use heat for heating residential areas. Heated buildings and their average annual consumption and rated heat output are classified in energy efficiency class D according to the energy efficiency classification of buildings.

FIGURE 275: CHANGES IN THE AVERAGE RETAIL PRICE OF HEAT FOR HOUSEHOLD CONSUMERS IN INDIVIDUAL SLOVENIAN CITIES IN THE 2022–2024 PERIOD



SOURCE: ENERGY AGENCY

Regulating the Price of Heat for District Heating

The Energy Agency regulates the price of heat for district heating based on the current Act on the Heat Supply Pricing Methodology. Entities subject to regulation are heat distributors performing an optional service of general economic interest using distribution systems to which more than 500 household consumers are connected. Heat producers supplying heat to such systems are also subject to regulation.

The regulated entities must obtain the Energy Agency's consent to the first determined heat price for a particular distribution system or heat supply and to any change in the starting heat price. However, these entities must only notify the regulatory authority about the adjustment of the individual elements of the starting heat price due to changes in eligible costs. In all cases, the starting price for heat has to be established in accordance with the criteria and references set out in the Act mentioned above.

The Energy Agency was dealing with requests for approval of the initial heat price of regulated entities, which it granted because they met the criteria for submitting a new request under the Act on the

Heat Supply Pricing Methodology. These criteria relate to major technological changes, changes to the tariff system, changes to the planned quantities of heat distributed by more than 20% or changes to the planned billing power of consumers by more than 10%, a significant change or discontinuation of a specific activity of the company, and a lower realised cost price than the last valid average price.

It monitored and analysed adjustments to base heat prices due to changes in eligible costs, and also supervised the method of heat billing and the publication of heat tariff items. In 2024, it received 128 notifications of adjustments to the variable and fixed components of the base heat price. The base heat prices were adjusted mainly due to changes in the prices of energy sources for heat production.

Unbundling

Distributors performing services of general economic interest and carrying out activities other than heat distribution should keep separate accounts in accordance with the 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 expenditures, and revenues, taking into account 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 judgements should be audited annually by an auditor, who must produce a special report.

LIST OF ABBREVIATIONS AND ACRONYMS

ACER	Agency for the Cooperation of Energy Regulators
Agencija za energijo	Energy Agency
AI	Artificial Intelligence
AJPES	Agency of the Republic of Slovenia for Public Legal Records and Related Services
AM	Amortization
AMR	Automatic Meter Read
AMRP	Average monthly retail price
AMS	Advance Metering System
APG	Austrian Power Grid
aFRR	Automatic Frequency Restoration Reserve
ATC	Available Transfer Capacities
B2B	Business to Business
B2C	Business to Consumer
B2G	Business to Government
BEV	Battery Electric Vehicle
BG	Balance Group
Borzen	BORZEN, Market operator
BSP	BSP, Regional Energy Exchange, Southpool
CDS	Closed Distribution System
CDS / ZDS	Closed distribution system
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
CEGHIX	Central European Gas Hub AG Vienna Index
CEP	Clean Energy Package
CEREMP	Central European Registry for Energy Market Participants
CERT-EU	The Computer Emergency Response Team for the EU institutions, bodies and agencies
CHP	Combined Heat and Power
CIM	Common Information Model (IEC 61970-3XX)
CONE	Cost of New Entry
CPO	Charge Point Operator
CROPEX	Croatian Power Exchange
CSD	Social Work Centre
CUO	Price for using the network
CZP	Cross-zonal capacity
DA	Day-Ahead
DOM / CP	Contracted Capacity
DSO / OPS	Distribution system operator

E / I	Incentives
EAFO	European Alternative Fuels Observatory
ebIX	European Forum for Energy Business Information eXchange
EC	European Commission
EDP /EDC	Electricity distribution company
EE	Electricity
EENS	Expected energy non-served
EEX	European Energy Exchange AG, Leipzig
EFET	European Federation of Energy Traders
ENISA	The European Union Agency for Cybersecurity
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
EPOS	E-Reporting of energy service providers
EPRI	Electric Power Research Institute, Washington
ERAA	European Resource Adequacy Assesment
ET / UT	Uniform Tariff
EU	European Union
EU DSO	EU DSO Entity
EU ETS	EU Emissions Trading System
EUA	European Union Allowance
EV	Electric vehicle
EVT /SEP	Single Entry Point
EVT/Portal CEEPS	A hub providing data exchange between electricity distributors and suppliers, end-users and their proxies; a central data hub for the exchange of electricity market data
EXAA	Energy Exchange Austria
EZ-1	Energy Act, Official Gazette of the Republic of Slovenia, No. 60/19 – uradno prečiščeno besedilo, 65/20, 158/20 – ZURE, 121/21 – ZSROVE, 172/21 – ZOEE, 204/21 – ZOP, 44/22 – ZOTDS in 38/24 – EZ-2
EZ-2	Energy Act, Official Gazette of the Republic of Slovenia, No. 38/24
FCR	Frequency containment reserve
FB	Flow Based
GDPR	General Data Protection Regulation
GJS	Service of general economic interest
GME	Gestore Mercati Energetici, Italian Exchange
GO /HC	Household consumer
HEP	Hrvatska elektroprivreda d.d.
HESS	Hidroelektrarne na Spodnji Savi, d.o.o.
HHI	Herfindahl-Hirschmanov indeks koncentracije trga
HPPP	Hydroelectric Power Plant
HSE	HOLDING SLOVENSKE ELEKTRARNE d.o.o.
HUPX	Hungarian Power Exchange
HV	High Voltage
ICS	Industrial Control Sistems
ICS-CERT	Industrial Control Systems Cyber Emergency Response Team
ICT	Information and Communications Technology
ID	Intraday
IDA	Implicit Intraday Auction
IGCC	International Grid Control Cooperation
IoT	Internet of Things
IOTEE / NEMO	Nominated Electricity Market Operator
IPET	Energy Market Data Exchange (IPET Section)

IT	Information Technology (Business Informatics)
JAO	Joint Allocation Office
JPEL	JAVNO PODJETJE ENERGETIKA LJUBLJANA d.o.o.
KO / FC	Final Consumer
KPI	Key Performance Indicator
LNG	Liquefied Natural gas
LOLE	Loss of Load Expectation
MAIFI	Momentary Average Interruption Frequency Index
mFRR	Manual Frequency Restoration Reserve
MID	Measuring Instruments Directive
MM / DP	Delivery Point
MRS	Metering-Regulation Station
MS-ISAC	Multi-State Information Sharing and Analysis Center
MT / LT	Low tariff
NCA	National Competent Authority for Cyber Security
NCCS	Network Code on Cybersecurity
NEK / NPP	NUKLEARNA ELEKTRARNA KRŠKO d.o.o. (Nuclear Power plant)
NEPN	National energy and climate plan
NN / LV	Low voltage
NOKI	National Cyber Incident Response Plan
nPPA	Nuclear Power Purchase Agreements
NRA	Nacional Regulatory Authority
OT	Operational technology
P	Power
PADS	Steam distribution system
PCI	Projects of Common Interest
PHEV	Plug-in hybrid electric vehicles
PLC	Programmable Logic Controller
PM / CP	Charging (recharging) point
PO / BC	Business consumer
POM	Exceeding contracted capacity
POMP / MDPP	Measurement data processing platform
PPA	Power Purchase Agreements
PSI / BSP	Balancing Service Provider
Q	Quality of Supply
RDS / RDA	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
REMIT II	Regulation (EU) 2024/1106 of the European Parliament and of the Council of 11 April 2024 amending Regulations (EU) No 1227/2011 and (EU) 2019/942 as regards improving the Union's protection against market manipulation on the wholesale energy market
RES	Renewable Energy Sources
RI	Research and Innovations
RISIG	REMIT Information Security Implementation Group (skupina za implementacijo informacijske varnosti REMIT)
RN / DP	Development plan
RO / RF	Regulatory framework
RRM	Registered Reporting Mechanism
RTP / DS	Distribution substation
RTU	Remote Terminal Unit

S / I	Incentives
S(E)	Incentives for successful smart grid investments
SAFA	Synchronous Area Framework Agreement for Continental Europe
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SDO / DSH	District heating system
SDV /OMC	Operating and maintenance costs
SEEI	Costs of network losses
SEVF	Slovenian Energy Security Forum
SGTF	Smart Grid Task Force
SHB	Slovenia, Croatia, Bosnia and Herzegovina (block SHB)
SI-CERT	Slovenian Computer Emergency Response Team
SIDC	Single IntraDay Coupling
SIPX	Slovenian Price Index
SKM	PPS - Power Purchase Standard
SKT	Single Contact Point
SN / MV	Middle Voltage
SO GL	System Operation Guideline (Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation)
SONDSEE	System operating instructions for the electricity distribution system
SONPO-E	System operating instructions for the electricity transmission system of the Republic of Slovenia (Official Gazette of the RS, No. 29/16)
SS / AS	System services / Ancillary Services
SSP	Distribution operator flexibility service costs
SURS / STAT	Statistical Office of the Republic of Slovenia
T	Annual operational hours
TEB	TERMOELEKTRARNA BRESTANICA d.o.o.
TEŠ	TERMOELEKTRARNA ŠOŠTANJ d.o.o.
TP / TS	Transformation station
TPP	Thermoelectric Power Plant
TPP / TE-TOL	Termoelektrarna Toplarna Ljubljana
URSIV	Government Information Security Office
US-CERT	United States Computer Emergency Readiness Team
USEF	Usef Energy – Universal Smart Energy Framework
V2G	Vehicle-to-Grid
VOLL	Value of Lost Load
WELMEC	Western European Legal Metrology Cooperation
ZGD-1	Companies Act
ZIAG	The Act on infrastructure for alternative fuels and promotion of the transition to alternative fuels in transport
ZOEE	Electricity Supply Act
ZOP	Gas Supply Act
ZOTDS	Act on the heat supply from distribution systems
ZSROVE	Act on the promotion of the use of renewable energy sources
ZUOKPOE	Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply
ZURE	Act on Energy Efficiency

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